



## Open Source Used In WSA Secure Web Appliance 14.5.3 (WSA)

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Julian Seward, Cambridge, UK.

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bzip2/libbzip2 version 1.0.4 of 20 December 2006

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-- \$Id: README,v 1.2 2000/03/12 02:39:12 Daniel.Weaver Exp \$

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-----
```

```
-- $Id: AUTHORS,v 1.2 2006/10/28 21:44:52 tom Exp $
-----
```

These are the principal authors/contributors of ncurses since 1.9.9e,  
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TD Thomas E. Dickey  
JPF Juergen Pfeifer  
ESR Eric S Raymond  
AVL Alexander V Lukyanov  
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# 1.4 ncurses 5.7

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# 1.5 libjpeg 6b

## 1.5.1 Notifications :

This software is based in part on the work of the Independent JPEG Group.

## 1.5.2 Available under license :

The Independent JPEG Group's JPEG software

=====

README for release 6b of 27-Mar-1998

=====

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Serious users of this software (particularly those incorporating it into

larger programs) should contact IJG at [jpeg-info@uunet.uu.net](mailto:jpeg-info@uunet.uu.net) to be added to our electronic mailing list. Mailing list members are notified of updates and have a chance to participate in technical discussions, etc.

This software is the work of Tom Lane, Philip Gladstone, Jim Boucher, Lee Crocker, Julian Minguillon, Luis Ortiz, George Phillips, Davide Rossi, Guido Vollbeding, Ge' Weijers, and other members of the Independent JPEG Group.

IJG is not affiliated with the official ISO JPEG standards committee.

## DOCUMENTATION

### ROADMAP

=====

This file contains the following sections:

|                   |                                                     |
|-------------------|-----------------------------------------------------|
| OVERVIEW          | General description of JPEG and the IJG software.   |
| LEGAL ISSUES      | Copyright, lack of warranty, terms of distribution. |
| REFERENCES        | Where to learn more about JPEG.                     |
| ARCHIVE LOCATIONS | Where to find newer versions of this software.      |
| RELATED SOFTWARE  | Other stuff you should get.                         |
| FILE FORMAT WARS  | Software *not* to get.                              |
| TO DO             | Plans for future IJG releases.                      |

Other documentation files in the distribution are:

User documentation:

|             |                                                                        |
|-------------|------------------------------------------------------------------------|
| install.doc | How to configure and install the IJG software.                         |
| usage.doc   | Usage instructions for cjpeg, djpeg, jpegtran, rdjpgcom, and wrjpgcom. |
| *.1         | Unix-style man pages for programs (same info as usage.doc).            |
| wizard.doc  | Advanced usage instructions for JPEG wizards only.                     |
| change.log  | Version-to-version change highlights.                                  |

Programmer and internal

documentation:

|                |                                                            |
|----------------|------------------------------------------------------------|
| libjpeg.doc    | How to use the JPEG library in your own programs.          |
| example.c      | Sample code for calling the JPEG library.                  |
| structure.doc  | Overview of the JPEG library's internal structure.         |
| filelist.doc   | Road map of IJG files.                                     |
| coderrules.doc | Coding style rules --- please read if you contribute code. |

Please read at least the files `install.doc` and `usage.doc`. Useful information can also be found in the JPEG FAQ (Frequently Asked Questions) article. See ARCHIVE LOCATIONS below to find out where to obtain the FAQ article.

If you want to understand how the JPEG code works, we suggest reading one or

more of the REFERENCES, then looking at the documentation files (in roughly the order listed) before diving into the code.

## OVERVIEW

=====

This package contains C software to implement JPEG image compression and decompression. JPEG (pronounced "jay-peg") is a standardized compression method for full-color and gray-scale images.

JPEG is intended for compressing "real-world" scenes; line drawings, cartoons and other non-realistic images are not its strong suit. JPEG is lossy, meaning that the output image is not exactly identical to the input image. Hence you must not use JPEG if you have to have identical output bits. However, on typical photographic images, very good compression levels can be obtained with no visible change, and remarkably high compression levels are possible if you can tolerate a low-quality image. For more details, see the references, or just experiment with various compression settings.

This software implements JPEG baseline, extended-sequential, and progressive compression processes. Provision is made for supporting all variants of these processes, although some uncommon parameter settings aren't implemented yet. For legal reasons, we are not distributing code for the arithmetic-coding variants of JPEG; see LEGAL ISSUES. We have made no provision for supporting the hierarchical or lossless processes defined in the standard.

We provide a set of library routines for reading and writing JPEG image files, plus two sample applications "cjpeg" and "djpeg", which use the library to perform conversion between JPEG and some other popular image file formats. The library is intended to be reused in other applications.

In order to support file conversion and viewing software, we have included considerable functionality beyond the bare JPEG coding/decoding capability; for example, the color quantization modules are not strictly part of JPEG decoding, but they are essential for output to colormapped file formats or colormapped displays. These extra functions can be compiled out of the library if not required for a particular application. We have also included "jpegtran", a utility for lossless transcoding between different JPEG processes, and "rdjpgcom" and "wrjpgcom", two simple applications for inserting and extracting textual comments in JFIF files.

The emphasis in designing this software has been on achieving portability and flexibility, while also making it fast enough to be useful. In particular, the software is not intended to be read as a tutorial on JPEG. (See the REFERENCES section for introductory material.) Rather, it is intended to

be reliable, portable, industrial-strength code. We do not claim to have achieved that goal in every aspect of the software, but we strive for it.

We welcome the use of this software as a component of commercial products. No royalty is required, but we do ask for an acknowledgement in product documentation, as described under LEGAL ISSUES.

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=====

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that you must include source code if you redistribute it. (See the file  
ansi2knr.c for full details.) However, since ansi2knr.c is not needed as part  
of any program generated from the IJG code, this does not limit you more than  
the foregoing paragraphs do.

The Unix configuration script "configure" was produced with GNU Autoconf.  
It is copyright by the Free Software Foundation but is freely distributable.  
The same holds for its supporting scripts (config.guess, config.sub,  
ltconfig, ltmain.sh). Another support script, install-sh, is copyright  
by M.I.T. but is also freely distributable.

It appears that the arithmetic coding option of the JPEG spec is covered by  
patents owned by IBM, AT&T, and Mitsubishi. Hence arithmetic  
coding cannot  
legally be used without obtaining one or more licenses. For this reason,  
support for arithmetic coding has been removed from the free JPEG software.  
(Since arithmetic coding provides only a marginal gain over the unpatented  
Huffman mode, it is unlikely that very many implementations will support it.)  
So far as we are aware, there are no patent restrictions on the remaining  
code.

The IJG distribution formerly included code to read and write GIF files.  
To avoid entanglement with the Unisys LZW patent, GIF reading support has  
been removed altogether, and the GIF writer has been simplified to produce  
"uncompressed GIFs". This technique does not use the LZW algorithm; the  
resulting GIF files are larger than usual, but are readable by all standard  
GIF decoders.

We are required to state that

"The Graphics Interchange Format(c) is the Copyright property of  
CompuServe Incorporated. GIF(sm) is a Service Mark property of

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## REFERENCES

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We

highly recommend reading one or more of these references before trying to understand the innards of the JPEG software.

The best short technical introduction to the JPEG compression algorithm is Wallace, Gregory K. "The JPEG Still Picture Compression Standard", Communications of the ACM, April 1991 (vol. 34 no. 4), pp. 30-44. (Adjacent articles in that issue discuss MPEG motion picture compression, applications of JPEG, and related topics.) If you don't have the CACM issue handy, a PostScript file containing a revised version of Wallace's article is available at <ftp://ftp.uu.net/graphics/jpeg/wallace.ps.gz>. The file (actually a preprint for an article that appeared in IEEE Trans. Consumer Electronics) omits the sample images that appeared in CACM, but it includes corrections and some added material. Note: the Wallace article is copyright ACM and IEEE, and it may not be used for commercial purposes.

A somewhat less technical, more

leisurely introduction to JPEG can be found in

"The Data Compression Book" by Mark Nelson and Jean-loup Gailly, published by M&T Books (New York), 2nd ed. 1996, ISBN 1-55851-434-1. This book provides good explanations and example C code for a multitude of compression methods including JPEG. It is an excellent source if you are comfortable reading C code but don't know much about data compression in general. The book's JPEG sample code is far from industrial-strength, but when you are ready to look at a full implementation, you've got one here...

The best full description of JPEG is the textbook "JPEG Still Image Data Compression Standard" by William B. Pennebaker and Joan L. Mitchell, published by Van Nostrand Reinhold, 1993, ISBN 0-442-01272-1. Price US\$59.95, 638 pp. The book includes the complete text of the ISO JPEG standards (DIS 10918-1 and draft DIS 10918-2). This is by far the most complete exposition of JPEG in existence, and we highly recommend it.

The

JPEG standard itself is not available electronically; you must order a paper copy through ISO or ITU. (Unless you feel a need to own a certified official copy, we recommend buying the Pennebaker and Mitchell book instead; it's much cheaper and includes a great deal of useful explanatory material.) In the USA, copies of the standard may be ordered from ANSI Sales at (212) 642-4900, or from Global Engineering Documents at (800) 854-7179. (ANSI doesn't take credit card orders, but Global does.) It's not cheap: as of 1992, ANSI was charging \$95 for Part 1 and \$47 for Part 2, plus 7%

shipping/handling. The standard is divided into two parts, Part 1 being the actual specification, while Part 2 covers compliance testing methods. Part 1 is titled "Digital Compression and Coding of Continuous-tone Still Images, Part 1: Requirements and guidelines" and has document numbers ISO/IEC IS 10918-1, ITU-T T.81. Part 2 is titled "Digital Compression and Coding of Continuous-tone Still Images, Part 2: Compliance testing" and has document numbers ISO/IEC IS 10918-2, ITU-T T.83.

Some extensions to the original JPEG standard are defined in JPEG Part 3, a newer ISO standard numbered ISO/IEC IS 10918-3 and ITU-T T.84. IJG currently does not support any Part 3 extensions.

The JPEG standard does not specify all details of an interchangeable file format. For the omitted details we follow the "JFIF" conventions, revision 1.02. A copy of the JFIF spec is available from:

Literature Department  
C-Cube Microsystems, Inc.

1778 McCarthy Blvd.

Milpitas, CA 95035

phone (408) 944-6300, fax (408) 944-6314

A PostScript version of this document is available by FTP at

<ftp://ftp.uu.net/graphics/jpeg/jfif.ps.gz>. There is also a plain text

version at <ftp://ftp.uu.net/graphics/jpeg/jfif.txt.gz>, but it is missing the figures.

The TIFF 6.0 file format specification can be obtained by FTP from <ftp://ftp.sgi.com/graphics/tiff/TIFF6.ps.gz>. The JPEG incorporation scheme

found in the TIFF 6.0 spec of 3-June-92 has a number of serious problems.

IJG does not recommend use of the TIFF 6.0 design (TIFF Compression tag 6).

Instead, we recommend the JPEG design proposed by TIFF Technical Note #2

(Compression tag 7). Copies of this Note can be obtained from [ftp.sgi.com](ftp://ftp.sgi.com) or

from <ftp://ftp.uu.net/graphics/jpeg/>. It is expected that the next revision

of the TIFF spec will replace the 6.0 JPEG design with the Note's design.

Although IJG's own code does not support TIFF/JPEG, the free libtiff library

uses our library to implement TIFF/JPEG per the Note. libtiff is available

from <ftp://ftp.sgi.com/graphics/tiff/>.

## ARCHIVE LOCATIONS

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The "official" archive site for this software is [ftp.uu.net](ftp://ftp.uu.net) (Internet address 192.48.96.9). The most recent released version can always be found there in directory [graphics/jpeg](ftp://ftp.uu.net/graphics/jpeg/). This particular version will be archived as <ftp://ftp.uu.net/graphics/jpeg/jpegsrc.v6b.tar.gz>. If you don't



have  
direct Internet access, UUNET's archives are also available via UUCP; contact  
help@uUNET.uu.net for information on retrieving files that way.

Numerous Internet sites maintain copies of the UUNET files. However, only  
ftp.uu.net is guaranteed to have the latest official version.

You can also obtain this software in DOS-compatible "zip" archive format from  
the SimTel archives (ftp://ftp.simtel.net/pub/simtelnet/msdos/graphics/), or  
on CompuServe in the Graphics Support forum (GO CIS:GRAPHSUP), library 12  
"JPEG Tools". Again, these versions may sometimes lag behind the ftp.uu.net  
release.

The JPEG FAQ (Frequently Asked Questions) article is a useful source of  
general information about JPEG. It is updated constantly and therefore is  
not included in this distribution. The FAQ is posted every two weeks to  
Usenet newsgroups comp.graphics.misc, news.answers, and other groups.  
It is available on the World Wide Web at <http://www.faqs.org/faqs/jpeg-faq/>  
and other news.answers  
archive sites, including the official news.answers  
archive at rtfm.mit.edu: <ftp://rtfm.mit.edu/pub/usenet/news.answers/jpeg-faq/>.  
If you don't have Web or FTP access, send e-mail to mail-server@rtfm.mit.edu  
with body  
send usenet/news.answers/jpeg-faq/part1  
send usenet/news.answers/jpeg-faq/part2

## RELATED SOFTWARE

=====

Numerous viewing and image manipulation programs now support JPEG. (Quite a  
few of them use this library to do so.) The JPEG FAQ described above lists  
some of the more popular free and shareware viewers, and tells where to  
obtain them on Internet.

If you are on a Unix machine, we highly recommend Jef Poskanzer's free  
PBMPLUS software, which provides many useful operations on PPM-format image  
files. In particular, it can convert PPM images to and from a wide range of  
other formats, thus making cjpeg/djpeg considerably more useful. The latest  
version is distributed by the NetPBM group, and is available from numerous  
sites,  
notably <ftp://wuarchive.wustl.edu/graphics/graphics/packages/NetPBM/>.  
Unfortunately PBMPLUS/NETPBM is not nearly as portable as the IJG software is;  
you are likely to have difficulty making it work on any non-Unix machine.

A different free JPEG implementation, written by the PVRG group at Stanford,  
is available from <ftp://havefun.stanford.edu/pub/jpeg/>. This program  
is designed for research and experimentation rather than production use;

it is slower, harder to use, and less portable than the IJG code, but it is easier to read and modify. Also, the PVRG code supports lossless JPEG, which we do not. (On the other hand, it doesn't do progressive JPEG.)

## FILE FORMAT WARS

=====

Some JPEG programs produce files that are not compatible with our library. The root of the problem is that the ISO JPEG committee failed to specify a concrete file format. Some vendors "filled in the blanks" on their own, creating proprietary formats that no one else could read.

(For example, none of the early commercial JPEG implementations for the Macintosh were able to exchange compressed files.)

The file format we have adopted is called JFIF (see REFERENCES). This format has been agreed to by a number of major commercial JPEG vendors, and it has become the de facto standard. JFIF is a minimal or "low end" representation. We recommend the use of TIFF/JPEG (TIFF revision 6.0 as modified by TIFF Technical Note #2) for "high end" applications that need to record a lot of additional data about an image. TIFF/JPEG is fairly new and not yet widely supported, unfortunately.

The upcoming JPEG Part 3 standard defines a file format called SPIFF. SPIFF is interoperable with JFIF, in the sense that most JFIF decoders should be able to read the most common variant of SPIFF. SPIFF has some technical advantages over JFIF, but its major claim to fame is simply that it is an official standard rather than an informal one. At this point it is unclear whether

SPIFF will supersede JFIF or whether JFIF will remain the de-facto standard. IJG intends to support SPIFF once the standard is frozen, but we have not decided whether it should become our default output format or not. (In any case, our decoder will remain capable of reading JFIF indefinitely.)

Various proprietary file formats incorporating JPEG compression also exist. We have little or no sympathy for the existence of these formats. Indeed, one of the original reasons for developing this free software was to help force convergence on common, open format standards for JPEG files. Don't use a proprietary file format!

## TO DO

=====

The major thrust for v7 will probably be improvement of visual quality. The current method for scaling the quantization tables is known not to be very good at low Q values. We also intend to investigate block boundary

smoothing, "poor man's variable quantization", and other means of improving quality-vs-file-size performance without sacrificing compatibility.

In future versions, we are considering supporting some of the upcoming JPEG Part 3 extensions --- principally, variable quantization and the SPIFF file format.

As always, speeding things up is of great interest.

Please send bug reports, offers of help, etc. to [jpeg-info@uunet.uu.net](mailto:jpeg-info@uunet.uu.net).

## 1.6 openssl 1.0.0d

### 1.6.1 Notifications :

This product includes cryptographic software written by Eric Young ([ey@cryptsoft.com](mailto:ey@cryptsoft.com)).

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## 1.8 lua 5.1.5

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bzip2/libbzip2 version 1.0.2 of 30 December 2001

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* /miglayout-3-5-5-sources-jar/net/miginfocom/swing/SwingComponentWrapper.java
* /miglayout-3-5-5-sources-jar/net/miginfocom/swt/MigLayout.java
*
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* /miglayout-3-5-5-sources-jar/net/miginfocom/layout/IDEUtil.java
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- \*
- \* @version 1.0
- \* @author Mikael Grev, MiG InfoCom AB
- \*     Date: 2006-sep-08
- \*/
- /\*\* Returns the absolute positioning of one or more of the edges. This will be applied last in the layout cycle and will not
  - \* affect the flow or grid positions. The positioning is relative to the parent
  - and can not (as padding) be used
  - \* to adjust the edges relative to the old value. May be `<code>null</code>` and elements may be `<code>null</code>`.
  - \* `<code>null</code>` value(s) for the x2 and y2 will be interpreted as to keep the preferred size and thus the x1
  - \* and x2 will just absolutely positions the component.
  - \* `<p>`
  - \* Note that {`@link #setBoundsInGrid(boolean)`} changes the interpretation of thisproperty slightly.
  - \* `<p>`
  - \* For a more thorough explanation of what this constraint does see the white paper or cheat Sheet at [www.migcomponents.com](http://www.migcomponents.com).
  - \* @return The current value as a new array, free to modify.
  - \*/

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- \*
- \* @version 1.0
- \* @author Mikael Grev, MiG InfoCom AB
- \*     Date: 2006-sep-08
- \*/
- /\*\* Returns the gaps as pixel values.
- \* @param parent The parent. Used to get the pixel values.
- \* @param defGap The default gap to use if there is no gap set on this object (i.e. it is null).
- \* @param
- refSize The reference size used to get the pixel sizes.
- \* @param before IF it is the gap before rather than the gap after to return.
- \* @return The [min,preferred,max] sizes for the specified gap. Uses {@link
- net.miginfo.com.layout.LayoutUtil#NOT\_SET}
- \* for gap sizes that are `null`. Returns `null` if there was no gap specified. A new and
- free to use array.
- \*/

Found in path(s):

- \* /miglayout-3-5-5-sources-jar/net/miginfo.com/layout/DimConstraint.java

## 1.26 commons-collections 3.2.2

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## 1.27 taglibs-standard-spec 1.2.5

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# 1.28 Idns 1.6.17

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Ldns is a great library. It is a powerfull tool for working with DNS. python-ldns it is a straight up clone of the C interface, however that is not a very good interface for python. Its documentation is incomplete and some functions don't work as described. And some objects don't have a full python API.

ldnsx aims to fix this. It wraps around the ldns python bindings, working around its limitations and providing a well-documented, more pythonistic interface.

/\*

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## 1.35 bison 3.0.4

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under certain conditions; type `show c' for details.
```

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```
#!/usr/bin/perl -0777 -pi
```

```
# Update b4_copyright invocations or b4_copyright_years definitions to
# include the current year.
```

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```

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```

```
use strict;
use warnings;
```

```
my $margin = 72;
```

```
my $this_year = $ENV{UPDATE_COPYRIGHT_YEAR};
if (!$this_year || $this_year !~ m/^\d{4}$/)
{
    my ($sec, $min, $hour, $mday, $month, $year) = localtime
(time ());
    $this_year = $year + 1900;
}
my $old_re = <<'EOF'
(
    (?^\n)
    #BEFORE
    (?
        b4_copyright\[([^\[\]]*)
        | m4_(?:push|pop)def\[b4_copyright_years]
    )
    #AFTER
)
(?:
```

```

,\s*
(
  \[s* (?:\d{4}(?:,\s*|-))* (\d{4}) \s*]
)
)?
\)
EOF
;

while (/($old_re)/gx)
{
  my $start = pos() - length ($1);
  my $b4_copyright_line = $2;
  my $year_lines = $3;
  my $final_year = $4;
  $year_lines .= ')';

  # If there was a second argument, it contains years, so update them.
  if ($final_year)
  {
    $b4_copyright_line .= ';';
    if ($final_year != $this_year)
    {
      # Update the year.
      $year_lines =~ s/$final_year/$final_year, $this_year/;
    }

    # Normalize all whitespace.
    $year_lines =~ s/\s+/ /g;

    # Put spaces after commas.
    $year_lines =~ s/, ?/, /g;

    # Compress to intervals.
    $year_lines =~
    s/
    (\d{4})
    (?
    (, \ | -)
    ((?{
      if ($2 eq '-') { '\d{4}'; }
      elsif (!$3)    { $1 + 1; }
      else          { $3 + 1; }
    })))
    )+
    /$1-$3/gx;

    # Format within margin.

```

```

my $year_lines_new;
my $indent = index ($b4_copyright_line, '[');
--$indent if ($b4_copyright_line =~ m/^\n/);
while (length $year_lines)
{
    my $text_margin = $margin - $indent;
    if (($year_lines =~ s/^(.{1,$text_margin})(?:|$)/))
        || ($year_lines =~ s/^(.*)\n(?:|$)/))
    {
        my $line = "\n" . (' ' x $indent) . $1;
        ++$indent if (!$year_lines_new);
        $year_lines_new .= $line;
    }
    else
    {
        # Should be unreachable, but we don't want an infinite
        # loop if it can be reached.
        die;
    }
}

# Replace the old invocation. Should never die.
die if (!s/$old_re/G/$b4_copyright_line$year_lines_new/x);

# Prepare for the next search.
pos () = $start + length ("b4_copyright_line$year_lines_new");
}
}

while (/(\bb4_copyright\()/g)
{
    my $start = pos () - length ($1);
    my $end = pos ();
    my $re = $old_re;
    pos () = $start;
    $re =~ s/#BEFORE/\\G/;
    if (!$re/x)
    {
        my $line = (substr ($_, 0, $start) =~ s/\n/\n/g) + 1;
        print STDERR
            "$ARGV:$line: warning: failed to update a b4_copyright\n";
    }
    pos () = $end;
}

while (/(\[b4_copyright_years])/g)
{

```

```

my $start = pos () - length ($1);
my $end = pos ();
my $re = $old_re;
$re =~ s/^#AFTER\\G/;
if (!$re/x)
{
    # The substr operation blows away pos (), so restoring pos ()
    # at the end is necessary.
    my $line = (substr ($_, 0, $start) =~ s/\n\n/g) + 1;
    print STDERR
        "$ARGV:$line: warning: failed to update a"
        . " b4_copyright_years\n";
}
pos () = $end;
}

```

## 1.36 urllib3 1.22

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This product includes software written by Tim Hudson (tjh@cryptsoft.com).

This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit  
(<http://www.openssl.org/>)

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# Contributions to the urllib3 project

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## Contributors

In chronological order:

\* victor.vde <<http://code.google.com/u/victor.vde/>>

\* HTTPS patch (which inspired HTTPSConnectionPool)

\* erikcederstrand <<http://code.google.com/u/erikcederstrand/>>

\* NTLM-authenticated HTTPSConnectionPool

\* Basic-authenticated HTTPSConnectionPool (merged into make\_headers)

\* niphlod <niphlod@gmail.com>

\* Client-verified SSL certificates for HTTPSConnectionPool

\* Response gzip and deflate encoding support

\* Better unicode support for filepost using StringIO buffers

\* btoconnor <brian@btoconnor.net>

\* Non-multipart encoding for POST requests

\* p.dobrogost <<http://code.google.com/u/@WBRSRIBZDhBFXQB6/>>

\* Code review, PEP8 compliance, benchmark fix

\* kennethreitz <me@kennethreitz.com>

\* Bugfixes, suggestions, Requests integration

\* georgemarshall <<http://github.com/georgemarshall>>

\* Bugfixes, Improvements and Test coverage

\*

Thomas Kluyver <thomas@kluyver.me.uk>

\* Python 3 support

\* brandon-rhodes <<http://rhodesmill.org/brandon>>

\* Design review, bugfixes, test coverage.

\* studer <theo.studer@gmail.com>

\* IPv6 url support and test coverage

\* Shivaram Lingamneni <slingamn@cs.stanford.edu>

\* Support for explicitly closing pooled connections

- \* hartator <hartator@gmail.com>
- \* Corrected multipart behavior for params
  
- \* Thomas Weischuh <thomas@t-8ch.de>
- \* Support for TLS SNI
- \* API unification of ssl\_version/cert\_reqs
- \* SSL fingerprint and alternative hostname verification
- \* Bugfixes in testsuite
  
- \* Sune Kirkeby <mig@ibofobi.dk>
- \* Optional SNI-support for Python 2 via PyOpenSSL.
  
- \* Marc Schlaich <marc.schlaich@gmail.com>
- \* Various bugfixes and test improvements.
  
- \* Bryce Boe <bbzbryce@gmail.com>
- \* Correct six.moves conflict
- \* Fixed pickle support of some exceptions
  
- \* Boris Figovsky <boris.figovsky@ravellosystems.com>
- \* Allowed to skip SSL hostname verification
  
- \* Cory Benfield
- <<http://lukasa.co.uk/about/>>
- \* Stream method for Response objects.
- \* Return native strings in header values.
- \* Generate 'Host' header when using proxies.
  
- \* Jason Robinson <jaywink@basshero.org>
- \* Add missing WrappedSocket.fileno method in PyOpenSSL
  
- \* Audrius Butkevicius <audrius.butkevicius@elastichosts.com>
- \* Fixed a race condition
  
- \* Stanislav Vitkovskiy <stas.vitkovsky@gmail.com>
- \* Added HTTPS (CONNECT) proxy support
  
- \* Stephen Holsapple <sholsapp@gmail.com>
- \* Added abstraction for granular control of request fields
  
- \* Martin von Gagern <Martin.vGagern@gmx.net>
- \* Support for non-ASCII header parameters
  
- \* Kevin Burke <kev@inburke.com> and Pavel Kirichenko <juanych@yandex-team.ru>
- \* Support for separate connect and request timeouts
  
- \* Peter Waller <p@pwaller.net>
- \* HTTPResponse.tell() for determining amount received over the wire

- \* Nipunn Koorapati <nipunn1313@gmail.com>
- \* Ignore default ports when comparing hosts for equality
  
- \* Danilo @dbrgn <http://dbrgn.ch/>
- \* Disabled TLS compression by default on Python 3.2+
- \* Disabled TLS compression in pyopenssl contrib module
- \* Configurable cipher suites in pyopenssl contrib module
  
- \* Roman Bogorodskiy <roman.bogorodskiy@ericsson.com>
- \* Account retries on proxy errors
  
- \* Nicolas Delaby <nicolas.delaby@ezeep.com>
- \* Use the platform-specific CA certificate locations
  
- \* Josh Schneier <https://github.com/jschneier>
- \* HTTPHeaderDict and associated tests and docs
- \* Bugfixes, docs, test coverage
  
- \* Tahia Khan <http://tahia.tk/>
- \* Added Timeout examples in docs
  
- \* Arthur Grunseid <http://grunseid.com>
- \* source\_address support and tests (with https://github.com/bui)
  
- \* Ian Cordasco <graffatcolmingov@gmail.com>
- \* PEP8 Compliance and Linting
- \* Add ability to pass socket options to an HTTP Connection
  
- \* Erik Tollerud <erik.tollerud@gmail.com>
- \* Support for standard library io module.
  
- \* Krishna Prasad <kprasad.iitd@gmail.com>
- \* Google App Engine documentation
  
- \* Aaron Meurer <asmeurer@gmail.com>
- \* Added Url.url, which unparses a Url
  
- \* Evgeny Kapun <abacabadabacaba@gmail.com>
- \* Bugfixes
  
- \* Benjamin Meyer <bm\_witness@yahoo.com>
- \* Security Warning Documentation update for proper capture
  
- \* Shivan Sornarajah <github@sornars.com>
- \* Support for using ConnectionPool and PoolManager as context managers.
  
- \* Alex Gaynor <alex.gaynor@gmail.com>

- \* Updates to the default SSL configuration
- \* Tomas Tomecek <ttomecek@redhat.com>
- \* Implemented generator for getting chunks from chunked responses.
- \* tlynn <https://github.com/tlynn>
- \* Respect the warning preferences at import.
- \* David D. Riddle <ddriddle@illinois.edu>
- \* IPv6 bugfixes in testsuite
- \* Jon Wayne Parrott <jonwayne@google.com>
- \* App Engine environment tests.
- \* John Krauss <https://github.com/talos>
- \* Clues to debugging problems with `cryptography` dependency in docs
- \* Disassem <https://github.com/Disassem>
- \* Fix pool-default headers not applying for url-encoded requests like GET.
- \* James Atherfold <jlatherfold@hotmail.com>
- \* Bugfixes relating to cleanup of connections during errors.
- \* Christian Pedersen <https://github.com/chripede>
- \* IPv6 HTTPS proxy bugfix
- \* Jordan Moldow <https://github.com/jmoldow>
- \* Fix low-level exceptions leaking from ``HTTPResponse.stream()``.
- \* Bugfix for ``ConnectionPool.urlopen(release\_conn=False)``.
- \* Creation of ``HTTPConnectionPool.ResponseCls``.
- \* Predrag Gruevski <https://github.com/obi1kenobi>
- \* Made cert digest comparison use a constant-time algorithm.
- \* Adam Talsma <https://github.com/a-tal>
- \* Bugfix to ca\_cert file paths.
- \* Evan Meagher <https://evanmeagher.net>
- \* Bugfix related to `memoryview` usage in PyOpenSSL adapter
- \* John Vandenberg <jayvdb@gmail.com>
- \* Python 2.6 fixes; pyflakes and pep8 compliance
- \* Andy Caldwell <andy.m.caldwell@googlemail.com>
- \* Bugfix related to reusing connections in indeterminate states.
- \* Ville Skytt <ville.skytta@iki.fi>

- \* Logging efficiency improvements, spelling fixes, Travis config.
- \* Shige Takeda <smtakeda@gmail.com>
- \* Started Recipes documentation and added a recipe about handling concatenated gzip data in HTTP response
- \* Jesse Shapiro <jesse@jesseshapiro.net>
- \* Various character-encoding fixes/tweaks
- \* Disabling IPv6 DNS when IPv6 connections not supported
- \* David Foster <http://dafoster.net/>
- \* Ensure order of request and response headers are preserved.
- \* Jeremy Cline <jeremy@jcline.org>
- \* Added connection pool keys by scheme
- \* Aviv Palivoda <palaviv@gmail.com>
- \* History list to Retry object.
- \* HTTPResponse contains the last Retry object.
- \* Nate Prewitt <nate.prewitt@gmail.com>
- \* Ensure timeouts are not booleans and greater than zero.
- \* Fixed infinite loop in ``stream`` when amt=None.
- \* Added length\_remaining to determine remaining data to be read.
- \* Added enforce\_content\_length to raise exception when incorrect content-length received.
- \* Seth Michael Larson <sethmichaellarson@protonmail.com>
- \* Created selectors backport that supports PEP 475.
- \* Alexandre Dias <alex.dias@smarkets.com>
- \* Don't retry on timeout if method not in whitelist
- \* Moinuddin Quadri <moin18@gmail.com>
- \* Lazily load idna package
- \* Tom White <s6yg1ez3@mail2tor.com>
- \* Made SOCKS handler differentiate socks5h from socks5 and socks4a from socks4.
- \* Tim Burke <tim.burke@gmail.com>
- \* Stop buffering entire deflate-encoded responses.
- \* Tuukka Mustonen <tuukka.mustonen@gmail.com>
- \* Add counter for status\_forcelist retries.
- \* Erik Rose <erik@mozilla.com>
- \* Bugfix to pyopenssl vendoring

\* [Your name or handle] <[email or website]>

\* [Brief summary of your changes]

## 1.37 enum34 1.1.6

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## 1.38 slf4j 1.7.16

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Date: 10 March 2006

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Version: GnuPG v1.4.1 (GNU/Linux)

iD8DBQFDjMI6J97Uv2IW248RAmGNAJ9/krpkiYJRrJTMXVkJ3cdnVvfU+QCfYFEh  
pN0h9U/xdFTRMFsXYFHQeN4=  
=24Hd

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Full name: Timothy Philip Venum

E-Mail: `tim@adjective.org`

Mailing Address: 7/9-11 Cook St, Sutherland, NSW 2232, Australia

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Version: GnuPG v1.4.1 (Darwin)

iD8DBQFEnjfA9nwd0ZUd8/ERArwdAJ4lzyXEi4zSliJwEAxknGPhzMRswCfRsdI  
RUioI0BYmYpaETSqxt2oLFU=  
=Tr57

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E-Mail: `simone.bordet@gmail.com`  
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Date: 8 January 2007

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Version: GnuPG v1.4.3 (GNU/Linux)

iD8DBQFFoniQJVhlFus9dGQRAmJmAJwL5y1loonhVQIICsparvjHMQuwqwCgiZFy  
LBDVaad1bJ1v1EHY901kPcg=  
=6rqm

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Version: GnuPG v1.0.7 (GNU/Linux)

iD8DBQFE85cgaq9Frj/CIrIRAmuJAKCFgi4W0UOH8IUUn+SV6PBHRF3BnLgCcDqqC  
Zokttk0bTHfwaa5TxQbScw=

=N/w/

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Date: 2012-07-17

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Version: GnuPG v1.4.10 (GNU/Linux)

iQEcBAEBAGAGBQJQBb4tAAoJEMHhjBmtgF91HDcH/2nQDPuPztWFrBifnEoLF6Jl  
RUkfJzAPZaLDtDMfiDz7ucdRL1RDodmz4VIF2+fbKeBYQquZXfXIeEghz+tKriK3  
0M12guFkNLDteQp9h2p3Zu9JU3K0y4m84IDWq72HRmh1nRyD6lzZFhDGZ/D+69fF  
tgYG0FwEit00MAq/lRbsXHLpBOY+Jyh/Xy+QRnQTcAQ+tAgOlxd3w+JSs2sGdes  
YLAJQQacLeGh7EzD3F+CKuiwT4c5ub64LdXSIAVj1u2OjZBfqLaJ3FA60Ti+I3kn  
FNWKpzaeX+SQgMak6hsuatXi6EsVk6sIaskwEgl6+Xk+HYWy23ZQ8BKQRLKOZTw=  
=gAqN

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Date: January 30th 2006

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Version: GnuPG v1.4.1 (Darwin)

iD8DBQFD37/4dL6IZr4c+6kRAtsIAJ41tfd3lj4OM6sIMfJfTOdYdT1bxwCdGgWv  
8sfMxEDZquIqhVbfZU2c76U=  
=8WW7

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PGP SIGNATURE-----

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Hash: SHA1

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E-Mail: [ngonzalez@exist.com](mailto:ngonzalez@exist.com)

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Version: GnuPG v1.4.4 (MingW32)

iD8DBQFEt1ZxHR/ESK2w6H8RApbOAJ9c1eooNr2oN59WZVitJExGJjUvKgCfaKji  
6etDJ6AUj0jTuSl59hUsWMQ=  
=HmqH

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-----

Oracle

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<https://glassfish.dev.java.net/nonav/public/CDDL+GPL.html>

javax.servlet:javax.servlet-api  
javax.servlet.jsp:javax.servlet.jsp-api  
org.glassfish.web:javax.servlet.jsp  
org.glassfish.web:javax.servlet.jsp  
org.glassfish.web:javax.servlet.jsp.jstl  
org.eclipse.jetty.orbit:javax.servlet.jsp.jstl

-----



## Apache

The following artifacts are ASL2 licensed.

org.apache.taglibs:taglibs-standard-spec  
org.apache.taglibs:taglibs-standard-impl

-----

## MortBay

The

following artifacts are ASL2 licensed. Based on selected classes from following Apache Tomcat jars, all ASL2 licensed.

org.mortbay.jasper:apache-jsp  
org.apache.tomcat:tomcat-jasper  
org.apache.tomcat:tomcat-juli  
org.apache.tomcat:tomcat-jsp-api  
org.apache.tomcat:tomcat-el-api  
org.apache.tomcat:tomcat-jasper-el  
org.apache.tomcat:tomcat-api  
org.apache.tomcat:tomcat-util-scan  
org.apache.tomcat:tomcat-util

org.mortbay.jasper:apache-el  
org.apache.tomcat:tomcat-jasper-el  
org.apache.tomcat:tomcat-el-api

-----

## Mortbay

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<https://glassfish.dev.java.net/nonav/public/CDDL+GPL.html>

org.eclipse.jetty.toolchain:jetty-schemas

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## Assorted

The UnixCrypt.java code implements the one way cryptography used by Unix systems for simple password protection. Copyright 1996 Aki Yoshida, modified April 2001 by Iris Van den Broeke, Daniel Deville.

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E-Mail: `jules@coredevelopers.net`

Mailing Address: 2, Tannery Cottages, Tannery Lane, Bramley, Surrey, GU5 0AB, UK.

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iD8DBQFEEbh9SoT4b97cQk4RAnCMAKCuNGYLHa6n/Ot3GEdwCCLeQxsMPACdEhnE  
I/stizRWWZZkeLbcglzdQCE=  
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Mailing Address: 4676 Admiralty Way, Suite 520

Marina Del Rey, CA 90292

Point of Contact:

Full name: Gordon King

E-Mail: gordon.king@simulalabs.com

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Positions: Chief Operational Officer

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8. You agree to notify MortBay of any facts or circumstances of which you become aware that would make these representations inaccurate in any respect.

Date:

Please sign:

```
<html xmlns:o="urn:schemas-microsoft-com:office:office" xmlns:w="urn:schemas-microsoft-com:office:word"
xmlns="http://www.w3.org/TR/REC-html40"><head>
```

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<o:Lines>77</o:Lines>
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<w:TrackRevisions/>
</w:WordDocument>
</xml><![endif]-->
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/* Font Definitions */
@font-face
{font-family:Tahoma;
panose-1:2 11 6 4 3 5 4 4 2 4;
mso-font-charset:0;
mso-generic-font-family:swiss;
mso-font-pitch:variable;
mso-font-signature:553679495 -2147483648 8 0 66047 0;}
```

```

/* Style Definitions */
p.MsoNormal, li.MsoNormal, div.MsoNormal
{mso-style-parent:"";
margin:0in;
margin-bottom:.0001pt;
mso-pagination:widow-orphan;
font-size:12.0pt;
font-family:"Times New Roman";
mso-fareast-font-family:"Times New Roman";}

p
{margin-right:0in;
mso-margin-top-alt:auto;
mso-margin-bottom-alt:auto;
margin-left:0in;
mso-pagination:widow-orphan;
font-size:12.0pt;
font-family:"Times New Roman";
mso-fareast-font-family:"Times New Roman";}

p.BalloonText, li.BalloonText, div.BalloonText
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margin-bottom:.0001pt;
mso-pagination:widow-orphan;
font-size:8.0pt;
font-family:Tahoma;
mso-fareast-font-family:"Times
New Roman";}

@page Section1
{size:8.5in 11.0in;
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mso-footer-margin:.5in;
mso-paper-source:0;}

div.Section1
{page:Section1;}

-->
</style>
</head><body style="" lang="EN-US">

<div class="Section1">

<p style="text-align: center;" align="center"><b>Eclipse Public License - v 1.0</b>
</p>

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```



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<p class="MsoNormal" style="margin-left: 0.5in;"><span style="font-size: 10pt;">a)</span>

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this Agreement, and<br clear="left">

b) in the case of each subsequent Contributor:</span></p>

<p class="MsoNormal" style="margin-left: 0.5in;"><span style="font-size: 10pt;">i)</span>

changes to the Program, and</span></p>

<p class="MsoNormal" style="margin-left: 0.5in;"><span style="font-size: 10pt;">ii)</span>

additions to the Program;</span></p>

<p class="MsoNormal" style="margin-left: 0.5in;"><span style="font-size: 10pt;">where

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*<p class="MsoNormal" style="margin-left: 0.5in;"><span style="font-size: 10pt;">iii>  
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Contributor alone and not by any other party; and</span></p>*

*<p class="MsoNormal" style="margin-left: 0.5in;"><span style="font-size: 10pt;">iv>  
states that source code for the Program is available from such Contributor, and  
informs licensees how to obtain it in a reasonable manner on or through a  
medium customarily used for software exchange.<span style="color: blue;"> </span></span></p>*

*<p><span style="font-size: 10pt;">When the Program is made available in source  
code form:</span> </p>*

*<p class="MsoNormal" style="margin-left: 0.5in;"><span style="font-size: 10pt;">a>  
it must be made  
available under this Agreement; and </span></p>*

*<p class="MsoNormal" style="margin-left: 0.5in;"><span style="font-size: 10pt;">b> a  
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<p class="MsoNormal"><!--[if !supportEmptyParas]-->&nbsp;<!--[endif]--><o:p></o:p></p>

</div>

<div class="Section2">

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"Legal Entity" shall mean the union of the acting entity and all  
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"control" means (i) the power, direct or indirect, to cause the  
direction or management of such entity, whether by contract or  
otherwise, or (ii) ownership of fifty percent (50%) or more of the  
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<p><span

style="font-size: 10pt;">

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source, and configuration files.</span></p>

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transformation or translation of a Source form, including but  
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<p><b><span style="font-size: 10pt;">

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</li>

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<p><b><span style="font-size: 10pt;">

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</span></p>

<p><span style="font-size: 10pt;">

END OF TERMS AND CONDITIONS

</span></p>

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</span></p>

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To apply the Apache License to your work, attach the following  
boilerplate notice, with the fields enclosed by brackets "[]"  
replaced with your own identifying information. (Don't include  
the brackets!) The text should be enclosed in the appropriate  
comment syntax for the file format. We also recommend  
that a  
file or class name and description of purpose be included on the  
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Full name: David Jencks

E-Mail: `david_jencks@yahoo.com`

Mailing Address: 2215 SE 39th Ave, Portland OR 97214 USA

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```
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* -----
*/
```

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# install - install a program, script, or datafile  
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```
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This software contains code derived from the RSA Data Security  
 Inc. MD5 Message-Digest Algorithm, including various  
 modifications by Spyglass Inc., Carnegie Mellon University, and  
 Bell Communications Research, Inc (Bellcore).

## 1.45 tcsh 6.20.00

### 1.45.1 Available under license :

```
/*
 * config.h -- configure various defines for tcsh
 *
 * All source files should #include this FIRST.
 *
 * Edit this to match your system type.
 */

#ifndef _h_config
#define _h_config
/***** System dependant compilation flags *****/
/*
 * POSIX This system supports IEEE Std 1003.1-1988 (POSIX).
 */
#undef POSIX

/*
 * POSIXJOBS This system supports the optional IEEE Std 1003.1-1988 (POSIX)
 * job control facilities.
```

```

*/
#undef POSIXJOBS

/*
* Vfork This machine has a vfork().
* It used to be that for job control to work, this define
* was mandatory. This is not the case any more.
* If you think you still need it, but you don't have vfork,
* define this anyway and then do #define vfork fork.
* I do this anyway on a Sun because of yellow pages brain damage,
* [should not be needed under 4.1]
* and on the iris4d cause SGI's fork is sufficiently "virtual"
* that vfork isn't necessary. (Besides, SGI's vfork is weird).
* Note that some machines
  eg. rs6000 have a vfork, but not
* with the berkeley semantics, so we cannot use it there either.
*/
#define Vfork

/*
* BSDJOBS You have BSD-style job control (both process groups and
* a tty that deals correctly
*/
#define BSDJOBS

/*
* BSDTIMES You have BSD-style process time stuff (like rusage)
* This may or may not be true. For example, Apple Unix
* (OREO) has BSDJOBS but not BSDTIMES.
*/
#define BSDTIMES

/*
* BSDLIMIT You have BSD-style resource limit stuff (getrlimit/setrlimit)
*/
#define BSDLIMIT

/*
* TERMIO You have struct termio instead of struct sgtyb.
* This is usually the case for SYSV systems, where
* BSD uses sgtyb. POSIX systems should define this
* anyway, even though they use struct termios.
*/
#undef TERMIO

/*
* SYSVREL Your machine is SYSV based (HPUX, A/UX)
* NOTE: don't do this if you are on a Pyramid -- tcsh is

```

```

* built in a BSD universe.
* Set SYSVREL to 1, 2, 3, or 4, depending the version of System V
* you are running.
Or set it to 0 if you are not SYSV based
*/
#define SYSVREL 0

/*
* YPBUGS Work around Sun YP bugs that cause expansion of ~username
* to send command output to /dev/null
*/
#undef YPBUGS

/***** local defines *****/

#endif /* _h_config */
/*-
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```

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Found in path(s):

- \* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/validation/Languages.java
- \* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/util/Nodes.java
- \* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/diff/Difference.java
- \* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/util/IterableNodeList.java
- \* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/transform/Transformation.java
- \*
- /xmlunit-core-2-3-0-sources-jar/org/xmlunit/diff/ComparisonListenerSupport.java
- \* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/diff/ChildNodeXPathContextProvider.java
- \* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/diff/Comparison.java
- \* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/builder/package-info.java
- \* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/input/NormalizedSource.java
- \* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/validation/ValidationResult.java
- \* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/diff/ComparisonType.java
- \* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/diff/ElementSelectors.java
- \* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/validation/package-info.java
- \* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/util/Linqy.java
- \* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/diff/ByNameAndTextRecSelector.java
- \* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/diff/NodeMatcher.java
- \* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/diff/DefaultConditionalSelectorBuilder.java
- \* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/builder/AbstractTransformationBuilder.java
- \*
- /xmlunit-core-2-3-0-sources-jar/org/xmlunit/validation/ParsingValidator.java
- \* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/diff/DefaultComparisonFormatter.java
- \* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/xpath/JAXPXPathEngine.java
- \* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/diff/XPathContext.java
- \* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/util/Convert.java
- \* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/diff/NodeFilters.java



```

* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/XMLUnitException.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/validation/JAXPValidator.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/builder/Transform.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/input/WhitespaceNormalizedSource.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/validation/ValidationHandler.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/package-info.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/input/CommentLessSource.java
*
/xmlunit-core-2-3-0-sources-jar/org/xmlunit/input/package-info.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/diff/ComparisonControllers.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/transform/package-info.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/diff/DifferenceEvaluator.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/xpath/package-info.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/diff/DOMDifferenceEngine.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/util/package-info.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/util/Mapper.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/util/Predicate.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/builder/TransformationBuilderBase.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/builder/Input.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/diff/MultiLevelByNameAndTextSelector.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/validation/Validator.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/util/IsNullPredicate.java
*
/xmlunit-core-2-3-0-sources-jar/org/xmlunit/diff/Diff.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/diff/DifferenceEngine.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/validation/ValidationProblem.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/diff/ComparisonResult.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/diff/ElementSelector.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/diff/RecursiveXPathBuilder.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/diff/DifferenceEvaluators.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/diff/DefaultNodeMatcher.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/input/WhitespaceStrippedSource.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/diff/AbstractDifferenceEngine.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/diff/ComparisonController.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/diff/package-info.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/diff/ComparisonListener.java
*
/xmlunit-core-2-3-0-sources-jar/org/xmlunit/xpath/XPathEngine.java
* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/ConfigurationException.java
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```

```

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Found in path(s):

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\* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/builder/JaxbBuilder.java

\* /xmlunit-core-2-3-0-sources-jar/org/xmlunit/builder/DiffBuilder.java

## 1.47 binutils 2.30

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```
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This is free software, and you are welcome to redistribute it
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```

The hypothetical commands

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```
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```

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<signature of Ty Coon>, 1 April 1989
Ty Coon, President of Vice
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+++++

Dean Elsner wrote the original gas for vax. [more details?]

Jay Fenlason maintained gas for a while, adding support for gdb-specific debug information and the 68k series machines, most of the preprocessing pass, and extensive changes in messages.c, input-file.c, write.c.

K. Richard Pixley maintained gas for a while, adding various enhancements and many bug fixes, including merging support for several processors, breaking gas up to handle multiple object file format backends (including heavy rewrite, testing, an integration of the coff and b.out backends), adding configuration including heavy testing and verification of cross assemblers and file splits and renaming, converted gas to strictly ansi C including full prototypes, added support for m680[34]0 & cpu32, considerable work on i960 including a coff port (including considerable amounts of reverse engineering), a sparc opcode file rewrite, decstation, rs6000, and hp300hpux host ports, updated "know" assertions and made them work, much other reorganization, cleanup, and lint.

Ken Raeburn wrote the high-level BFD interface code to replace most of the code in format-specific I/O modules.

The original Vax-VMS support was contributed by David L. Kashtan. Eric Youngdale and Pat Rankin have done much work with it since.

The Intel 80386 machine description was written by Eliot Dresselhaus.

Minh Tran-Le at IntelliCorp contributed some AIX 386 support.

The Motorola 88k machine description was contributed by Devon Bowen of Buffalo University and Torbjorn Granlund of the Swedish Institute of Computer Science.

Keith

Knowles at the Open Software Foundation wrote the original MIPS back end (tc-mips.c, tc-mips.h), and contributed Rose format support that hasn't been merged in yet. Ralph Campbell worked with the MIPS code to support a.out format.

Support for the Zilog Z8k and Hitachi H8/300, H8/500 and SH processors (tc-z8k, tc-h8300, tc-h8500, tc-sh), and IEEE 695 object file format (obj-ieee), was written by Steve Chamberlain of Cygnus Solutions. Steve also modified the COFF back end (obj-coffbfd) to use BFD for some low-level operations, for use with the Hitachi, 29k and Zilog targets.

John Gilmore built the AMD 29000 support, added .include support, and simplified the configuration of which versions accept which pseudo-ops. He updated the 68k machine description so that Motorola's opcodes always produced fixed-size instructions (e.g. jsr), while synthetic instructions remained shrinkable (jbsr). John fixed many bugs, including true tested cross-compilation support, and one bug in relaxation that took a week and required the proverbial one-bit fix.

Ian Lance Taylor of Cygnus Solutions merged the Motorola and MIT syntaxes for the 68k, completed support for some COFF targets (68k, i386 SVR3, and SCO Unix), wrote the ECOFF support based on Michael Meissner's mips-tfile program, wrote the PowerPC and RS/6000 support, and made a few other minor patches. He handled the binutils releases for versions 2.7 through 2.9.

David Edelsohn contributed fixes for the PowerPC and AIX support.

Steve Chamberlain made gas able to generate listings.

Support for the HP9000/300 was contributed by Glenn Engel of HP.

Support for ELF format files has been worked on by Mark Eichin of Cygnus Solutions (original, incomplete implementation), Pete Hoogenboom at the University of Utah (HPPA mainly), Michael Meissner of the Open Software Foundation (i386 mainly), and Ken Raeburn of Cygnus Solutions (sparc, initial 64-bit support).

Several engineers at Cygnus Solutions have also provided many small bug fixes and configuration enhancements.

The initial Alpha support was contributed by Carnegie-Mellon University. Additional work was done by Ken Raeburn of Cygnus Solutions. Richard Henderson then rewrote much of the Alpha support.

Ian Dall updated the support code for the National Semiconductor 32000 series, and added support for Mach 3 and NetBSD running on the PC532.

Klaus Kaempf ported the assembler and the binutils to openVMS/Alpha.

Steve Haworth contributed the support for the Texas Instruction c30 (tms320c30).

H.J. Lu has contributed many patches and much testing.

Alan Modra reworked much of the i386 backend, improving the error

checking, updating the code, and improving the 16 bit support, using patches from the work of Martynas Kunigelis and H.J. Lu.

Many others have contributed large or small bugfixes and enhancements. If you've contributed significant work and are not mentioned on this list, and want to be, let us know. Some of the history has been lost; we aren't intentionally leaving anyone out.

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@c ispell-local-pdict: "ispell-dict"

@c End:

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Version 2, June 1991

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[This is the first released version of the library GPL. It is numbered 2 because it goes with version 2 of the ordinary GPL.]

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To protect your rights, we need to make restrictions that forbid anyone to deny you these rights or to ask you to surrender the rights. These restrictions translate to certain responsibilities for you if

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Also, for each distributor's protection, we want to make certain that everyone understands that there is no warranty for this free library. If the library is modified by someone else and passed on, we want its recipients to know that what they have is not the original version, so that any problems introduced by others will not reflect on the original authors' reputations.

Finally, any free program is threatened constantly by software patents. We wish to avoid the danger that companies distributing free software will individually obtain patent licenses, thus in effect transforming the program into proprietary software. To prevent this, we have made it clear that any patent must be licensed for everyone's free use or not licensed at all.

Most GNU software, including some libraries, is covered by the ordinary GNU General Public License, which was designed for utility programs. This license, the GNU Library General Public License, applies to certain designated libraries. This license is quite different from the ordinary one; be sure to read it in full, and don't assume that anything in it is the same as in the ordinary license.

The reason we have a separate public license for some libraries is that they blur the distinction we usually make between modifying or adding to a program and simply using it. Linking a program with a library, without changing the library, is in some sense simply using the library, and is analogous to running a utility program or application program. However, in a textual and legal sense, the linked executable is a combined work, a derivative of the original library, and the ordinary General Public License treats it as such.

Because



of this blurred distinction, using the ordinary General Public License for libraries did not effectively promote software sharing, because most developers did not use the libraries. We concluded that weaker conditions might promote sharing better.

However, unrestricted linking of non-free programs would deprive the users of those programs of all benefit from the free status of the libraries themselves. This Library General Public License is intended to permit developers of non-free programs to use free libraries, while preserving your freedom as a user of such programs to change the free libraries that are incorporated in them. (We have not seen how to achieve this as regards changes in header files, but we have achieved it as regards changes in the actual functions of the Library.) The hope is that this will lead to faster development of free libraries.

The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a "work based on the library" and a "work that uses the library". The former contains code derived from the library, while the latter only works together with the library.

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"Source code" for a work means the preferred form of the work for

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b) You must cause the files modified to carry prominent notices stating that you changed the files and the date of any change.

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d) If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful.

(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must

be optional: if the application does not supply it, the square root function must still compute square roots.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Library, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Library.

In addition,

mere aggregation of another work not based on the Library with the Library (or with a work based on the Library) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may opt to apply the terms of the ordinary GNU General Public License instead of this License to a given copy of the Library. To do this, you must alter all the notices that refer to this License, so that they refer to the ordinary GNU General Public License, version 2, instead of to this License. (If a newer version than version 2 of the ordinary GNU General Public License has appeared, then you can specify that version instead if you wish.) Do not make any other change in these notices.

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This option is useful when you wish to copy part of the code of the

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4. You may copy and distribute the Library (or a portion or

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If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a "work that uses the library". The executable is therefore covered by this License. Section 6 states terms for distribution of such executables.

When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

6. As an exception to the Sections above, you may also compile or link a "work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work

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You must give prominent notice with each copy of the work that the Library is used in it and that the Library and its use are covered by this License. You must supply a copy of this License. If the work during execution displays copyright notices, you must include the copyright notice for the Library among them, as well as a reference directing the user to the copy of this License. Also, you must do one of these things:

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b) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.

c) If distribution of the work is made by offering access to copy from a designated place, offer equivalent access to copy the above specified materials from the same place.

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#### Appendix: How to Apply These Terms to Your New Libraries

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<signature of Ty Coon>, 1 April 1990

Ty Coon, President of Vice

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there is no warranty for the free library. Also, if the library is modified by someone else and passed on, the recipients should know that what they have is not the original version, so that the original author's reputation will not be affected by problems that might be introduced by others.

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For example, on rare occasions, there may be a special need to encourage the widest possible use of a certain library, so that it becomes a de-facto standard. To achieve this, non-free programs must be allowed to use the library. A more frequent case is that a free library does the same job as widely used non-free libraries. In this case, there is little to gain by limiting the free library to free software only, so we use the Lesser General Public License.

In other cases, permission to use a particular library in non-free

programs enables a greater number of people to use a large body of free software. For example, permission to use the GNU C Library in non-free programs enables many more people to use the whole GNU operating system, as well as its variant, the GNU/Linux operating system.

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2. You may modify your copy or copies of the Library or any portion of it, thus forming a work based on the Library, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

a) The modified work must itself be a software library.

b) You must cause the files modified to carry prominent notices stating that you changed the files and the date of any change.

c) You must cause the whole of the work to be licensed at no charge to all third parties under the terms of this License.

d) If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful.

(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

These requirements apply to the modified work as a whole. If

identifiable sections of that work are not derived from the Library, and can be reasonably considered independent and separate works in themselves,

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3. You may opt to apply the terms of the ordinary GNU General Public License instead of this License to a given copy of the Library. To do this, you must alter all the notices that refer to this License, so that they refer to the ordinary GNU General Public License, version 2, instead of to this License. (If a newer version than version 2 of the ordinary GNU General Public License has appeared, then you can specify that version instead if you wish.) Do not make any other change in these notices.

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This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the

source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a "work that uses the library". The executable is therefore covered by this License.

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If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

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## 1.48 curl 7.60.0

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=====

libcurl can be built to use a fair amount of various third party libraries, libraries that are written and provided by other parties that are distributed using their own licenses. Even libcurl itself contains code that may cause problems to some. This document attempts to describe what licenses libcurl and the other libraries use and what possible dilemmas linking and mixing them all can lead to for end users.

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## libcurl

Uses an [MIT style license](<https://curl.haxx.se/docs/copyright.html>) that is very liberal.

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## ##

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#### ## c-ares

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#### ## libssh2

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# 1.49 Izo 2.10

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## 1.52 gdb 8.1

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```
BEGIN {
  FS="\\";
  print "/* ==> Do not modify this file!! " \
    "-*- buffer-read-only: t -*- vi" \
    ":set ro:";
  print " It is created automatically by copying.awk.";
  print " Modify copying.awk instead. <== */";
  print ""
  print "#include \"defs.h\""
  print "#include \"command.h\""
  print "#include \"gdbcmd.h\""
  print ""
  print "static void show_copying_command (const char *, int);"
  print ""
  print "static void show_warranty_command (const char *, int);"
```

```

print ""
print "static void";
print "show_copying_command (const char *ignore, int from_tty)";
print "{";
}
NR == 1,/^[ ]*15\. Disclaimer of Warranty\.[ ]*$/ {
    if ($0 ~ //)
    {
        printf " printf_filtered (\\"\\n\\");\\n";
    }
    else if ($0 !~ /^[ ]*15\. Disclaimer of Warranty\.[ ]*$/)
    {
        printf " printf_filtered (\\"";
        for (i = 1; i < NF; i++)
        printf "%s\\\\" , $i;
        printf "%s\\n\\");\\n", $NF;
    }
}
/^[ ]*15\. Disclaimer of Warranty\.[ ]*$/ {

print "}";
print "";
print "static void";
print "show_warranty_command (const char *ignore, int from_tty)";
print "{";
}
/^[ ]*15\. Disclaimer of Warranty\.[ ]*$/,/^[ ]*END OF TERMS AND CONDITIONS[ ]*$/ {
    if (! ($0 ~ /^[ ]*END OF TERMS AND CONDITIONS[ ]*$/))
    {
        printf " printf_filtered (\\"";
        for (i = 1; i < NF; i++)
        printf "%s\\\\" , $i;
        printf "%s\\n\\");\\n", $NF;
    }
}
END {
    print "}";
    print "";
    print "void"
    print "_initialize_copying (void)";
    print "{";
    print " add_cmd (\\"copying\\", no_set_class, show_copying_command,";
    print " _(\\"Conditions for redistributing copies of GDB.\\"),";
    print " &showlist);";
    print " add_cmd (\\"warranty\\", no_set_class, show_warranty_command,";
    print " _(\\"Various kinds of warranty you do not have.\\"),";
    print " &showlist);";
    print "";
}

```



```

print " /* For old-timers, allow \"info copying\", etc. */";
print " add_info (\"copying\", show_copying_command,");

print " _(\"Conditions for redistributing copies of GDB.\");";
print " add_info (\"warranty\", show_warranty_command,");
print " _(\"Various kinds of warranty you do not have.\");";
print "};";
}

```

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4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a "work that uses the library". The executable is therefore covered by this License.

Section 6 states terms for distribution of such executables.

When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may

distribute the object code for the work under the terms of Section 6.

Any

executables containing that work also fall under Section 6,  
whether or not they are linked directly with the Library itself.

6. As an exception to the Sections above, you may also combine or link a "work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer's own use and reverse engineering for debugging such modifications.

You must give prominent notice with each copy of the work that the Library is used in it and that the Library and its use are covered by this License. You must supply a copy of this License. If the work during execution displays copyright notices, you must include the copyright notice for the Library among them, as well as a reference directing the user to the copy of this License. Also, you must do one of these things:

a) Accompany the work with the complete corresponding machine-readable source code for the Library including whatever changes were used in the work (which must be distributed under Sections 1 and 2 above); and, if the work is an executable linked with the Library, with the complete machine-readable "work that uses the Library", as object code and/or source code, so that the user can modify the Library and then relink to produce a modified executable containing the modified Library. (It is understood that the user who changes the contents of definitions files in the Library will not necessarily be able to recompile the application to use the modified definitions.)

b) Use a suitable shared library mechanism for linking with the Library. A suitable mechanism is one that (1) uses at run time a copy of the library already present on the user's computer system, rather than copying library functions into the executable, and (2) will operate properly with a modified version of the library, if the user installs one, as long as the modified version is interface-compatible with the version that the work was made with.

c) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.

d) If distribution of the work is made by offering access to copy

from a designated place, offer equivalent access to copy the above specified materials from the same place.

e) Verify that the user has already received a copy of these materials or that you have already sent this user a copy.

For an executable, the required form of the "work that uses the Library" must include any data and utility programs needed for reproducing the executable from it. However, as a special exception, the materials to be distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

It may happen that this requirement contradicts the license restrictions of other proprietary libraries that do not normally accompany the operating system. Such a contradiction means you cannot use both them and the Library together in an executable that you distribute.

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Sections above.

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Version 2, June 1991

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[This is the first released version of the library GPL. It is  
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### Preamble

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The reason we have a separate public license for some libraries is that they blur the distinction we usually make between modifying or adding to a program and simply using it. Linking a program with a library, without changing the library, is in some sense simply using the library, and is analogous to running a utility program or application program. However, in a textual and legal sense, the linked executable is a combined work, a derivative of the original library, and the ordinary General Public License treats it as such.

Because of this blurred distinction, using the ordinary General Public License for libraries did not effectively promote software sharing, because most developers did not use the libraries. We concluded that weaker conditions might promote sharing better.

However, unrestricted linking of non-free programs would deprive the



users of those programs of all benefit from the free status of the libraries themselves. This Library General Public License is intended to permit developers of non-free programs to use free libraries, while preserving your freedom as a user of such programs to change the free libraries that are incorporated in them. (We have not seen how to achieve this as regards changes in header files, but we have achieved it as regards changes in the actual functions of the Library.) The hope is that this will lead to faster development of free libraries.

The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a "work based on the library" and a "work that uses the library". The former contains code derived from the library, while the latter only works together with the library.

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"Source code" for a work means the preferred form of the work for making modifications to it. For a library, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the library.

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b) You must cause the files modified to carry prominent notices stating that you changed the files and the date of any change.

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d) If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful.

(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must

be optional: if the application does not supply it, the square

root function must still compute square roots.)

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This option is useful when you wish to copy part of the code of the

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4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a "work that uses the library". The executable is therefore covered by this License. Section 6 states terms for distribution of such executables.

When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

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b) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.

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For an executable, the required form of the "work that uses the Library" must include any data and utility programs needed for reproducing the executable from it. However, as a special exception, the source code distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

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```
#!/usr/bin/env python
```

```
# Copyright (C) 2011-2018 Free Software Foundation, Inc.
```

```
#
```

```
# This file is part of GDB.
```

```
#
```

```
# This program is free software; you can redistribute it and/or modify  
# it under the terms of the GNU General Public License as published by  
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```

```
#
```

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```

```
#
```

```
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```

```
"""copyright.py
```

This script updates the list of years in the copyright notices in most files maintained by the GDB project.

Usage: cd src/gdb && python copyright.py

Always review the output of this script before committing it!

A useful command to review

the output is:

```
% filterdiff -x \*.c -x \*.cc -x \*.h -x \*.exp updates.diff
```

This removes the bulk of the changes which are most likely to be correct.

```
"""
```

```
import datetime
import os
import os.path
import subprocess
```

```
def get_update_list():
    """Return the list of files to update.
```

Assumes that the current working directory when called is the root of the GDB source tree (NOT the gdb/ subdirectory!). The names of the files are relative to that root directory.

```
"""
```

```
result = []
for gdb_dir in ('gdb', 'sim', 'include/gdb'):
    for root, dirs, files in os.walk(gdb_dir, topdown=True):
        for dirname in dirs:
            reldirname = "%s/%s" % (root, dirname)
            if (dirname in EXCLUDE_ALL_LIST
                or reldirname in EXCLUDE_LIST
                or reldirname in NOT_FSF_LIST
                or reldirname in BY_HAND):
                # Prune this directory from our search list.
                dirs.remove(dirname)
        for filename in files:
            relpath = "%s/%s" % (root, filename)
            if (filename in EXCLUDE_ALL_LIST
                or relpath in EXCLUDE_LIST
                or relpath in NOT_FSF_LIST
                or relpath in BY_HAND):
                # Ignore this file.
                pass
            else:
                result.append(relpath)
return result
```

```

def update_files(update_list):
    """Update the copyright header of the files in the given list.

    We use gnulib's update-copyright script for that.
    """
    # We want to use year intervals in the copyright notices, and
    # all years should be collapsed to one single year interval,
    # even if there are "holes" in the list of years found in the
    # original copyright notice (OK'ed by the FSF, case [gnu.org #719834]).
    os.environ['UPDATE_COPYRIGHT_USE_INTERVALS'] = '2'

    # Perform the update, and save the output in a string.
    update_cmd
    = ['bash', 'gdb/gnulib/import/extra/update-copyright']
    update_cmd += update_list

    p = subprocess.Popen(update_cmd, stdout=subprocess.PIPE,
                          stderr=subprocess.STDOUT)
    update_out = p.communicate()[0]

    # Process the output. Typically, a lot of files do not have
    # a copyright notice :-(. The update-copyright script prints
    # a well defined warning when it did not find the copyright notice.
    # For each of those, do a sanity check and see if they may in fact
    # have one. For the files that are found not to have one, we filter
    # the line out from the output, since there is nothing more to do,
    # short of looking at each file and seeing which notice is appropriate.
    # Too much work! (~4,000 files listed as of 2012-01-03).
    update_out = update_out.splitlines()
    warning_string = ': warning: copyright statement not found'
    warning_len = len(warning_string)

    for line in update_out:
        if line.endswith("\n"):

            line = line[:-1]
            if line.endswith(warning_string):
                filename = line[:-warning_len]
                if may_have_copyright_notice(filename):
                    print line
            else:
                # Unrecognized file format. !?!
                print "*** " + line

def may_have_copyright_notice(filename):

```

```
"""Check that the given file does not seem to have a copyright notice.
```

The filename is relative to the root directory.

This function assumes that the current working directory is that root directory.

The algorithm is fairly crude, meaning that it might return some false positives. I do not think it will return any false negatives... We might improve this function to handle more complex cases later...

```
"""
```

```
# For now, it may have a copyright notice if we find the word
```

```
# "Copyright" at the (reasonable) start of the given file, say
```

```
# 50 lines...
```

```
MAX_LINES = 50
```

```
fd = open(filename)
```

```
lineno = 1
```

```
for line in fd:
```

```
    if 'Copyright' in line:
```

```
        return True
```

```
    lineno += 1
```

```
    if lineno > 50:
```

```
        return False
```

```
return False
```

```
def main ():
```

```
    """The main subprogram."""
```

```
    if not os.path.isfile("gnulib/import/extra/update-copyright"):
```

```
        print "Error: This script must be called from the gdb directory."
```

```
    root_dir = os.path.dirname(os.getcwd())
```

```
    os.chdir(root_dir)
```

```
    update_list = get_update_list()
```

```
    update_files (update_list)
```

```
# Remind the user that some files need to be updated by HAND...
```

```
if MULTIPLE_COPYRIGHT_HEADERS:
```

```
    print
```

```
    print("\033[31m"
```

```
        "REMINDER: Multiple copyright headers must be updated by hand:"
```

```
        "\033[0m")
```

```
    for filename in MULTIPLE_COPYRIGHT_HEADERS:
```

```
        print " ", filename
```

```

if BY_HAND:
    print
    print "\033[31mREMINDER: The following files must be updated by hand." \
        "\033[0m"
    for filename in BY_HAND:
        print " ", filename

#####
#
#
# Some constants, placed at the end because they take up a lot of room.
# The actual value of these constants is not significant to the understanding
# of the script.
#
#####

# Files which should not be modified, either because they are
# generated, non-FSF, or otherwise special (e.g. license text,
# or test cases which must be sensitive to line numbering).
#
# Filenames are relative to the root directory.
EXCLUDE_LIST = (
    'gdb/nat/glibc_thread_db.h',
    'gdb/CONTRIBUTE',
    'gdb/gnulib/import'
)

# Files which should not be modified, either because they are
# generated, non-FSF, or otherwise special (e.g. license text,
# or test cases which must be sensitive to line numbering).
#
# Matches any file or directory name anywhere. Use with caution.
# This is mostly for files that can be found in multiple directories.
# Eg: We want all
# files named COPYING to be left untouched.

EXCLUDE_ALL_LIST = (
    "COPYING", "COPYING.LIB", "CVS", "configure", "copying.c",
    "fdl.texi", "gpl.texi", "aclocal.m4",
)

# The list of files to update by hand.
BY_HAND = (
    # Nothing at the moment :-).
)

# Files containing multiple copyright headers. This script is only
# fixing the first one it finds, so we need to finish the update

```



```

# by hand.
MULTIPLE_COPYRIGHT_HEADERS = (
    "gdb/doc/gdb.texinfo",
    "gdb/doc/refcard.tex",
    "gdb/gdbarch.sh",
)

# The list of file which have a copyright, but not head by the FSF.
# Filenames are relative to the root directory.
NOT_FSF_LIST = (
    "gdb/exc_request.defs",
    "gdb/gdbtk",
    "gdb/testsuite/gdb.gdbtk/",
    "sim/arm/armemu.h", "sim/arm/armos.c", "sim/arm/gdbhost.c",
    "sim/arm/dbg_hif.h", "sim/arm/dbg_conf.h", "sim/arm/communicate.h",
    "sim/arm/armos.h", "sim/arm/armcopro.c", "sim/arm/armemu.c",
    "sim/arm/kid.c", "sim/arm/thumbemu.c", "sim/arm/armdefs.h",
    "sim/arm/armopts.h",
    "sim/arm/dbg_cp.h", "sim/arm/dbg_rdi.h",
    "sim/arm/parent.c", "sim/arm/armsupp.c", "sim/arm/armrdi.c",
    "sim/arm/bag.c", "sim/arm/armvirt.c", "sim/arm/main.c", "sim/arm/bag.h",
    "sim/arm/communicate.c", "sim/arm/gdbhost.h", "sim/arm/armfpe.h",
    "sim/arm/arminit.c",
    "sim/common/cgen-fpu.c", "sim/common/cgen-fpu.h",
    "sim/common/cgen-accftp.c",
    "sim/mips/m16run.c", "sim/mips/sim-main.c",
    "sim/moxie/moxie-gdb.dts",
    # Not a single file in sim/ppc/ appears to be copyright FSF :-(.
    "sim/ppc/filter.h", "sim/ppc/gen-support.h", "sim/ppc/ld-insn.h",
    "sim/ppc/hw_sem.c", "sim/ppc/hw_disk.c", "sim/ppc/idecode_branch.h",
    "sim/ppc/sim-endian.h", "sim/ppc/table.c", "sim/ppc/hw_core.c",
    "sim/ppc/gen-support.c", "sim/ppc/gen-semantics.h", "sim/ppc/cpu.h",
    "sim/ppc/sim_callbacks.h", "sim/ppc/RUN", "sim/ppc/Makefile.in",
    "sim/ppc/emul_chirp.c", "sim/ppc/hw_nvram.c", "sim/ppc/dc-test.01",
    "sim/ppc/hw_phb.c", "sim/ppc/hw_eeprom.c", "sim/ppc/bits.h",
    "sim/ppc/hw_vm.c", "sim/ppc/cap.h", "sim/ppc/os_emul.h",
    "sim/ppc/options.h", "sim/ppc/gen-idecode.c", "sim/ppc/filter.c",
    "sim/ppc/corefile-n.h", "sim/ppc/std-config.h", "sim/ppc/ld-decode.h",
    "sim/ppc/filter_filename.h", "sim/ppc/hw_shm.c",
    "sim/ppc/pk_disklabel.c", "sim/ppc/dc-simple", "sim/ppc/misc.h",
    "sim/ppc/device_table.h", "sim/ppc/ld-insn.c", "sim/ppc/inline.c",
    "sim/ppc/emul_bugapi.h", "sim/ppc/hw_cpu.h", "sim/ppc/debug.h",
    "sim/ppc/hw_ide.c", "sim/ppc/debug.c", "sim/ppc/gen-itable.h",
    "sim/ppc/interrupts.c", "sim/ppc/hw_glue.c", "sim/ppc/emul_unix.c",
    "sim/ppc/sim_calls.c", "sim/ppc/dc-complex", "sim/ppc/ld-cache.c",
    "sim/ppc/registers.h", "sim/ppc/dc-test.02", "sim/ppc/options.c",
    "sim/ppc/igen.h", "sim/ppc/registers.c", "sim/ppc/device.h",
    "sim/ppc/emul_chirp.h", "sim/ppc/hw_register.c", "sim/ppc/hw_init.c",

```

```

"sim/ppc/sim-endian-n.h", "sim/ppc/filter_filename.c",
"sim/ppc/bits.c", "sim/ppc/idecode_fields.h",
"sim/ppc/hw_memory.c",
"sim/ppc/misc.c", "sim/ppc/double.c", "sim/ppc/psim.h",
"sim/ppc/hw_trace.c", "sim/ppc/emul_netbsd.h", "sim/ppc/psim.c",
"sim/ppc/ppc-instructions", "sim/ppc/tree.h", "sim/ppc/README",
"sim/ppc/gen-icache.h", "sim/ppc/gen-model.h", "sim/ppc/ld-cache.h",
"sim/ppc/mon.c", "sim/ppc/corefile.h", "sim/ppc/vm.c",
"sim/ppc/INSTALL", "sim/ppc/gen-model.c", "sim/ppc/hw_cpu.c",
"sim/ppc/corefile.c", "sim/ppc/hw_opic.c", "sim/ppc/gen-icache.c",
"sim/ppc/events.h", "sim/ppc/os_emul.c", "sim/ppc/emul_generic.c",
"sim/ppc/main.c", "sim/ppc/hw_com.c", "sim/ppc/gen-semantics.c",
"sim/ppc/emul_bugapi.c", "sim/ppc/device.c", "sim/ppc/emul_generic.h",
"sim/ppc/tree.c", "sim/ppc/mon.h", "sim/ppc/interrupts.h",
"sim/ppc/cap.c", "sim/ppc/cpu.c", "sim/ppc/hw_phb.h",
"sim/ppc/device_table.c", "sim/ppc/lf.c", "sim/ppc/lf.c",
"sim/ppc/dc-stupid", "sim/ppc/hw_pal.c", "sim/ppc/ppc-spr-table",
"sim/ppc/emul_unix.h", "sim/ppc/words.h",
"sim/ppc/basics.h",
"sim/ppc/hw_htab.c", "sim/ppc/lf.h", "sim/ppc/ld-decode.c",
"sim/ppc/sim-endian.c", "sim/ppc/gen-itable.c",
"sim/ppc/idecode_expression.h", "sim/ppc/table.h", "sim/ppc/dgen.c",
"sim/ppc/events.c", "sim/ppc/gen-idecode.h", "sim/ppc/emul_netbsd.c",
"sim/ppc/igen.c", "sim/ppc/vm_n.h", "sim/ppc/vm.h",
"sim/ppc/hw_iobus.c", "sim/ppc/inline.h",
"sim/testsuite/sim/bfin/s21.s", "sim/testsuite/sim/mips/mips32-dsp2.s",
)

```

```

if __name__ == "__main__":

```

```

    main()

```

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Version 2, June 1991

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of this blurred distinction, using the ordinary General  
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between a  
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(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must

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If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a "work that uses the library". The executable is therefore covered by this License. Section 6 states terms for distribution of such executables.

When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

6. As an exception to the Sections above, you may also compile or link a "work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer's own use and reverse engineering for debugging such modifications.

You must give prominent notice with each copy of the work that the Library is used in it and that the Library and its use are covered by this License. You must supply a copy of this License. If the work during execution displays copyright notices, you must include the copyright notice for the Library among them, as well as a reference directing the user to the copy of this License. Also, you must do one of these things:

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b) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.

c) If distribution of the work is made by offering access to copy



from a designated place, offer equivalent access to copy the above specified materials from the same place.

d) Verify that the user has already received a copy of these materials or that you have already sent this user a copy.

For an executable, the required form of the "work that uses the Library" must include any data and utility programs needed for reproducing the executable from it. However, as a special exception, the source code distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

It may happen that this requirement contradicts the license restrictions of other proprietary libraries that do not normally accompany the operating system. Such a contradiction means you cannot use both them and the Library together in an executable that you distribute.

7. You may place library facilities that are a work based on the Library side-by-side in a single library together with other library facilities not covered by this License, and distribute such a combined library, provided that the separate distribution of the work based on the Library and of the other library facilities is otherwise permitted, and provided that you do these two things:

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## END OF TERMS AND CONDITIONS

### Appendix: How to Apply These Terms to Your New Libraries

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<one line to give the library's name and a brief idea of what it does.>

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the names:

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library 'Frob' (a library for tweaking knobs) written by James Random Hacker.

<signature of Ty Coon>, 1 April 1990

Ty Coon, President of Vice

That's all there is to it!

@ignore

@c Set file name and title for man page.

@setfilename gpl

@settitle GNU General Public License

@c man begin SEEALSO

gfdl(7), fsf-funding(7).

@c man end

@c man begin COPYRIGHT

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@c man end

@end ignore

@node Copying

@c man begin DESCRIPTION

@appendix GNU GENERAL PUBLIC LICENSE

@c The GNU General Public License.

@center Version 3, 29 June 2007

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@c hence no sectioning command or @node.

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To prevent this, the GPL assures that patents cannot be used to render the program non-free.

The precise terms and conditions for copying, distribution and modification follow.

@heading TERMS AND CONDITIONS

@enumerate 0

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To ``convey" a work means any kind of propagation that enables other parties to make or receive copies. Mere interaction with a user through a computer network, with no transfer of a copy, is not conveying.

An interactive user interface displays ``Appropriate Legal Notices" to

the extent that it includes a convenient and prominently visible feature that (1) displays an appropriate copyright notice, and (2) tells the user that there is no warranty for the work (except to the extent that warranties are provided), that licensees may convey the work under this License, and how to view a copy of this License. If the interface presents a list of user commands or options, such as a menu, a prominent item in the list meets this criterion.

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The ``source code" for a work means the preferred form of the work for making modifications to it. ``Object code" means any non-source form of a work.

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The ``System Libraries" of an executable work include anything, other than the work as a whole, that (a) is included in the normal form of packaging a Major Component, but which is not part of that Major Component, and (b) serves only to enable use of the work with that Major Component, or to implement a Standard Interface for which an implementation is available to the public in source code form. A ``Major Component", in this context, means a major essential component (kernel, window system, and so on) of the specific operating system (if any) on which the executable work runs, or a compiler used to produce the work, or an object code interpreter used to run it.

The ``Corresponding Source" for a work in object code form means all the source code needed to generate, install, and (for an executable work) run the object code and to modify the work, including scripts to control those activities. However, it does not include the work's System Libraries, or general-purpose tools or generally available free programs which are used unmodified in performing those activities but which are not part of the work. For example, Corresponding Source includes interface definition files associated with source files for the work, and the source code for shared libraries and dynamically linked subprograms that the work is specifically designed to require, such as by intimate data communication or control flow between those subprograms and other parts of the work.

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You may convey a work based on the Program, or the modifications to produce it from the Program, in the form of source code under the terms of section 4, provided that you also meet all of these conditions:

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The work must carry prominent notices stating that you modified it, and giving a relevant date.

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The work must carry prominent notices stating that it is released under this License and any conditions added under section 7. This requirement modifies the requirement in section 4 to ``keep intact all notices".

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@item

Convey the object code in, or embodied in, a physical product (including a physical distribution medium), accompanied by the Corresponding Source fixed on a durable physical medium customarily used for software interchange.

@item

Convey the object code in, or embodied in, a physical product (including a physical distribution medium), accompanied by a written offer, valid for at least three years and valid for as long as you offer spare parts or customer support for that product model, to give anyone who possesses the object code either (1) a copy of the Corresponding Source for all the software in the product that is covered by this License, on a durable physical medium customarily used for software interchange, for a price no more than your reasonable cost of physically performing this conveying of source, or (2) access to copy the Corresponding Source from a network server at no charge.

@item

Convey individual copies of the object code with a copy of the written offer to provide the Corresponding Source. This alternative is allowed only occasionally and noncommercially, and only if you received the object code with such an offer, in accord with subsection 6b.

@item

Convey the object code by offering access from a designated place (gratis or for a charge), and offer equivalent access to the

Corresponding Source in the same way through the same place at no further charge. You need not require recipients to copy the Corresponding Source along with the object code. If the place to copy the object code is a network server, the Corresponding Source may be on a different server (operated by you or a third party) that supports equivalent copying facilities, provided you maintain clear directions next to the object code saying where to find the Corresponding Source. Regardless of what server hosts the Corresponding Source, you remain obligated to ensure that it is available for as long as needed to satisfy these requirements.

#### @item

Convey the object code using peer-to-peer transmission, provided you inform other peers where the object code and Corresponding Source of the work are being offered to the general public at no charge under subsection 6d.

#### @end enumerate

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```
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```

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```
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@end smallexample
```

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```
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@var{program} Copyright (C) @var{year} @var{name of author}
This program comes with ABSOLUTELY NO WARRANTY; for details type @samp{show w}.
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under certain conditions; type @samp{show c} for details.
@end smallexample
```

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@c man end

## 1.53 glib 2.46.2

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## PCRE LICENCE

Please see the file LICENCE in the PCRE distribution for licensing details.

End

```
/******
```

```
* Perl-Compatible Regular Expressions *
```

```
*****/
```

```
/* This is the public header file for the PCRE library, to be #included by  
applications that call the PCRE functions.
```

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-----  
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-----  
\*/

```
#ifndef _PCRE_H
```

```
#define _PCRE_H
```

```
/*
```

The current PCRE version information. \*/

```
#define PCRE_MAJOR      8
#define PCRE_MINOR      31
```

```
#define PCRE_PRERELEASE
```

```
#define PCRE_DATE        2012-07-06
```

/\* When an application links to a PCRE DLL in Windows, the symbols that are imported have to be identified as such. When building PCRE, the appropriate export setting is defined in pcre\_internal.h, which includes this file. So we don't change existing definitions of PCRE\_EXP\_DECL and PCRECPP\_EXP\_DECL. \*/

```
#if defined(_WIN32) && !defined(PCRE_STATIC)
#  ifndef PCRE_EXP_DECL
#    define PCRE_EXP_DECL extern __declspec(dllimport)
#  endif
#  ifdef __cplusplus
#    ifndef PCRECPP_EXP_DECL
#      define PCRECPP_EXP_DECL extern __declspec(dllimport)
#    endif
#    ifndef PCRECPP_EXP_DEFN
#      define PCRECPP_EXP_DEFN __declspec(dllimport)
#    endif
#  endif
#endif
```

/\* By default, we use the standard "extern" declarations. \*/

```
#ifndef PCRE_EXP_DECL
#  ifdef __cplusplus
#    define PCRE_EXP_DECL extern "C"
#  else
#
#    define PCRE_EXP_DECL extern
#  endif
#endif
```

```
#ifdef __cplusplus
#  ifndef PCRECPP_EXP_DECL
#    define PCRECPP_EXP_DECL extern
#  endif
#  ifndef PCRECPP_EXP_DEFN
#    define PCRECPP_EXP_DEFN
#  endif
#endif
```

/\* Have to include stdlib.h in order to ensure that size\_t is defined; it is needed here for malloc. \*/

```
#include <stdlib.h>
```

```
/* Allow for C++ users */
```

```
#ifdef __cplusplus
```

```
extern "C" {
```

```
#endif
```

/\* Options. Some are compile-time only, some are run-time only, and some are both, so we keep them all distinct. However, almost all the bits in the options word are now used. In the long run, we may have to re-use some of the compile-time only bits for runtime options, or vice versa. In the comments below, "compile", "exec", and "DFA exec" mean that the option is permitted to be set for those functions; "used in" means that an option may be set only for compile, but is subsequently referenced in exec and/or DFA exec. Any of the compile-time options may be inspected during studying (and therefore JIT compiling). \*/

```
#define PCRE_CASELESS      0x00000001 /* Compile */
```

```
#define PCRE_MULTILINE     0x00000002 /* Compile */
```

```
#define PCRE_DOTALL       0x00000004 /* Compile */
```

```
#define PCRE_EXTENDED     0x00000008 /* Compile */
```

```
#define PCRE_ANCHORED     0x00000010 /* Compile, exec, DFA exec */
```

```
#define PCRE_DOLLAR_ENDONLY 0x00000020 /* Compile, used in exec, DFA exec */
```

```
#define PCRE_EXTRA        0x00000040 /* Compile */
```

```
#define PCRE_NOTBOL       0x00000080 /* Exec, DFA exec */
```

```
#define PCRE_NOTEOL       0x00000100 /* Exec, DFA exec */
```

```
#define PCRE_UNGREEDY     0x00000200 /* Compile */
```

```
#define PCRE_NOTEMPTY     0x00000400 /* Exec, DFA exec */
```

```
/* The next two are also used in exec and DFA exec */
```

```
#define PCRE_UTF8         0x00000800 /* Compile (same as PCRE_UTF16) */
```

```
#define PCRE_UTF16        0x00000800 /* Compile (same as PCRE_UTF8) */
```

```
#define PCRE_NO_AUTO_CAPTURE 0x00001000 /* Compile */
```

```
/*
```

```
  The next two are also used in exec and DFA exec */
```

```
#define PCRE_NO_UTF8_CHECK 0x00002000 /* Compile (same as PCRE_NO_UTF16_CHECK) */
```

```
#define PCRE_NO_UTF16_CHECK 0x00002000 /* Compile (same as PCRE_NO_UTF8_CHECK) */
```

```
#define PCRE_AUTO_CALLOUT 0x00004000 /* Compile */
```

```
#define PCRE_PARTIAL_SOFT 0x00008000 /* Exec, DFA exec */
```

```
#define PCRE_PARTIAL      0x00008000 /* Backwards compatible synonym */
```

```
#define PCRE_DFA_SHORTEST 0x00010000 /* DFA exec */
```

```
#define PCRE_DFA_RESTART  0x00020000 /* DFA exec */
```

```
#define PCRE_FIRSTLINE     0x00040000 /* Compile, used in exec, DFA exec */
```

```
#define PCRE_DUPNAMES      0x00080000 /* Compile */
```

```
#define PCRE_NEWLINE_CR    0x00100000 /* Compile, exec, DFA exec */
```

```
#define PCRE_NEWLINE_LF    0x00200000 /* Compile, exec, DFA exec */
```



```

#define PCRE_NEWLINE_CRLF    0x00300000 /* Compile, exec, DFA exec */
#define PCRE_NEWLINE_ANY     0x00400000 /* Compile, exec, DFA exec */
#define PCRE_NEWLINE_ANYCRLF
    0x00500000 /* Compile, exec, DFA exec */
#define PCRE_BSR_ANYCRLF     0x00800000 /* Compile, exec, DFA exec */
#define PCRE_BSR_UNICODE     0x01000000 /* Compile, exec, DFA exec */
#define PCRE_JAVASCRIPT_COMPAT 0x02000000 /* Compile, used in exec */
#define PCRE_NO_START_OPTIMIZE 0x04000000 /* Compile, exec, DFA exec */
#define PCRE_NO_START_OPTIMISE 0x04000000 /* Synonym */
#define PCRE_PARTIAL_HARD     0x08000000 /* Exec, DFA exec */
#define PCRE_NOTEMPTY_ATSTART 0x10000000 /* Exec, DFA exec */
#define PCRE_UCP              0x20000000 /* Compile, used in exec, DFA exec */

/* Exec-time and get/set-time error codes */

#define PCRE_ERROR_NOMATCH    (-1)
#define PCRE_ERROR_NULL      (-2)
#define PCRE_ERROR_BADOPTION  (-3)
#define PCRE_ERROR_BADMAGIC  (-4)
#define PCRE_ERROR_UNKNOWN_OPCODE (-5)
#define PCRE_ERROR_UNKNOWN_NODE (-5) /* For backward compatibility */
#define PCRE_ERROR_NOMEMORY   (-6)
#define PCRE_ERROR_NOSUBSTRING
    (-7)
#define PCRE_ERROR_MATCHLIMIT (-8)
#define PCRE_ERROR_CALLOUT    (-9) /* Never used by PCRE itself */
#define PCRE_ERROR_BADUTF8     (-10) /* Same for 8/16 */
#define PCRE_ERROR_BADUTF16    (-10) /* Same for 8/16 */
#define PCRE_ERROR_BADUTF8_OFFSET (-11) /* Same for 8/16 */
#define PCRE_ERROR_BADUTF16_OFFSET (-11) /* Same for 8/16 */
#define PCRE_ERROR_PARTIAL     (-12)
#define PCRE_ERROR_BADPARTIAL  (-13)
#define PCRE_ERROR_INTERNAL    (-14)
#define PCRE_ERROR_BADCOUNT  (-15)
#define PCRE_ERROR_DFA_UITEM   (-16)
#define PCRE_ERROR_DFA_UCOND   (-17)
#define PCRE_ERROR_DFA_UMLIMIT (-18)
#define PCRE_ERROR_DFA_WSSIZE  (-19)
#define PCRE_ERROR_DFA_RECURSE (-20)
#define PCRE_ERROR_RECURSIONLIMIT (-21)
#define PCRE_ERROR_NULLWSLIMIT (-22) /* No longer actually used */
#define PCRE_ERROR_BADNEWLINE  (-23)
#define PCRE_ERROR_BADOFFSET   (-24)
#define PCRE_ERROR_SHORTUTF8   (-25)
#define PCRE_ERROR_SHORTUTF16  (-25) /* Same for 8/16 */
#define PCRE_ERROR_RECURSELOOP (-26)
#define PCRE_ERROR_JIT_STACKLIMIT (-27)

```

```
#define PCRE_ERROR_BADMODE      (-28)
#define PCRE_ERROR_BADENDIANNESS (-29)
#define PCRE_ERROR_DFA_BADRESTART (-30)
```

```
/* Specific error codes for UTF-8 validity checks */
```

```
#define PCRE_UTF8_ERR0      0
#define PCRE_UTF8_ERR1      1
#define PCRE_UTF8_ERR2      2
#define PCRE_UTF8_ERR3      3
#define PCRE_UTF8_ERR4      4
#define PCRE_UTF8_ERR5      5
#define PCRE_UTF8_ERR6      6
#define PCRE_UTF8_ERR7      7
#define PCRE_UTF8_ERR8      8
#define PCRE_UTF8_ERR9      9
#define PCRE_UTF8_ERR10     10
#define PCRE_UTF8_ERR11     11
#define PCRE_UTF8_ERR12     12
#define PCRE_UTF8_ERR13     13
#define PCRE_UTF8_ERR14     14
#define PCRE_UTF8_ERR15     15
#define PCRE_UTF8_ERR16     16
#define PCRE_UTF8_ERR17     17
#define PCRE_UTF8_ERR18     18
#define PCRE_UTF8_ERR19     19
#define PCRE_UTF8_ERR20     20
#define PCRE_UTF8_ERR21     21
```

```
/* Specific error codes for UTF-16 validity checks */
```

```
#define PCRE_UTF16_ERR0      0
#define PCRE_UTF16_ERR1      1
#define PCRE_UTF16_ERR2      2
#define PCRE_UTF16_ERR3      3
#define PCRE_UTF16_ERR4      4
```

```
/* Request types for pcre_fullinfo() */
```

```
#define PCRE_INFO_OPTIONS      0
#define PCRE_INFO_SIZE         1
#define PCRE_INFO_CAPTURECOUNT 2
#define PCRE_INFO_BACKREFMAX   3
#define PCRE_INFO_FIRSTBYTE     4
#define PCRE_INFO_FIRSTCHAR     4 /* For backwards compatibility */
#define PCRE_INFO_FIRSTTABLE     5
#define PCRE_INFO_LASTLITERAL   6
```

```

#define PCRE_INFO_NAMEENTRYSIZE 7
#define PCRE_INFO_NAMECOUNT 8
#define PCRE_INFO_NAMETABLE 9
#define PCRE_INFO_STUDYSIZE 10
#define PCRE_INFO_DEFAULT_TABLES
11
#define PCRE_INFO_OKPARTIAL 12
#define PCRE_INFO_JCHANGED 13
#define PCRE_INFO_HASCORLRF 14
#define PCRE_INFO_MINLENGTH 15
#define PCRE_INFO_JIT 16
#define PCRE_INFO_JITSIZE 17
#define PCRE_INFO_MAXLOOKBEHIND 18

/* Request types for pcre_config(). Do not re-arrange, in order to remain
compatible. */

#define PCRE_CONFIG_UTF8 0
#define PCRE_CONFIG_NEWLINE 1
#define PCRE_CONFIG_LINK_SIZE 2
#define PCRE_CONFIG_POSIX_MALLOC_THRESHOLD 3
#define PCRE_CONFIG_MATCH_LIMIT 4
#define PCRE_CONFIG_STACKRECURSE 5
#define PCRE_CONFIG_UNICODE_PROPERTIES 6
#define PCRE_CONFIG_MATCH_LIMIT_RECURSION 7
#define PCRE_CONFIG_BSR 8
#define PCRE_CONFIG_JIT 9
#define PCRE_CONFIG_UTF16 10
#define PCRE_CONFIG_JITTARGET 11

/* Request types for pcre_study(). Do not re-arrange, in order to remain
compatible.
*/

#define PCRE_STUDY_JIT_COMPILE 0x0001
#define PCRE_STUDY_JIT_PARTIAL_SOFT_COMPILE 0x0002
#define PCRE_STUDY_JIT_PARTIAL_HARD_COMPILE 0x0004

/* Bit flags for the pcre[16]_extra structure. Do not re-arrange or redefine
these bits, just add new ones on the end, in order to remain compatible. */

#define PCRE_EXTRA_STUDY_DATA 0x0001
#define PCRE_EXTRA_MATCH_LIMIT 0x0002
#define PCRE_EXTRA_CALLOUT_DATA 0x0004
#define PCRE_EXTRA_TABLES 0x0008
#define PCRE_EXTRA_MATCH_LIMIT_RECURSION 0x0010
#define PCRE_EXTRA_MARK 0x0020
#define PCRE_EXTRA_EXECUTABLE_JIT 0x0040

```

```

/* Types */

struct real_pcre;          /* declaration; the definition is private */
typedef struct real_pcre pcre;

struct real_pcre16;        /* declaration; the definition is private */
typedef struct real_pcre16 pcre16;

struct real_pcre_jit_stack; /* declaration; the definition is private */
typedef
struct real_pcre_jit_stack pcre_jit_stack;

struct real_pcre16_jit_stack; /* declaration; the definition is private */
typedef struct real_pcre16_jit_stack pcre16_jit_stack;

/* If PCRE is compiled with 16 bit character support, PCRE_UCHAR16 must contain
a 16 bit wide signed data type. Otherwise it can be a dummy data type since
pcre16 functions are not implemented. There is a check for this in pcre_internal.h. */
#ifndef PCRE_UCHAR16
#define PCRE_UCHAR16 unsigned short
#endif

#ifndef PCRE_SPTR16
#define PCRE_SPTR16 const PCRE_UCHAR16 *
#endif

/* When PCRE is compiled as a C++ library, the subject pointer type can be
replaced with a custom type. For conventional use, the public interface is a
const char *. */

#ifndef PCRE_SPTR
#define PCRE_SPTR const char *
#endif

/* The structure for passing additional data to pcre_exec(). This is defined in
such a way as to be extensible. Always add new fields at the end, in order to
remain compatible. */

typedef struct pcre_extra {
    unsigned long int flags; /* Bits for which fields are set */
    void *study_data; /* Opaque data from pcre_study() */
    unsigned long int match_limit; /* Maximum number of calls to match() */
    void *callout_data; /* Data passed back in callouts */
    const unsigned char *tables; /* Pointer to character tables */
    unsigned long int match_limit_recursion; /* Max recursive calls to match() */
    unsigned char **mark; /* For passing back a mark pointer */
    void *executable_jit; /* Contains a pointer to a compiled jit code */

```

```
} pcre_extra;
```

```
/* Same structure as above, but with 16 bit char pointers. */
```

```
typedef struct pcre16_extra {  
    unsigned long int flags;      /* Bits for which fields are set */  
    void *study_data;            /* Opaque data from pcre_study() */  
    unsigned long int match_limit; /* Maximum number of calls to match() */  
    void *callout_data;          /* Data passed back in callouts */  
    const unsigned char  
    *tables; /* Pointer to character tables */  
    unsigned long int match_limit_recursion; /* Max recursive calls to match() */  
    PCRE_UCHAR16 **mark;         /* For passing back a mark pointer */  
    void *executable_jit;        /* Contains a pointer to a compiled jit code */  
} pcre16_extra;
```

/\* The structure for passing out data via the pcre\_callout\_function. We use a structure so that new fields can be added on the end in future versions, without changing the API of the function, thereby allowing old clients to work without modification. \*/

```
typedef struct pcre_callout_block {  
    int    version;      /* Identifies version of block */  
    /* ----- Version 0 ----- */  
    int    callout_number; /* Number compiled into pattern */  
    int    *offset_vector; /* The offset vector */  
    PCRE_SPTR  subject;    /* The subject being matched */  
    int    subject_length; /* The length of the subject */  
    int  
        start_match; /* Offset to start of this match attempt */  
    int    current_position; /* Where we currently are in the subject */  
    int    capture_top;      /* Max current capture */  
    int    capture_last;     /* Most recently closed capture */  
    void    *callout_data;   /* Data passed in with the call */  
    /* ----- Added for Version 1 ----- */  
    int    pattern_position; /* Offset to next item in the pattern */  
    int    next_item_length; /* Length of next item in the pattern */  
    /* ----- Added for Version 2 ----- */  
    const unsigned char *mark; /* Pointer to current mark or NULL */  
    /* ----- */  
} pcre_callout_block;
```

```
/* Same structure as above, but with 16 bit char pointers. */
```

```
typedef struct pcre16_callout_block {  
    int    version;      /* Identifies version of block */  
    /* -----
```

```

Version 0 ----- */
int      callout_number; /* Number compiled into pattern */
int      *offset_vector; /* The offset vector */
PCRE_SPTR16 subject;     /* The subject being matched */
int      subject_length; /* The length of the subject */
int      start_match;     /* Offset to start of this match attempt */
int      current_position; /* Where we currently are in the subject */
int      capture_top;     /* Max current capture */
int      capture_last;    /* Most recently closed capture */
void      *callout_data;  /* Data passed in with the call */
/* ----- Added for Version 1 ----- */
int      pattern_position; /* Offset to next item in the pattern */
int      next_item_length; /* Length of next item in the pattern */
/* ----- Added for Version 2 ----- */
const PCRE_UCHAR16 *mark;
        /* Pointer to current mark or NULL */
/* ----- */
} pcre16_callout_block;

/* Indirection for store get and free functions. These can be set to
alternative malloc/free functions if required. Special ones are used in the
non-recursive case for "frames". There is also an optional callout function
that is triggered by the (?) regex item. For Virtual Pascal, these definitions
have to take another form. */

#ifdef VPCOMPAT
PCRE_EXP_DECL void (*pcre_malloc)(size_t);
PCRE_EXP_DECL void (*pcre_free)(void *);
PCRE_EXP_DECL void (*pcre_stack_malloc)(size_t);
PCRE_EXP_DECL void (*pcre_stack_free)(void *);
PCRE_EXP_DECL int (*pcre_callout)(pcre_callout_block *);

PCRE_EXP_DECL void (*pcre16_malloc)(size_t);
PCRE_EXP_DECL void (*pcre16_free)(void *);
PCRE_EXP_DECL void (*pcre16_stack_malloc)(size_t);
PCRE_EXP_DECL void (*pcre16_stack_free)(void *);
PCRE_EXP_DECL int (*pcre16_callout)(pcre16_callout_block *);
#else
/* VPCOMPAT */
PCRE_EXP_DECL void *pcre_malloc(size_t);
PCRE_EXP_DECL void pcre_free(void *);
PCRE_EXP_DECL void *pcre_stack_malloc(size_t);
PCRE_EXP_DECL void pcre_stack_free(void *);
PCRE_EXP_DECL int pcre_callout(pcre_callout_block *);

PCRE_EXP_DECL void *pcre16_malloc(size_t);
PCRE_EXP_DECL void pcre16_free(void *);
PCRE_EXP_DECL void *pcre16_stack_malloc(size_t);

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PCRE_EXP_DECL void pcre16_stack_free(void *);
PCRE_EXP_DECL int pcre16_callout(pcre16_callout_block *);
#endif /* VPCOMPAT */

/* User defined callback which provides a stack just before the match starts. */

typedef pcre_jit_stack *(*pcre_jit_callback)(void *);
typedef pcre16_jit_stack *(*pcre16_jit_callback)(void *);

/* Exported PCRE functions */

PCRE_EXP_DECL pcre *pcre_compile(const char *, int, const char **, int *,
    const unsigned char *);
PCRE_EXP_DECL pcre16 *pcre16_compile(PCRE_SPTR16, int, const char **, int *,
    const unsigned char *);
PCRE_EXP_DECL pcre *pcre_compile2(const
    char *, int, int *, const char **,
    int *, const unsigned char *);
PCRE_EXP_DECL pcre16 *pcre16_compile2(PCRE_SPTR16, int, int *, const char **,
    int *, const unsigned char *);
PCRE_EXP_DECL int pcre_config(int, void *);
PCRE_EXP_DECL int pcre16_config(int, void *);
PCRE_EXP_DECL int pcre_copy_named_substring(const pcre *, const char *,
    int *, int, const char *, char *, int);
PCRE_EXP_DECL int pcre16_copy_named_substring(const pcre16 *, PCRE_SPTR16,
    int *, int, PCRE_SPTR16, PCRE_UCHAR16 *, int);
PCRE_EXP_DECL int pcre_copy_substring(const char *, int *, int, int,
    char *, int);
PCRE_EXP_DECL int pcre16_copy_substring(PCRE_SPTR16, int *, int, int,
    PCRE_UCHAR16 *, int);
PCRE_EXP_DECL int pcre_dfa_exec(const pcre *, const pcre_extra *,
    const char *, int, int, int *, int *, int *, int);
PCRE_EXP_DECL int pcre16_dfa_exec(const pcre16 *, const
    pcre16_extra *,
    PCRE_SPTR16, int, int, int *, int *, int *, int);
PCRE_EXP_DECL int pcre_exec(const pcre *, const pcre_extra *, PCRE_SPTR,
    int, int, int *, int);
PCRE_EXP_DECL int pcre16_exec(const pcre16 *, const pcre16_extra *,
    PCRE_SPTR16, int, int, int *, int);
PCRE_EXP_DECL void pcre_free_substring(const char *);
PCRE_EXP_DECL void pcre16_free_substring(PCRE_SPTR16);
PCRE_EXP_DECL void pcre_free_substring_list(const char **);
PCRE_EXP_DECL void pcre16_free_substring_list(PCRE_SPTR16 *);
PCRE_EXP_DECL int pcre_fullinfo(const pcre *, const pcre_extra *, int,
    void *);
PCRE_EXP_DECL int pcre16_fullinfo(const pcre16 *, const pcre16_extra *, int,
    void *);
PCRE_EXP_DECL int pcre_get_named_substring(const pcre *, const char *,

```

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    int *, int, const char *, const char **);
PCRE_EXP_DECL int pcre16_get_named_substring(const pcre16 *, PCRE_SPTR16,
    int
    *, int, PCRE_SPTR16, PCRE_SPTR16 *);
PCRE_EXP_DECL int pcre_get_stringnumber(const pcre *, const char *);
PCRE_EXP_DECL int pcre16_get_stringnumber(const pcre16 *, PCRE_SPTR16);
PCRE_EXP_DECL int pcre_get_stringtable_entries(const pcre *, const char *,
    char **, char **);
PCRE_EXP_DECL int pcre16_get_stringtable_entries(const pcre16 *, PCRE_SPTR16,
    PCRE_UCHAR16 **, PCRE_UCHAR16 **);
PCRE_EXP_DECL int pcre_get_substring(const char *, int *, int, int,
    const char **);
PCRE_EXP_DECL int pcre16_get_substring(PCRE_SPTR16, int *, int, int,
    PCRE_SPTR16 *);
PCRE_EXP_DECL int pcre_get_substring_list(const char *, int *, int,
    const char ***);
PCRE_EXP_DECL int pcre16_get_substring_list(PCRE_SPTR16, int *, int,
    PCRE_SPTR16 **);
PCRE_EXP_DECL const unsigned char *pcre_maketables(void);
PCRE_EXP_DECL const unsigned char *pcre16_maketables(void);
PCRE_EXP_DECL int pcre_refcount(pcre *,
    int);
PCRE_EXP_DECL int pcre16_refcount(pcre16 *, int);
PCRE_EXP_DECL pcre_extra *pcre_study(const pcre *, int, const char **);
PCRE_EXP_DECL pcre16_extra *pcre16_study(const pcre16 *, int, const char **);
PCRE_EXP_DECL void pcre_free_study(pcre_extra *);
PCRE_EXP_DECL void pcre16_free_study(pcre16_extra *);
PCRE_EXP_DECL const char *pcre_version(void);
PCRE_EXP_DECL const char *pcre16_version(void);

/* Utility functions for byte order swaps. */
PCRE_EXP_DECL int pcre_pattern_to_host_byte_order(pcre *, pcre_extra *,
    const unsigned char *);
PCRE_EXP_DECL int pcre16_pattern_to_host_byte_order(pcre16 *, pcre16_extra *,
    const unsigned char *);
PCRE_EXP_DECL int pcre16_utf16_to_host_byte_order(PCRE_UCHAR16 *,
    PCRE_SPTR16, int, int *, int);

/* JIT compiler related functions. */

PCRE_EXP_DECL pcre_jit_stack *pcre_jit_stack_alloc(int, int);
PCRE_EXP_DECL pcre16_jit_stack *pcre16_jit_stack_alloc(int, int);
PCRE_EXP_DECL void pcre_jit_stack_free(pcre_jit_stack
    *);
PCRE_EXP_DECL void pcre16_jit_stack_free(pcre16_jit_stack *);
PCRE_EXP_DECL void pcre_assign_jit_stack(pcre_extra *,
    pcre_jit_callback, void *);
PCRE_EXP_DECL void pcre16_assign_jit_stack(pcre16_extra *,

```



```

        pcre16_jit_callback, void *);

#ifdef __cplusplus
} /* extern "C" */
#endif

#endif /* End of pcre.h */

```

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#define __GLIB_H_INSIDE__

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#include <glib/garray.h>
#include <glib/gasyncqueue.h>
#include <glib/gatomic.h>
#include <glib/gbacktrace.h>
#include <glib/gbase64.h>
#include <glib/gbitlock.h>
#include <glib/gbookmarkfile.h>
#include <glib/gbytes.h>
#include <glib/gcharset.h>
#include <glib/gchecksum.h>
#include <glib/gconvert.h>
#include <glib/gdataset.h>
#include <glib/gdate.h>
#include <glib/gdatetime.h>
#include <glib/gdir.h>
#include <glib/genviron.h>
#include <glib/gerror.h>
#include <glib/gfileutils.h>
#include <glib/ggettext.h>
#include <glib/ghash.h>
#include <glib/ghmac.h>
#include <glib/ghook.h>
#include <glib/ghostutils.h>
#include <glib/giochannel.h>
#include <glib/gkeyfile.h>
#include <glib/glist.h>
#include <glib/gmacros.h>
#include <glib/gmain.h>
#include <glib/gmappedfile.h>
#include <glib/gmarkup.h>

```

```

#include <glib/gmem.h>
#include <glib/gmessages.h>
#include
    <glib/gnode.h>
#include <glib/goption.h>
#include <glib/gpattern.h>
#include <glib/gpoll.h>
#include <glib/gprimes.h>
#include <glib/gqsort.h>
#include <glib/gquark.h>
#include <glib/gqueue.h>
#include <glib/grand.h>
#include <glib/gregex.h>
#include <glib/gscanner.h>
#include <glib/gsequence.h>
#include <glib/gshell.h>
#include <glib/gslice.h>
#include <glib/gslist.h>
#include <glib/gspawn.h>
#include <glib/gstrfuncs.h>
#include <glib/gstring.h>
#include <glib/gstringchunk.h>
#include <glib/gtestutils.h>
#include <glib/gthread.h>
#include <glib/gthreadpool.h>
#include <glib/gtimer.h>
#include <glib/gtimezone.h>
#include <glib/gtrashstack.h>
#include <glib/gtree.h>
#include <glib/gtypes.h>
#include <glib/gunicode.h>
#include <glib/gurifuncs.h>
#include <glib/gutils.h>
#include <glib/gvarianttype.h>
#include <glib/gvariant.h>
#include <glib/gversion.h>
#include <glib/gversionmacros.h>
#ifdef G_PLATFORM_WIN32
#include <glib/gwin32.h>
#endif

#ifndef G_DISABLE_DEPRECATED
#include <glib/deprecated/gallocator.h>
#include
    <glib/deprecated/gcache.h>
#include <glib/deprecated/gcompletion.h>
#include <glib/deprecated/gmain.h>
#include <glib/deprecated/grel.h>

```

```
#include <glib/deprecated/gthread.h>
#endif /* G_DISABLE_DEPRECATED */
```

```
#include <glib/glib-autocleanups.h>
```

```
#undef __GLIB_H_INSIDE__
```

```
#endif /* __G_LIB_H__ */
```

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## 1.54 libtool 2.4.6

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## 1.57 ncurses 6.0

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Current ncurses maintainer: Thomas Dickey <[dickey@invisible-island.net](mailto:dickey@invisible-island.net)>

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From network\_io/unix/inet\_ntop.c, network\_io/unix/inet\_pton.c:

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From dso/aix/dso.c:

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From strings/apr\_strnatcmp.c,  
include/apr\_strings.h:

strnatcmp.c -- Perform 'natural order' comparisons of strings in C.  
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strings/apr\_snprintf.c:

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\* cvt - IEEE floating point formatting routines.  
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```
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* /hikaricp-java7-2-4-13-sources-zip/com/zaxxer/hikari/metrics/dropwizard/CodaHaleMetricsTracker.java
* /hikaricp-java7-2-4-13-sources-zip/com/zaxxer/hikari/metrics/MetricsTracker.java
* /hikaricp-java7-2-4-13-sources-zip/com/zaxxer/hikari/metrics/MetricsTrackerFactory.java
*
* /hikaricp-java7-2-4-13-sources-zip/com/zaxxer/hikari/HikariJNDIFactory.java
* /hikaricp-java7-2-4-13-sources-zip/com/zaxxer/hikari/metrics/dropwizard/CodaHaleMetricsTrackerFactory.java
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- \* /hikaricp-java7-2-4-13-sources-zip/com/zaxxer/hikari/metrics/prometheus/HikariCPCollector.java
- \* /hikaricp-java7-2-4-13-sources-zip/com/zaxxer/hikari/metrics/prometheus/PrometheusMetricsTracker.java

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- \* /hikaricp-java7-2-4-13-sources-zip/com/zaxxer/hikari/util/FastList.java
- \* /hikaricp-java7-2-4-13-sources-zip/com/zaxxer/hikari/pool/ProxyLeakTask.java
- \* /hikaricp-java7-2-4-13-sources-zip/com/zaxxer/hikari/pool/ProxyResultSet.java
- \*
- /hikaricp-java7-2-4-13-sources-zip/com/zaxxer/hikari/pool/ProxyConnection.java
- \* /hikaricp-java7-2-4-13-sources-zip/com/zaxxer/hikari/util/DriverDataSource.java
- \* /hikaricp-java7-2-4-13-sources-zip/com/zaxxer/hikari/pool/ProxyFactory.java
- \* /hikaricp-java7-2-4-13-sources-zip/com/zaxxer/hikari/util/ConcurrentBag.java
- \* /hikaricp-java7-2-4-13-sources-zip/com/zaxxer/hikari/util/SuspendResumeLock.java
- \* /hikaricp-java7-2-4-13-sources-zip/com/zaxxer/hikari/util/JavassistProxyFactory.java

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- \* /hikaricp-java7-2-4-13-sources-zip/com/zaxxer/hikari/pool/ProxyCallableStatement.java
- \* /hikaricp-java7-2-4-13-sources-zip/com/zaxxer/hikari/util/UtilityElf.java
- \*
- \* /hikaricp-java7-2-4-13-sources-zip/com/zaxxer/hikari/hibernate/HikariConfigurationUtil.java
- \* /hikaricp-java7-2-4-13-sources-zip/com/zaxxer/hikari/util/PropertyElf.java
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## 1.73 commons-beanutils 1.9.4

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## 1.76 sbsigntool 1.3

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\*/

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#define UV\_BSD\_H

#define UV\_PLATFORM\_FS\_EVENT\_FIELDS \

uv\_\_io\_t event\_watcher; \

#define UV\_IO\_PRIVATE\_PLATFORM\_FIELDS \

int rcount; \

int wcount; \

#define UV\_HAVE\_KQUEUE 1

#endif /\* UV\_BSD\_H \*/

Files: \*

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@end enumerate

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@page

@heading Appendix: How to Apply These Terms to Your New Programs

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To do so, attach the following notices to the program. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty; and each file should have at least the ``copyright" line and a pointer to where the full notice is found.

@smallexample

@var{one line to give the program's name  
and a brief idea of what it does.}

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@end smallexample

Also add information on how to contact you by electronic and paper mail.

If the program is interactive, make it output a short notice like this  
when it starts in an interactive mode:

```
@smallexample
Gnomovision version
69, Copyright (C) @var{year} @var{name of author}
Gnomovision comes with ABSOLUTELY NO WARRANTY; for details type `show w'.
This is free software, and you are welcome to redistribute it
under certain conditions; type `show c' for details.
@end smallexample
```

The hypothetical commands @samp{show w} and @samp{show c} should show  
the appropriate parts of the General Public License. Of course, the  
commands you use may be called something other than @samp{show w} and  
@samp{show c}; they could even be mouse-clicks or menu items---whatever  
suits your program.

You should also get your employer (if you work as a programmer) or your  
school, if any, to sign a ``copyright disclaimer" for the program, if  
necessary. Here is a sample; alter the names:

```
@example
Yoyodyne, Inc., hereby disclaims all copyright interest in the program
`Gnomovision' (which makes passes at compilers) written by James Hacker.

@var{signature of Ty Coon}, 1 April 1989
Ty Coon, President of Vice
@end example
```

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Version 3, 29 June 2007

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```
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```
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```

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Ty Coon, President of Vice
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file\_io/unix/mktemp.c, strings/apr\_strings.c:

```
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From network\_io/unix/inet\_ntop.c, network\_io/unix/inet\_pton.c:

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From dso/aix/dso.c:

- \* Based on libdl (dlfcn.c/dlfcn.h) which is

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From strings/apr\_strnatcmp.c,  
include/apr\_strings.h:

strnatcmp.c -- Perform 'natural order' comparisons of strings in C.

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From  
strings/apr\_snprintf.c:

```
*  
* cvt - IEEE floating point formatting routines.  
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*
```

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\* org.eclipse.jetty.orbit:javax.security.auth.message

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\* javax.servlet:javax.servlet-api

- \* javax.annotation:javax.annotation-api
- \* javax.transaction:javax.transaction-api
- \* javax.websocket:javax.websocket-api

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- \* java.sun.security.ssl

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<http://openjdk.java.net/legal/gplv2+ce.html>

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org.ow2.asm:asm-commons  
org.ow2.asm:asm

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org.apache.taglibs:taglibs-standard-impl

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org.mortbay.jasper:apache-jsp  
org.apache.tomcat:tomcat-jasper  
org.apache.tomcat:tomcat-juli



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org.apache.tomcat:tomcat-util-scan  
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org.apache.tomcat:tomcat-jasper-el  
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org.eclipse.jetty.toolchain:jetty-schemas

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Eclipse

The following artifacts are EPL.

\* org.eclipse.jetty.orbit:org.eclipse.jdt.core

The following artifacts are EPL and ASL2.

\* org.eclipse.jetty.orbit:javax.security.auth.message

The following artifacts are EPL and CDDL 1.0.

\* org.eclipse.jetty.orbit:javax.mail.glassfish

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Oracle

The following artifacts are CDDL + GPLv2 with classpath exception.

<https://glassfish.dev.java.net/nonav/public/CDDL+GPL.html>

\* javax.servlet:javax.servlet-api

\* javax.annotation:javax.annotation-api

\* javax.transaction:javax.transaction-api

\* javax.websocket:javax.websocket-api

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Oracle OpenJDK

If ALPN is used to negotiate HTTP/2 connections, then the following artifacts may be included in the distribution or downloaded when ALPN module is selected.

\* java.sun.security.ssl

These artifacts replace/modify OpenJDK classes. The modifications are hosted at github and both modified and original are under GPL v2 with classpath exceptions.

<http://openjdk.java.net/legal/gplv2+ce.html>

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OW2

The following artifacts are licensed by the OW2 Foundation according to the terms of <http://asm.ow2.org/license.html>

org.ow2.asm:asm-commons  
org.ow2.asm:asm

-----  
Apache

The following artifacts are ASL2 licensed.

org.apache.taglibs:taglibs-standard-spec  
org.apache.taglibs:taglibs-standard-impl

-----  
MortBay

The following artifacts are ASL2 licensed. Based on selected classes from following Apache Tomcat jars, all ASL2 licensed.

org.mortbay.jasper:apache-jsp  
org.apache.tomcat:tomcat-jasper  
org.apache.tomcat:tomcat-juli  
org.apache.tomcat:tomcat-jsp-api  
org.apache.tomcat:tomcat-el-api  
org.apache.tomcat:tomcat-jasper-el  
org.apache.tomcat:tomcat-api  
org.apache.tomcat:tomcat-util-scan  
org.apache.tomcat:tomcat-util

org.mortbay.jasper:apache-el  
org.apache.tomcat:tomcat-jasper-el  
org.apache.tomcat:tomcat-el-api

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Mortbay

The following artifacts are CDDL + GPLv2 with classpath exception.

<https://glassfish.dev.java.net/nonav/public/CDDL+GPL.html>

org.eclipse.jetty.toolchain:jetty-schemas

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Assorted

The UnixCrypt.java code implements the one way cryptography used by Unix systems for simple password protection. Copyright 1996 Aki Yoshida, modified April 2001 by Iris Van den Broeke, Daniel Deville. Permission to use, copy, modify and distribute UnixCrypt for non-commercial or commercial purposes and without fee is granted provided that the copyright notice appears in all copies.

## 1.87 idna 2.6

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- javaee\_5.xsd
- javaee\_web\_services\_1\_2.xsd
- javaee\_web\_services\_client\_1\_2.xsd
- javaee\_6.xsd
- javaee\_web\_services\_1\_3.xsd
- javaee\_web\_services\_client\_1\_3.xsd
- jsp\_2\_2.xsd
- web-app\_3\_0.xsd
- web-common\_3\_0.xsd
- web-fragment\_3\_0.xsd
- javaee\_7.xsd
- javaee\_web\_services\_1\_4.xsd
- javaee\_web\_services\_client\_1\_4.xsd
- jsp\_2\_3.xsd
- web-app\_3\_1.xsd
- web-common\_3\_1.xsd
- web-fragment\_3\_1.xsd

may be obtained from:

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- web-fragment\_3\_0.xsd
- javaee\_7.xsd
- javaee\_web\_services\_1\_4.xsd
- javaee\_web\_services\_client\_1\_4.xsd
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Apache Standard Taglib Implementation

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- javaee\_web\_services\_1\_2.xsd
- javaee\_web\_services\_client\_1\_2.xsd
- javaee\_6.xsd
- javaee\_web\_services\_1\_3.xsd
- javaee\_web\_services\_client\_1\_3.xsd
- jsp\_2\_2.xsd
- web-app\_3\_0.xsd
- web-common\_3\_0.xsd
- web-fragment\_3\_0.xsd
- javaee\_7.xsd
- javaee\_web\_services\_1\_4.xsd
- javaee\_web\_services\_client\_1\_4.xsd
- jsp\_2\_3.xsd
- web-app\_3\_1.xsd
- web-common\_3\_1.xsd
- web-fragment\_3\_1.xsd
- javaee\_8.xsd
- web-app\_4\_0.xsd
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```
#ifndef X86_BSD_NAT_H
#define X86_BSD_NAT_H
```

```
#include "x86-nat.h"
```

```
/* Low level x86 XSAVE info. */
extern size_t x86bsd_xsave_len;
```

```
/* A prototype *BSD/x86 target. */
```

```
template<typename BaseTarget>
class x86bsd_nat_target
: public x86_nat_target<BaseTarget>
{
    using base_class = x86_nat_target<BaseTarget>;
public:
#ifdef HAVE_PT_GETDBREGS
    void mourn_inferior () override
    {
        x86_cleanup_dregs ();
        base_class::mourn_inferior ();
    }
#endif /* HAVE_PT_GETDBREGS */
};
```

```
#endif /* x86-bsd-nat.h */
```

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```
#ifndef I386_BSD_NAT_H
#define I386_BSD_NAT_H

/* Helper functions. See definitions. */
extern void i386bsd_fetch_inferior_registers (struct regcache *regcache,
                                             int regnum);
extern void i386bsd_store_inferior_registers
(struct regcache *regcache,
 int regnum);

/* A prototype *BSD/i386 target. */

template<typename BaseTarget>
class i386_bsd_nat_target : public x86bsd_nat_target<BaseTarget>
{
public:
void fetch_registers (struct regcache *regcache, int regnum) override
{ i386bsd_fetch_inferior_registers (regcache, regnum); }

void store_registers (struct regcache *regcache, int regnum) override
{ i386bsd_store_inferior_registers (regcache, regnum); }
};

#endif /* i386-bsd-nat.h */
/* Native-dependent code for modern AMD64 BSD's.
```

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```
#ifndef AMD64_BSD_NAT_H
#define AMD64_BSD_NAT_H

#include "x86-bsd-nat.h"

/* Helper functions. See definitions. */
extern void amd64bsd_fetch_inferior_registers (struct regcache *regcache,
        int regnum);
extern
void amd64bsd_store_inferior_registers (struct regcache *regcache,
        int regnum);

/* A prototype *BSD/AMD64 target. */

template<typename BaseTarget>
class amd64_bsd_nat_target : public x86bsd_nat_target<BaseTarget>
{
public:
    void fetch_registers (struct regcache *regcache, int regnum) override
    { amd64bsd_fetch_inferior_registers (regcache, regnum); }

    void store_registers (struct regcache *regcache, int regnum) override
    { amd64bsd_store_inferior_registers (regcache, regnum); }
};

#endif /* i386-bsd-nat.h */

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@settitle GNU General Public License
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@smallexample  
@var{program} Copyright (C) @var{year} @var{name of author}  
This program comes with ABSOLUTELY NO WARRANTY; for details type @samp{show w}.  
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@c man end

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library 'Frob' (a library for tweaking knobs) written by James Random Hacker.

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/\* BSD Kernel Data Access Library (libkvm) interface.

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```
#define _KMEMUSER
#include "defs.h"
#include "cli/cli-cmds.h"
#include "command.h"
#include "frame.h"
#include "regcache.h"
#include "target.h"
#include "process-stratum-target.h"
#include "value.h"
#include "gdbcore.h"
#include
```

```

"inferior.h"      /* for get_exec_file */
#include "gdbthread.h"

#include <fcntl.h>
#include <kvm.h>
#ifdef HAVE_NLIST_H
#include <nlist.h>
#endif
#include <paths.h>
#include "readline/readline.h"
#include <sys/param.h>
#include <sys/proc.h>
#ifdef HAVE_SYS_USER_H
#include <sys/user.h>
#endif

#include "bsd-kvm.h"

/* Kernel memory device file. */
static const char *bsd_kvm_corefile;

/* Kernel memory interface descriptor. */
static kvm_t *core_kd;

/* Address of process control block. */
static struct pcb *bsd_kvm_paddr;

/* Pointer to architecture-specific function that reconstructs the
   register state from PCB and supplies it to REGCACHE. */
static int (*bsd_kvm_supply_pcb)(struct regcache *regcache, struct pcb *pcb);

/* This is the ptid we use while we're connected to kvm. The kvm
   target currently doesn't export any view of the running processes,
   so this represents the kernel task. */
static ptid_t bsd_kvm_ptid;

/* The libkvm target. */

static
const target_info bsd_kvm_target_info = {
    "kvm",
    N_("Kernel memory interface"),
    N_("Use a kernel virtual memory image as a target.\n\
Optionally specify the filename of a core dump."),
};

class bsd_kvm_target final : public process_stratum_target
{

```

```

public:
bsd_kvm_target () = default;

const target_info &info () const override
{ return bsd_kvm_target_info; }

void close () override;

void fetch_registers (struct regcache *, int) override;
enum target_xfer_status xfer_partial (enum target_object object,
    const char *annex,
    gdb_byte *readbuf,
    const gdb_byte *writebuf,
    ULONGEST offset, ULONGEST len,
    ULONGEST *xfered_len) override;

void files_info () override;
bool thread_alive (ptid_t ptid) override;
const char *pid_to_str (ptid_t) override;

bool has_memory () override { return true; }
bool has_stack () override { return true; }
bool has_registers () override { return true; }
};

/* Target ops for libkvm interface. */
static bsd_kvm_target
bsd_kvm_ops;

static void
bsd_kvm_target_open (const char *arg, int from_tty)
{
    char errbuf[_POSIX2_LINE_MAX];
    char *execfile = NULL;
    kvm_t *temp_kd;
    char *filename = NULL;

    target_preopen (from_tty);

    if (arg)
    {
        char *temp;

        filename = tilde_expand (arg);
        if (filename[0] != '/')
        {
            temp = concat (current_directory, "/", filename, (char *)NULL);
            xfree (filename);

```

```

    filename = temp;
}
}

execfile = get_exec_file (0);
temp_kd = kvm_openfiles (execfile, filename, NULL,
    write_files ? O_RDWR : O_RDONLY, errbuf);
if (temp_kd == NULL)
    error ("%s", errbuf);

bsd_kvm_corefile = filename;
unpush_target (&bsd_kvm_ops);
core_kd = temp_kd;
push_target (&bsd_kvm_ops);

add_thread_silent (bsd_kvm_ptid);
inferior_ptid = bsd_kvm_ptid;

target_fetch_registers (get_current_regcache (), -1);

reinit_frame_cache ();
print_stack_frame (get_selected_frame (NULL), 0, SRC_AND_LOC, 1);
}

void
bsd_kvm_target::close ()
{
    if (core_kd)
    {
        if (kvm_close (core_kd) == -1)
            warning ("%s", kvm_geterr(core_kd));
        core_kd = NULL;
    }

    inferior_ptid = null_ptid;
    discard_all_inferiors ();
}

static LONGEST
bsd_kvm_xfer_memory (CORE_ADDR addr, ULONGEST len,
    gdb_byte *readbuf, const gdb_byte *writebuf)
{
    ssize_t nbytes = len;

    if (readbuf)
        nbytes = kvm_read (core_kd, addr, readbuf, nbytes);
    if (writebuf && nbytes > 0)
        nbytes = kvm_write (core_kd, addr, writebuf, nbytes);
}

```

```

return nbytes;
}

enum target_xfer_status
bsd_kvm_target::xfer_partial (enum target_object object,
    const char *annex, gdb_byte *readbuf,
    const gdb_byte *writebuf,
    ULONGEST offset, ULONGEST len, ULONGEST *xfered_len)
{
    switch (object)
    {
        case TARGET_OBJECT_MEMORY:
        {
            LONGEST ret = bsd_kvm_xfer_memory (offset, len, readbuf, writebuf);

            if (ret < 0)
                return TARGET_XFER_E_IO;
            else if (ret == 0)
                return TARGET_XFER_EOF;
            else
            {
                *xfered_len = (ULONGEST)
ret;
                return TARGET_XFER_OK;
            }
        }

        default:
            return TARGET_XFER_E_IO;
    }
}

void
bsd_kvm_target::files_info ()
{
    if (bsd_kvm_corefile && strcmp (bsd_kvm_corefile, _PATH_MEM) != 0)
        printf_filtered (_("\tUsing the kernel crash dump %s.\n"),
            bsd_kvm_corefile);
    else
        printf_filtered (_("\tUsing the currently running kernel.\n"));
}

/* Fetch process control block at address PADDR. */

static int
bsd_kvm_fetch_pcb (struct regcache *regcache, struct pcb *paddr)
{
    struct pcb pcb;

```



```

if (kvm_read (core_kd, (unsigned long) paddr, &pcb, sizeof pcb) == -1)
    error (("%%s"), kvm_geterr (core_kd));

gdb_assert (bsd_kvm_supply_pcb);
return bsd_kvm_supply_pcb (regcache, &pcb);
}

void
bsd_kvm_target::fetch_registers (struct regcache *regcache, int regnum)
{
    struct nlist nl[2];

    if (bsd_kvm_paddr)
    {
        bsd_kvm_fetch_pcb (regcache, bsd_kvm_paddr);
        return;
    }

    /* On dumping core, BSD kernels store the faulting context (PCB)

    in the variable "dumppcb". */
    memset (nl, 0, sizeof nl);
    nl[0].n_name = "_dumppcb";

    if (kvm_nlist (core_kd, nl) == -1)
        error (("%%s"), kvm_geterr (core_kd));

    if (nl[0].n_value != 0)
    {
        /* Found dumppcb. If it contains a valid context, return
        immediately. */
        if (bsd_kvm_fetch_pcb (regcache, (struct pcb *) nl[0].n_value))
            return;
    }

    /* Traditional BSD kernels have a process proc0 that should always
    be present. The address of proc0's PCB is stored in the variable
    "proc0paddr". */

    memset (nl, 0, sizeof nl);
    nl[0].n_name = "_proc0paddr";

    if (kvm_nlist (core_kd, nl) == -1)
        error (("%%s"), kvm_geterr (core_kd));

    if (nl[0].n_value != 0)
    {

```

```

    struct pcb *paddr;

    /* Found proc0paddr. */
    if (kvm_read (core_kd, nl[0].n_value, &paddr, sizeof paddr) == -1)
        error (("s"), kvm_geterr (core_kd));

    bsd_kvm_fetch_pcb (regcache, paddr);
    return;
}

#ifdef HAVE_STRUCT_THREAD_TD_PCB
/* In FreeBSD kernels
for 5.0-RELEASE and later, the PCB no longer
lives in `struct proc' but in `struct thread'. The `struct
thread' for the initial thread for proc0 can be found in the
variable "thread0". */

memset (nl, 0, sizeof nl);
nl[0].n_name = "_thread0";

if (kvm_nlist (core_kd, nl) == -1)
    error (("s"), kvm_geterr (core_kd));

if (nl[0].n_value != 0)
{
    struct pcb *paddr;

    /* Found thread0. */
    nl[0].n_value += offsetof (struct thread, td_pcb);
    if (kvm_read (core_kd, nl[0].n_value, &paddr, sizeof paddr) == -1)
        error (("s"), kvm_geterr (core_kd));

    bsd_kvm_fetch_pcb (regcache, paddr);
    return;
}
#endif

/* i18n: PCB == "Process Control Block". */
error (_("Cannot find a valid PCB"));
}

/* Kernel memory interface commands. */
struct cmd_list_element *bsd_kvm_cmdlist;

static void
bsd_kvm_cmd (const char *arg, int fromtty)
{

```

```

/* ??? Should this become an alias for "target kvm"? */
}

#ifdef HAVE_STRUCT_THREAD_TD_PCB

static
void
bsd_kvm_proc_cmd (const char *arg, int fromtty)
{
    CORE_ADDR addr;

    if (arg == NULL)
        error_no_arg (_, "proc address");

    if (core_kd == NULL)
        error (_, "No kernel memory image.");

    addr = parse_and_eval_address (arg);
#ifdef HAVE_STRUCT_LWP
    addr += offsetof (struct lwp, l_addr);
#else
    addr += offsetof (struct proc, p_addr);
#endif

    if (kvm_read (core_kd, addr, &bsd_kvm_paddr, sizeof bsd_kvm_paddr) == -1)
        error (("%%s"), kvm_geterr (core_kd));

    target_fetch_registers (get_current_regcache (), -1);

    reinit_frame_cache ();
    print_stack_frame (get_selected_frame (NULL), 0, SRC_AND_LOC, 1);
}

#endif

static void
bsd_kvm_pcb_cmd (const char *arg, int fromtty)
{
    if (arg == NULL)
        /* i18n: PCB == "Process Control Block". */
        error_no_arg (_, "pcb address");

    if (core_kd == NULL)
        error (_, "No kernel memory image.");

    bsd_kvm_paddr = (struct pcb *) (u_long) parse_and_eval_address (arg);

    target_fetch_registers (get_current_regcache (),

```

```

-1);

reinit_frame_cache ();
print_stack_frame (get_selected_frame (NULL), 0, SRC_AND_LOC, 1);
}

bool
bsd_kvm_target::thread_alive (ptid_t ptid)
{
    return true;
}

const char *
bsd_kvm_target::pid_to_str (ptid_t ptid)
{
    static char buf[64];
    xsnprintf (buf, sizeof buf, "<kvm>");
    return buf;
}

/* Add the libkvm interface to the list of all possible targets and
   register CUPPLY_PCB as the architecture-specific process control
   block interpreter. */

void
bsd_kvm_add_target (int (*supply_pcb)(struct regcache *, struct pcb *))
{
    gdb_assert (bsd_kvm_supply_pcb == NULL);
    bsd_kvm_supply_pcb = supply_pcb;

    add_target (bsd_kvm_target_info, bsd_kvm_target_open);

    add_prefix_cmd ("kvm", class_obscure, bsd_kvm_cmd, _("\
Generic command for manipulating the kernel memory interface."),
        &bsd_kvm_cmdlist, "kvm ", 0, &cmdlist);

#ifdef HAVE_STRUCT_THREAD_TD_PCB
    add_cmd ("proc", class_obscure, bsd_kvm_proc_cmd,
        _("Set current context from proc address"), &bsd_kvm_cmdlist);
#endif
    add_cmd ("pcb", class_obscure, bsd_kvm_pcb_cmd,
        /* i18n: PCB == "Process Control Block". */
        _("Set current context from pcb address"), &bsd_kvm_cmdlist);

    /* Some notes on the ptid usage on this target.

       The pid field represents the kvm inferior instance. Currently,
       we don't support multiple kvm inferiors, but we start at 1

```

anyway. The lwp field is set to != 0, in case the core wants to refer to the whole kvm inferior with ptid(1,0,0).

If kvm is made to export running processes as gdb threads, the following form can be used:

ptid (1, 1, 0) -> kvm inferior 1, in kernel

ptid (1, 1, 1) -> kvm inferior 1, process 1

ptid (1, 1, 2) -> kvm inferior 1, process 2

ptid (1, 1, n) -> kvm inferior 1, process n \*/

```
bsd_kvm_ptid = ptid_t (1, 1, 0);
}
BEGIN {
  FS="\"";
  print "/* ==> Do not modify this file!! \" \
\"-* - buffer-read-only: t -* - vi\" \
\":set ro: ";
  print " It is created automatically by copying.awk.";
  print " Modify copying.awk instead. <== */";
  print ""
  print "#include \"defs.h\""
  print "#include \"command.h\""
  print "#include \"gdbcmd.h\""
  print ""
  print "static void show_copying_command (const char *, int);"
  print ""
  print "static void show_warranty_command (const char *, int);"
  print ""
  print "static void";
  print "show_copying_command (const char *ignore, int from_tty)";
  print "{";
}
NR == 1,/^[ ]*15\. Disclaimer of Warranty\.[ ]*$/ {
  if ($0 ~ //)
  {
    printf " printf_filtered (\"\\n\\n\");\n";
  }
  else if ($0 !~ /^[ ]*15\. Disclaimer of Warranty\.[ ]*$/ )
  {
    printf " printf_filtered (\"";
    for (i = 1; i < NF; i++)
      printf "%s\\n", $i;
    printf "%s\\n\");\n", $NF;
  }
}
/^[ ]*15\. Disclaimer of Warranty\.[ ]*$/ {
```

```

print "}";
print "";
print "static void";
print "show_warranty_command (const char *ignore, int from_tty)";
print "{";
}
/^[ ]*15\. Disclaimer of Warranty\.[ ]*$/ ,/^[ ]*END OF TERMS AND CONDITIONS[ ]*$/ {
    if (! ($0 ~ /^[ ]*END OF TERMS AND CONDITIONS[ ]*$/))
    {
        printf " printf_filtered (\"";
        for (i = 1; i < NF; i++)
        printf "%s\\\" ", $i;
        printf "%s\\n\");\n", $NF;
    }
}
END {
    print "}";
    print "";
    print "void"
    print "_initialize_copying (void)";
    print "{";
    print " add_cmd (\"copying\", no_set_class, show_copying_command,\"";
    print " _(\"Conditions for redistributing copies of GDB.\");";
    print " &showlist);";
    print " add_cmd (\"warranty\", no_set_class, show_warranty_command,\"";
    print " _(\"Various kinds of warranty you do not have.\");";
    print " &showlist);";
    print "";
    print " /* For old-timers, allow \"info copying\", etc. */";
    print " add_info (\"copying\", show_copying_command,\"";

    print " _(\"Conditions for redistributing copies of GDB.\");";
    print " add_info (\"warranty\", show_warranty_command,\"";
    print " _(\"Various kinds of warranty you do not have.\");";
    print "}";
}
#!/usr/bin/env python

# Copyright (C) 2011-2019 Free Software Foundation, Inc.
#
# This file is part of GDB.
#
# This program is free software; you can redistribute it and/or modify
# it under the terms of the GNU General Public License as published by
# the Free Software Foundation; either version 3 of the License, or
# (at your option) any later version.
#
# This program is distributed in the hope that it will be useful,

```

```
# but WITHOUT ANY WARRANTY; without even the implied warranty of
# MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the
# GNU General Public License for more details.
#
# You should have received a copy of the GNU General Public License
# along with this program. If not, see <http://www.gnu.org/licenses/>.
```

```
"""copyright.py
```

This script updates the list of years in the copyright notices in most files maintained by the GDB project.

Usage: cd src/gdb && python copyright.py

Always review the output of this script before committing it!

A useful command to review

the output is:

```
% filterdiff -x \*.c -x \*.cc -x \*.h -x \*.exp updates.diff
```

This removes the bulk of the changes which are most likely to be correct.

```
"""
```

```
import datetime
import os
import os.path
import subprocess
```

```
def get_update_list():
    """Return the list of files to update.
```

Assumes that the current working directory when called is the root of the GDB source tree (NOT the gdb/ subdirectory!). The names of the files are relative to that root directory.

```
"""
```

```
result = []
for gdb_dir in ('gdb', 'sim', 'include/gdb'):
    for root, dirs, files in os.walk(gdb_dir, topdown=True):
        for dirname in dirs:
            reldirname = "%s/%s" % (root, dirname)
            if (dirname in EXCLUDE_ALL_LIST
                or reldirname in EXCLUDE_LIST
                or reldirname in NOT_FSF_LIST
                or reldirname in BY_HAND):
                # Prune this directory from our search list.
                dirs.remove(dirname)
        for filename in files:
            relpath = "%s/%s" % (root, filename)
            if (filename in EXCLUDE_ALL_LIST
```

```

        or relpath in EXCLUDE_LIST
        or relpath in NOT_FSF_LIST
        or relpath in BY_HAND):
    # Ignore this file.
    pass
else:
    result.append(relpath)
return result

def update_files(update_list):
    """Update the copyright header of the files in the given list.

    We use gnulib's update-copyright script for that.
    """
    # We want to use year intervals in the copyright notices, and
    # all years should be collapsed to one single year interval,
    # even if there are "holes" in the list of years found in the
    # original copyright notice (OK'ed by the FSF, case [gnu.org #719834]).
    os.environ['UPDATE_COPYRIGHT_USE_INTERVALS'] = '2'

    # Perform the update, and save the output in a string.
    update_cmd
    = ['bash', 'gdb/gnulib/import/extra/update-copyright']
    update_cmd += update_list

    p = subprocess.Popen(update_cmd, stdout=subprocess.PIPE,
                          stderr=subprocess.STDOUT)
    update_out = p.communicate()[0]

    # Process the output. Typically, a lot of files do not have
    # a copyright notice :-(. The update-copyright script prints
    # a well defined warning when it did not find the copyright notice.
    # For each of those, do a sanity check and see if they may in fact
    # have one. For the files that are found not to have one, we filter
    # the line out from the output, since there is nothing more to do,
    # short of looking at each file and seeing which notice is appropriate.
    # Too much work! (~4,000 files listed as of 2012-01-03).
    update_out = update_out.splitlines()
    warning_string = ': warning: copyright statement not found'
    warning_len = len(warning_string)

    for line in update_out:
        if line.endswith("\n"):

            line = line[:-1]
            if line.endswith(warning_string):
                filename = line[:-warning_len]

```



```

    if may_have_copyright_notice(filename):
        print line
    else:
        # Unrecognized file format. !?!
        print "*** " + line

```

```

def may_have_copyright_notice(filename):
    """Check that the given file does not seem to have a copyright notice.

```

The filename is relative to the root directory.  
 This function assumes that the current working directory is that root directory.

The algorithm is fairly crude, meaning that it might return some false positives. I do not think it will return any false negatives... We might improve this function to handle more complex cases later...

```

    """
    # For now, it may have a copyright notice if we find the word
    # "Copyright" at the (reasonable) start of the given file, say
    # 50 lines...
    MAX_LINES = 50

```

```

    fd = open(filename)

```

```

    lineno = 1
    for line in fd:
        if 'Copyright' in line:
            return True
        lineno += 1
    if lineno > 50:
        return False
    return False

```

```

def main ():
    """The main subprogram."""
    if not os.path.isfile("gnulib/import/extra/update-copyright"):
        print "Error: This script must be called from the gdb directory."
    root_dir = os.path.dirname(os.getcwd())
    os.chdir(root_dir)

    update_list = get_update_list()
    update_files (update_list)

    # Remind the user that some files need to be updated by HAND...

```

```

if MULTIPLE_COPYRIGHT_HEADERS:
    print
    print("\033[31m"
          "REMINDER: Multiple copyright headers must be updated by hand:"
          "\033[0m")
    for filename in MULTIPLE_COPYRIGHT_HEADERS:
        print " ", filename

if BY_HAND:
    print
    print "\033[31mREMINDER: The following files must be updated by hand." \
          "\033[0m"
    for filename in BY_HAND:
        print " ", filename

#####
#
#
# Some constants, placed at the end because they take up a lot of room.
# The actual value of these constants is not significant to the understanding
# of the script.
#
#####

# Files which should not be modified, either because they are
# generated, non-FSF, or otherwise special (e.g. license text,
# or test cases which must be sensitive to line numbering).
#
# Filenames are relative to the root directory.
EXCLUDE_LIST = (
    'gdb/nat/glibc_thread_db.h',
    'gdb/CONTRIBUTE',
    'gdb/gnulib/import'
)

# Files which should not be modified, either because they are
# generated, non-FSF, or otherwise special (e.g. license text,
# or test cases which must be sensitive to line numbering).
#
# Matches any file or directory name anywhere. Use with caution.
# This is mostly for files that can be found in multiple directories.
# Eg: We want all
# files named COPYING to be left untouched.

EXCLUDE_ALL_LIST = (
    "COPYING", "COPYING.LIB", "CVS", "configure", "copying.c",
    "fdl.texi", "gpl.texi", "aclocal.m4",
)

```

```

# The list of files to update by hand.
BY_HAND = (
    # Nothing at the moment :-).
)

# Files containing multiple copyright headers. This script is only
# fixing the first one it finds, so we need to finish the update
# by hand.
MULTIPLE_COPYRIGHT_HEADERS = (
    "gdb/doc/gdb.texinfo",
    "gdb/doc/refcard.tex",
    "gdb/gdbarch.sh",
)

# The list of file which have a copyright, but not head by the FSF.
# Filenames are relative to the root directory.
NOT_FSF_LIST = (
    "gdb/exc_request.defs",
    "gdb/gdbtk",
    "gdb/testsuite/gdb.gdbtk/",
    "sim/arm/armemu.h", "sim/arm/armos.c", "sim/arm/gdbhost.c",
    "sim/arm/dbg_hif.h", "sim/arm/dbg_conf.h", "sim/arm/communicate.h",
    "sim/arm/armos.h", "sim/arm/armcopro.c", "sim/arm/armemu.c",
    "sim/arm/kid.c", "sim/arm/thumbemu.c", "sim/arm/armdefs.h",
    "sim/arm/armopts.h",
    "sim/arm/dbg_cp.h", "sim/arm/dbg_rdi.h",
    "sim/arm/parent.c", "sim/arm/armsupp.c", "sim/arm/armrdi.c",
    "sim/arm/bag.c", "sim/arm/armvirt.c", "sim/arm/main.c", "sim/arm/bag.h",
    "sim/arm/communicate.c", "sim/arm/gdbhost.h", "sim/arm/armfpe.h",
    "sim/arm/arminit.c",
    "sim/common/cgen-fpu.c", "sim/common/cgen-fpu.h",
    "sim/common/cgen-accftp.c",
    "sim/mips/m16run.c", "sim/mips/sim-main.c",
    "sim/moxie/moxie-gdb.dts",
    # Not a single file in sim/ppc/ appears to be copyright FSF :-(.
    "sim/ppc/filter.h", "sim/ppc/gen-support.h", "sim/ppc/ld-insn.h",
    "sim/ppc/hw_sem.c", "sim/ppc/hw_disk.c", "sim/ppc/idecode_branch.h",
    "sim/ppc/sim-endian.h", "sim/ppc/table.c", "sim/ppc/hw_core.c",
    "sim/ppc/gen-support.c", "sim/ppc/gen-semantics.h", "sim/ppc/cpu.h",
    "sim/ppc/sim_callbacks.h", "sim/ppc/RUN", "sim/ppc/Makefile.in",
    "sim/ppc/emul_chirp.c", "sim/ppc/hw_nvram.c", "sim/ppc/dc-test.01",
    "sim/ppc/hw_phb.c", "sim/ppc/hw_eeprom.c", "sim/ppc/bits.h",
    "sim/ppc/hw_vm.c", "sim/ppc/cap.h", "sim/ppc/os_emul.h",
    "sim/ppc/options.h", "sim/ppc/gen-idecode.c", "sim/ppc/filter.c",
    "sim/ppc/corefile-n.h", "sim/ppc/std-config.h", "sim/ppc/ld-decode.h",
    "sim/ppc/filter_filename.h", "sim/ppc/hw_shm.c",
    "sim/ppc/pk_disklabel.c", "sim/ppc/dc-simple", "sim/ppc/misc.h",

```

```

"sim/ppc/device_table.h", "sim/ppc/ld-insn.c", "sim/ppc/inline.c",
"sim/ppc/emul_bugapi.h", "sim/ppc/hw_cpu.h", "sim/ppc/debug.h",
"sim/ppc/hw_ide.c", "sim/ppc/debug.c", "sim/ppc/gen-itable.h",
"sim/ppc/interrupts.c", "sim/ppc/hw_glue.c", "sim/ppc/emul_unix.c",
"sim/ppc/sim_calls.c", "sim/ppc/dc-complex", "sim/ppc/ld-cache.c",
"sim/ppc/registers.h", "sim/ppc/dc-test.02", "sim/ppc/options.c",
"sim/ppc/igen.h", "sim/ppc/registers.c", "sim/ppc/device.h",
"sim/ppc/emul_chirp.h", "sim/ppc/hw_register.c", "sim/ppc/hw_init.c",
"sim/ppc/sim-endian-n.h", "sim/ppc/filter_filename.c",
"sim/ppc/bits.c", "sim/ppc/idecode_fields.h",
"sim/ppc/hw_memory.c",
"sim/ppc/misc.c", "sim/ppc/double.c", "sim/ppc/psim.h",
"sim/ppc/hw_trace.c", "sim/ppc/emul_netbsd.h", "sim/ppc/psim.c",
"sim/ppc/ppc-instructions", "sim/ppc/tree.h", "sim/ppc/README",
"sim/ppc/gen-icache.h", "sim/ppc/gen-model.h", "sim/ppc/ld-cache.h",
"sim/ppc/mon.c", "sim/ppc/corefile.h", "sim/ppc/vm.c",
"sim/ppc/INSTALL", "sim/ppc/gen-model.c", "sim/ppc/hw_cpu.c",
"sim/ppc/corefile.c", "sim/ppc/hw_opic.c", "sim/ppc/gen-icache.c",
"sim/ppc/events.h", "sim/ppc/os_emul.c", "sim/ppc/emul_generic.c",
"sim/ppc/main.c", "sim/ppc/hw_com.c", "sim/ppc/gen-semantics.c",
"sim/ppc/emul_bugapi.c", "sim/ppc/device.c", "sim/ppc/emul_generic.h",
"sim/ppc/tree.c", "sim/ppc/mon.h", "sim/ppc/interrupts.h",
"sim/ppc/cap.c", "sim/ppc/cpu.c", "sim/ppc/hw_phb.h",
"sim/ppc/device_table.c", "sim/ppc/lf.c", "sim/ppc/lf.c",
"sim/ppc/dc-stupid", "sim/ppc/hw_pal.c", "sim/ppc/ppc-spr-table",
"sim/ppc/emul_unix.h", "sim/ppc/words.h",
"sim/ppc/basics.h",
"sim/ppc/hw_htab.c", "sim/ppc/lf.h", "sim/ppc/ld-decode.c",
"sim/ppc/sim-endian.c", "sim/ppc/gen-itable.c",
"sim/ppc/idecode_expression.h", "sim/ppc/table.h", "sim/ppc/dgen.c",
"sim/ppc/events.c", "sim/ppc/gen-idecode.h", "sim/ppc/emul_netbsd.c",
"sim/ppc/igen.c", "sim/ppc/vm_n.h", "sim/ppc/vm.h",
"sim/ppc/hw_iobus.c", "sim/ppc/inline.h",
"sim/testsuite/sim/bfin/s21.s", "sim/testsuite/sim/mips/mips32-dsp2.s",
)

```

```

if __name__ == "__main__":

```

```

    main()

```

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Version 2, June 1991

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[This is the first released version of the library GPL. It is  
numbered 2 because it goes with version 2 of the ordinary GPL.]

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Most GNU software, including some libraries, is covered by the ordinary GNU General Public License, which was designed for utility programs. This license, the GNU Library General Public License, applies to certain designated libraries. This license is quite different from the ordinary one; be sure to read it in full, and don't assume that anything in it is the same as in the ordinary license.

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Because of this blurred distinction, using the ordinary General Public License for libraries did not effectively promote software sharing, because most developers did not use the libraries. We concluded that weaker conditions might promote sharing better.

However, unrestricted linking of non-free programs would deprive the users of those programs of all benefit from the free status of the libraries themselves. This Library General Public License is intended to permit developers of non-free programs to use free libraries, while preserving your freedom as a user of such programs to change the free libraries that are incorporated in them. (We have not seen how to achieve this as regards changes in header files, but we have achieved it as regards changes in the actual functions of the Library.) The hope is that this will lead to faster development of free libraries.

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This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

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The "source code" for a work means the preferred form of the work for making modifications to it. "Object code" means any non-source form of a work.

A "Standard Interface" means an interface that either is an official standard defined by a recognized standards body, or, in the case of interfaces specified for a particular programming language, one that is widely used among developers working in that language.

The

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## 1.97 libnettle6 3.4

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```
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```

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## 1.98 lua 5.2.4

## 1.99 make 4.2

### 1.99.1 Available under license :

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Version 3, 29 June 2007

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# Contributions to the urllib3 project

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\* erikcederstrand <<http://code.google.com/u/erikcederstrand/>>

\* NTLM-authenticated HTTPSConnectionPool

\* Basic-authenticated HTTPSConnectionPool (merged into make\_headers)

\* niphlod <[niphlod@gmail.com](mailto:niphlod@gmail.com)>

\* Client-verified SSL certificates for HTTPSConnectionPool

\* Response gzip and deflate encoding support

\* Better unicode support for filepost using StringIO buffers



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- \* Sune Kirkeby <mig@ibofobi.dk>
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- \* Marc Schlaich <marc.schlaich@gmail.com>
- \* Various bugfixes and test improvements.
  
- \* Bryce Boe <bbzbryce@gmail.com>
- \* Correct six.moves conflict
- \* Fixed pickle support of some exceptions
  
- \* Boris Figovsky <boris.figovsky@ravellosystems.com>
- \* Allowed to skip SSL hostname verification
  
- \* Cory Benfield

<<https://lukasa.co.uk/about/>>

- \* Stream method for Response objects.
- \* Return native strings in header values.
- \* Generate 'Host' header when using proxies.

\* Jason Robinson <[jaywink@basshero.org](mailto:jaywink@basshero.org)>

- \* Add missing WrappedSocket.fileno method in PyOpenSSL

\* Audrius Butkevicius <[audrius.butkevicius@elastichosts.com](mailto:audrius.butkevicius@elastichosts.com)>

- \* Fixed a race condition

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- \* Added HTTPS (CONNECT) proxy support

\* Stephen Holsapple <[sholsapp@gmail.com](mailto:sholsapp@gmail.com)>

- \* Added abstraction for granular control of request fields

\* Martin von Gagern <[Martin.vGagern@gmx.net](mailto:Martin.vGagern@gmx.net)>

- \* Support for non-ASCII header parameters

\* Kevin Burke <[kev@inburke.com](mailto:kev@inburke.com)> and Pavel Kirichenko <[juanych@yandex-team.ru](mailto:juanych@yandex-team.ru)>

- \* Support for separate connect and request timeouts

\* Peter Waller <[p@pwaller.net](mailto:p@pwaller.net)>

- \* HTTPResponse.tell() for determining amount received over the wire

\* Nipunn Koorapati <[nipunn1313@gmail.com](mailto:nipunn1313@gmail.com)>

- \* Ignore default ports when comparing hosts for equality

\* Danilo @dbrgn <<https://dbrgn.ch/>>

- \* Disabled TLS compression by default on Python 3.2+
- \* Disabled TLS compression in pyopenssl contrib module
- \* Configurable cipher suites in pyopenssl contrib module

\* Roman Bogorodskiy <[roman.bogorodskiy@ericsson.com](mailto:roman.bogorodskiy@ericsson.com)>

- \* Account retries on proxy errors

\* Nicolas Delaby <[nicolas.delaby@ezeep.com](mailto:nicolas.delaby@ezeep.com)>

- \* Use the platform-specific CA certificate locations

\* Josh Schneier <<https://github.com/jschneier>>

- \* HTTPHeaderDict and associated tests and docs
- \* Bugfixes, docs, test coverage

\* Tahia Khan <<http://tahia.tk/>>

- \* Added Timeout examples in docs

\* Arthur Grunseid <<https://grunseid.com>>

- \* source\_address support and tests (with <https://github.com/bui>)
- \* Ian Cordasco <[graffatcolmingov@gmail.com](mailto:graffatcolmingov@gmail.com)>
  - \* PEP8 Compliance and Linting
  - \* Add ability to pass socket options to an HTTP Connection
- \* Erik Tollerud <[erik.tollerud@gmail.com](mailto:erik.tollerud@gmail.com)>
  - \* Support for standard library io module.
- \* Krishna Prasad <[kprasad.iitd@gmail.com](mailto:kprasad.iitd@gmail.com)>
  - \* Google App Engine documentation
- \* Aaron Meurer  
<[asmeurer@gmail.com](mailto:asmeurer@gmail.com)>
  - \* Added Url.url, which unparses a Url
- \* Evgeny Kapun <[abacabadabacaba@gmail.com](mailto:abacabadabacaba@gmail.com)>
  - \* Bugfixes
- \* Benjamin Meyer <[bm\\_witness@yahoo.com](mailto:bm_witness@yahoo.com)>
  - \* Security Warning Documentation update for proper capture
- \* Shivan Sornarajah <[github@sornars.com](mailto:github@sornars.com)>
  - \* Support for using ConnectionPool and PoolManager as context managers.
- \* Alex Gaynor <[alex.gaynor@gmail.com](mailto:alex.gaynor@gmail.com)>
  - \* Updates to the default SSL configuration
- \* Tomas Tomecek <[ttomecek@redhat.com](mailto:ttomecek@redhat.com)>
  - \* Implemented generator for getting chunks from chunked responses.
- \* tlynn <<https://github.com/tlynn>>
  - \* Respect the warning preferences at import.
- \* David D. Riddle <[ddriddle@illinois.edu](mailto:ddriddle@illinois.edu)>
  - \* IPv6 bugfixes in testsuite
- \* Thea Flowers <[magicalgirl@google.com](mailto:magicalgirl@google.com)>
  - \* App Engine environment tests.
  - \* Documentation re-write.
- \* John Krauss <<https://github.com/talos>>
  - \* Clues to debugging problems with `cryptography` dependency in docs
- \* Disassem <<https://github.com/Disassem>>
  - \* Fix pool-default headers not applying for url-encoded requests like GET.

- \* James Atherfold <jlatherfold@hotmail.com>
- \* Bugfixes relating to cleanup of connections during errors.
  
- \* Christian Pedersen <https://github.com/chripede>
- \* IPv6 HTTPS proxy bugfix
  
- \* Jordan Moldow <https://github.com/jmoldow>
- \* Fix low-level exceptions leaking from ``HTTPResponse.stream()``.
- \* Bugfix for ``ConnectionPool.urlopen(release\_conn=False)``.
- \* Creation of ``HTTPConnectionPool.ResponseCls``.
  
- \* Predrag Gruevski <https://github.com/obi1kenobi>
- \* Made cert digest comparison use a constant-time algorithm.
  
- \* Adam Talsma <https://github.com/a-tal>
- \* Bugfix to ca\_cert file paths.
  
- \* Evan Meagher <https://evanmeagher.net>
- \* Bugfix related to `memoryview` usage in PyOpenSSL adapter
  
- \* John Vandenberg <jayvdb@gmail.com>
- \* Python 2.6 fixes; pyflakes and pep8 compliance
  
- \* Andy Caldwell <andy.m.caldwell@googlemail.com>
- \* Bugfix related to reusing connections in indeterminate states.
  
- \* Ville Skytt <ville.skytta@iki.fi>
- \* Logging efficiency improvements, spelling fixes, Travis config.
  
- \* Shige Takeda <smtakeda@gmail.com>
- \* Started Recipes documentation and added a recipe about handling concatenated gzip data in HTTP response
  
- \* Jess Shapiro <jesse@jesseshapiro.net>
- \* Various character-encoding fixes/tweaks
- \* Disabling IPv6 DNS when IPv6 connections not supported
  
- \* David Foster <http://dafoster.net/>
- \* Ensure order of request and response headers are preserved.
  
- \* Jeremy Cline <jeremy@jcline.org>
- \* Added connection pool keys by scheme
  
- \* Aviv Palivoda <palaviv@gmail.com>
- \* History list to Retry object.
- \* HTTPResponse contains the last Retry object.
  
- \* Nate Prewitt <nate.prewitt@gmail.com>

- \* Ensure timeouts are not booleans and greater than zero.
  - \* Fixed infinite loop in ``stream`` when amt=None.
  - \* Added length\_remaining to determine remaining data to be read.
  - \* Added enforce\_content\_length to raise exception when incorrect content-length received.
- 
- \* Seth Michael Larson <sethmichaellarson@protonmail.com>
  - \* Created selectors backport that supports PEP 475.
- 
- \* Alexandre Dias <alex.dias@smarkets.com>
  - \* Don't retry on timeout if method not in whitelist
- 
- \* Moinuddin Quadri <moin18@gmail.com>
  - \* Lazily load idna package
- 
- \* Tom White <s6yg1ez3@mail2tor.com>
  - \* Made SOCKS handler differentiate socks5h from socks5 and socks4a from socks4.
- 
- \* Tim Burke <tim.burke@gmail.com>
  - \* Stop buffering entire deflate-encoded responses.
- 
- \* Tuukka Mustonen <tuukka.mustonen@gmail.com>
  - \* Add counter for status\_forcelist retries.
- 
- \* Erik Rose <erik@mozilla.com>
  - \* Bugfix to pyopenssl vendoring
- 
- \* Wolfgang Richter <wolfgang.richter@gmail.com>
  - \* Bugfix related to loading full certificate chains with PyOpenSSL backend.
- 
- \* Mike Miller <github@mikeage.net>
  - \* Logging improvements to include the HTTP(S) port when opening a new connection
- 
- \* Ioannis Tziakos <mail@itziakos.gr>
  - \* Fix ``util.selectors.\_fileobj\_to\_fd`` to accept ``long``.
  - \* Update appveyor tox setup to use the 64bit python.
- 
- \* Akamai
  - (through Jess Shapiro) <jshapiro@akamai.com>
  - \* Ongoing maintenance; 2017-2018
- 
- \* Dominique Leuenberger <dimstar@opensuse.org>
  - \* Minor fixes in the test suite
- 
- \* Will Bond <will@wbond.net>
  - \* Add Python 2.6 support to ``contrib.securetransport``
- 
- \* Aleksei Alekseev <alekseev.yeskela@gmail.com>
  - \* using auth info for socks proxy

- \* Chris Wilcox <git@crwilcox.com>
- \* Improve contribution guide
- \* Add ``HTTPResponse.geturl`` method to provide ``urllib2.urlopen().geturl()`` behavior
  
- \* Bruce Merry <https://www.brucemerry.org.za>
- \* Fix leaking exceptions when system calls are interrupted with zero timeout
  
- \* Hugo van Kemenade <https://github.com/hugovk>
- \* Drop support for EOL Python 2.6
  
- \* Tim Bell <https://github.com/timb07>
- \* Bugfix for responses with Content-Type: message/\* logging warnings
  
- \* Justin Bramley <https://github.com/jbramleycl>
- \* Add ability to handle multiple Content-Encodings
  
- \* Katsuhiko YOSHIDA <https://github.com/kyoshidajp>
- \* Remove Authorization header  
regardless of case when redirecting to cross-site
  
- \* [Your name or handle] <[email or website]>
- \* [Brief summary of your changes]

# 1.104 xerces-j 2.7.1

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## 1.106 binutils 2.29.51

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+++++

Dean Elsner wrote the original gas for vax. [more details?]

Jay Fenlason maintained gas for a while, adding support for gdb-specific debug information and the 68k series machines, most of the preprocessing pass, and extensive changes in messages.c, input-file.c, write.c.

K. Richard Pixley maintained gas for a while, adding various enhancements and many bug fixes, including merging support for several processors, breaking gas up to handle multiple object file format backends (including heavy rewrite, testing, an integration of the coff and b.out backends), adding configuration including heavy testing and verification of cross assemblers and file splits and renaming, converted gas to strictly ansi C including full prototypes, added support for m680[34]0 & cpu32, considerable work on i960 including a coff port (including considerable amounts of reverse engineering), a sparc opcode file rewrite, decstation, rs6000, and hp300hpux host ports, updated "know" assertions and made them work, much other reorganization, cleanup, and lint.

Ken Raeburn wrote the high-level BFD interface code to replace most of the code in format-specific I/O modules.

The original Vax-VMS support was contributed by David L. Kashtan. Eric Youngdale and Pat Rankin have done much work with it since.

The Intel 80386 machine description was written by Eliot Dresselhaus.

Minh Tran-Le at IntelliCorp contributed some AIX 386 support.

The Motorola 88k machine description was contributed by Devon Bowen of Buffalo University and Torbjorn Granlund of the Swedish Institute of Computer Science.

Keith

Knowles at the Open Software Foundation wrote the original MIPS back end (tc-mips.c, tc-mips.h), and contributed Rose format support that hasn't been merged in yet. Ralph Campbell worked with the MIPS code to support a.out format.

Support for the Zilog Z8k and Hitachi H8/300, H8/500 and SH processors (tc-z8k, tc-h8300, tc-h8500, tc-sh), and IEEE 695 object file format (obj-ieee), was written by Steve Chamberlain of Cygnus Solutions. Steve also modified the COFF back end (obj-coffbfd) to use BFD for some low-level operations, for use with the Hitachi, 29k and Zilog targets.

John Gilmore built the AMD 29000 support, added .include support, and simplified the configuration of which versions accept which pseudo-ops. He updated the 68k machine description so that Motorola's opcodes always produced fixed-size instructions (e.g. jsr), while synthetic instructions remained shrinkable (jbsr). John fixed many bugs, including true tested cross-compilation support, and one bug in relaxation that took a week and required the proverbial one-bit fix.

Ian Lance Taylor of Cygnus Solutions merged the Motorola and MIT syntaxes for the 68k, completed support for some COFF targets (68k, i386 SVR3, and SCO Unix), wrote the ECOFF support based on Michael Meissner's mips-tfile program, wrote the PowerPC and RS/6000 support, and made a few other minor patches. He handled the binutils releases for versions 2.7 through 2.9.

David Edelsohn contributed fixes for the PowerPC and AIX support.

Steve Chamberlain made gas able to generate listings.

Support for the HP9000/300 was contributed by Glenn Engel of HP.

Support for ELF format files has been worked on by Mark Eichin of Cygnus Solutions (original, incomplete implementation), Pete Hoogenboom at the University of Utah (HPPA mainly), Michael Meissner of the Open Software Foundation (i386 mainly), and Ken Raeburn of Cygnus Solutions (sparc, initial 64-bit support).

Several engineers at Cygnus Solutions have also provided many small bug fixes and configuration enhancements.

The initial Alpha support was contributed by Carnegie-Mellon University. Additional work was done by Ken Raeburn of Cygnus Solutions. Richard Henderson then rewrote much of the Alpha support.

Ian Dall updated the support code for the National Semiconductor 32000 series, and added support for Mach 3 and NetBSD running on the PC532.

Klaus Kaempf ported the assembler and the binutils to openVMS/Alpha.

Steve Haworth contributed the support for the Texas Instruction c30 (tms320c30).

H.J. Lu has contributed many patches and much testing.

Alan Modra reworked much of the i386 backend, improving the error checking, updating the code, and improving the 16 bit support, using patches from the work of Martynas Kunigelis and H.J. Lu.

Many others have contributed large or small bugfixes and enhancements. If you've contributed significant work and are not mentioned on this list, and want to be, let us know. Some of the history has been lost; we aren't intentionally leaving anyone out.

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Although the Lesser General Public License is Less protective of the users' freedom, it does ensure that the user of a program that is linked with the Library has the freedom and the wherewithal to run that program using a modified version of the Library.

The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a "work based on the library" and a "work that uses the library". The former contains code derived from the library, whereas the latter must be combined with the library in order to run.

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program which contains a notice placed by the copyright holder or other authorized party saying it may be distributed under the terms of this Lesser General Public License (also called "this License"). Each licensee is addressed as "you".

A "library" means a collection of software functions and/or data prepared so as to be conveniently linked with application programs (which use some of those functions and data) to form executables.

The "Library", below, refers to any such software library or work which has been distributed under these terms. A "work based on the Library" means either the Library or any derivative work under copyright law: that is to say, a work containing the Library or a portion of it, either verbatim or with modifications and/or translated straightforwardly into another language. (Hereinafter, translation is included without limitation in the term "modification".)

"Source code" for a work means the preferred form of the work for making modifications to it. For a library, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the library.

Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running a program using the Library is not restricted, and output from such a program is covered only if its contents constitute a work based on the Library (independent of the use of the Library in a tool for writing it). Whether that is true depends on what the Library does and what the program that uses the Library does.

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- d) If a facility in the modified

Library refers to a function or a

table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful.

(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library, and can be reasonably considered independent and separate works in themselves,

then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Library, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Library.

In addition, mere aggregation of another work not based on the Library with the Library (or with a work based on the Library) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

3. You may opt to apply the terms of the ordinary GNU General Public License instead of this License to a given copy of the Library. To do this, you must alter all the notices that refer to this License, so that they refer to the ordinary GNU General Public License, version 2, instead of to this License. (If a newer version than version 2 of the ordinary GNU General Public License has appeared, then you can specify that version instead if you wish.) Do not make any other change in these notices.

Once this change is made in a given copy, it is irreversible for that copy, so the ordinary GNU General Public License applies to all subsequent copies and derivative works made from that copy.

This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a "work that uses the library". The executable is therefore covered by this License.

Section 6 states terms for distribution of such executables.

When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be

linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6.

Any

executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

6. As an exception to the Sections above, you may also combine or link a "work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer's own use and reverse engineering for debugging such modifications.

You must give prominent notice with each copy of the work that the Library is used in it and that the Library and its use are covered by this License. You must supply a copy of this License. If the work during execution displays copyright notices, you must include the copyright notice for the Library among them, as well as a reference directing the user to the copy of this License. Also, you must do one of these things:

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b) Use a suitable shared library mechanism for linking with the Library. A suitable mechanism is one that (1) uses at run time a copy of the library already present on the user's computer system, rather than copying library functions into the executable, and (2)

will operate properly with a modified version of the library, if the user installs one, as long as the modified version is interface-compatible with the version that the work was made with.

c) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.

d) If distribution of the work is made by offering access to copy from a designated place, offer equivalent access to copy the above specified materials from the same place.

e) Verify that the user has already received a copy of these materials or that you have already sent this user a copy.

For an executable, the required form of the "work that uses the Library" must include any data and utility programs needed for reproducing the executable from it. However, as a special exception, the materials to be distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

It may happen that this requirement contradicts the license restrictions of other proprietary libraries that do not normally accompany the operating system. Such a contradiction means you cannot use both them and the Library together in an executable that you distribute.

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Also, for each distributor's protection, we want to make certain that everyone understands that there is no warranty for this free library. If the library is modified by someone else and passed on, we want its recipients to know that what they have is not the original version, so that any problems introduced by others will not reflect on the original authors' reputations.

Finally, any free program is threatened constantly by software patents. We wish to avoid the danger that companies distributing free software will individually obtain patent licenses, thus in effect transforming the program into proprietary software. To prevent this, we have made it clear that any patent must be licensed for everyone's free use or not licensed at all.

Most GNU software, including some libraries, is covered by the ordinary GNU General Public License, which was designed for utility programs. This license, the GNU Library General Public License, applies to certain designated libraries. This license is quite different from the ordinary one; be sure to read it in full, and don't assume that anything in it is the same as in the ordinary license.

The reason we have a separate public license for some libraries is that they blur the distinction we usually make between modifying or adding to a program and simply using it. Linking a program with a library, without changing the library, is in some sense simply using the library, and is analogous to running a utility program or application program. However, in

a textual and legal sense, the linked executable is a combined work, a derivative of the original library, and the ordinary General Public License treats it as such.

Because

of this blurred distinction, using the ordinary General Public License for libraries did not effectively promote software sharing, because most developers did not use the libraries. We concluded that weaker conditions might promote sharing better.

However, unrestricted linking of non-free programs would deprive the users of those programs of all benefit from the free status of the libraries themselves. This Library General Public License is intended to permit developers of non-free programs to use free libraries, while preserving your freedom as a user of such programs to change the free libraries that are incorporated in them. (We have not seen how to achieve this as regards changes in header files, but we have achieved it as regards changes in the actual functions of the Library.) The hope is that this will lead to faster development of free libraries.

The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a "work based on the library" and a "work that uses the library". The former contains code derived from the library, while the latter only works together with the library.

Note that it is possible for a library to be covered by the ordinary General Public License rather than by this special one.

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2. You may modify your copy or copies of the Library or any portion of it, thus forming a work based on the Library, and copy and distribute such modifications or work under the terms of Section 1 above, provided that you also meet all of these conditions:

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- b) You must cause the files modified to carry prominent notices stating that you changed the files and the date of any change.
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is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful.

(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

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This option is useful when you wish to copy part of the code of the

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4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

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whether or not they are linked directly with the Library itself.

6. As an exception to the Sections above, you may also compile or link a "work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer's own use and reverse engineering for debugging such modifications.

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b) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.

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d) Verify that the user has already received a copy of these materials or that you have already sent this user a copy.

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components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

It may happen that this requirement contradicts the license restrictions of other proprietary libraries that do not normally accompany the operating system. Such a contradiction means you cannot use both them and the Library together in an executable that you distribute.

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## 1.107 bash 4.4.19

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=====

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```

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Version 3, 29 June 2007

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## 1.117 xz 5.2.3

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## \*-makefile\*-

## BSD-specific setup (FreeBSD, OpenBSD, NetBSD, \*BSD)

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## Commands to generate dependency files

GEN\_DEPS.c= \$(CC) -E -MM \$(DEFS) \$(CPPFLAGS)

GEN\_DEPS.cc= \$(CXX) -E -MM \$(DEFS) \$(CPPFLAGS)

## Flags for position independent code

SHAREDLIBCFLAGS = -fPIC

SHAREDLIBCXXFLAGS = -fPIC

SHAREDLIBCPPFLAGS = -DPIC

## Additional flags when building libraries and with threads

THREADSCPPFLAGS = -D\_REENTRANT

LIBCPPFLAGS =

## Compiler switch to embed a runtime search path

LD\_RPATH=

LD\_RPATH\_PRE= -Wl,-rpath,

## Compiler switch to embed a library name

LD\_SONAME = -Wl,-soname -Wl,\$(notdir \$(MIDDLE\_SO\_TARGET))

## Shared object suffix

SO = so

## Non-shared intermediate object suffix

STATIC\_O = ao

## Compilation rules

%. \$(STATIC\_O): \$(srcdir)/%.c

\$(COMPILE.c) \$(STATICCPPFLAGS) \$(STATICCFLAGS) -o \$@ \$<

%.o: \$(srcdir)/%.c

```

$(COMPILE.c) $(DYNAMICCPPFLAGS) $(DYNAMICCFLAGS) -o $@ $<

%. $(STATIC_O):
$(srcdir)/%.cpp
$(COMPILE.cc) $(STATICCPPFLAGS) $(STATICCXXFLAGS) -o $@ $<
%.o: $(srcdir)/%.cpp
$(COMPILE.cc) $(DYNAMICCPPFLAGS) $(DYNAMICCXXFLAGS) -o $@ $<

## Dependency rules
%.d: $(srcdir)/%.c
@echo "generating dependency information for $<"
@$(SHELL) -ec '$(GEN_DEPS.c) $< \
| sed "s/^(.*)\.o[ :]*/^1.o $@ : /g\" > $@; \
[ -s $@ ] || rm -f $@'

%.d: $(srcdir)/%.cpp
@echo "generating dependency information for $<"
@$(SHELL) -ec '$(GEN_DEPS.cc) $< \
| sed "s/^(.*)\.o[ :]*/^1.o $@ : /g\" > $@; \
[ -s $@ ] || rm -f $@'

## Versioned libraries rules

%. $(SO).$(SO_TARGET_VERSION_MAJOR): %. $(SO).$(SO_TARGET_VERSION)
$(RM) $@ && ln -s ${<F} $@
%. $(SO): %. $(SO).$(SO_TARGET_VERSION_MAJOR)
$(RM) $@ && ln -s ${*F}. $(SO).$(SO_TARGET_VERSION) $@

## End FreeBSD-specific setup

```

## 1.122 libxml2 2.7.6

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section 10

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@enumerate a

@item

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@item

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```
tree grammar ATNBuilder;  
options {  
    language    = Java;  
    tokenVocab  = ANTLRParser;  
    ASTLabelType = GrammarAST;  
    // filter    = true;  
}
```

```
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```

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```

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```

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```

```
*/
```

```
package org.antlr.v4.parse;  
import org.antlr.v4.tool.*;  
import org.antlr.v4.tool.ast.*;  
import org.antlr.v4.automata.ATNFactory;  
}
```

```

@members {
    ATNFactory factory;
    public ATNBuilder(TreeNodeStream input, ATNFactory factory) {
        this(input);
        this.factory = factory;
    }
}

```

dummy : block[null] ; // avoid error about no start rule

ruleBlock[GrammarAST ebnfRoot] returns [ATNFactory.Handle p]

```

@init {
    List<ATNFactory.Handle> alts = new ArrayList<ATNFactory.Handle>();
    int alt = 1;
    factory.setCurrentOuterAlt(alt);
}
: ^(BLOCK
    (^ (OPTIONS .*)?
    ( a=alternative
        {alts.add($a.p); factory.setCurrentOuterAlt(++alt);}
    )+
    )
    {$p
= factory.block((BlockAST)$BLOCK, ebnfRoot, alts);}
;

```

block[GrammarAST ebnfRoot] returns [ATNFactory.Handle p]

```

@init {List<ATNFactory.Handle> alts = new ArrayList<ATNFactory.Handle>();}
: ^(BLOCK (^ (OPTIONS .*)? (a=alternative {alts.add($a.p);})+)
    {$p = factory.block((BlockAST)$BLOCK, ebnfRoot, alts);}
;

```

alternative returns [ATNFactory.Handle p]

```

@init {List<ATNFactory.Handle> els = new ArrayList<ATNFactory.Handle>();}
: ^(LEXER_ALT_ACTION a=alternative lexerCommands)
    {$p = factory.lexerAltCommands($a.p,$lexerCommands.p);}
| ^(ALT elementOptions? EPSILON)    {$p = factory.epsilon($EPSILON);}
| ^(ALT elementOptions? (e=element {els.add($e.p);})+) {$p = factory.alt(els);}
;

```

lexerCommands returns [ATNFactory.Handle p]

```

@init {List<ATNFactory.Handle> cmds = new ArrayList<ATNFactory.Handle>();}
: (c=lexerCommand {if ($c.cmd != null) cmds.add($c.cmd);})+
    {
        $p = factory.alt(cmds);
    }
;

```

```

lexerCommand returns [ATNFactory.Handle
cmd]
: ^(LEXER_ACTION_CALL ID lexerCommandExpr)
  {$cmd = factory.lexerCallCommand($ID, $lexerCommandExpr.start);}
| ID
  {$cmd = factory.lexerCommand($ID);}
;

lexerCommandExpr
: ID
| INT
;

element returns [ATNFactory.Handle p]
: labeledElement {$p = $labeledElement.p;}
| atom {$p = $atom.p;}
| subrule {$p = $subrule.p;}
| ACTION {$p = factory.action((ActionAST)$ACTION);}
| SEMPRED {$p = factory.sempred((PredAST)$SEMPRED);}
| ^(ACTION .) {$p = factory.action((ActionAST)$ACTION);}
| ^(SEMPRED .) {$p = factory.sempred((PredAST)$SEMPRED);}
| ^(NOT b=blockSet[true]) {$p = $b.p;}
| LEXER_CHAR_SET {$p = factory.charSetLiteral($start);}
;

astOperand returns [ATNFactory.Handle p]
: atom {$p = $atom.p;}
| ^(NOT blockSet[true]) {$p = $blockSet.p;}
;

labeledElement returns [ATNFactory.Handle p]
: ^(ASSIGN ID element) {$p = factory.label($element.p);}
| ^(PLUS_ASSIGN ID element) {$p = factory.listLabel($element.p);}
;

subrule
returns [ATNFactory.Handle p]
: ^(OPTIONAL block[$start]) {$p = $block.p;}
| ^(CLOSURE block[$start]) {$p = $block.p;}
| ^(POSITIVE_CLOSURE block[$start]) {$p = $block.p;}
| block[null] {$p = $block.p;}
;

blockSet[boolean invert] returns [ATNFactory.Handle p]
@init {List<GrammarAST> alts = new ArrayList<GrammarAST>();}
: ^(SET (setElement {alts.add($setElement.start);})+) {$p = factory.set($start, alts, $invert);}
;

```

```

/** Don't combine with atom otherwise it will build spurious ATN nodes */
setElement
: ^(STRING_LITERAL .)
| ^(TOKEN_REF .)
| STRING_LITERAL
| TOKEN_REF
| ^(RANGE a=STRING_LITERAL b=STRING_LITERAL)
| LEXER_CHAR_SET
;

atom returns [ATNFactory.Handle p]
: range    {$p = $range.p;}
| ^(DOT ID terminal) {$p = $terminal.p;}
| ^(DOT ID ruleref) {$p = $ruleref.p;}
| ^(WILDCARD .) {$p = factory.wildcard($start);}
| WILDCARD {$p = factory.wildcard($start);}
| blockSet[false] {$p =
$blockSet.p;}
| terminal {$p = $terminal.p;}
| ruleref {$p = $ruleref.p;}
;

ruleref returns [ATNFactory.Handle p]
: ^(RULE_REF ARG_ACTION? ^(ELEMENT_OPTIONS .*)) {$p = factory.ruleRef($RULE_REF);}
| ^(RULE_REF ARG_ACTION?) {$p = factory.ruleRef($RULE_REF);}
| RULE_REF {$p = factory.ruleRef($RULE_REF);}
;

range returns [ATNFactory.Handle p]
: ^(RANGE a=STRING_LITERAL b=STRING_LITERAL) {$p = factory.range($a,$b);}
;

terminal returns [ATNFactory.Handle p]
: ^(STRING_LITERAL .) {$p = factory.stringLiteral((TerminalAST)$start);}
| STRING_LITERAL {$p = factory.stringLiteral((TerminalAST)$start);}
| ^(TOKEN_REF ARG_ACTION .) {$p = factory.tokenRef((TerminalAST)$start);}
| ^(TOKEN_REF .) {$p = factory.tokenRef((TerminalAST)$start);}
| TOKEN_REF {$p = factory.tokenRef((TerminalAST)$start);}
;

elementOptions
: ^(ELEMENT_OPTIONS elementOption*)
;

elementOption
: ID
| ^(ASSIGN ID ID)
| ^(ASSIGN

```



```
ID STRING_LITERAL)
| ^ (ASSIGN ID ACTION)
| ^ (ASSIGN ID INT)
;
```

Found in path(s):

\* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/parse/ATNBuilder.g

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Found in path(s):

\* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/gui/JFileChooserConfirmOverwrite.java

\* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/target/CSharpTarget.java

\* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/templates/codegen/CSharp/CSharp.stg

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Found in path(s):

- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/parse/ActionSplitterListener.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/ast/RuleRefAST.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/ast/OptionalBlockAST.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/PlusBlock.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/semantics/ActionSniffer.java
- \*
- /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/ThisRulePropertyRef\_start.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/CodeBlockForAlt.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/Attribute.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/dbg.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/ThrowEarlyExitException.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/DefaultToolListener.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/ArgAction.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/decl/TokenListDecl.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/analysis/LeftRecursionDetector.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/AttributeResolver.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/automata/ATNVisitor.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/ThisRulePropertyRef\_parser.java

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* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/GrammarTransformPipeline.java
*
/antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/TokenRef.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/ThisRulePropertyRef_ctx.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/LabelElementPair.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/ANTLRMessage.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/ActionText.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/LexerFile.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/decl/ContextGetterDecl.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/decl/ContextTokenGetterDecl.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/LL1StarBlockSingleAlt.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/misc/OrderedHashMap.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/automata/TailEpsilonRemover.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/TokenPropertyRef_index.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/TokenPropertyRef_int.java
*
/antlr4-4-5-1-1-sources-jar/org/antlr/v4/parse/v3TreeGrammarException.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/MatchNotSet.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/StarBlock.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/automata/ATNFactory.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/ast/StarBlockAST.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/decl/AttributeDecl.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/LabelRef.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/ast/GrammarAST.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/LL1Loop.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/decl/ContextRuleListGetterDecl.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/ast/PredAST.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/decl/TokenTypeDecl.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/analysis/LeftRecursiveRuleTransformer.java
*
/antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/NonLocalAttrRef.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/ToolMessage.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/semantics/BlankActionSplitterListener.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/OutputFile.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/misc/MutableInt.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/LL1OptionalBlockSingleAlt.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/ast/GrammarRootAST.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/automata/ParserATNFactory.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/RulePropertyRef_stop.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/Action.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/VisitorDispatchMethod.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/RuleElement.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/decl/AltLabelStructDecl.java
*
/antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/ErrorType.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/OptionalBlock.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/Target.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/DefaultOutputModelFactory.java

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- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/VisitorFile.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/decl/RuleContextDecl.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/MatchToken.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/parse/ToolANTLRParser.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/LL1AltBlock.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/Grammar.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/CodeGenerator.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/SetAttr.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/RuleActionFunction.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/ast/PlusBlockAST.java
- \*
- /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/ThisRulePropertyRef\_stop.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/ast/SetAST.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/Parser.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/ast/QuantifierAST.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/decl/TokenDecl.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/Sync.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/RulePropertyRef\_parser.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/ast/GrammarASTErrorNode.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/decl/Decl.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/ExceptionClause.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/ArgRef.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/RuleFunction.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/TokenPropertyRef\_channel.java
- \*
- /antlr4-4-5-1-1-sources-jar/org/antlr/v4/parse/ResyncToEndOfRuleBlock.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/SrcOp.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/semantics/SymbolCollector.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/OutputModelFactory.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/analysis/LeftRecursiveRuleAltInfo.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/Tool.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/ast/ActionAST.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/LexerGrammar.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/AddToLabelList.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/target/JavaTarget.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/parse/v4ParserException.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/CaptureNextToken.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/parse/ScopeParser.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/SetNonLocalAttr.java
- \*
- /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/target/Python2Target.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/decl/ContextTokenListGetterDecl.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/misc/FrequencySet.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/misc/Graph.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/gui/GraphicsSupport.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/BaseListenerFile.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/semantics/RuleCollector.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/templates/codegen/Java/Java.stg

- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/DOTGenerator.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/automata/LexerATNFactory.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/decl/ContextRuleGetterDecl.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/ThrowNoViableAlt.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/InvokeRule.java
- \*
- /antlr4-4-5-1-1-sources-jar/org/antlr/v4/analysis/LeftRecursiveRuleAnalyzer.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/gui/TreeTextProvider.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/LeftRecursionCyclesMessage.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/gui/TreeLayoutAdaptor.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/ast/RuleAST.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/RulePropertyRef.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/analysis/AnalysisPipeline.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/misc/Utils.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/AltBlock.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/Wildcard.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/semantics/SymbolChecks.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/gui/TreeView.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/Lexer.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/Alternative.java
- \*
- /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/ast/RuleElementAST.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/semantics/AttributeChecks.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/Choice.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/ErrorSeverity.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/ANTLRToolListener.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/BaseVisitorFile.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/RulePropertyRef\_start.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/TokenPropertyRef\_type.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/LL1PlusBlockSingleAlt.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/semantics/BasicSemanticChecks.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/ListenerFile.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/CodeGeneratorExtension.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/semantics/UseDefAnalyzer.java
- \*
- /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/ActionTemplate.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/QRetValueRef.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/LL1Choice.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/CodeBlockForOuterMostAlt.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/gui/BasicFontMetrics.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/LeftRecursiveRule.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/GrammarSyntaxMessage.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/SerializedATN.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/LeftRecursiveRuleFunction.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/semantics/SemanticPipeline.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/parse/ToolANTLR Lexer.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/automata/ATNPrinter.java
- \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/RuleSempredFunction.java

\*  
 /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/BuildDependencyGenerator.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/OutputModelController.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/gui/TestRig.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/ast/RangeAST.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/parse/TokenVocabParser.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/decl/StructDecl.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/target/JavaScriptTarget.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/decl/CodeBlock.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/parse/GrammarASTAdaptor.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/OutputModelObject.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/ast/GrammarASTVisitor.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/OutputModelWalker.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/decl/RuleContextListDecl.java  
 \*  
 /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/SemPred.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/RulePropertyRef\_ctx.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/ast/TerminalAST.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/LabelType.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/ast/NotAST.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/misc/CharSupport.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/RulePropertyRef\_text.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/DispatchMethod.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/ast/BlockAST.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/TestSetInline.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/Rule.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/decl/ContextTokenListIndexedGetterDecl.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/LL1OptionalBlock.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/automata/ATNOptimizer.java  
 \*  
 /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/ParserFactory.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/gui/SystemFontMetrics.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/TokenPropertyRef\_pos.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/ThrowRecognitionException.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/ast/AltAST.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/ast/GrammarASTWithOptions.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/CodeGenPipeline.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/LexerFactory.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/BlankOutputModelFactory.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/GrammarSemanticsMessage.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/GrammarInterpreterRuleContext.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/TokenPropertyRef.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/TokenPropertyRef\_line.java  
 \*  
 /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/ModelElement.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/Loop.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/ParserFile.java  
 \* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/LabeledOp.java

```

* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/TokenPropertyRef_text.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/ListenerDispatchMethod.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/LocalRef.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/decl/ContextRuleListIndexedGetterDecl.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/target/Python3Target.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/gui/TreePostScriptGenerator.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/RetValRef.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/decl/ElementListDecl.java

```

```

*

```

```

/antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/ThisRulePropertyRef_text.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/ActionTranslator.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/ListLabelRef.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/chunk/ActionChunk.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/CaptureNextTokenType.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/GrammarParserInterpreter.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/AttributeDict.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/model/MatchSet.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/gui/PostScriptDocument.java
* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/tool/EventManager.java

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\*/

tree grammar BlockSetTransformer;

```
options {  
    language    = Java;  
    tokenVocab  = ANTLRParser;  
    ASTLabelType = GrammarAST;  
    output      = AST;  
    filter      = true;  
}
```

```
@header {  
package org.antlr.v4.parse;  
import org.antlr.v4.misc.Utills;  
import org.antlr.v4.misc.*;  
import org.antlr.v4.tool.*;  
import org.antlr.v4.tool.ast.*;  
import java.util.List;  
import java.util.Set;  
import java.util.HashSet;  
import  
    java.util.ArrayList;  
import org.antlr.v4.runtime.misc.IntervalSet;  
}
```

```
@members {  
public String currentRuleName;  
public GrammarAST currentAlt;  
public Grammar g;  
public BlockSetTransformer(TreeNodeStream input, Grammar g) {  
    this(input, new RecognizerSharedState());  
    this.g = g;  
}  
}
```

```
topdown  
: ^(RULE (id=TOKEN_REF|id=RULE_REF) {currentRuleName=$id.text;} .+)  
| setAlt  
| ebnfBlockSet  
| blockSet  
;
```

```
setAlt  
: {inContext("RULE BLOCK")}?  
ALT {currentAlt = $start;}  
;
```



```

// (BLOCK (ALT (+ (BLOCK (ALT INT) (ALT ID))))))
ebnfBlockSet
@after {
    GrammarTransformPipeline.setGrammarPtr(g, $tree);
}
: ^(ebnfSuffix blockSet) -> ^(ebnfSuffix ^(BLOCK<BlockAST> ^(ALT<AltAST> blockSet)))
;

ebnfSuffix
@after {$tree = (GrammarAST)adaptor.dupNode($start);}
: OPTIONAL
| CLOSURE
| POSITIVE_CLOSURE
;

blockSet
@init {
    boolean inLexer = Grammar.isTokenName(currentRuleName);
}
@after {
    GrammarTransformPipeline.setGrammarPtr(g, $tree);
}
: {inContext("RULE")}?
// top-level: rule block and > 1 alt
^(BLOCK ^(alt=ALT elementOptions? {((AltAST)$alt).altLabel==null}? setElement[inLexer]) ( ^(ALT
elementOptions? setElement[inLexer]) )+ )
-> ^(BLOCK<BlockAST>[$BLOCK.token] ^(ALT<AltAST>[$BLOCK.token,"ALT"] ^(SET[$BLOCK.token,
"SET"] setElement+)))
| {!inContext("RULE")}? // if not rule block and > 1 alt
^(BLOCK ^(ALT elementOptions? setElement[inLexer]) ( ^(ALT elementOptions? setElement[inLexer]) )+ )
-> ^(SET[$BLOCK.token, "SET"] setElement+)
;

setElement[boolean inLexer]
@after {
    GrammarTransformPipeline.setGrammarPtr(g, $tree);
}
: ( ^(a=STRING_LITERAL elementOptions) {!inLexer ||
CharSupport.getCharValueFromGrammarCharLiteral($a.getText())!=-1}?
| a=STRING_LITERAL {!inLexer || CharSupport.getCharValueFromGrammarCharLiteral($a.getText())!=-1}?
| {!inLexer}?=> ^(TOKEN_REF elementOptions)
| {!inLexer}?=> TOKEN_REF
| {!inLexer}?=> ^(RANGE a=STRING_LITERAL b=STRING_LITERAL
{CharSupport.getCharValueFromGrammarCharLiteral($a.getText())!=-1
&&
CharSupport.getCharValueFromGrammarCharLiteral($b.getText())!=-1}?
)

```

;

elementOptions

: ^(ELEMENT\_OPTIONS elementOption\*)

;

elementOption

: ID

| ^(ASSIGN id=ID v=ID)

| ^(ASSIGN ID v=STRING\_LITERAL)

| ^(ASSIGN ID v=ACTION)

| ^(ASSIGN ID v=INT)

;

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\* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/parse/BlockSetTransformer.g

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\*/

```

/** Find left-recursive rules */
tree grammar LeftRecursiveRuleWalker;

options {
    tokenVocab=ANTLRParser;
    ASTLabelType=GrammarAST;
}

@header {
package org.antlr.v4.parse;

import org.antlr.v4.misc.*;
import org.antlr.v4.tool.*;
import org.antlr.v4.tool.ast.*;
}

@members {
private String ruleName;
private int currentOuterAltNumber; // which outer alt of rule?
public int
    numAlts; // how many alts for this rule total?

public void setAltAssoc(AltAST altTree, int alt) {}
public void binaryAlt(AltAST altTree, int alt) {}
public void prefixAlt(AltAST altTree, int alt) {}
public void suffixAlt(AltAST altTree, int alt) {}
public void otherAlt(AltAST altTree, int alt) {}
public void setReturnValues(GrammarAST t) {}
}

@rulecatch { }

// TODO: can get parser errors for not matching pattern; make them go away
public
rec_rule returns [boolean isLeftRec]
@init
{
    currentOuterAltNumber = 1;
}
: ^( r=RULE id=RULE_REF {ruleName=$id.getText();}
    ruleModifier?
// (ARG_ACTION)? shouldn't allow args, right?
    (^(RETURNS a=ARG_ACTION {setReturnValues($a);}))?
// (^(THROWS .+)) ? don't allow
    (^(LOCALS ARG_ACTION) )? // TODO: copy these to gen'd code
    (^(OPTIONS .*)
    | ^(AT ID ACTION) // TODO: copy

```

```

    )*
    ruleBlock { $isLeftRec = $ruleBlock.isLeftRec;}
    exceptionGroup
  )
;

exceptionGroup
: exceptionHandler* finallyClause?
;

exceptionHandler
: ^(CATCH ARG_ACTION ACTION)
;

finallyClause
: ^(FINALLY ACTION)
;

ruleModifier
: PUBLIC
| PRIVATE
| PROTECTED
;

ruleBlock returns [boolean isLeftRec]
@init{boolean lr=false; this.numAlts = $start.getChildCount();}
: ^( BLOCK
  (
    o=outerAlternative
    {if ($o.isLeftRec) $isLeftRec = true;}
    {currentOuterAltNumber++;}
  )+
)
;

/** An alt is either prefix, suffix, binary, or ternary operation or "other" */
outerAlternative returns [boolean isLeftRec]
: (binary)=>      binary
    {binaryAlt((AltAST)$start, currentOuterAltNumber); $isLeftRec=true;}
| (prefix)=>      prefix
    {prefixAlt((AltAST)$start, currentOuterAltNumber);}
| (suffix)=>      suffix
    {suffixAlt((AltAST)$start, currentOuterAltNumber); $isLeftRec=true;}
| nonLeftRecur    {otherAlt((AltAST)$start, currentOuterAltNumber);}
;

binary
: ^(

```

```

ALT elementOptions? recurse element* recurse epsilonElement* )
    {setAltAssoc((AltAST)$ALT,currentOuterAltNumber);}
;

prefix
: ^( ALT elementOptions?
  ({!((CommonTree)input.LT(1)).getText().equals(ruleName)}? element)+
  recurse epsilonElement*
)
  {setAltAssoc((AltAST)$ALT,currentOuterAltNumber);}
;

suffix
: ^( ALT elementOptions? recurse element+ )
  {setAltAssoc((AltAST)$ALT,currentOuterAltNumber);}
;

nonLeftRecur
: ^(ALT elementOptions? element+)
;

recurse
: ^(ASSIGN ID recurseNoLabel)
| ^(PLUS_ASSIGN ID recurseNoLabel)
| recurseNoLabel
;

recurseNoLabel : {((CommonTree)input.LT(1)).getText().equals(ruleName)}? RULE_REF;

token returns [GrammarAST t=null]
: ^(ASSIGN ID s=token {$t = $s.t;})
| ^(PLUS_ASSIGN ID s=token {$t = $s.t;})
| b=STRING_LITERAL      {$t = $b;}
| ^(b=STRING_LITERAL elementOptions) {$t = $b;}
| ^(c=TOKEN_REF elementOptions) {$t = $c;}
| c=TOKEN_REF           {$t = $c;}
;

elementOptions
: ^(ELEMENT_OPTIONS elementOption*)
;

elementOption
: ID
| ^(ASSIGN ID ID)
| ^(ASSIGN ID STRING_LITERAL)
| ^(ASSIGN ID ACTION)
| ^(ASSIGN ID INT)

```

;

element

: atom  
| ^(NOT element)  
| ^(RANGE atom atom)  
| ^(ASSIGN ID element)  
| ^(PLUS\_ASSIGN ID element)  
| ^(SET setElement+)  
| RULE\_REF  
| ebnf  
| epsilonElement  
;

epsilonElement

: ACTION  
| SEMPRED  
| EPSILON  
| ^(ACTION elementOptions)  
| ^(SEMPRED elementOptions)  
;

setElement

: ^(STRING\_LITERAL elementOptions)  
| ^(TOKEN\_REF elementOptions)  
| STRING\_LITERAL  
| TOKEN\_REF  
;

ebnf: block

| ^( OPTIONAL block )  
| ^( CLOSURE block )  
| ^( POSITIVE\_CLOSURE block )  
;

block

: ^(BLOCK ACTION? alternative+)  
;

alternative

: ^(ALT elementOptions? element+)  
;

atom

: ^(RULE\_REF ARG\_ACTION? elementOptions?)  
| ^(STRING\_LITERAL elementOptions)  
| STRING\_LITERAL  
| ^(TOKEN\_REF elementOptions)

```
| TOKEN_REF
| ^(WILDCARD elementOptions)
| WILDCARD
| ^(.DOT
ID element)
;
```

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\* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/parse/LeftRecursiveRuleWalker.g

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 \*/

```
lexer grammar ActionSplitter;
```

```
options { filter=true; }
```

```
@header {  
package organtlr.v4.parse;  
import organtlr.v4.tool.*;  
import organtlr.v4.tool.ast.*;  
}
```

```
@members {  
ActionSplitterListener delegate;
```

```
public ActionSplitter(CharStream input, ActionSplitterListener delegate) {  
    this(input, new RecognizerSharedState());  
    this.delegate = delegate;  
}
```

```
/** force filtering (and  
    return tokens). triggers all above actions. */  
public List<Token> getActionTokens() {
```



```

List<Token> chunks = new ArrayList<Token>();
Token t = nextToken();
while ( t.getType()!=Token.EOF ) {
    chunks.add(t);
    t = nextToken();
}
return chunks;
}

private boolean isIDStartChar(int c) {
    return c == '_' || Character.isLetter(c);
}
}

// ignore comments right away

COMMENT
: '/' ( options {greedy=false;} : . )* '/' {delegate.text($text);}
;

LINE_COMMENT
: '/' ~("\n"|"r")* 'r'? '\n' {delegate.text($text);}
;

SET_NONLOCAL_ATTR
: '$' x=ID '::' y=ID WS? '=' expr=ATTR_VALUE_EXPR ';'
{
    delegate.setNonLocalAttr($text, $x, $y, $expr);
}
;

NONLOCAL_ATTR
: '$' x=ID '::' y=ID {delegate.nonLocalAttr($text, $x, $y);}
;

QUALIFIED_ATTR
: '$' x=ID '.' y=ID {input.LA(1)!='('}? {delegate.qualifiedAttr($text, $x, $y);}
;

SET_ATTR
: '$' x=ID WS? '=' expr=ATTR_VALUE_EXPR ';'
{
    delegate.setAttr($text, $x, $expr);
}
;

ATTR
: '$'

```

```

x=ID {delegate.attr($text, $x);}
;

// Anything else is just random text
TEXT
@init {StringBuilder buf = new StringBuilder();}
@after {delegate.text(buf.toString());}
: ( c=~("\| '$') {buf.append((char)$c);}
  | '\$' {buf.append('$');}
  | '\\" c=~('$') {buf.append("\").append((char)$c);}
  | {!isIDStartChar(input.LA(2))}? => '$' {buf.append('$');}
)+
;

fragment
ID : ('a'..'z'|'A'..'Z'|'_') ('a'..'z'|'A'..'Z'|'0'..'9'|'_')*
;

/** Don't allow an = as first char to prevent $x == 3; kind of stuff. */
fragment
ATTR_VALUE_EXPR
: ~'=' (~';')*
;

fragment
WS : (' '|'\t'|\n'|\r')+
;

```

Found in path(s):

\* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/parse/ActionSplitter.g

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\*/

```

tree grammar SourceGenTriggers;
options {
    language    = Java;
    tokenVocab  = ANTLRParser;
    ASTLabelType = GrammarAST;
}

```

```

@header {
package org.antlr.v4.codegen;
import org.antlr.v4.misc.Utils;
import org.antlr.v4.codegen.model.*;
import org.antlr.v4.codegen.model.decl.*;
import org.antlr.v4.tool.*;
import org.antlr.v4.tool.ast.*;
import java.util.Collections;
import java.util.Map;
import
    java.util.HashMap;
}

```

```

@members {
public OutputModelController controller;
public boolean hasLookaheadBlock;
public SourceGenTriggers(TreeNodeStream input, OutputModelController controller) {
    this(input);
    this.controller = controller;
}
}

```

```

dummy : block[null, null] ;

```

```

block[GrammarAST label, GrammarAST ebfnRoot] returns [List<? extends SrcOp> omos]
: ^( blk=BLOCK (^ (OPTIONS .+))?
{List<CodeBlockForAlt> alts = new ArrayList<CodeBlockForAlt>();}
( alternative {alts.add($alternative.altCodeBlock);} )+
)
{
if ( alts.size()==1 && ebfnRoot==null) return alts;
if ( ebfnRoot==null ) {
    $omos = DefaultOutputModelFactory.list(controller.getChoiceBlock((BlockAST)$blk, alts, $label));
}
else {
    Choice choice = controller.getEBNFBlock($ebfnRoot, alts);
    hasLookaheadBlock |= choice instanceof PlusBlock || choice instanceof StarBlock;
    $omos = DefaultOutputModelFactory.list(choice);
}
}

```

```

;

alternative returns [CodeBlockForAlt altCodeBlock, List<SrcOp> ops]
@init {
    boolean outerMost = inContext("RULE BLOCK");
}
@after {
    controller.finishAlternative($altCodeBlock, $ops, outerMost);
}
: a=alt[outerMost] { $altCodeBlock=$a.altCodeBlock; $ops=$a.ops; }
;

alt[boolean outerMost] returns [CodeBlockForAlt altCodeBlock, List<SrcOp> ops]
@init {
    // set alt if outer ALT only (the only ones with alt field set to Alternative object)
    AltAST altAST = (AltAST)retval.start;
    if ( outerMost ) controller.setCurrentOuterMostAlt(altAST.alt);
}
: {
    List<SrcOp> elems = new ArrayList<SrcOp>();
    // TODO: shouldn't we pass $start to controller.alternative()?
    $altCodeBlock = controller.alternative(controller.getCurrentOuterMostAlt(), outerMost);
    $altCodeBlock.ops = $ops = elems;
    controller.setCurrentBlock($altCodeBlock);
}
^( ALT elementOptions? ( element {if ($element.omos!=null) elems.addAll($element.omos);} )+ )

| ^(ALT elementOptions? EPSILON)
    { $altCodeBlock = controller.epsilon(controller.getCurrentOuterMostAlt(), outerMost); }
;

element returns [List<? extends SrcOp> omos]
: labeledElement { $omos = $labeledElement.omos; }
| atom[null,false] { $omos = $atom.omos; }
| subrule { $omos = $subrule.omos; }
| ACTION { $omos = controller.action((ActionAST)$ACTION); }
| SEMPRED { $omos = controller.sempred((ActionAST)$SEMPRED); }
| ^(ACTION elementOptions) { $omos = controller.action((ActionAST)$ACTION); }
| ^(SEMPRED elementOptions) { $omos = controller.sempred((ActionAST)$SEMPRED); }
;

labeledElement returns [List<? extends SrcOp> omos]
: ^(ASSIGN ID atom[$ID,false] ) { $omos = $atom.omos; }
| ^(PLUS_ASSIGN ID atom[$ID,false]) { $omos = $atom.omos; }
| ^(ASSIGN ID block[$ID,null] ) { $omos = $block.omos; }
| ^(PLUS_ASSIGN ID block[$ID,null]) { $omos = $block.omos; }
;

```

```

subrule returns [List<? extends SrcOp> omos]
: ^(OPTIONAL b=block[null,$OPTIONAL])
{
  $omos = $block.omos;
}
| ( ^(op=CLOSURE
b=block[null,null])
| ^(op=POSITIVE_CLOSURE b=block[null,null])
)
{
  List<CodeBlockForAlt> alts = new ArrayList<CodeBlockForAlt>();
  SrcOp blk = $b.omos.get(0);
  CodeBlockForAlt alt = new CodeBlockForAlt(controller.delegate);
  alt.addOp(blk);
  alts.add(alt);
  SrcOp loop = controller.getEBNFBlock($op, alts); // "star it"
  hasLookaheadBlock |= loop instanceof PlusBlock || loop instanceof StarBlock;
  $omos = DefaultOutputModelFactory.list(loop);
}
| block[null, null] { $omos = $block.omos; }
;

```

```

blockSet[GrammarAST label, boolean invert] returns [List<SrcOp> omos]
: ^(SET atom[label,invert]+) { $omos = controller.set($SET, $label, invert); }
;

```

```

/*
setElement
: STRING_LITERAL
| TOKEN_REF
| ^(RANGE STRING_LITERAL STRING_LITERAL)
;
*/

```

// TODO: combine ROOT/BANG into one then just make new op ref'ing return value of atom/terminal...

// TODO: same for NOT

```

atom[GrammarAST label, boolean invert] returns [List<SrcOp> omos]
: ^(NOT a=atom[$label,
true]) { $omos = $a.omos; }
| range[label] { $omos = $range.omos; }
| ^(DOT ID terminal[$label])
| ^(DOT ID ruleref[$label])
| ^(WILDCARD .) { $omos = controller.wildcard($WILDCARD, $label); }
| WILDCARD { $omos = controller.wildcard($WILDCARD, $label); }
| terminal[label] { $omos = $terminal.omos; }
| ruleref[label] { $omos = $ruleref.omos; }
| blockSet[$label, invert] { $omos = $blockSet.omos; }
;

```

```

ruleref[GrammarAST label] returns [List<SrcOp> omos]
: ^(RULE_REF ARG_ACTION? elementOptions?) {$omos = controller.ruleRef($RULE_REF, $label,
$ARG_ACTION);}
;

```

```

range[GrammarAST label] returns [List<SrcOp> omos]
: ^(RANGE a=STRING_LITERAL b=STRING_LITERAL)
;

```

```

terminal[GrammarAST label] returns [List<SrcOp> omos]
: ^(STRING_LITERAL .) {$omos = controller.stringRef($STRING_LITERAL, $label);}
| STRING_LITERAL {$omos = controller.stringRef($STRING_LITERAL, $label);}
| ^(TOKEN_REF ARG_ACTION .) {$omos = controller.tokenRef($TOKEN_REF,
$label, $ARG_ACTION);}
| ^(TOKEN_REF .) {$omos = controller.tokenRef($TOKEN_REF, $label, null);}
| TOKEN_REF {$omos = controller.tokenRef($TOKEN_REF, $label, null);}
;

```

```

elementOptions
: ^(ELEMENT_OPTIONS elementOption+)
;

```

```

elementOption
: ID
| ^(ASSIGN ID ID)
| ^(ASSIGN ID STRING_LITERAL)
| ^(ASSIGN ID ACTION)
| ^(ASSIGN ID INT)
;

```

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\* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/codegen/SourceGenTriggers.g

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\*/



```

// File    : A3Lexer.g
// Author   : Jim Idle (jimi@temporal-wave.com)
// Copyright : Free BSD - See @header clause below
// Version  : First implemented as part of ANTLR 3.2 this is the self
//            hosting ANTLR 3 Lexer.
//
// Description
// -----
// This is the definitive lexer grammar for parsing ANTLR V3.x.x grammars. All other
// grammars are derived from
// this grammar via source code control integration (perforce)
// or by the gdiff tool.
//
// This grammar and its associated grmmars A3Parser.g and A3Walker.g exhibit the following
// traits, which are recommended for all production quality grammars:
//
// 1) They are separate grammars, not composite grammars;
// 2) They implement all supporting methods in a superclass (at least this is recommended
//    for language targets that support inheritance;
// 3) All errors are pushed as far down the parsing chain as possible, which means
//    that the lexer tries to defer error reporting to the parser, and the parser
//    tries to defer error reporting to a semantic phase consisting of a single
//    walk of the AST. The reason for this is that the error messages produced
//    from later phases of the parse will generally have better context and so
//    be more useful to the end user. Consider the message: "Syntax error at 'options'"
//    vs: "You cannot specify two options{} sections
//        in a single grammar file".
// 4) The lexer is 'programmed' to catch common mistakes such as unterminated literals
//    and report them specifically and not just issue confusing lexer mismatch errors.
//
//
/** Read in an ANTLR grammar and build an AST. Try not to do
 * any actions, just build the tree.
 *
 * The phases are:
 *
 * A3Lexer.g (this file)
 *     A3Parser.g
 *     A3Verify.g (derived from A3Walker.g)
 * assign.types.g
 * define.g
 * buildnfa.g
 * antlr.print.g (optional)
 * codegen.g
 *
 * Terence Parr
 * University of San Francisco
 * 2005

```

```
* Jim Idle (this v3 grammar)
* Temporal Wave LLC
* 2009
*/
```

```
lexer grammar ANTLRLexer;
```

```
// =====
// Note that while this grammar does not care about order of constructs
// that don't really matter, such as options before @header etc, it must first
// be parsed by the original v2 parser, before it replaces it. That parser does
// care
// about order of structures. Hence we are constrained by the v2 parser
// for at least the first bootstrap release that causes this parser to replace
// the v2 version.
// =====
```

```
// -----
```

```
// Options
```

```
//
```

```
// V3 option directives to tell the tool what we are asking of it for this
```

```
// grammar.
```

```
//
```

```
options {
```

```
    // Target language is Java, which is the default but being specific
```

```
    // here as this grammar is also meant as a good example grammar for
```

```
    // for users.
```

```
    //
```

```
    language    = Java;
```

```
    // The super class that this lexer should expect to inherit from, and
```

```
    // which contains any and all support routines for the lexer. This is
```

```
    // commented out in this baseline (definitive or normative grammar)
```

```
    // - see the ANTLR tool implementation for hints on how to use the super
```

```
    // class
```

```
    //
```

```
    //superclass = AbstractA3Lexer;
```

```
}
```

```
tokens { SEMPRED; TOKEN_REF; RULE_REF; LEXER_CHAR_SET; ARG_ACTION; }
```

```
// Include the copyright in this
```

```
source and also the generated source
```

```
//
```

```
@lexer::header {
```

```
/*
```

```
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```

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\*/

```
package org.antlr.v4.parse;
import org.antlr.v4.tool.*;
}
```

```
@members {
```

```
    public static final int COMMENTS_CHANNEL = 2;
```

```
    public CommonTokenStream tokens; // track stream we push to; need for context info
    public boolean isLexerRule = false;
```

```
    public void grammarError(ErrorType etype, org.antlr.runtime.Token token, Object... args) { }
```

```
    /** scan backwards from current point in this.tokens list
```

```
    * looking for the start of the rule or subrule.
```

```
    * Return token or null if for some reason
```

```
    we can't find the start.
```

```
    */
```

```
    public Token getRuleOrSubruleStartToken() {
```

```
        if ( tokens==null ) return null;
```

```
        int i = tokens.index();
```

```
        int n = tokens.size();
```

```
        if ( i>=n ) i = n-1; // seems index == n as we lex
```

```
        while ( i>=0 && i<n) {
```

```

int ttype = tokens.get(i).getType();
if ( ttype == LPAREN || ttype == TOKEN_REF || ttype == RULE_REF ) {
    return tokens.get(i);
}
i--;
}
return null;
}
}

// -----
// Comments
//
// ANTLR comments can be multi or single line and we don't care
// which particularly. However we also accept Javadoc style comments
// of the form: /** ... */ and we do take care to distinguish those
// from ordinary multi-line comments
// Note how we guide the lexical PATH because we want to issue a decriptive
// error message in case of a standalone '/' character, which makes no
// sense in ANTLR source code. We also trap unterminated multi-line comments
//
fragment DOC_COMMENT : ;
COMMENT
@init {

    // Record the start line and offsets
    as if we need to report an
    // unterminated comment, then we want to show the start of the comment
    // we think is broken, not the end, where people will have to try and work
    // it out themselves.
    //
    int startLine = $line;
    int offset   = getCharPositionInLine();
}

: // Eat the first character only, then see if we have a comment
  // or something silly.
  //
  '/' // Comment introducer

(
    // Single line comment, possibly with embedded src/line directives
    // in a similar style to the C pre-processor, allowing generated
    // code to refer the programmer back to the original source code
    // in case of error.
    //
    '/'
    (
        (' $ANTLR')=> ' $ANTLR' SRC

```

```

    | ~(NLCHARS)*
)

| // Multi-line comment, which may be a documentation comment
  // if it starts /** (note that we protect against accidentally
  // recognizing a comment /**/ as a documentation
comment
  //
  /** (
    { input.LA(2) != '/' }?=> '*' { $type = DOC_COMMENT; }
  | { true }?=> // Required to cover all alts with predicates
  )

  // Should we support embedded multiline comments here?
  //
  (
    // Pick out end of multiline comment and exit the loop
    // if we find it.
    //
    { !(input.LA(1) == '*' && input.LA(2) == '/') }?

    // Anything else other than the non-greedy match of
    // the comment close sequence
    //
    .
  )*
  (
    // Look for the comment terminator, but if it is accidentally
    // unterminated, then we will hit EOF, which will trigger the
    // epsilon alt and hence we can issue an error message relative
    // to the start of
the unterminated multi-line comment
    //
    '*'/'

    | // Unterminated comment!
    //
    {
      // ErrorManager.msg(Msg.UNTERMINATED_DOC_COMMENT, startLine, offset, $pos, startLine,
offset, $pos, (Object)null);
    }
  )

  | // There was nothing that made sense following the opening '/' and so
  // we issue an error regarding the malformed comment
  //
  {
    // TODO: Insert error message relative to comment start

```

```

        //
    }
)
{
    // We do not wish to pass the comments in to the parser. If you are
    // writing a formatter then you will want to preserve the comments off
    // channel, but could just skip and save token space if not.
    //
    $channel=COMMENTS_CHANNEL;
}
;

ARG_OR_CHARSET
options {k=1;}
: {isLexerRule}?=> LEXER_CHAR_SET {$type=LEXER_CHAR_SET;}
| {!isLexerRule}?=> ARG_ACTION
{
    $type=ARG_ACTION;
    // Set the token text to our gathered string minus outer [ ]
    String t = $text;
    t = t.substring(1,t.length()-1);
    setText(t);
}
;

fragment
LEXER_CHAR_SET
: '['
( '\\' ~('r'|\n')
| ~('r'|\n'|\\'|']')
)*
']'
;

// -----
// Argument specs
//
// Certain argument lists, such as those specifying call parameters
// to a rule invocation, or input parameters to a rule specification
// are contained within square brackets. In the lexer we consume them
// all at once and sort them out later in the grammar analysis.
//
fragment
ARG_ACTION
: '['
(
    ARG_ACTION

```

```

| ("")=>ACTION_STRING_LITERAL

| ("\")=>ACTION_CHAR_LITERAL

| ~(('[']|
)*

'|
;

// -----
// Actions
//
// Other than making sure to distinguish between { and } embedded
// within what we have assumed to be literals in the action
// code, the
// job of the lexer is merely to gather the code within the action
// (delimited by {}) and pass it to the parser as a single token.
// We know that this token will be asked for its text somewhere
// in the upcoming parse, so setting the text here to exclude
// the delimiting {} is no additional overhead.
//
ACTION
: NESTED_ACTION
( '?' { $type = SEMPRED; }
( (WSNLCHARS* '=>') => WSNLCHARS* '=>' // v3 gated sempred
{
Token t = new CommonToken(input, state.type, state.channel, state.tokenStartCharIndex, getCharIndex()-1);
t.setLine(state.tokenStartLine);
t.setText(state.text);
t.setCharPositionInLine(state.tokenStartCharPositionInLine);
grammarError(ErrorType.V3_GATED_SEMPRED, t);
}
)?
)?
;

// -----
// Action structure
//
// Many language targets use {} as block delimiters and so we
// must recursively match {} delimited blocks to balance the
// braces. Additionally, we must make some assumptions about
// literal string representation
// in the target language. We assume
// that they are delimited by ' or " and so consume these
// in their own alts so as not to inadvertantly match {}.
// This rule calls itself on matching a {

```

```

//
fragment
NESTED_ACTION
@init {

    // Record the start line and offsets as if we need to report an
    // unterminated block, then we want to show the start of the comment
    // we think is broken, not the end, where people will have to try and work
    // it out themselves.
    //
    int startLine = getLine();
    int offset   = getCharPositionInLine();
}

: // Action and other blocks start with opening {
    //
    '{'
    (
        // And now we can match one of a number of embedded
        // elements within the action until we find a
        // } that balances the opening {. If we do not find
        // the balanced } then we will hit EOF and can issue
        // an error message about the brace that we believe to
        // be mismatched. This won't be foolproof but we will
        // be able to at least report
an error against the
        // opening brace that we feel is in error and this will
        // guide the user to the correction as best we can.
        //

        // An embedded {} block
        //
        NESTED_ACTION

    | // What appears to be a literal
        //
        ACTION_CHAR_LITERAL

    | // We have assumed that the target language has C/Java
        // type comments.
        //
        COMMENT

    | // What appears to be a literal
        //
        ACTION_STRING_LITERAL

```



```

| // What appears to be an escape sequence
//
ACTION_ESC

| // Some other single character that is not
// handled above
//
~(\\|'|"|\|/|'{'|'})

)*

(
// Correctly balanced closing brace
//
'}'

| // Looks like have an imbalanced {} block, report
// with respect to the opening brace.
//
{
// TODO: Report imbalanced {}
System.out.println("Block starting at line " + startLine
+ " offset " + (offset+1) + " contains imbalanced {} or is missing a }");
}
)
;

// Keywords
// -----
// keywords used to specify ANTLR v3 grammars. Keywords may not be used as
// labels for rules or in any other context where they would be ambiguous
// with the keyword vs some other identifier
// OPTIONS, TOKENS, and CHANNELS must also consume the opening brace that captures
// their option block, as this is the easiest way to parse it separate
// to an ACTION block, despite it using the same {} delimiters.
//
OPTIONS    : 'options' WSNLCHARS* '{' ;
TOKENS_SPEC : 'tokens' WSNLCHARS* '{' ;
CHANNELS   : 'channels' WSNLCHARS* '{' ;

IMPORT     : 'import'          ;
FRAGMENT   : 'fragment'        ;
LEXER      : 'lexer'           ;
PARSER     : 'parser'          ;
GRAMMAR    : 'grammar'         ;
TREE_GRAMMAR : 'tree' WSNLCHARS* 'grammar' ;
PROTECTED  : 'protected'       ;

```

```

PUBLIC      : 'public'      ;
PRIVATE
    : 'private'      ;
RETURNS     : 'returns'     ;
LOCALS      : 'locals'      ;
THROWS      : 'throws'      ;
CATCH       : 'catch'       ;
FINALLY     : 'finally'     ;
MODE        : 'mode'        ;

// -----
// Punctuation
//
// Character sequences used as separators, delimiters, operators, etc
//
COLON       : ':'
    {
        // scan backwards, looking for a RULE_REF or TOKEN_REF.
        // which would indicate the start of a rule definition.
        // If we see a LPAREN, then it's the start of the subrule.
        // this.tokens is the token string we are pushing into, so
        // just loop backwards looking for a rule definition. Then
        // we set isLexerRule.
        Token t = getRuleOrSubruleStartToken();
        if ( t!=null ) {
            if ( t.getType()==RULE_REF ) isLexerRule = false;
            else
                if ( t.getType()==TOKEN_REF ) isLexerRule = true;
            // else must be subrule; don't alter context
        }
    }
;
COLONCOLON  : '::'          ;
COMMA       : ','           ;
SEMI        : ';'           ;
LPAREN      : '('           ;
RPAREN      : ')'           ;
RARROW      : '->'         ;
LT          : '<'           ;
GT          : '>'           ;
ASSIGN      : '='           ;
QUESTION    : '?'           ;
SYNPRED     : '=>'
    {
        Token t = new CommonToken(input, state.type, state.channel,
                                   state.tokenStartCharIndex, getCharIndex()-1);
        t.setLine(state.tokenStartLine);
        t.setText(state.text);
    }

```

```

t.setCharPositionInLine(state.tokenStartCharPositionInLine);
grammarError(ErrorType.V3_SYNPRED, t);
    $channel=HIDDEN;
}
;
STAR      : '*'
;
PLUS      : '+'
;
PLUS_ASSIGN : '+='
;
OR        : '|'
;
DOLLAR    : '$'
;
DOT       : '.' ; // can be WILDCARD or DOT in qid or imported rule ref
RANGE     : '..'
;
AT        : '@'
;
POUND     : '#'
;
NOT       : '~'
;
RBRACE    : '}'
;

```

/\*\* Allow unicode rule/token names \*/

```

ID : a=NameStartChar NameChar*
{
    if ( Grammar.isTokenName($a.text) ) $type = TOKEN_REF;
    else $type = RULE_REF;
}
;

```

fragment

```

NameChar : NameStartChar
| '0'..'9'
| '_'
| '\u00B7'
| '\u0300'..'u036F'
| '\u203F'..'u2040'
;

```

fragment

```

NameStartChar
: 'A'..'Z' | 'a'..'z'
| '\u00C0'..'u00D6'
| '\u00D8'..'u00F6'
| '\u00F8'..'u02FF'

| '\u0370'..'u037D'
| '\u037F'..'u1FFF'
| '\u200C'..'u200D'
| '\u2070'..'u218F'
| '\u2C00'..'u2FEF'
| '\u3001'..'uD7FF'

```

```

        | '\uF900'..\uFDCF'
        | '\uFDF0'..\uFEFE'
        | '\uFF00'..\uFFFD'
        ; // ignores | [\u10000-\uEFFFD] ;

// -----
// Literals embedded in actions
//
// Note that we have made the assumption that the language used within
// actions uses the fairly standard " and ' delimiters for literals and
// that within these literals, characters are escaped using the \ character.
// There are some languages which do not conform to this in all cases, such
// as by using /string/ and so on. We will have to deal with such cases if
// if they come up in targets.
//

// Within actions, or other structures that are not part of the ANTLR
// syntax, we may encounter literal characters. Within these, we do
// not want to inadvertently match
// things like '}' and so we eat them
// specifically. While this rule is called CHAR it allows for the fact that
// some languages may use/allow ' as the string delimiter.
//
fragment
ACTION_CHAR_LITERAL
: "\"" ((\"\\)=>ACTION_ESC | ~\"")* "\""
;

// Within actions, or other structures that are not part of the ANTLR
// syntax, we may encounter literal strings. Within these, we do
// not want to inadvertently match things like '}' and so we eat them
// specifically.
//
fragment
ACTION_STRING_LITERAL
: "\"" ((\"\\)=>ACTION_ESC | ~\"")* "\""
;

// Within literal strings and characters that are not part of the ANTLR
// syntax, we must allow for escaped character sequences so that we do not
// inadvertently recognize the end of a string or character when the terminating
// delimiter has been escaped.
//
fragment
ACTION_ESC
: \"\\\" .
;

```

```

// -----
// Integer
//
// Obviously (I hope) match an arbitrary long sequence of digits.
//
INT : ('0'..'9')+
    ;

// -----
// Source spec
//
//
// A fragment rule for picking up information about an originating
// file from which the grammar we are parsing has been generated. This allows
// ANTLR to report errors against the originating file and not the generated
// file.
//
fragment
SRC : 'src' WSCHARS+ file=ACTION_STRING_LITERAL WSCHARS+ line=INT
    {
        // TODO: Add target specific code to change the source file name and current line number
        //
    }
    ;

// -----
// Literal string
//
// ANTLR makes no distinction between a single character literal and a
// multi-character string. All literals are single quote delimited and
// may contain unicode escape sequences of the form \uxxxx, where x
// is a valid hexadecimal number (as per Java basically).
STRING_LITERAL
: '\" ( ( ESC_SEQ | ~('\\'|\"'|\"r'|\"n') ) ) *
  ( '\"
  | // Unterminated string literal
    {
        Token t = new CommonToken(input, state.type, state.channel, state.tokenStartCharIndex, getCharIndex()-1);
        t.setLine(state.tokenStartLine);
        t.setText(state.text);
        t.setCharPositionInLine(state.tokenStartCharPositionInLine);
        grammarError(ErrorType.UNTERMINATED_STRING_LITERAL, t);
    }
  )
;

// A valid hex digit specification
//

```

```

fragment
HEX_DIGIT : ('0'..'9'|'a'..'f'|'A'..'F') ;

// Any kind of escaped character that we can embed within ANTLR
// literal strings.
//
fragment
ESC_SEQ
: '\\'
(
    // The standard escaped character set such as tab, newline,
    // etc.
    //
    'b'|'t'|'n'|'f'|'r'|'\''|'\"'|'\\'

    | // A Java style Unicode escape sequence
    //
    UNICODE_ESC

    | // An illegal escape sequence
    //
    {
        Token t = new CommonToken(input, state.type, state.channel, getCharIndex()-1, getCharIndex());
        t.setText(t.getText());
        t.setLine(input.getLine());

        t.setCharPositionInLine(input.getCharPositionInLine()-1);
        grammarError(ErrorType.INVALID_ESCAPE_SEQUENCE, t);
    }
)
;

fragment
UNICODE_ESC

@init {

    // Flag to tell us whether we have a valid number of
    // hex digits in the escape sequence
    //
    int hCount = 0;
}

: 'u' // Leadin for unicode escape sequence

    // We now require 4 hex digits. Note though
    // that we accept any number of characters
    // and issue an error if we do not get 4. We cannot
    // use an infinite count such as + because this

```

```

// might consume too many, so we lay out the lexical
// options and issue an error at the invalid paths.
//
(
(
    HEX_DIGIT { hCount++; }
    (
        HEX_DIGIT { hCount++; }
        (
            HEX_DIGIT { hCount++; }
            (
                // Four valid hex digits, we are good
                //

                HEX_DIGIT { hCount++; }

                | // Three valid digits
            )

            | // Two valid digits
        )

            | // One valid digit
        )
    )
    | // No valid hex digits at all
)

// Now check the digit count and issue an error if we need to
//
{
    if (hCount != 4) {
        Token t = new CommonToken(input, state.type, state.channel, getCharIndex()-3-hCount, getCharIndex()-
1);
        t.setText(t.getText());
        t.setLine(input.getLine());
        t.setCharPositionInLine(input.getCharPositionInLine()-hCount-2);
        grammarError(ErrorType.INVALID_ESCAPE_SEQUENCE, t);
    }
}
;

// -----
// Whitespace
//
// Characters and character constructs that are of no import
// to the parser and are used to make the grammar easier to read
// for humans.

```

```

//
WS
: (
    ' '
    | '\t'
    | '\r'
    | '\n'
    | '\f'
  )+
  {$channel=HIDDEN;}
;

// A fragment rule for use in recognizing end of line in
// rules like COMMENT.
//
fragment
NLCHARS
: '\n' | '\r'
;

// A fragment rule for recognizing traditional whitespace
// characters within lexer rules.
//
fragment
WSCHARS
: ' ' | '\t' | '\f'
;

// A fragment rule for recognizing both traditional whitespace and
// end of line markers, when we don't care to distinguish but don't
// want any action code going on.
//
fragment
WSNLCHARS
: ' ' | '\t' | '\f' | '\n' | '\r'
;

// This rule allows ANTLR 4 to parse grammars using the UTF-8 encoding with a
// byte order mark. Since this Unicode character doesn't appear as a token
// anywhere else in the grammar, we can simply skip all instances of it without
// problem. This rule will not break usage of \uFEFF inside a LEXER_CHAR_SET or
// STRING_LITERAL.
UnicodeBOM
: '\uFEFF' {skip();}
;

// -----
// Illegal Character

```



```
//
// This is an
// illegal character trap which is always the last rule in the
// lexer specification. It matches a single character of any value and being
// the last rule in the file will match when no other rule knows what to do
// about the character. It is reported as an error but is not passed on to the
// parser. This means that the parser to deal with the gramamr file anyway
// but we will not try to analyse or code generate from a file with lexical
// errors.
//
ERRCHAR
: .
{
    Token t = new CommonToken(input, state.type, state.channel, state.tokenStartCharIndex, getCharIndex()-1);
    t.setLine(state.tokenStartLine);
    t.setText(state.text);
    t.setCharPositionInLine(state.tokenStartCharPositionInLine);
    String msg = getTokenErrorDisplay(t) + " came as a complete surprise to me";
    grammarError(ErrorType.SYNTAX_ERROR, t, msg);
    state.syntaxErrors++;
    skip();
}
;
```

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*/
```

```
/** The definitive ANTLR v3 tree grammar to walk/visit ANTLR v4 grammars.
```

```
* Parses trees created by ANTLRParser.g.
```

```
*
```

```
* Rather than have multiple tree grammars, one for each visit, I'm
```

```
* creating this generic visitor that knows about context. All of the
```

```
* boilerplate pattern recognition is done here. Then, subclasses can
```

```
* override the methods they care about. This
```

```
prevents a lot of the same
```

```
* context tracking stuff like "set current alternative for current
```

```
* rule node" that is repeated in lots of tree filters.
```

```
*/
```

```
tree grammar GrammarTreeVisitor;
```

```
options {
```

```
language    = Java;
```

```
tokenVocab  = ANTLRParser;
```

```
ASTLabelType = GrammarAST;
```

```
}
```

```
// Include the copyright in this source and also the generated source
```

```
@header {
```

```
/*
```

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\*/

```
package org.antlr.v4.parse;
import org.antlr.v4.Tool;
import org.antlr.v4.tool.*;
import org.antlr.v4.tool.ast.*;
import java.lang.reflect.InvocationTargetException;
import java.lang.reflect.Method;
}

@members
{
    public String grammarName;
    public GrammarAST currentRuleAST;
    public String currentModeName = LexerGrammar.DEFAULT_MODE_NAME;
    public String currentRuleName;
    public GrammarAST currentOuterAltRoot;
    public int currentOuterAltNumber = 1; // 1..n
    public int rewriteEBNFLevel = 0;

    public GrammarTreeVisitor() { this(null); }

    // Should be abstract but can't make gen'd parser abstract;
    // subclasses should implement else everything goes to stderr!
    public ErrorManager getErrorManager() { return null; }

    public void visitGrammar(GrammarAST t) { visit(t, "grammarSpec"); }
    public void visit(GrammarAST t, String ruleName) {
        CommonTreeNodeStream nodes = new CommonTreeNodeStream(new GrammarASTAdaptor(), t);
        setTreeNodeStream(nodes);
        try {
            Method m = getClass().getMethod(ruleName);
            m.invoke(this);
        }
        catch (Throwable e) {
            ErrorManager errMgr = getErrorManager();
            if ( e instanceof InvocationTargetException ) {
                e = e.getCause();
            }
        }
    }
}
```

```

    }
    //e.printStackTrace(System.err);
    if
    ( errMgr==null ) {
        System.err.println("can't find rule "+ruleName+
            " or tree structure error: "+t.toStringTree()
        );
        e.printStackTrace(System.err);
    }
    else errMgr.toolError(ErrorType.INTERNAL_ERROR, e);
    }
    }

public void discoverGrammar(GrammarRootAST root, GrammarAST ID) { }
public void finishPrequels(GrammarAST firstPrequel) { }
public void finishGrammar(GrammarRootAST root, GrammarAST ID) { }

public void grammarOption(GrammarAST ID, GrammarAST valueAST) { }
public void ruleOption(GrammarAST ID, GrammarAST valueAST) { }
public void blockOption(GrammarAST ID, GrammarAST valueAST) { }
public void defineToken(GrammarAST ID) { }
public void defineChannel(GrammarAST ID) { }
public void globalNamedAction(GrammarAST scope, GrammarAST ID, ActionAST action) { }
public void importGrammar(GrammarAST label, GrammarAST ID) { }

public void modeDef(GrammarAST m, GrammarAST ID) { }

public void discoverRules(GrammarAST rules) { }
public void finishRules(GrammarAST rule)
{ }
public void discoverRule(RuleAST rule, GrammarAST ID, List<GrammarAST> modifiers,
    ActionAST arg, ActionAST returns, GrammarAST thrws,
    GrammarAST options, ActionAST locals,
    List<GrammarAST> actions,
    GrammarAST block) { }
public void finishRule(RuleAST rule, GrammarAST ID, GrammarAST block) { }
public void discoverLexerRule(RuleAST rule, GrammarAST ID, List<GrammarAST> modifiers,
    GrammarAST block) { }
public void finishLexerRule(RuleAST rule, GrammarAST ID, GrammarAST block) { }
public void ruleCatch(GrammarAST arg, ActionAST action) { }
public void finallyAction(ActionAST action) { }
public void discoverOuterAlt(AltAST alt) { }
public void finishOuterAlt(AltAST alt) { }
public void discoverAlt(AltAST alt) { }
public void finishAlt(AltAST alt) { }

public void ruleRef(GrammarAST ref, ActionAST arg) { }
public void tokenRef(TerminalAST ref) { }

```

```

public void elementOption(GrammarASTWithOptions t, GrammarAST ID, GrammarAST valueAST)
{ }
public void stringRef(TerminalAST ref) { }
public void wildcardRef(GrammarAST ref) { }
public void actionInAlt(ActionAST action) { }
public void sempredInAlt(PredAST pred) { }
public void label(GrammarAST op, GrammarAST ID, GrammarAST element) { }
public void lexerCallCommand(int outerAltNumber, GrammarAST ID, GrammarAST arg) { }
public void lexerCommand(int outerAltNumber, GrammarAST ID) { }

protected void enterGrammarSpec(GrammarAST tree) { }
protected void exitGrammarSpec(GrammarAST tree) { }

protected void enterPrequelConstructs(GrammarAST tree) { }
protected void exitPrequelConstructs(GrammarAST tree) { }

protected void enterPrequelConstruct(GrammarAST tree) { }
protected void exitPrequelConstruct(GrammarAST tree) { }

protected void enterOptionsSpec(GrammarAST tree) { }
protected void exitOptionsSpec(GrammarAST tree) { }

protected void enterOption(GrammarAST tree) { }
protected void exitOption(GrammarAST tree) { }

protected void enterOptionValue(GrammarAST tree) {
}
protected void exitOptionValue(GrammarAST tree) { }

protected void enterDelegateGrammars(GrammarAST tree) { }
protected void exitDelegateGrammars(GrammarAST tree) { }

protected void enterDelegateGrammar(GrammarAST tree) { }
protected void exitDelegateGrammar(GrammarAST tree) { }

protected void enterTokensSpec(GrammarAST tree) { }
protected void exitTokensSpec(GrammarAST tree) { }

protected void enterTokenSpec(GrammarAST tree) { }
protected void exitTokenSpec(GrammarAST tree) { }

protected void enterChannelsSpec(GrammarAST tree) { }
protected void exitChannelsSpec(GrammarAST tree) { }

protected void enterChannelSpec(GrammarAST tree) { }
protected void exitChannelSpec(GrammarAST tree) { }

protected void enterAction(GrammarAST tree) { }

```



```

protected void exitAction(GrammarAST tree) { }

protected void enterRules(GrammarAST tree) { }
protected void exitRules(GrammarAST tree) { }

protected void enterMode(GrammarAST tree) { }
protected void exitMode(GrammarAST tree) { }

protected void
    enterLexerRule(GrammarAST tree) { }
protected void exitLexerRule(GrammarAST tree) { }

protected void enterRule(GrammarAST tree) { }
protected void exitRule(GrammarAST tree) { }

protected void enterExceptionGroup(GrammarAST tree) { }
protected void exitExceptionGroup(GrammarAST tree) { }

protected void enterExceptionHandler(GrammarAST tree) { }
protected void exitExceptionHandler(GrammarAST tree) { }

protected void enterFinallyClause(GrammarAST tree) { }
protected void exitFinallyClause(GrammarAST tree) { }

protected void enterLocals(GrammarAST tree) { }
protected void exitLocals(GrammarAST tree) { }

protected void enterRuleReturns(GrammarAST tree) { }
protected void exitRuleReturns(GrammarAST tree) { }

protected void enterThrowsSpec(GrammarAST tree) { }
protected void exitThrowsSpec(GrammarAST tree) { }

protected void enterRuleAction(GrammarAST tree) { }
protected void exitRuleAction(GrammarAST tree) { }

protected void enterRuleModifier(GrammarAST tree) { }
protected void exitRuleModifier(GrammarAST
tree) { }

protected void enterLexerRuleBlock(GrammarAST tree) { }
protected void exitLexerRuleBlock(GrammarAST tree) { }

protected void enterRuleBlock(GrammarAST tree) { }
protected void exitRuleBlock(GrammarAST tree) { }

protected void enterLexerOuterAlternative(AltAST tree) { }
protected void exitLexerOuterAlternative(AltAST tree) { }

```

```
protected void enterOuterAlternative(AltAST tree) { }
protected void exitOuterAlternative(AltAST tree) { }

protected void enterLexerAlternative(GrammarAST tree) { }
protected void exitLexerAlternative(GrammarAST tree) { }

protected void enterLexerElements(GrammarAST tree) { }
protected void exitLexerElements(GrammarAST tree) { }

protected void enterLexerElement(GrammarAST tree) { }
protected void exitLexerElement(GrammarAST tree) { }

protected void enterLabeledLexerElement(GrammarAST tree) { }
protected void exitLabeledLexerElement(GrammarAST tree) { }

protected void enterLexerBlock(GrammarAST tree) { }
protected void
    exitLexerBlock(GrammarAST tree) { }

protected void enterLexerAtom(GrammarAST tree) { }
protected void exitLexerAtom(GrammarAST tree) { }

protected void enterActionElement(GrammarAST tree) { }
protected void exitActionElement(GrammarAST tree) { }

protected void enterAlternative(AltAST tree) { }
protected void exitAlternative(AltAST tree) { }

protected void enterLexerCommand(GrammarAST tree) { }
protected void exitLexerCommand(GrammarAST tree) { }

protected void enterLexerCommandExpr(GrammarAST tree) { }
protected void exitLexerCommandExpr(GrammarAST tree) { }

protected void enterElement(GrammarAST tree) { }
protected void exitElement(GrammarAST tree) { }

protected void enterAstOperand(GrammarAST tree) { }
protected void exitAstOperand(GrammarAST tree) { }

protected void enterLabeledElement(GrammarAST tree) { }
protected void exitLabeledElement(GrammarAST tree) { }

protected void enterSubrule(GrammarAST tree) { }
protected void exitSubrule(GrammarAST tree) { }

protected void enterLexerSubrule(GrammarAST
```

```

tree) { }
protected void exitLexerSubrule(GrammarAST tree) { }

protected void enterBlockSuffix(GrammarAST tree) { }
protected void exitBlockSuffix(GrammarAST tree) { }

protected void enterEbnfSuffix(GrammarAST tree) { }
protected void exitEbnfSuffix(GrammarAST tree) { }

protected void enterAtom(GrammarAST tree) { }
protected void exitAtom(GrammarAST tree) { }

protected void enterBlockSet(GrammarAST tree) { }
protected void exitBlockSet(GrammarAST tree) { }

protected void enterSetElement(GrammarAST tree) { }
protected void exitSetElement(GrammarAST tree) { }

protected void enterBlock(GrammarAST tree) { }
protected void exitBlock(GrammarAST tree) { }

protected void enterRuleref(GrammarAST tree) { }
protected void exitRuleref(GrammarAST tree) { }

protected void enterRange(GrammarAST tree) { }
protected void exitRange(GrammarAST tree) { }

protected void enterTerminal(GrammarAST tree) { }
protected void exitTerminal(GrammarAST tree) { }

protected void enterElementOptions(GrammarAST
tree) { }
protected void exitElementOptions(GrammarAST tree) { }

protected void enterElementOption(GrammarAST tree) { }
protected void exitElementOption(GrammarAST tree) { }

@Override
public void traceIn(String ruleName, int ruleIndex) {
    System.err.println("enter "+ruleName+": "+input.LT(1));
}

@Override
public void traceOut(String ruleName, int ruleIndex) {
    System.err.println("exit "+ruleName+": "+input.LT(1));
}
}

```

```

grammarSpec
@init {
    enterGrammarSpec($start);
}
@after {
    exitGrammarSpec($start);
}
: ^( GRAMMAR ID {grammarName=$ID.text;}
    {discoverGrammar((GrammarRootAST)$GRAMMAR, $ID);}
    prequelConstructs
    {finishPrequels($prequelConstructs.firstOne);}
    rules mode*
    {finishGrammar((GrammarRootAST)$GRAMMAR, $ID);}
)
;

```

prequelConstructs returns [GrammarAST firstOne=null]

```

@init {
    enterPrequelConstructs($start);
}
@after {
    exitPrequelConstructs($start);
}
: {$firstOne=$start;} prequelConstruct+
|
;

```

prequelConstruct

```

@init
{
    enterPrequelConstructs($start);
}
@after {
    exitPrequelConstructs($start);
}
: optionsSpec
| delegateGrammars
| tokensSpec
| channelsSpec
| action
;

```

optionsSpec

```

@init {
    enterOptionsSpec($start);
}
@after {
    exitOptionsSpec($start);
}

```

```

}
: ^(OPTIONS option*)
;

option
@init {
    enterOption($start);
    boolean rule = inContext("RULE ...");
    boolean block = inContext("BLOCK ...");
}
@after {
    exitOption($start);
}
: ^(a=ASSIGN ID v=optionValue)
{
    if ( block ) blockOption($ID, $v.start); // most specific first
    else if ( rule ) ruleOption($ID, $v.start);
    else grammarOption($ID, $v.start);
}
;

```

optionValue returns [String v]

```

@init {
    enterOptionValue($start);
    $v = $start.token.getText();
}
@after {
    exitOptionValue($start);
}
: ID
| STRING_LITERAL
| INT
;

```

delegateGrammars

```

@init {
    enterDelegateGrammars($start);
}
@after {
    exitDelegateGrammars($start);
}
: ^(IMPORT delegateGrammar+)
;

```

delegateGrammar

```

@init
{
    enterDelegateGrammar($start);
}

```

```

}
@after {
    exitDelegateGrammar($start);
}
: ^(ASSIGN label=ID id=ID) {importGrammar($label, $id);}
| id=ID    {importGrammar(null, $id);}
;

```

```

tokensSpec
@init {
    enterTokensSpec($start);
}
@after {
    exitTokensSpec($start);
}
: ^(TOKENS_SPEC tokenSpec+)
;

```

```

tokenSpec
@init {
    enterTokenSpec($start);
}
@after {
    exitTokenSpec($start);
}
: ID    {defineToken($ID);}
;

```

```

channelsSpec
@init {
    enterChannelsSpec($start);
}
@after {
    exitChannelsSpec($start);
}
: ^(CHANNELS channelSpec+)
;

```

```

channelSpec
@init {
    enterChannelSpec($start);
}
@after {
    exitChannelSpec($start);
}
: ID    {defineChannel($ID);}
;

```

```

action
@init {
    enterAction($start);
}
@after {
    exitAction($start);
}
: ^(AT sc=ID? name=ID ACTION) {globalNamedAction($sc, $name, (ActionAST)$ACTION);}
;

```

```

rules
@init {
    enterRules($start);
}
@after {
    exitRules($start);
}
: ^(RULES {discoverRules($RULES);} (rule|lexerRule)* {finishRules($RULES);})
;

```

```

mode
@init {
    enterMode($start);
}
@after {
    exitMode($start);
}
: ^( MODE ID {currentModeName=$ID.text; modeDef($MODE, $ID);} lexerRule* )
;

```

```

lexerRule
@init {
    enterLexerRule($start);
    List<GrammarAST> mods = new ArrayList<GrammarAST>();
    currentOuterAltNumber=0;
}
@after {
    exitLexerRule($start);
}
: ^( RULE TOKEN_REF
    {currentRuleName=$TOKEN_REF.text; currentRuleAST=$RULE;}
    (^ (RULEMODIFIERS m=FRAGMENT {mods.add($m);}))?
    {discoverLexerRule((RuleAST)$RULE, $TOKEN_REF, mods, (GrammarAST)input.LT(1));}
    lexerRuleBlock
    {
        finishLexerRule((RuleAST)$RULE, $TOKEN_REF, $lexerRuleBlock.start);
        currentRuleName=null; currentRuleAST=null;
    }
)

```

```

    )
;

rule
@init {
    enterRule($start);
    List<GrammarAST> mods = new ArrayList<GrammarAST>();
    List<GrammarAST> actions = new ArrayList<GrammarAST>(); // track roots
    currentOuterAltNumber=0;
}
@after {
    exitRule($start);
}
: ^( RULE RULE_REF {currentRuleName=$RULE_REF.text;
currentRuleAST=$RULE;}
    (^ (RULEMODIFIERS (m=ruleModifier{mods.add($m.start);}))+)?
    ARG_ACTION?
    ret=ruleReturns?
    thr=throwsSpec?
    loc=locals?
    ( opts=optionsSpec
    | a=ruleAction {actions.add($a.start);}
    )*
    {discoverRule((RuleAST)$RULE, $RULE_REF, mods, (ActionAST)$ARG_ACTION,
        $ret.start!=null?(ActionAST)$ret.start.getChild(0):null,
        $thr.start, $opts.start,
        $loc.start!=null?(ActionAST)$loc.start.getChild(0):null,
        actions, (GrammarAST)input.LT(1));}
    ruleBlock exceptionGroup
    {finishRule((RuleAST)$RULE, $RULE_REF, $ruleBlock.start); currentRuleName=null; currentRuleAST=null;}
    )
;

exceptionGroup
@init {
    enterExceptionGroup($start);
}
@after {
    exitExceptionGroup($start);
}
: exceptionHandler* finallyClause?
;

exceptionHandler
@init {
    enterExceptionHandler($start);
}
@after {

```



```

exitExceptionHandler($start);
}
: ^(CATCH ARG_ACTION ACTION) {ruleCatch($ARG_ACTION,
(ActionAST)$ACTION);}
;

```

```

finallyClause
@init {
enterFinallyClause($start);
}
@after {
exitFinallyClause($start);
}
: ^(FINALLY ACTION) {finallyAction((ActionAST)$ACTION);}
;

```

```

locals
@init {
enterLocals($start);
}
@after {
exitLocals($start);
}
: ^(LOCALS ARG_ACTION)
;

```

```

ruleReturns
@init {
enterRuleReturns($start);
}
@after {
exitRuleReturns($start);
}
: ^(RETURNS ARG_ACTION)
;

```

```

throwsSpec
@init {
enterThrowsSpec($start);
}
@after {
exitThrowsSpec($start);
}
: ^(THROWS ID+)
;

```

```

ruleAction
@init {

```

```

    enterRuleAction($start);
}
@after {
    exitRuleAction($start);
}
: ^(AT ID ACTION)
;

```

```

ruleModifier
@init {
    enterRuleModifier($start);
}
@after {
    exitRuleModifier($start);
}
: PUBLIC
| PRIVATE
| PROTECTED
| FRAGMENT
;

```

```

lexerRuleBlock
@init {
    enterLexerRuleBlock($start);
}
@after {
    exitLexerRuleBlock($start);
}
: ^( BLOCK
    ( {
        currentOuterAltRoot = (GrammarAST)input.LT(1);
        currentOuterAltNumber++;
    }
    lexerOuterAlternative
    )+
    )
;

```

```

ruleBlock
@init {
    enterRuleBlock($start);
}
@after {
    exitRuleBlock($start);
}
: ^( BLOCK
    ( {
        currentOuterAltRoot = (GrammarAST)input.LT(1);

```

```

        currentOuterAltNumber++;
    }
    outerAlternative
  )+
)
;

lexerOuterAlternative
@init {
    enterLexerOuterAlternative((AltAST)$start);
    discoverOuterAlt((AltAST)$start);
}
@after {
    finishOuterAlt((AltAST)$start);
    exitLexerOuterAlternative((AltAST)$start);
}
: lexerAlternative
;

outerAlternative
@init {
    enterOuterAlternative((AltAST)$start);
    discoverOuterAlt((AltAST)$start);
}
@after {
    finishOuterAlt((AltAST)$start);
    exitOuterAlternative((AltAST)$start);
}
: alternative
;

lexerAlternative
@init {
    enterLexerAlternative($start);
}
@after {
    exitLexerAlternative($start);
}
: ^(LEXER_ALT_ACTION lexerElements lexerCommand+)
  | lexerElements
;

lexerElements
@init {
    enterLexerElements($start);
}
@after {

```

```

exitLexerElements($start);
}
: ^(ALT
lexerElement+)
;

```

```

lexerElement
@init {
enterLexerElement($start);
}
@after {
exitLexerElement($start);
}
: labeledLexerElement
| lexerAtom
| lexerSubrule
| ACTION {actionInAlt((ActionAST)$ACTION);}
| SEMPRED {sempredInAlt((PredAST)$SEMPRED);}
| ^(ACTION elementOptions) {actionInAlt((ActionAST)$ACTION);}
| ^(SEMPRED elementOptions) {sempredInAlt((PredAST)$SEMPRED);}
| EPSILON
;

```

```

labeledLexerElement
@init {
enterLabeledLexerElement($start);
}
@after {
exitLabeledLexerElement($start);
}
: ^((ASSIGN|PLUS_ASSIGN) ID (lexerAtom|block))
;

```

```

lexerBlock
@init {
enterLexerBlock($start);
}
@after {
exitLexerBlock($start);
}
: ^(BLOCK optionsSpec? lexerAlternative+)
;

```

```

lexerAtom
@init {
enterLexerAtom($start);
}
@after {

```

```

exitLexerAtom($start);
}
: terminal
| ^(NOT blockSet)
| blockSet
| ^(WILDCARD elementOptions)
| WILDCARD
| LEXER_CHAR_SET
| range
| ruleref
;

actionElement
@init {
    enterActionElement($start);
}
@after
{
    exitActionElement($start);
}
: ACTION
| ^(ACTION elementOptions)
| SEMPRED
| ^(SEMPRED elementOptions)
;

alternative
@init {
    enterAlternative((AltAST)$start);
    discoverAlt((AltAST)$start);
}
@after {
    finishAlt((AltAST)$start);
    exitAlternative((AltAST)$start);
}
: ^(ALT elementOptions? element+)
| ^(ALT elementOptions? EPSILON)
;

lexerCommand
@init {
    enterLexerCommand($start);
}
@after {
    exitLexerCommand($start);
}
: ^(LEXER_ACTION_CALL ID lexerCommandExpr)
    {lexerCallCommand(currentOuterAltNumber, $ID, $lexerCommandExpr.start);}

```

```
| ID
    {lexerCommand(currentOuterAltNumber, $ID);}
;
```

lexerCommandExpr

```
@init {
    enterLexerCommandExpr($start);
}
@after {
    exitLexerCommandExpr($start);
}
: ID
| INT
;
```

element

```
@init {
    enterElement($start);
}
@after {
    exitElement($start);
}
: labeledElement
| atom
| subrule
| ACTION    {actionInAlt((ActionAST)$ACTION);}
| SEMPRED   {sempredInAlt((PredAST)$SEMPRED);}
| ^(ACTION
elementOptions) {actionInAlt((ActionAST)$ACTION);}
| ^(SEMPRED elementOptions) {sempredInAlt((PredAST)$SEMPRED);}

| ^(NOT blockSet)
| ^(NOT block)
;
```

astOperand

```
@init {
    enterAstOperand($start);
}
@after {
    exitAstOperand($start);
}
: atom
| ^(NOT blockSet)
| ^(NOT block)
;
```

labeledElement

```

@init {
    enterLabeledElement($start);
}
@after {
    exitLabeledElement($start);
}
: ^((ASSIGN|PLUS_ASSIGN) ID element) {label($start, $ID, $element.start);}
;

```

```

subrule
@init {
    enterSubrule($start);
}
@after {
    exitSubrule($start);
}
: ^(blockSuffix block)
| block
;

```

```

lexerSubrule
@init {
    enterLexerSubrule($start);
}
@after {
    exitLexerSubrule($start);
}
: ^(blockSuffix lexerBlock)
| lexerBlock
;

```

```

blockSuffix
@init {
    enterBlockSuffix($start);
}
@after {
    exitBlockSuffix($start);
}
: ebnfSuffix
;

```

```

ebnfSuffix
@init {
    enterEbnfSuffix($start);
}
@after {
    exitEbnfSuffix($start);
}

```

```

: OPTIONAL
| CLOSURE
| POSITIVE_CLOSURE
;

```

atom

```

@init {
    enterAtom($start);
}
@after
{
    exitAtom($start);
}
: ^(DOT ID terminal)
| ^(DOT ID ruleref)
| ^(WILDCARD elementOptions) {wildcardRef($WILDCARD);}
| WILDCARD    {wildcardRef($WILDCARD);}
| terminal
| blockSet
| ruleref
;

```

blockSet

```

@init {
    enterBlockSet($start);
}
@after {
    exitBlockSet($start);
}
: ^(SET setElement+)
;

```

setElement

```

@init {
    enterSetElement($start);
}
@after {
    exitSetElement($start);
}
: ^(STRING_LITERAL elementOptions) {stringRef((TerminalAST)$STRING_LITERAL);}
| ^(TOKEN_REF elementOptions) {tokenRef((TerminalAST)$TOKEN_REF);}
| STRING_LITERAL    {stringRef((TerminalAST)$STRING_LITERAL);}
| TOKEN_REF         {tokenRef((TerminalAST)$TOKEN_REF);}
| ^(RANGE a=STRING_LITERAL b=STRING_LITERAL)
{
    stringRef((TerminalAST)$a);
    stringRef((TerminalAST)$b);
}

```



```

    | LEXER_CHAR_SET
;

block
@init {
    enterBlock($start);
}
@after {
    exitBlock($start);
}
: ^(BLOCK optionsSpec? ruleAction* ACTION? alternative+)
;

ruleref
@init {
    enterRuleref($start);
}
@after {
    exitRuleref($start);
}
: ^(RULE_REF arg=ARG_ACTION? elementOptions?)
{
    ruleRef($RULE_REF, (ActionAST)$ARG_ACTION);
    if ( $arg!=null ) actionInAlt((ActionAST)$arg);
}
;

range
@init {
    enterRange($start);
}
@after {
    exitRange($start);
}
: ^(RANGE STRING_LITERAL STRING_LITERAL)
;

terminal
@init {
    enterTerminal($start);
}
@after {
    exitTerminal($start);
}
: ^(STRING_LITERAL elementOptions)
    {stringRef((TerminalAST)$STRING_LITERAL);}
| STRING_LITERAL {stringRef((TerminalAST)$STRING_LITERAL);}
| ^(TOKEN_REF elementOptions) {tokenRef((TerminalAST)$TOKEN_REF);}

```

```

| TOKEN_REF      {tokenRef((TerminalAST)$TOKEN_REF);}
;

elementOptions
@init {
    enterElementOptions($start);
}
@after {
    exitElementOptions($start);
}
: ^(ELEMENT_OPTIONS elementOption[(GrammarASTWithOptions)$start.getParent()]*)
;

elementOption[GrammarASTWithOptions t]
@init {
    enterElementOption($start);
}
@after
{
    exitElementOption($start);
}
: ID      {elementOption(t, $ID, null);}
| ^(ASSIGN id=ID v=ID) {elementOption(t, $id, $v);}
| ^(ASSIGN ID v=STRING_LITERAL) {elementOption(t, $ID, $v);}
| ^(ASSIGN ID v=ACTION) {elementOption(t, $ID, $v);}
| ^(ASSIGN ID v=INT) {elementOption(t, $ID, $v);}
;

```

Found in path(s):

\* /antlr4-4-5-1-1-sources-jar/org/antlr/v4/parse/GrammarTreeVisitor.g

# 1.128 python-requests 2.18.4

## 1.128.1 Available under license :

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## 1.130 llvm 6.0.0

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```
; RUN: llc < %s -mtriple=s390x-linux-gnu -mcpu=zEC12 -verify-machineinstrs | FileCheck %s
;
; Test that early if conversion produces LOCR with operands of the right
; register classes.
```

```
define void @autogen_SD4739(i8*) {
; CHECK-NOT: Expected a GR32Bit register, but got a GRX32Bit register
```

BB:

```
%L34 = load i8, i8* %0
%Cmp56 = icmp sgt i8 undef, %L34
br label %CF246
```

CF246: ; preds = %CF246, %BB

```
%S1163 = select i1 %Cmp56, i8 %L34, i8 undef
br i1 undef, label %CF246, label %CF248
```

CF248: ; preds = %CF248, %CF246

```
store i8 %S1163, i8* %0
br label %CF248
```

}

; NOTE: Assertions have been autogenerated by utils/update\_llc\_test\_checks.py

; RUN: llc < %s -mtriple=x86\_64-unknown-unknown -mattr=avx512vl,avx512bw,avx512dq,prefer-256-bit |  
FileCheck %s

; This file primarily contains tests for specific places in X86ISelLowering.cpp that needed be made aware of the  
legalizer not allowing 512-bit vectors due to prefer-256-bit even though AVX512 is enabled.

define void @add256(<16 x i32>\* %a, <16 x i32>\* %b, <16 x i32>\* %c) "min-legal-vector-width"="256" {

; CHECK-LABEL: add256:

; CHECK: # %bb.0:

; CHECK-NEXT: vmovdqa (%rdi), %ymm0

; CHECK-NEXT: vmovdqa 32(%rdi), %ymm1

; CHECK-NEXT: vpaddd (%rsi), %ymm0, %ymm0

; CHECK-NEXT: vpaddd 32(%rsi), %ymm1, %ymm1

; CHECK-NEXT: vmovdqa %ymm1, 32(%rdx)

; CHECK-NEXT: vmovdqa %ymm0, (%rdx)

; CHECK-NEXT: vzeroupper

; CHECK-NEXT: retq

```
%d = load <16 x i32>, <16 x i32>* %a
```

```
%e = load <16 x i32>, <16 x i32>* %b
```

```
%f = add <16 x i32> %d, %e
```

```
store <16 x i32> %f, <16 x i32>* %c
```

```
ret void
```

}

define

void @add512(<16 x i32>\* %a, <16 x i32>\* %b, <16 x i32>\* %c) "min-legal-vector-width"="512" {

; CHECK-LABEL: add512:

; CHECK: # %bb.0:

; CHECK-NEXT: vmovdqa64 (%rdi), %zmm0

; CHECK-NEXT: vpaddd (%rsi), %zmm0, %zmm0

; CHECK-NEXT: vmovdqa64 %zmm0, (%rdx)

; CHECK-NEXT: vzeroupper

; CHECK-NEXT: retq

```
%d = load <16 x i32>, <16 x i32>* %a
```

[illegible]

## Open Source Used In WSA Secure Web Appliance 14.5.3 (WSA) 1658



```

; CHECK-NEXT: vmovdqa64 (%rdi), %zmm0
; CHECK-NEXT: vpmaddwd (%rsi), %zmm0, %zmm0
; CHECK-NEXT: vmovdqa64 %zmm0, (%rdx)
; CHECK-NEXT: vzeroupper
; CHECK-NEXT: retq

%A = load <32 x i16>, <32 x i16>* %APtr
%B = load <32 x i16>, <32 x i16>* %BPtr
%a = sext <32 x i16> %A to <32 x i32>
%b = sext <32 x i16> %B to <32 x i32>
%m = mul nsw <32 x i32> %a, %b
%odd = shufflevector <32 x i32> %m, <32 x i32> undef, <16 x i32> <i32 0, i32 2, i32 4, i32 6, i32 8, i32 10, i32
12, i32 14, i32 16, i32 18, i32 20, i32 22, i32 24, i32 26, i32 28, i32 30>
%even = shufflevector <32 x i32> %m, <32 x i32> undef, <16 x i32> <i32 1, i32 3, i32 5, i32 7, i32 9, i32 11, i32
13, i32 15, i32 17, i32 19, i32 21, i32 23, i32 25, i32 27, i32 29, i32 31>
%ret = add <16 x i32> %odd, %even
store <16 x i32> %ret, <16 x i32>* %CPtr
ret void
}

```

```

define void @psubus_64i8_max_256(<64 x i8>* %xptr,
<64 x i8>* %yptr, <64 x i8>* %zptr) "min-legal-vector-width"="256" {
; CHECK-LABEL: psubus_64i8_max_256:
; CHECK:      # %bb.0:
; CHECK-NEXT: vmovdqa (%rdi), %ymm0
; CHECK-NEXT: vmovdqa 32(%rdi), %ymm1
; CHECK-NEXT: vpsubusb (%rsi), %ymm0, %ymm0
; CHECK-NEXT: vpsubusb 32(%rsi), %ymm1, %ymm1
; CHECK-NEXT: vmovdqa %ymm1, 32(%rdx)
; CHECK-NEXT: vmovdqa %ymm0, (%rdx)
; CHECK-NEXT: vzeroupper
; CHECK-NEXT: retq
%x = load <64 x i8>, <64 x i8>* %xptr
%y = load <64 x i8>, <64 x i8>* %yptr
%cmp = icmp ult <64 x i8> %x, %y
%max = select <64 x i1> %cmp, <64 x i8> %y, <64 x i8> %x
%res = sub <64 x i8> %max, %y
store <64 x i8> %res, <64 x i8>* %zptr
ret void
}

```

```

define void @psubus_64i8_max_512(<64 x i8>* %xptr, <64 x i8>* %yptr, <64 x i8>* %zptr) "min-legal-vector-
width"="512" {
; CHECK-LABEL: psubus_64i8_max_512:
; CHECK:      # %bb.0:
; CHECK-NEXT: vmovdqa64 (%rdi), %zmm0
; CHECK-NEXT: vpsubusb (%rsi), %zmm0, %zmm0
; CHECK-NEXT: vmovdqa64 %zmm0,

```



```

(%rdx)
; CHECK-NEXT:  vzeroupper
; CHECK-NEXT:  retq
%x = load <64 x i8>, <64 x i8>* %xptr
%y = load <64 x i8>, <64 x i8>* %yptr
%cmp = icmp ult <64 x i8> %x, %y
%max = select <64 x i1> %cmp, <64 x i8> %y, <64 x i8> %x
%res = sub <64 x i8> %max, %y
store <64 x i8> %res, <64 x i8>* %zptr
ret void
}

```

```

define i32 @_Z9test_charPcS_i_256(i8* nocapture readonly, i8* nocapture readonly, i32) "min-legal-vector-
width"="256" {

```

```

; CHECK-LABEL: _Z9test_charPcS_i_256:
; CHECK:      # %bb.0: # %entry
; CHECK-NEXT:  movl %edx, %eax
; CHECK-NEXT:  vpxor %xmm0, %xmm0, %xmm0
; CHECK-NEXT:  xorl %ecx, %ecx
; CHECK-NEXT:  vpxor %xmm1, %xmm1, %xmm1
; CHECK-NEXT:  vpxor %xmm2, %xmm2, %xmm2
; CHECK-NEXT:  .p2align 4, 0x90
; CHECK-NEXT:  .LBB8_1: # %vector.body
; CHECK-NEXT:  # =>This Inner Loop Header: Depth=1
; CHECK-NEXT:  vpmovsxbw (%rdi,%rcx), %ymm3
; CHECK-NEXT:  vpmovsxbw 16(%rdi,%rcx), %ymm4
; CHECK-NEXT:  vpmovsxbw (%rsi,%rcx), %ymm5
; CHECK-NEXT:  vpmaddwd %ymm3,
%ymm5, %ymm3
; CHECK-NEXT:  vpadd %ymm1, %ymm3, %ymm1
; CHECK-NEXT:  vpmovsxbw 16(%rsi,%rcx), %ymm3
; CHECK-NEXT:  vpmaddwd %ymm4, %ymm3, %ymm3
; CHECK-NEXT:  vpadd %ymm2, %ymm3, %ymm2
; CHECK-NEXT:  addq $32, %rcx
; CHECK-NEXT:  cmpq %rcx, %rax
; CHECK-NEXT:  jne .LBB8_1
; CHECK-NEXT:  # %bb.2: # %middle.block
; CHECK-NEXT:  vpadd %ymm0, %ymm1, %ymm1
; CHECK-NEXT:  vpadd %ymm0, %ymm2, %ymm0
; CHECK-NEXT:  vpadd %ymm0, %ymm1, %ymm0
; CHECK-NEXT:  vextracti128 $1, %ymm0, %xmm1
; CHECK-NEXT:  vpadd %ymm1, %ymm0, %ymm0
; CHECK-NEXT:  vpsltd { {.*#+}} xmm1 = xmm0[2,3,0,1]
; CHECK-NEXT:  vpadd %ymm1, %ymm0, %ymm0
; CHECK-NEXT:  vpsltd { {.*#+}} xmm1 = xmm0[1,1,2,3]
; CHECK-NEXT:  vpadd %xmm1, %xmm0, %xmm0
; CHECK-NEXT:  vmovd %xmm0, %eax
; CHECK-NEXT:  vzeroupper

```

; CHECK-NEXT: retq

entry:

%3 = zext i32 %2 to i64

br label %vector.body

vector.body:

%index = phi i64 [ %index.next, %vector.body ], [ 0, %entry ]

%vec.phi = phi <32 x i32>

[ %i1, %vector.body ], [ zeroinitializer, %entry ]

%4 = getelementptr inbounds i8, i8\* %0, i64 %index

%5 = bitcast i8\* %4 to <32 x i8>\*

%wide.load = load <32 x i8>, <32 x i8>\* %5, align 1

%6 = sext <32 x i8> %wide.load to <32 x i32>

%7 = getelementptr inbounds i8, i8\* %1, i64 %index

%8 = bitcast i8\* %7 to <32 x i8>\*

%wide.load14 = load <32 x i8>, <32 x i8>\* %8, align 1

%9 = sext <32 x i8> %wide.load14 to <32 x i32>

%10 = mul nsw <32 x i32> %9, %6

%11 = add nsw <32 x i32> %10, %vec.phi

%index.next = add i64 %index, 32

%12 = icmp eq i64 %index.next, %3

br i1 %12, label %middle.block, label %vector.body

middle.block:

%rdx.shuf1 = shufflevector <32 x i32> %11, <32 x i32> undef, <32 x i32> <i32 16, i32 17, i32 18, i32 19, i32 20, i32 21, i32 22, i32 23, i32 24, i32 25, i32 26, i32 27, i32 28, i32 29, i32 30, i32 31, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef>

%bin.rdx1 = add <32 x i32> %11, %rdx.shuf1

%rdx.shuf = shufflevector <32 x i32> %bin.rdx1, <32 x i32> undef, <32 x i32> <i32 8, i32 9, i32 10, i32 11, i32 12, i32 13, i32 14, i32 15, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef>

%bin.rdx = add <32 x i32> %bin.rdx1, %rdx.shuf

%rdx.shuf15 = shufflevector <32 x i32> %bin.rdx, <32 x i32> undef, <32 x i32> <i32 4, i32 5, i32 6, i32 7, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef>

%bin.rdx32 = add <32 x i32> %bin.rdx, %rdx.shuf15

%rdx.shuf17 = shufflevector <32 x i32> %bin.rdx32, <32 x i32> undef, <32 x i32> <i32 2, i32 3, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef>

%bin.rdx18 = add <32 x i32> %bin.rdx32, %rdx.shuf17

%rdx.shuf19 = shufflevector <32 x i32> %bin.rdx18, <32 x i32> undef, <32 x i32> <i32 1, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef>

```

%bin.rdx20 = add <32 x i32> %bin.rdx18, %rdx.shuf19
%13 = extractelement <32 x i32> %bin.rdx20,
i32 0
ret i32 %13
}

```

```

define i32 @_Z9test_charPcS_i_512(i8* nocapture readonly, i8* nocapture readonly, i32) "min-legal-vector-
width"="512" {

```

```

; CHECK-LABEL: _Z9test_charPcS_i_512:
; CHECK:      # %bb.0: # %entry
; CHECK-NEXT:  movl %edx, %eax
; CHECK-NEXT:  vpxor %xmm0, %xmm0, %xmm0
; CHECK-NEXT:  xorl %ecx, %ecx
; CHECK-NEXT:  vpxor %xmm1, %xmm1, %xmm1
; CHECK-NEXT:  .p2align 4, 0x90
; CHECK-NEXT:  .LBB9_1: # %vector.body
; CHECK-NEXT:  # =>This Inner Loop Header: Depth=1
; CHECK-NEXT:  vpmovsxbw (%rdi,%rcx), %zmm2
; CHECK-NEXT:  vpmovsxbw (%rsi,%rcx), %zmm3
; CHECK-NEXT:  vpmaddwd %zmm2, %zmm3, %zmm2
; CHECK-NEXT:  vpadd %zmm1, %zmm2, %zmm1
; CHECK-NEXT:  addq $32, %rcx
; CHECK-NEXT:  cmpq %rcx, %rax
; CHECK-NEXT:  jne .LBB9_1
; CHECK-NEXT:  # %bb.2: # %middle.block
; CHECK-NEXT:  vpadd %zmm0, %zmm1, %zmm0
; CHECK-NEXT:  vextracti64x4 $1, %zmm0, %ymm1
; CHECK-NEXT:  vpadd %zmm1, %zmm0, %zmm0
; CHECK-NEXT:  vextracti128 $1, %ymm0, %xmm1
;
; CHECK-NEXT:  vpadd %zmm1, %zmm0, %zmm0
; CHECK-NEXT:  vpslufd {{.*#+}} xmm1 = xmm0[2,3,0,1]
; CHECK-NEXT:  vpadd %zmm1, %zmm0, %zmm0
; CHECK-NEXT:  vpslufd {{.*#+}} xmm1 = xmm0[1,1,2,3]
; CHECK-NEXT:  vpadd %xmm1, %xmm0, %xmm0
; CHECK-NEXT:  vmovd %xmm0, %eax
; CHECK-NEXT:  vzeroupper
; CHECK-NEXT:  retq
entry:
%3 = zext i32 %2 to i64
br label %vector.body

```

```

vector.body:
%index = phi i64 [ %index.next, %vector.body ], [ 0, %entry ]
%vec.phi = phi <32 x i32> [ %11, %vector.body ], [ zeroinitializer, %entry ]
%4 = getelementptr inbounds i8, i8* %0, i64 %index
%5 = bitcast i8* %4 to <32 x i8>*
%wide.load = load <32 x i8>, <32 x i8>* %5, align 1

```

```

%6 = sext <32 x i8> %wide.load to <32 x i32>
%7 = getelementptr inbounds i8, i8* %1, i64 %index
%8 = bitcast i8* %7 to <32 x i8>*
%wide.load14 = load <32 x i8>, <32 x i8>* %8, align 1
%9 = sext <32 x i8> %wide.load14 to <32 x i32>
%10 = mul nsw <32 x i32> %9, %6
%11 = add nsw <32 x i32> %10, %vec.phi
%index.next = add i64 %index, 32
%12 = icmp eq i64 %index.next, %3
br i1 %12, label %middle.block, label %vector.body

```

middle.block:

```

%rdx.shuf1 = shufflevector <32 x i32> %11, <32 x i32> undef, <32 x i32> <i32 16, i32 17, i32 18, i32 19, i32 20,
i32 21, i32 22, i32 23, i32 24, i32 25, i32 26, i32 27, i32 28, i32 29, i32 30, i32 31, i32 undef, i32 undef, i32 undef,
i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32
undef, i32 undef, i32 undef>
%bin.rdx1 = add <32 x i32> %11, %rdx.shuf1
%rdx.shuf = shufflevector <32 x i32> %bin.rdx1, <32 x i32> undef, <32 x i32> <i32 8, i32 9, i32 10, i32 11, i32
12, i32 13, i32 14, i32 15, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32
undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef,
i32 undef, i32 undef, i32 undef, i32 undef>
%bin.rdx = add <32 x i32> %bin.rdx1,
%rdx.shuf
%rdx.shuf15 = shufflevector <32 x i32> %bin.rdx, <32 x i32> undef, <32 x i32> <i32 4, i32 5, i32 6, i32 7, i32
undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef,
i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32
undef, i32 undef, i32 undef, i32 undef, i32 undef>
%bin.rdx32 = add <32 x i32> %bin.rdx, %rdx.shuf15
%rdx.shuf17 = shufflevector <32 x i32> %bin.rdx32, <32 x i32> undef, <32 x i32> <i32 2, i32 3, i32 undef, i32
undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef,
i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32
undef, i32 undef, i32 undef, i32 undef, i32 undef>
%bin.rdx18 = add <32 x i32> %bin.rdx32, %rdx.shuf17
%rdx.shuf19 = shufflevector
<32 x i32> %bin.rdx18, <32 x i32> undef, <32 x i32> <i32 1, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef,
i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32
undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef,
i32 undef, i32 undef, i32 undef, i32 undef>
%bin.rdx20 = add <32 x i32> %bin.rdx18, %rdx.shuf19
%13 = extractelement <32 x i32> %bin.rdx20, i32 0
ret i32 %13
}

```

@a = global [1024 x i8] zeroinitializer, align 16

@b = global [1024 x i8] zeroinitializer, align 16

```

define i32 @sad_16i8_256() "min-legal-vector-width"="256" {
; CHECK-LABEL: sad_16i8_256:

```

```

; CHECK:      # %bb.0: # %entry
; CHECK-NEXT: vpxor %xmm0, %xmm0, %xmm0
; CHECK-NEXT: movq $-1024, %rax # imm = 0xFC00
; CHECK-NEXT: vpxor %xmm1, %xmm1, %xmm1
; CHECK-NEXT: .p2align 4, 0x90
; CHECK-NEXT: .LBB10_1: # %vector.body
; CHECK-NEXT: # =>This Inner Loop Header:
Depth=1
; CHECK-NEXT: vmovdqu a+1024(%rax), %xmm2
; CHECK-NEXT: vpsadbw b+1024(%rax), %xmm2, %xmm2
; CHECK-NEXT: vpaddq %ymm1, %ymm2, %ymm1
; CHECK-NEXT: addq $4, %rax
; CHECK-NEXT: jne .LBB10_1
; CHECK-NEXT: # %bb.2: # %middle.block
; CHECK-NEXT: vpaddq %ymm0, %ymm1, %ymm0
; CHECK-NEXT: vextracti128 $1, %ymm0, %xmm1
; CHECK-NEXT: vpaddq %ymm1, %ymm0, %ymm0
; CHECK-NEXT: vpsltd {{.*#+}} xmm1 = xmm0[2,3,0,1]
; CHECK-NEXT: vpaddq %ymm1, %ymm0, %ymm0
; CHECK-NEXT: vpsltd {{.*#+}} xmm1 = xmm0[1,1,2,3]
; CHECK-NEXT: vpaddq %xmm1, %xmm0, %xmm0
; CHECK-NEXT: vmovd %xmm0, %eax
; CHECK-NEXT: vzeroupper
; CHECK-NEXT: retq

```

entry:

```
br label %vector.body
```

vector.body:

```

%index = phi i64 [ 0, %entry ], [ %index.next, %vector.body ]
%vec.phi = phi <16 x i32> [ zeroinitializer, %entry ], [ %10, %vector.body ]
%0 = getelementptr inbounds [1024 x i8], [1024 x i8]* @a, i64 0, i64 %index
%1 = bitcast i8* %0 to <16 x i8>*
%wide.load = load <16 x i8>,
<16 x i8>* %1, align 4
%2 = zext <16 x i8> %wide.load to <16 x i32>
%3 = getelementptr inbounds [1024 x i8], [1024 x i8]* @b, i64 0, i64 %index
%4 = bitcast i8* %3 to <16 x i8>*
%wide.load1 = load <16 x i8>, <16 x i8>* %4, align 4
%5 = zext <16 x i8> %wide.load1 to <16 x i32>
%6 = sub nsw <16 x i32> %2, %5
%7 = icmp sgt <16 x i32> %6, <i32 -1, i32 -1, i32 -1, i32 -1, i32 -1, i32 -1, i32 -1, i32 -1, i32 -1, i32 -1, i32 -1, i32 -1>
%8 = sub nsw <16 x i32> zeroinitializer, %6
%9 = select <16 x i1> %7, <16 x i32> %6, <16 x i32> %8
%10 = add nsw <16 x i32> %9, %vec.phi
%index.next = add i64 %index, 4
%11 = icmp eq i64 %index.next, 1024
br i1 %11, label %middle.block, label %vector.body

```

middle.block:

```
%lcssa = phi <16 x i32> [ %10, %vector.body ]
%rdx.shuf = shufflevector <16 x i32> %lcssa, <16 x i32> undef, <16 x i32> <i32 8, i32 9, i32 10, i32 11, i32 12,
i32 13, i32 14, i32 15, i32 undef, i32 undef, i32 undef, i32 undef, i32
undef, i32 undef, i32 undef, i32 undef>
%bin.rdx = add <16 x i32> %lcssa, %rdx.shuf
%rdx.shuf2 = shufflevector <16 x i32> %bin.rdx, <16 x i32> undef, <16 x i32> <i32 4, i32 5, i32 6, i32 7, i32
undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef,
i32 undef>
%bin.rdx2 = add <16 x i32> %bin.rdx, %rdx.shuf2
%rdx.shuf3 = shufflevector <16 x i32> %bin.rdx2, <16 x i32> undef, <16 x i32> <i32 2, i32 3, i32 undef, i32
undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef,
i32 undef, i32 undef>
%bin.rdx3 = add <16 x i32> %bin.rdx2, %rdx.shuf3
%rdx.shuf4 = shufflevector <16 x i32> %bin.rdx3, <16 x i32> undef, <16 x i32> <i32 1, i32 undef, i32 undef, i32
undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef,
i32 undef, i32 undef>
%bin.rdx4 = add <16 x i32> %bin.rdx3, %rdx.shuf4
%12 = extractelement
<16 x i32> %bin.rdx4, i32 0
ret i32 %12
}
```

```
define i32 @sad_16i8_512() "min-legal-vector-width"="512" {
; CHECK-LABEL: sad_16i8_512:
; CHECK:      # %bb.0: # %entry
; CHECK-NEXT: vpxor %xmm0, %xmm0, %xmm0
; CHECK-NEXT: movq $-1024, %rax # imm = 0xFC00
; CHECK-NEXT: .p2align 4, 0x90
; CHECK-NEXT: .LBB11_1: # %vector.body
; CHECK-NEXT: # =>This Inner Loop Header: Depth=1
; CHECK-NEXT: vmovdqu a+1024(%rax), %xmm1
; CHECK-NEXT: vpsadbw b+1024(%rax), %xmm1, %xmm1
; CHECK-NEXT: vpadd %zmm0, %zmm1, %zmm0
; CHECK-NEXT: addq $4, %rax
; CHECK-NEXT: jne .LBB11_1
; CHECK-NEXT: # %bb.2: # %middle.block
; CHECK-NEXT: vextracti64x4 $1, %zmm0, %ymm1
; CHECK-NEXT: vpadd %zmm1, %zmm0, %zmm0
; CHECK-NEXT: vextracti128 $1, %ymm0, %xmm1
; CHECK-NEXT: vpadd %zmm1, %zmm0, %zmm0
; CHECK-NEXT: vpshufd {{.*#+}} xmm1 = xmm0[2,3,0,1]
; CHECK-NEXT: vpadd %zmm1, %zmm0, %zmm0
; CHECK-NEXT: vpshufd {{.*#+}} xmm1 = xmm0[1,1,2,3]
; CHECK-NEXT: vpadd %xmm1,
%xmm0, %xmm0
; CHECK-NEXT: vmovd %xmm0, %eax
```

```

; CHECK-NEXT:  vzeroupper
; CHECK-NEXT:  retq
entry:
br label %vector.body

vector.body:
%index = phi i64 [ 0, %entry ], [ %index.next, %vector.body ]
%vec.phi = phi <16 x i32> [ zeroinitializer, %entry ], [ %10, %vector.body ]
%0 = getelementptr inbounds [1024 x i8], [1024 x i8]* @a, i64 0, i64 %index
%1 = bitcast i8* %0 to <16 x i8>*
%wide.load = load <16 x i8>, <16 x i8>* %1, align 4
%2 = zext <16 x i8> %wide.load to <16 x i32>
%3 = getelementptr inbounds [1024 x i8], [1024 x i8]* @b, i64 0, i64 %index
%4 = bitcast i8* %3 to <16 x i8>*
%wide.load1 = load <16 x i8>, <16 x i8>* %4, align 4
%5 = zext <16 x i8> %wide.load1 to <16 x i32>
%6 = sub nsw <16 x i32> %2, %5
%7 = icmp sgt <16 x i32> %6, <i32 -1, i32 -1, i32 -1, i32 -1, i32 -1, i32 -1, i32 -1, i32 -1, i32 -1, i32 -1, i32 -1, i32 -1, i32 -1, i32 -1, i32 -1, i32 -1>
%8 = sub nsw <16 x i32> zeroinitializer, %6
%9 = select <16 x i1> %7, <16 x i32>
%6, <16 x i32> %8
%10 = add nsw <16 x i32> %9, %vec.phi
%index.next = add i64 %index, 4
%11 = icmp eq i64 %index.next, 1024
br i1 %11, label %middle.block, label %vector.body

middle.block:
%.lcssa = phi <16 x i32> [ %10, %vector.body ]
%rdx.shuf = shufflevector <16 x i32> %.lcssa, <16 x i32> undef, <16 x i32> <i32 8, i32 9, i32 10, i32 11, i32 12, i32 13, i32 14, i32 15, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef>
%bin.rdx = add <16 x i32> %.lcssa, %rdx.shuf
%rdx.shuf2 = shufflevector <16 x i32> %bin.rdx, <16 x i32> undef, <16 x i32> <i32 4, i32 5, i32 6, i32 7, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef>
%bin.rdx2 = add <16 x i32> %bin.rdx, %rdx.shuf2
%rdx.shuf3 = shufflevector <16 x i32> %bin.rdx2, <16 x i32> undef, <16 x i32> <i32 2, i32 3, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef>
%bin.rdx3 = add <16 x i32> %bin.rdx2, %rdx.shuf3
%rdx.shuf4 = shufflevector <16 x i32> %bin.rdx3, <16 x i32> undef, <16 x i32> <i32 1, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef, i32 undef>
%bin.rdx4 = add <16 x i32> %bin.rdx3, %rdx.shuf4
%12 = extractelement <16 x i32> %bin.rdx4, i32 0
ret i32 %12
}

```

```

define void @sbto16f32_256(<16 x i16> %a, <16 x float>* %res) "min-legal-vector-width"="256" {
; CHECK-LABEL: sbto16f32_256:
; CHECK:      # %bb.0:
; CHECK-NEXT:  vpmovw2m %ymm0, %k0
; CHECK-NEXT:  kshiftrw $8, %k0, %k1
; CHECK-NEXT:  vpmovm2d %k1, %ymm0
; CHECK-NEXT:  vcvtdq2ps %ymm0, %ymm0
; CHECK-NEXT:  vpmovm2d %k0, %ymm1
; CHECK-NEXT:  vcvtdq2ps %ymm1, %ymm1
; CHECK-NEXT:  vmovaps %ymm1, (%rdi)
; CHECK-NEXT:  vmovaps %ymm0, 32(%rdi)
; CHECK-NEXT:  vzeroupper
; CHECK-NEXT:  retq
%mask
= icmp slt <16 x i16> %a, zeroinitializer
%1 = sitofp <16 x i1> %mask to <16 x float>
store <16 x float> %1, <16 x float>* %res
ret void
}

```

```

define void @sbto16f32_512(<16 x i16> %a, <16 x float>* %res) "min-legal-vector-width"="512" {
; CHECK-LABEL: sbto16f32_512:
; CHECK:      # %bb.0:
; CHECK-NEXT:  vpmovw2m %ymm0, %k0
; CHECK-NEXT:  vpmovm2d %k0, %zmm0
; CHECK-NEXT:  vcvtdq2ps %zmm0, %zmm0
; CHECK-NEXT:  vmovaps %zmm0, (%rdi)
; CHECK-NEXT:  vzeroupper
; CHECK-NEXT:  retq
%mask = icmp slt <16 x i16> %a, zeroinitializer
%1 = sitofp <16 x i1> %mask to <16 x float>
store <16 x float> %1, <16 x float>* %res
ret void
}

```

```

define void @sbto16f64_256(<16 x i16> %a, <16 x double>* %res) "min-legal-vector-width"="256" {
; CHECK-LABEL: sbto16f64_256:
; CHECK:      # %bb.0:
; CHECK-NEXT:  vpmovw2m %ymm0, %k0
; CHECK-NEXT:  kshiftrw $8, %k0, %k1
; CHECK-NEXT:  vpmovm2d %k1, %ymm0
; CHECK-NEXT:  vcvtdq2pd %xmm0, %ymm1
; CHECK-NEXT:  vextracti128 $1, %ymm0, %xmm0
;
; CHECK-NEXT:  vcvtdq2pd %xmm0, %ymm0
; CHECK-NEXT:  vpmovm2d %k0, %ymm2
; CHECK-NEXT:  vcvtdq2pd %xmm2, %ymm3
; CHECK-NEXT:  vextracti128 $1, %ymm2, %xmm2

```



```

; CHECK-NEXT:   vcvtdq2pd %xmm2, %ymm2
; CHECK-NEXT:   vmovaps %ymm2, 32(%rdi)
; CHECK-NEXT:   vmovaps %ymm3, (%rdi)
; CHECK-NEXT:   vmovaps %ymm0, 96(%rdi)
; CHECK-NEXT:   vmovaps %ymm1, 64(%rdi)
; CHECK-NEXT:   vzeroupper
; CHECK-NEXT:   retq
%mask = icmp slt <16 x i16> %a, zeroinitializer
%1 = sitofp <16 x i1> %mask to <16 x double>
store <16 x double> %1, <16 x double>* %res
ret void
}

```

```

define void @sbto16f64_512(<16 x i16> %a, <16 x double>* %res) "min-legal-vector-width"="512" {
; CHECK-LABEL: sbto16f64_512:
; CHECK:      # %bb.0:
; CHECK-NEXT:   vpmovw2m %ymm0, %k0
; CHECK-NEXT:   vpmovm2d %k0, %zmm0
; CHECK-NEXT:   vcvtdq2pd %ymm0, %zmm1
; CHECK-NEXT:   vextracti64x4 $1, %zmm0, %ymm0
; CHECK-NEXT:   vcvtdq2pd %ymm0, %zmm0
; CHECK-NEXT:   vmovaps %zmm0, 64(%rdi)
; CHECK-NEXT:   vmovaps %zmm1,
(%rdi)
; CHECK-NEXT:   vzeroupper
; CHECK-NEXT:   retq
%mask = icmp slt <16 x i16> %a, zeroinitializer
%1 = sitofp <16 x i1> %mask to <16 x double>
store <16 x double> %1, <16 x double>* %res
ret void
}

```

```

define void @ubto16f32_256(<16 x i16> %a, <16 x float>* %res) "min-legal-vector-width"="256" {
; CHECK-LABEL: ubto16f32_256:
; CHECK:      # %bb.0:
; CHECK-NEXT:   vpmovw2m %ymm0, %k0
; CHECK-NEXT:   kshiftrw $8, %k0, %k1
; CHECK-NEXT:   vpmovm2d %k1, %ymm0
; CHECK-NEXT:   vpsrld $31, %ymm0, %ymm0
; CHECK-NEXT:   vcvtdq2ps %ymm0, %ymm0
; CHECK-NEXT:   vpmovm2d %k0, %ymm1
; CHECK-NEXT:   vpsrld $31, %ymm1, %ymm1
; CHECK-NEXT:   vcvtdq2ps %ymm1, %ymm1
; CHECK-NEXT:   vmovaps %ymm1, (%rdi)
; CHECK-NEXT:   vmovaps %ymm0, 32(%rdi)
; CHECK-NEXT:   vzeroupper
; CHECK-NEXT:   retq
%mask = icmp slt <16 x i16> %a, zeroinitializer

```

```

%1 = uitofp <16 x i1> %mask to <16 x float>
store <16 x float> %1, <16 x float>* %res
ret void
}

```

```

define void @ubto16f32_512(<16 x i16>
%a, <16 x float>* %res) "min-legal-vector-width"="512" {
; CHECK-LABEL: ubto16f32_512:
; CHECK:      # %bb.0:
; CHECK-NEXT:  vpmovw2m %ymm0, %k0
; CHECK-NEXT:  vpmovm2d %k0, %zmm0
; CHECK-NEXT:  vpsrld $31, %zmm0, %zmm0
; CHECK-NEXT:  vcvtdq2ps %zmm0, %zmm0
; CHECK-NEXT:  vmovaps %zmm0, (%rdi)
; CHECK-NEXT:  vzeroupper
; CHECK-NEXT:  retq
%mask = icmp slt <16 x i16> %a, zeroinitializer
%1 = uitofp <16 x i1> %mask to <16 x float>
store <16 x float> %1, <16 x float>* %res
ret void
}

```

```

define void @ubto16f64_256(<16 x i16> %a, <16 x double>* %res) "min-legal-vector-width"="256" {
; CHECK-LABEL: ubto16f64_256:
; CHECK:      # %bb.0:
; CHECK-NEXT:  vpmovw2m %ymm0, %k0
; CHECK-NEXT:  kshiftrw $8, %k0, %k1
; CHECK-NEXT:  vpmovm2d %k1, %ymm0
; CHECK-NEXT:  vpsrld $31, %ymm0, %ymm0
; CHECK-NEXT:  vcvtdq2pd %xmm0, %ymm1
; CHECK-NEXT:  vextracti128 $1, %ymm0, %xmm0
; CHECK-NEXT:  vcvtdq2pd %xmm0, %ymm0
; CHECK-NEXT:  vpmovm2d %k0, %ymm2
; CHECK-NEXT:  vpsrld
$31, %ymm2, %ymm2
; CHECK-NEXT:  vcvtdq2pd %xmm2, %ymm3
; CHECK-NEXT:  vextracti128 $1, %ymm2, %xmm2
; CHECK-NEXT:  vcvtdq2pd %xmm2, %ymm2
; CHECK-NEXT:  vmovaps %ymm2, 32(%rdi)
; CHECK-NEXT:  vmovaps %ymm3, (%rdi)
; CHECK-NEXT:  vmovaps %ymm0, 96(%rdi)
; CHECK-NEXT:  vmovaps %ymm1, 64(%rdi)
; CHECK-NEXT:  vzeroupper
; CHECK-NEXT:  retq
%mask = icmp slt <16 x i16> %a, zeroinitializer
%1 = uitofp <16 x i1> %mask to <16 x double>
store <16 x double> %1, <16 x double>* %res
ret void
}

```

```

}

define void @ubto16f64_512(<16 x i16> %a, <16 x double>* %res) "min-legal-vector-width"="512" {
; CHECK-LABEL: ubto16f64_512:
; CHECK:      # %bb.0:
; CHECK-NEXT:  vpmovw2m %ymm0, %k0
; CHECK-NEXT:  vpmovm2d %k0, %zmm0
; CHECK-NEXT:  vpsrld $31, %zmm0, %zmm0
; CHECK-NEXT:  vcvtdq2pd %ymm0, %zmm1
; CHECK-NEXT:  vextracti64x4 $1, %zmm0, %ymm0
; CHECK-NEXT:  vcvtdq2pd %ymm0, %zmm0
; CHECK-NEXT:  vmovaps %zmm0, 64(%rdi)
; CHECK-NEXT:  vmovaps %zmm1, (%rdi)
; CHECK-NEXT:
    vzeroupper
; CHECK-NEXT:  retq
    %mask = icmp slt <16 x i16> %a, zeroinitializer
    %1 = uitofp <16 x i1> %mask to <16 x double>
    store <16 x double> %1, <16 x double>* %res
    ret void
}

```

```

define <16 x i16> @test_16f32toub_256(<16 x float>* %ptr, <16 x i16> %passthru) "min-legal-vector-width"="256" {
; CHECK-LABEL: test_16f32toub_256:
; CHECK:      # %bb.0:
; CHECK-NEXT:  vcvttps2dq (%rdi), %ymm1
; CHECK-NEXT:  vpslld $31, %ymm1, %ymm1
; CHECK-NEXT:  vpmovd2m %ymm1, %k0
; CHECK-NEXT:  vcvttps2dq 32(%rdi), %ymm1
; CHECK-NEXT:  vpslld $31, %ymm1, %ymm1
; CHECK-NEXT:  vpmovd2m %ymm1, %k1
; CHECK-NEXT:  kunpckbw %k0, %k1, %k1
; CHECK-NEXT:  vmovdqu16 %ymm0, %ymm0 {%k1} {z}
; CHECK-NEXT:  retq
    %a = load <16 x float>, <16 x float>* %ptr
    %mask = fptoui <16 x float> %a to <16 x i1>
    %select = select <16 x i1> %mask, <16 x i16> %passthru, <16 x i16> zeroinitializer
    ret <16 x i16> %select
}

```

```

define <16 x i16> @test_16f32toub_512(<16 x float>* %ptr, <16 x i16>
    %passthru) "min-legal-vector-width"="512" {
; CHECK-LABEL: test_16f32toub_512:
; CHECK:      # %bb.0:
; CHECK-NEXT:  vcvttps2dq (%rdi), %zmm1
; CHECK-NEXT:  vpslld $31, %zmm1, %zmm1
; CHECK-NEXT:  vpmovd2m %zmm1, %k1

```

```

; CHECK-NEXT: vmovdqu16 %ymm0, %ymm0 {%k1} {z}
; CHECK-NEXT: retq
%a = load <16 x float>, <16 x float>* %ptr
%mask = fptoui <16 x float> %a to <16 x i1>
%select = select <16 x i1> %mask, <16 x i16> %passthru, <16 x i16> zeroinitializer
ret <16 x i16> %select
}

define <16 x i16> @test_16f32tosb_256(<16 x float>* %ptr, <16 x i16> %passthru) "min-legal-vector-
width"="256" {
; CHECK-LABEL: test_16f32tosb_256:
; CHECK:    # %bb.0:
; CHECK-NEXT: vcvttps2dq (%rdi), %ymm1
; CHECK-NEXT: vpmovd2m %ymm1, %k0
; CHECK-NEXT: vcvttps2dq 32(%rdi), %ymm1
; CHECK-NEXT: vpmovd2m %ymm1, %k1
; CHECK-NEXT: kunpckbw %k0, %k1, %k1
; CHECK-NEXT: vmovdqu16 %ymm0, %ymm0 {%k1} {z}
; CHECK-NEXT: retq
%a = load <16 x float>, <16 x float>* %ptr
%mask =
fptosi <16 x float> %a to <16 x i1>
%select = select <16 x i1> %mask, <16 x i16> %passthru, <16 x i16> zeroinitializer
ret <16 x i16> %select
}

define <16 x i16> @test_16f32tosb_512(<16 x float>* %ptr, <16 x i16> %passthru) "min-legal-vector-
width"="512" {
; CHECK-LABEL: test_16f32tosb_512:
; CHECK:    # %bb.0:
; CHECK-NEXT: vcvttps2dq (%rdi), %zmm1
; CHECK-NEXT: vpmovd2m %zmm1, %k1
; CHECK-NEXT: vmovdqu16 %ymm0, %ymm0 {%k1} {z}
; CHECK-NEXT: retq
%a = load <16 x float>, <16 x float>* %ptr
%mask = fptosi <16 x float> %a to <16 x i1>
%select = select <16 x i1> %mask, <16 x i16> %passthru, <16 x i16> zeroinitializer
ret <16 x i16> %select
}

define void @mul256(<64 x i8>* %a, <64 x i8>* %b, <64 x i8>* %c) "min-legal-vector-width"="256" {
; CHECK-LABEL: mul256:
; CHECK:    # %bb.0:
; CHECK-NEXT: vmovdqa (%rdi), %ymm0
; CHECK-NEXT: vmovdqa 32(%rdi), %ymm1
; CHECK-NEXT: vmovdqa (%rsi), %ymm2
; CHECK-NEXT: vmovdqa 32(%rsi), %ymm3
; CHECK-NEXT: vpunpckhbw

```

```

{{.#+}} ymm4 =
ymm2[8],ymm0[8],ymm2[9],ymm0[9],ymm2[10],ymm0[10],ymm2[11],ymm0[11],ymm2[12],ymm0[12],ymm2[13],
ymm0[13],ymm2[14],ymm0[14],ymm2[15],ymm0[15],ymm2[24],ymm0[24],ymm2[25],ymm0[25],ymm2[26],ymm0[26],ymm2[27],ymm0[27],ymm2[28],ymm0[28],ymm2[29],ymm0[29],ymm2[30],ymm0[30],ymm2[31],ymm0[31]
; CHECK-NEXT: vpunpckhbw {{.#+}} ymm5 =
ymm0[8,8,9,9,10,10,11,11,12,12,13,13,14,14,15,15,24,24,25,25,26,26,27,27,28,28,29,29,30,30,31,31]
; CHECK-NEXT: vpmullw %ymm4, %ymm5, %ymm4
; CHECK-NEXT: vmovdqa {{.#+}} ymm5 =
[255,255,255,255,255,255,255,255,255,255,255,255,255,255,255,255]
; CHECK-NEXT: vpand %ymm5, %ymm4, %ymm4
; CHECK-NEXT: vpunpcklbw {{.#+}} ymm2 =
ymm2[0],ymm0[0],ymm2[1],ymm0[1],ymm2[2],ymm0[2],ymm2[3],ymm0[3],ymm2[4],ymm0[4],ymm2[5],ymm0[5],ymm2[6],ymm0[6],ymm2[7],ymm0[7],ymm2[16],ymm0[16],ymm2[17],ymm0[17],ymm2[18],ymm0[18],ymm2[19],ymm0[19],ymm2[20],ymm0[20],ymm2[21],ymm0[21],ymm2[22],ymm0[22],ymm2[23],ymm0[23]
; CHECK-NEXT: vpunpcklbw {{.#+}} ymm0
= ymm0[0,0,1,1,2,2,3,3,4,4,5,5,6,6,7,7,16,16,17,17,18,18,19,19,20,20,21,21,22,22,23,23]
; CHECK-NEXT: vpmullw %ymm2, %ymm0, %ymm0
; CHECK-NEXT: vpand %ymm5, %ymm0, %ymm0
; CHECK-NEXT: vpackuswb %ymm4, %ymm0, %ymm0
; CHECK-NEXT: vpunpckhbw {{.#+}} ymm2 =
ymm3[8],ymm0[8],ymm3[9],ymm0[9],ymm3[10],ymm0[10],ymm3[11],ymm0[11],ymm3[12],ymm0[12],ymm3[13],ymm0[13],ymm3[14],ymm0[14],ymm3[15],ymm0[15],ymm3[24],ymm0[24],ymm3[25],ymm0[25],ymm3[26],ymm0[26],ymm3[27],ymm0[27],ymm3[28],ymm0[28],ymm3[29],ymm0[29],ymm3[30],ymm0[30],ymm3[31],ymm0[31]
; CHECK-NEXT: vpunpckhbw {{.#+}} ymm4 =
ymm1[8],ymm0[8],ymm1[9],ymm0[9],ymm1[10],ymm0[10],ymm1[11],ymm0[11],ymm1[12],ymm0[12],ymm1[13],ymm0[13],ymm1[14],ymm0[14],ymm1[15],ymm0[15],ymm1[24],ymm0[24],ymm1[25],ymm0[25],ymm1[26],ymm0[26],ymm1[27],ymm0[27],ymm1[28],ymm0[28],ymm1[29],ymm0[29],ymm1[30],ymm0[30],ymm1[31],ymm0[31]
; CHECK-NEXT: vpmullw %ymm2, %ymm4, %ymm2
; CHECK-NEXT: vpand %ymm5, %ymm2, %ymm2
; CHECK-NEXT: vpunpcklbw {{.#+}}
ymm3 =
ymm3[0],ymm0[0],ymm3[1],ymm0[1],ymm3[2],ymm0[2],ymm3[3],ymm0[3],ymm3[4],ymm0[4],ymm3[5],ymm0[5],ymm3[6],ymm0[6],ymm3[7],ymm0[7],ymm3[16],ymm0[16],ymm3[17],ymm0[17],ymm3[18],ymm0[18],ymm3[19],ymm0[19],ymm3[20],ymm0[20],ymm3[21],ymm0[21],ymm3[22],ymm0[22],ymm3[23],ymm0[23]
; CHECK-NEXT: vpunpcklbw {{.#+}} ymm1 =
ymm1[0],ymm0[0],ymm1[1],ymm0[1],ymm1[2],ymm0[2],ymm1[3],ymm0[3],ymm1[4],ymm0[4],ymm1[5],ymm0[5],ymm1[6],ymm0[6],ymm1[7],ymm0[7],ymm1[16],ymm0[16],ymm1[17],ymm0[17],ymm1[18],ymm0[18],ymm1[19],ymm0[19],ymm1[20],ymm0[20],ymm1[21],ymm0[21],ymm1[22],ymm0[22],ymm1[23],ymm0[23]
; CHECK-NEXT: vpmullw %ymm3, %ymm1, %ymm1
; CHECK-NEXT: vpand %ymm5, %ymm1, %ymm1
; CHECK-NEXT: vpackuswb %ymm2, %ymm1, %ymm1
; CHECK-NEXT: vmovdqa %ymm1, 32(%rdx)
; CHECK-NEXT: vmovdqa %ymm0, (%rdx)
; CHECK-NEXT: vzeroupper
; CHECK-NEXT: retq

```

```

%d = load <64 x i8>, <64 x i8>* %a
%e = load <64 x i8>, <64 x i8>* %b
%f = mul <64 x i8> %d, %e
store <64 x i8> %f, <64 x i8>*
%c
ret void
}

```

```

define void @mul512(<64 x i8>* %a, <64 x i8>* %b, <64 x i8>* %c) "min-legal-vector-width"="512" {
; CHECK-LABEL: mul512:
; CHECK:      # %bb.0:
; CHECK-NEXT:  vmovdqa64 (%rdi), %zmm0
; CHECK-NEXT:  vmovdqa64 (%rsi), %zmm1
; CHECK-NEXT:  vpunpckhbw {{.##+}} %zmm2 =
zmm1[8],zmm0[8],zmm1[9],zmm0[9],zmm1[10],zmm0[10],zmm1[11],zmm0[11],zmm1[12],zmm0[12],zmm1[13],
zmm0[13],zmm1[14],zmm0[14],zmm1[15],zmm0[15],zmm1[24],zmm0[24],zmm1[25],zmm0[25],zmm1[26],zmm0
[26],zmm1[27],zmm0[27],zmm1[28],zmm0[28],zmm1[29],zmm0[29],zmm1[30],zmm0[30],zmm1[31],zmm0[31],z
mm1[40],zmm0[40],zmm1[41],zmm0[41],zmm1[42],zmm0[42],zmm1[43],zmm0[43],zmm1[44],zmm0[44],zmm1[
45],zmm0[45],zmm1[46],zmm0[46],zmm1[47],zmm0[47],zmm1[56],zmm0[56],zmm1[57],zmm0[57],zmm1[58],z
mm0[58],zmm1[59],zmm0[59],zmm1[60],zmm0[60],zmm1[61],zmm0[61],zmm1[62],zmm0[62],zmm1[63],zmm0[
63]
; CHECK-NEXT:  vpunpckhbw {{.##+}} %zmm3 =
zmm0[8,8,9,9,10,10,11,11,12,12,13,13,14,14,15,15,24,24,25,25,26,26,27,27,28,28,29,29,30,30,31,31,40,40,41,41,4
2,42,43,43,44,44,45,45,46,46,47,47,56,56,57,57,58,58,59,59,60,60,61,61,62,62,63,63]
;
CHECK-NEXT:  vpmullw %zmm2, %zmm3, %zmm2
; CHECK-NEXT:  vmovdqa64 {{.##+}} %zmm3 =
[255,255,255,255,255,255,255,255,255,255,255,255,255,255,255,255,255,255,255,255,255,255,255,255,255,255,2
55,255,255,255,255]
; CHECK-NEXT:  vpandq %zmm3, %zmm2, %zmm2
; CHECK-NEXT:  vpunpcklbw {{.##+}} %zmm1 =
zmm1[0],zmm0[0],zmm1[1],zmm0[1],zmm1[2],zmm0[2],zmm1[3],zmm0[3],zmm1[4],zmm0[4],zmm1[5],zmm0[5]
,zmm1[6],zmm0[6],zmm1[7],zmm0[7],zmm1[16],zmm0[16],zmm1[17],zmm0[17],zmm1[18],zmm0[18],zmm1[19]
,zmm0[19],zmm1[20],zmm0[20],zmm1[21],zmm0[21],zmm1[22],zmm0[22],zmm1[23],zmm0[23],zmm1[32],zmm
0[32],zmm1[33],zmm0[33],zmm1[34],zmm0[34],zmm1[35],zmm0[35],zmm1[36],zmm0[36],zmm1[37],zmm0[37],
zmm1[38],zmm0[38],zmm1[39],zmm0[39],zmm1[48],zmm0[48],zmm1[49],zmm0[49],zmm1[50],zmm0[50],zmm1
[51],zmm0[51],zmm1[52],zmm0[52],zmm1[53],zmm0[53],zmm1[54],zmm0[54],zmm1[55],zmm0[55]
; CHECK-NEXT:  vpunpcklbw {{.##+}}
zmm0 =
zmm0[0,0,1,1,2,2,3,3,4,4,5,5,6,6,7,7,16,16,17,17,18,18,19,19,20,20,21,21,22,22,23,23,32,32,33,33,34,34,35,35,36,3
6,37,37,38,38,39,39,48,48,49,49,50,50,51,51,52,52,53,53,54,54,55,55]
; CHECK-NEXT:  vpmullw %zmm1, %zmm0, %zmm0
; CHECK-NEXT:  vpandq %zmm3, %zmm0, %zmm0
; CHECK-NEXT:  vpackuswb %zmm2, %zmm0, %zmm0
; CHECK-NEXT:  vmovdqa64 %zmm0, (%rdx)
; CHECK-NEXT:  vzeroupper
; CHECK-NEXT:  retq
%d = load <64 x i8>, <64 x i8>* %a

```

```
%e = load <64 x i8>, <64 x i8>* %b
%f = mul <64 x i8> %d, %e
store <64 x i8> %f, <64 x i8>* %c
ret void
}
```

=====

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=====

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University of Illinois at Urbana-Champaign

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| Program                                                                                                                                                                          | Directory |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| -----                                                                                                                                                                            | -----     |
| <none yet>                                                                                                                                                                       |           |
| ; NOTE: Assertions have been autogenerated by utils/update_analyze_test_checks.py                                                                                                |           |
| ; RUN: opt < %s -cost-model -analyze -mtriple=x86_64-apple-macosx10.8.0 -mattr=+avx2   FileCheck %s --check-prefixes=CHECK,VEC256,AVX                                            |           |
| ; RUN: opt < %s -cost-model -analyze -mtriple=x86_64-apple-macosx10.8.0 -mattr=+avx512vl,+avx512bw,+avx512dq,+prefer-256-bit   FileCheck %s --check-prefixes=CHECK,VEC256,SKX256 |           |
| ; RUN: opt < %s -cost-model -analyze -mtriple=x86_64-apple-macosx10.8.0 -mattr=+avx512vl,+avx512bw,+avx512dq,-prefer-256-bit   FileCheck %s --check-prefixes=CHECK,VEC512        |           |
| define void @zext256() "min-legal-vector-width"="256" {                                                                                                                          |           |
| ; VEC256-LABEL: 'zext256'                                                                                                                                                        |           |
| ; VEC256-NEXT: Cost Model: Found an estimated cost of 7 for instruction: %A = zext <8 x i16> undef to <8 x i64>                                                                  |           |
| ; VEC256-NEXT: Cost Model: Found an estimated cost of 3 for instruction: %B = zext <8 x i32> undef to <8 x i64>                                                                  |           |
| ; VEC256-NEXT: Cost Model: Found an estimated cost of 4 for instruction: %C = zext <16 x i8> undef to <16 x i32>                                                                 |           |
| ; VEC256-NEXT:                                                                                                                                                                   |           |
| Cost Model: Found an estimated cost of 4 for instruction: %D = zext <16 x i16> undef to <16 x i32>                                                                               |           |
| ; VEC256-NEXT: Cost Model: Found an estimated cost of 3 for instruction: %E = zext <32 x i8> undef to <32 x i16>                                                                 |           |
| ; VEC256-NEXT: Cost Model: Found an estimated cost of 0 for instruction: ret void                                                                                                |           |
| ;                                                                                                                                                                                |           |
| ; VEC512-LABEL: 'zext256'                                                                                                                                                        |           |
| ; VEC512-NEXT: Cost Model: Found an estimated cost of 1 for instruction: %A = zext <8 x i16> undef to <8 x i64>                                                                  |           |
| ; VEC512-NEXT: Cost Model: Found an estimated cost of 1 for instruction: %B = zext <8 x i32> undef to <8 x i64>                                                                  |           |
| ; VEC512-NEXT: Cost Model: Found an estimated cost of 1 for instruction: %C = zext <16 x i8> undef to <16 x i32>                                                                 |           |
| ; VEC512-NEXT: Cost Model: Found an estimated cost of 1 for instruction: %D = zext <16 x i16> undef to <16 x i32>                                                                |           |
| ; VEC512-NEXT: Cost Model: Found an estimated cost of 1 for instruction: %E = zext <32 x i8> undef to <32 x i16>                                                                 |           |
| ; VEC512-NEXT: Cost Model: Found an estimated cost of 0 for instruction: ret void                                                                                                |           |
| ;                                                                                                                                                                                |           |



```

%A = zext <8 x i16>
undef to <8 x i64>
%B = zext <8 x i32> undef to <8 x i64>
%C = zext <16 x i8> undef to <16 x i32>
%D = zext <16 x i16> undef to <16 x i32>
%E = zext <32 x i8> undef to <32 x i16>
ret void
}

```

```

define void @zext512() "min-legal-vector-width"="512" {
; AVX-LABEL: 'zext512'
; AVX-NEXT: Cost Model: Found an estimated cost of 7 for instruction: %A = zext <8 x i16> undef to <8 x i64>
; AVX-NEXT: Cost Model: Found an estimated cost of 3 for instruction: %B = zext <8 x i32> undef to <8 x i64>
; AVX-NEXT: Cost Model: Found an estimated cost of 4 for instruction: %C = zext <16 x i8> undef to <16 x i32>
; AVX-NEXT: Cost Model: Found an estimated cost of 4 for instruction: %D = zext <16 x i16> undef to <16 x
i32>
; AVX-NEXT: Cost Model: Found an estimated cost of 3 for instruction: %E = zext <32 x i8> undef to <32 x i16>
; AVX-NEXT: Cost Model: Found an estimated cost of 0 for instruction: ret void
;
; SKX256-LABEL: 'zext512'
; SKX256-NEXT: Cost Model: Found an estimated cost of
1 for instruction: %A = zext <8 x i16> undef to <8 x i64>
; SKX256-NEXT: Cost Model: Found an estimated cost of 1 for instruction: %B = zext <8 x i32> undef to <8 x
i64>
; SKX256-NEXT: Cost Model: Found an estimated cost of 1 for instruction: %C = zext <16 x i8> undef to <16 x
i32>
; SKX256-NEXT: Cost Model: Found an estimated cost of 1 for instruction: %D = zext <16 x i16> undef to <16 x
i32>
; SKX256-NEXT: Cost Model: Found an estimated cost of 1 for instruction: %E = zext <32 x i8> undef to <32 x
i16>
; SKX256-NEXT: Cost Model: Found an estimated cost of 0 for instruction: ret void
;
; VEC512-LABEL: 'zext512'
; VEC512-NEXT: Cost Model: Found an estimated cost of 1 for instruction: %A = zext <8 x i16> undef to <8 x
i64>
; VEC512-NEXT: Cost Model: Found an estimated cost of 1 for instruction: %B = zext <8 x i32> undef to <8 x
i64>
; VEC512-NEXT: Cost Model: Found an estimated cost of 1 for instruction: %C = zext <16 x i8> undef to <16 x
i32>
; VEC512-NEXT: Cost Model: Found
an estimated cost of 1 for instruction: %D = zext <16 x i16> undef to <16 x i32>
; VEC512-NEXT: Cost Model: Found an estimated cost of 1 for instruction: %E = zext <32 x i8> undef to <32 x
i16>
; VEC512-NEXT: Cost Model: Found an estimated cost of 0 for instruction: ret void
;
%A = zext <8 x i16> undef to <8 x i64>
%B = zext <8 x i32> undef to <8 x i64>
%C = zext <16 x i8> undef to <16 x i32>

```

```

%D = sext <16 x i16> undef to <16 x i32>
%E = sext <32 x i8> undef to <32 x i16>
ret void
}

define void @sext256() "min-legal-vector-width"="256" {
; VEC256-LABEL: 'sext256'
; VEC256-NEXT: Cost Model: Found an estimated cost of 7 for instruction: %A = sext <8 x i8> undef to <8 x i64>
; VEC256-NEXT: Cost Model: Found an estimated cost of 7 for instruction: %B = sext <8 x i16> undef to <8 x i64>
; VEC256-NEXT: Cost Model: Found an estimated cost of 3 for instruction: %C = sext <8 x i32> undef to <8 x i64>
; VEC256-NEXT: Cost Model: Found an estimated cost of 4 for instruction: %D = sext <16 x i8> undef to <16 x i32>
; VEC256-NEXT: Cost Model: Found an estimated cost of 4 for instruction: %E = sext <16 x i16> undef to <16 x i32>
; VEC256-NEXT: Cost Model: Found an estimated cost of 3 for instruction: %F = sext <32 x i8> undef to <32 x i16>
; VEC256-NEXT: Cost Model: Found an estimated cost of 0 for instruction: ret void
;
; VEC512-LABEL: 'sext256'
; VEC512-NEXT: Cost Model: Found an estimated cost of 24 for instruction: %A = sext <8 x i8> undef to <8 x i64>
; VEC512-NEXT: Cost Model: Found an estimated cost of 1 for instruction: %B = sext <8 x i16> undef to <8 x i64>
; VEC512-NEXT: Cost Model: Found an estimated cost of 1 for instruction: %C = sext <8 x i32> undef to <8 x i64>
; VEC512-NEXT: Cost Model: Found an estimated cost of 1 for instruction: %D = sext <16 x i8> undef to <16 x i32>
; VEC512-NEXT: Cost Model: Found an estimated cost of 1 for instruction: %E = sext <16 x i16> undef to <16 x i32>
; VEC512-NEXT: Cost Model: Found an estimated cost of 1 for instruction: %F = sext <32 x i8> undef to <32 x i16>
; VEC512-NEXT: Cost Model: Found an estimated cost of 0 for instruction: ret void
;
%A = sext <8 x i8> undef to <8 x i64>
%B = sext <8 x i16> undef to <8 x i64>
%C = sext <8 x i32> undef to <8 x i64>
%D = sext <16 x i8> undef to <16 x i32>
%E = sext <16 x i16> undef to <16 x i32>
%F = sext <32 x i8> undef to <32 x i16>
ret void
}

define void @sext512() "min-legal-vector-width"="512" {
; AVX-LABEL: 'sext512'
; AVX-NEXT: Cost Model: Found an estimated cost of 7 for instruction: %A = sext <8 x i8> undef to <8 x i64>
; AVX-NEXT: Cost Model: Found an estimated cost of 7 for instruction: %B = sext <8 x i16> undef to <8 x i64>

```

```

; AVX-NEXT: Cost Model: Found an estimated cost of 3 for instruction: %C = sext <8 x i32> undef to <8 x i64>
; AVX-NEXT: Cost Model: Found an estimated cost of 4 for instruction: %D = sext <16 x i8> undef to <16 x i32>
; AVX-NEXT: Cost Model: Found an estimated cost of 4 for instruction: %E
= sext <16 x i16> undef to <16 x i32>
; AVX-NEXT: Cost Model: Found an estimated cost of 3 for instruction: %F = sext <32 x i8> undef to <32 x i16>
; AVX-NEXT: Cost Model: Found an estimated cost of 0 for instruction: ret void
;
; SKX256-LABEL: 'sext512'
; SKX256-NEXT: Cost Model: Found an estimated cost of 24 for instruction: %A = sext <8 x i8> undef to <8 x
i64>
; SKX256-NEXT: Cost Model: Found an estimated cost of 1 for instruction: %B = sext <8 x i16> undef to <8 x
i64>
; SKX256-NEXT: Cost Model: Found an estimated cost of 1 for instruction: %C = sext <8 x i32> undef to <8 x
i64>
; SKX256-NEXT: Cost Model: Found an estimated cost of 1 for instruction: %D = sext <16 x i8> undef to <16 x
i32>
; SKX256-NEXT: Cost Model: Found an estimated cost of 1 for instruction: %E = sext <16 x i16> undef to <16 x
i32>
; SKX256-NEXT: Cost Model: Found an estimated cost of 1 for instruction: %F = sext <32 x i8> undef to <32 x
i16>
; SKX256-NEXT: Cost Model: Found an estimated cost of 0 for
instruction: ret void
;
; VEC512-LABEL: 'sext512'
; VEC512-NEXT: Cost Model: Found an estimated cost of 24 for instruction: %A = sext <8 x i8> undef to <8 x
i64>
; VEC512-NEXT: Cost Model: Found an estimated cost of 1 for instruction: %B = sext <8 x i16> undef to <8 x
i64>
; VEC512-NEXT: Cost Model: Found an estimated cost of 1 for instruction: %C = sext <8 x i32> undef to <8 x
i64>
; VEC512-NEXT: Cost Model: Found an estimated cost of 1 for instruction: %D = sext <16 x i8> undef to <16 x
i32>
; VEC512-NEXT: Cost Model: Found an estimated cost of 1 for instruction: %E = sext <16 x i16> undef to <16 x
i32>
; VEC512-NEXT: Cost Model: Found an estimated cost of 1 for instruction: %F = sext <32 x i8> undef to <32 x
i16>
; VEC512-NEXT: Cost Model: Found an estimated cost of 0 for instruction: ret void
;
%A = sext <8 x i8> undef to <8 x i64>
%B = sext <8 x i16> undef to <8 x i64>
%C = sext <8 x i32> undef to <8 x i64>
%D = sext <16 x i8> undef to <16 x i32>
%E = sext <16 x i16>
undef to <16 x i32>
%F = sext <32 x i8> undef to <32 x i16>
ret void
}

```

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*
* @(#)COPYRIGHT 8.1 (Berkeley) 3/16/94
*/
; RUN: llc -march=hexagon < %s
; REQUIRES: asserts

; The two loads based on %struct.0, loading two different data types
; cause LSR to assume type "void" for the memory type. This would then
; cause an assert in isLegalAddressingMode. Make sure we no longer crash.

target triple = "hexagon"

%struct.0 = type { i8*, i8, %union.anon.0 }
%union.anon.0 = type { i8* }

define hidden fastcc void @fred() unnamed_addr #0 {
entry:
br i1 undef, label %while.end, label %while.body.lr.ph

while.body.lr.ph:                                ; preds = %entry
br label %while.body

while.body:                                       ; preds = %exit.2, %while.body.lr.ph

```

```

%lsr.iv = phi %struct.0* [ %cgep22, %exit.2 ], [ undef, %while.body.lr.ph ]
switch i32 undef, label %exit [
  i32 1, label %sw.bb.i
  i32 2, label %sw.bb3.i
]

sw.bb.i:                                ; preds = %while.body
unreachable

sw.bb3.i:                               ; preds = %while.body
unreachable

exit:                                   ; preds = %while.body
switch i32 undef, label %exit.2 [
  i32 1, label %sw.bb.i17
  i32 2, label %sw.bb3.i20
]

sw.bb.i17:                             ; preds = %exit
%0 = bitcast %struct.0* %lsr.iv to i32*
%1 = load i32, i32* %0, align 4
unreachable

sw.bb3.i20:                            ; preds = %exit
%2 = bitcast %struct.0* %lsr.iv to i8**
%3 = load i8*, i8** %2, align 4
unreachable

exit.2:                                ; preds = %exit
%cgep22 = getelementptr %struct.0, %struct.0* %lsr.iv, i32 1
br label %while.body

while.end:                             ; preds = %entry
ret void
}

attributes #0 = { nounwind optsize "target-cpu"="hexagonv55" }
; RUN: opt %s -inline -S | FileCheck %s

define internal void @innerSmall() "min-legal-vector-width"="128" {
  ret void
}

define internal void @innerLarge() "min-legal-vector-width"="512" {
  ret void
}

```

```
define internal void @innerNoAttribute() {
  ret void
}
```

; We should not add an attribute during inlining. No attribute means unknown.  
 ; Inlining doesn't change the fact that we don't know anything about this  
 ; function.

```
define void @outerNoAttribute() {
  call void @innerLarge()
  ret void
}
```

```
define void @outerConflictingAttributeSmall() "min-legal-vector-width"="128" {
  call void @innerLarge()
  ret void
}
```

```
define void @outerConflictingAttributeLarge() "min-legal-vector-width"="512" {
  call void @innerSmall()
  ret void
}
```

; We should remove the attribute after inlining since the callee's  
 ; vector width requirements are unknown.

```
define void @outerAttribute() "min-legal-vector-width"="128" {
  call void @innerNoAttribute()
  ret void
}
```

```
; CHECK: define void @outerNoAttribute() {
; CHECK:
  define void @outerConflictingAttributeSmall() #0
; CHECK: define void @outerConflictingAttributeLarge() #0
; CHECK: define void @outerAttribute() {
; CHECK: attributes #0 = { "min-legal-vector-width"="512" }
; RUN: llc -mtriple=aarch64-apple-ios %s -o - | FileCheck %s
```

```
define <16 x double> @test_sitofp_fixed(<16 x i32> %in) {
; CHECK-LABEL: test_sitofp_fixed:
```

```
; First, extend each i32 to i64
; CHECK-DAG: sshll2.2d [[BLOCK0_HI:v[0-9]+]], v0, #0
; CHECK-DAG: sshll2.2d [[BLOCK1_HI:v[0-9]+]], v1, #0
; CHECK-DAG: sshll2.2d [[BLOCK2_HI:v[0-9]+]], v2, #0
; CHECK-DAG: sshll2.2d [[BLOCK3_HI:v[0-9]+]], v3, #0
; CHECK-DAG: sshll.2d [[BLOCK0_LO:v[0-9]+]], v0, #0
; CHECK-DAG: sshll.2d [[BLOCK1_LO:v[0-9]+]], v1, #0
; CHECK-DAG: sshll.2d [[BLOCK2_LO:v[0-9]+]], v2, #0
```

```

; CHECK-DAG: sshll.2d [[BLOCK3_LO:v[0-9]+]], v3, #0

; Next, convert each to double.
; CHECK-DAG: scvtf.2d v0, [[BLOCK0_LO]]
; CHECK-DAG: scvtf.2d v1, [[BLOCK0_HI]]
; CHECK-DAG: scvtf.2d v2, [[BLOCK1_LO]]
; CHECK-DAG: scvtf.2d v3, [[BLOCK1_HI]]
; CHECK-DAG: scvtf.2d v4, [[BLOCK2_LO]]
; CHECK-DAG: scvtf.2d v5, [[BLOCK2_HI]]
; CHECK-DAG: scvtf.2d v6, [[BLOCK3_LO]]
; CHECK-DAG: scvtf.2d v7, [[BLOCK3_HI]]

; CHECK: ret
%flt = sitofp <16 x i32>
%in to <16 x double>
%res = fdiv <16 x double> %flt, <double 64.0, double 64.0, double 64.0, double 64.0, double 64.0, double 64.0,
double 64.0, double 64.0, double 64.0, double 64.0, double 64.0, double 64.0, double 64.0, double 64.0, double 64.0>
ret <16 x double> %res
}

; This one is small enough to satisfy isSimple, but still illegally large.
define <4 x double> @test_sitofp_fixed_shortish(<4 x i64> %in) {
; CHECK-LABEL: test_sitofp_fixed_shortish:

; CHECK-DAG: scvtf.2d v0, v0
; CHECK-DAG: scvtf.2d v1, v1

; CHECK: ret
%flt = sitofp <4 x i64> %in to <4 x double>
%res = fdiv <4 x double> %flt, <double 64.0, double 64.0, double 64.0, double 64.0>
ret <4 x double> %res
}

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Zbigniew Skowron <zbychs@gmail.com>  
; RUN: opt -consthoist -S -o - %s | FileCheck %s  
target datalayout = "e-m:e-p:32:32-i64:64-v128:64:128-a:0:32-n32-S64"  
target triple = "thumbv6m-none--musleabi"

```
; Check that for i8 type, the maximum legal offset is 31.
; Also check that an constant used as value to be stored rather than
; pointer in a store instruction is hoisted.
; CHECK: foo_i8
; CHECK-DAG: %[[C1:const[0-9]?]] = bitcast i32 805874720 to i32
; CHECK-DAG: %[[C2:const[0-9]?]] = bitcast i32 805874688 to i32
; CHECK-DAG: %[[C3:const[0-9]?]] = bitcast i32 805873720 to i32
; CHECK-DAG: %[[C4:const[0-9]?]] = bitcast i32 805873688 to i32
; CHECK: %0 = inttoptr i32 %[[C2]] to i8*
; CHECK-NEXT: %1 = load volatile i8, i8* %0
; CHECK-NEXT: %[[M1:const_mat[0-9]?]] = add i32 %[[C2]], 4
; CHECK-NEXT: %2 = inttoptr i32 %[[M1]] to i8*
; CHECK-NEXT: %3 = load volatile i8, i8* %2
; CHECK-NEXT: %[[M2:const_mat[0-9]?]] = add i32 %[[C2]], 31
; CHECK-NEXT: %4 = inttoptr i32 %[[M2]] to i8*
; CHECK-NEXT: %5 = load volatile i8, i8*
%4
; CHECK-NEXT: %6 = inttoptr i32 %[[C1]] to i8*
; CHECK-NEXT: %7 = load volatile i8, i8* %6
; CHECK-NEXT: %[[M3:const_mat[0-9]?]] = add i32 %[[C1]], 7
; CHECK-NEXT: %8 = inttoptr i32 %[[M3]] to i8*
; CHECK-NEXT: %9 = load volatile i8, i8* %8
; CHECK-NEXT: %10 = inttoptr i32 %[[C4]] to i8*
; CHECK-NEXT: store i8 %9, i8* %10
; CHECK-NEXT: %[[M4:const_mat[0-9]?]] = add i32 %[[C4]], 31
; CHECK-NEXT: %11 = inttoptr i32 %[[M4]] to i8*
; CHECK-NEXT: store i8 %7, i8* %11
; CHECK-NEXT: %12 = inttoptr i32 %[[C3]] to i8*
; CHECK-NEXT: store i8 %5, i8* %12
; CHECK-NEXT: %[[M5:const_mat[0-9]?]] = add i32 %[[C3]], 7
; CHECK-NEXT: %13 = inttoptr i32 %[[M5]] to i8*
; CHECK-NEXT: store i8 %3, i8* %13
; CHECK-NEXT: %[[M6:const_mat[0-9]?]] = add i32 %[[C1]], 80
; CHECK-NEXT: %14 = inttoptr i32 %[[M6]] to i8*
; CHECK-NEXT: store i8* %14, i8** @goo
```

@goo = global i8\* undef

```
define void @foo_i8() {
entry:
```

```

%0 = load volatile i8, i8* inttoptr (i32 805874688 to i8*)
%1 = load volatile
i8, i8* inttoptr (i32 805874692 to i8*)
%2 = load volatile i8, i8* inttoptr (i32 805874719 to i8*)
%3 = load volatile i8, i8* inttoptr (i32 805874720 to i8*)
%4 = load volatile i8, i8* inttoptr (i32 805874727 to i8*)
store i8 %4, i8* inttoptr(i32 805873688 to i8*)
store i8 %3, i8* inttoptr(i32 805873719 to i8*)
store i8 %2, i8* inttoptr(i32 805873720 to i8*)
store i8 %1, i8* inttoptr(i32 805873727 to i8*)
store i8* inttoptr(i32 805874800 to i8*), i8** @goo
ret void
}

```

```

; Check that for i16 type, the maximum legal offset is 62.
; CHECK: foo_i16
; CHECK-DAG: %[[C1:const[0-9]?]] = bitcast i32 805874752 to i32
; CHECK-DAG: %[[C2:const[0-9]?]] = bitcast i32 805874688 to i32
; CHECK: %0 = inttoptr i32 %[[C2]] to i16*
; CHECK-NEXT: %1 = load volatile i16, i16* %0, align 2
; CHECK-NEXT: %[[M1:const_mat[0-9]?]] = add i32 %[[C2]], 4
; CHECK-NEXT: %2 = inttoptr i32 %[[M1]] to i16*
; CHECK-NEXT: %3 = load volatile i16, i16* %2, align 2
; CHECK-NEXT: %[[M2:const_mat[0-9]?]] = add i32
%[[C2]], 32
; CHECK-NEXT: %4 = inttoptr i32 %[[M2]] to i16*
; CHECK-NEXT: %5 = load volatile i16, i16* %4, align 2
; CHECK-NEXT: %[[M3:const_mat[0-9]?]] = add i32 %[[C2]], 62
; CHECK-NEXT: %6 = inttoptr i32 %[[M3]] to i16*
; CHECK-NEXT: %7 = load volatile i16, i16* %6, align 2
; CHECK-NEXT: %8 = inttoptr i32 %[[C1]] to i16*
; CHECK-NEXT: %9 = load volatile i16, i16* %8, align 2
; CHECK-NEXT: %[[M4:const_mat[0-9]?]] = add i32 %[[C1]], 22
; CHECK-NEXT: %10 = inttoptr i32 %[[M4]] to i16*
; CHECK-NEXT: %11 = load volatile i16, i16* %10, align 2

```

```

define void @foo_i16() {
entry:
%0 = load volatile i16, i16* inttoptr (i32 805874688 to i16*), align 2
%1 = load volatile i16, i16* inttoptr (i32 805874692 to i16*), align 2
%2 = load volatile i16, i16* inttoptr (i32 805874720 to i16*), align 2
%3 = load volatile i16, i16* inttoptr (i32 805874750 to i16*), align 2
%4 = load volatile i16, i16* inttoptr (i32 805874752 to i16*), align 2
%5 = load volatile i16, i16* inttoptr (i32 805874774
to i16*), align 2
ret void
}

```

```

; Check that for i32 type, the maximum legal offset is 124.
; CHECK: foo_i32
; CHECK-DAG: %[[C1:const[0-9]?]] = bitcast i32 805874816 to i32
; CHECK-DAG: %[[C2:const[0-9]?]] = bitcast i32 805874688 to i32
; CHECK: %0 = inttoptr i32 %[[C2]] to i32*
; CHECK-NEXT: %1 = load volatile i32, i32* %0, align 4
; CHECK-NEXT: %[[M1:const_mat[0-9]?]] = add i32 %[[C2]], 4
; CHECK-NEXT: %2 = inttoptr i32 %[[M1]] to i32*
; CHECK-NEXT: %3 = load volatile i32, i32* %2, align 4
; CHECK-NEXT: %[[M2:const_mat[0-9]?]] = add i32 %[[C2]], 124
; CHECK-NEXT: %4 = inttoptr i32 %[[M2]] to i32*
; CHECK-NEXT: %5 = load volatile i32, i32* %4, align 4
; CHECK-NEXT: %6 = inttoptr i32 %[[C1]] to i32*
; CHECK-NEXT: %7 = load volatile i32, i32* %6, align 4
; CHECK-NEXT: %[[M3:const_mat[0-9]?]] = add i32 %[[C1]], 8
; CHECK-NEXT: %8 = inttoptr i32 %[[M3]] to i32*
; CHECK-NEXT: %9 = load volatile i32, i32* %8, align 4
; CHECK-NEXT: %[[M4:const_mat[0-9]?]] = add i32 %[[C1]],
12
; CHECK-NEXT: %10 = inttoptr i32 %[[M4]] to i32*
; CHECK-NEXT: %11 = load volatile i32, i32* %10, align 4

```

```

define void @foo_i32() {
entry:
%0 = load volatile i32, i32* inttoptr (i32 805874688 to i32*), align 4
%1 = load volatile i32, i32* inttoptr (i32 805874692 to i32*), align 4
%2 = load volatile i32, i32* inttoptr (i32 805874812 to i32*), align 4
%3 = load volatile i32, i32* inttoptr (i32 805874816 to i32*), align 4
%4 = load volatile i32, i32* inttoptr (i32 805874824 to i32*), align 4
%5 = load volatile i32, i32* inttoptr (i32 805874828 to i32*), align 4
ret void
}

```

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=====

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LLVM System Interface Library

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```
; RUN: llc < %s -mtriple=x86_64-linux-android -mattr=+mmx -enable-legalize-types-checking | FileCheck %s
;
; D31946
; Check that we dont end up with the ""LLVM ERROR: Cannot select" error.
; Additionally ensure that the output code actually put fp128 values in SSE registers.
```

```
declare fp128 @llvm.fabs.f128(fp128)
declare fp128 @llvm.copysign.f128(fp128, fp128)
```

```
define fp128 @TestSelect(fp128 %a, fp128 %b) {
    %cmp = fcmp ogt fp128 %a, %b
    %sub = fsub fp128 %a, %b
    %res = select i1 %cmp, fp128 %sub, fp128 0xL00000000000000000000000000000000
    ret fp128 %res
; CHECK-LABEL: TestSelect:
; CHECK      movaps 16(%rsp), %xmm1
; CHECK-NEXT  callq __subtf3
; CHECK-NEXT  testl %ebx, %ebx
; CHECK-NEXT  jg .LBB0_2
; CHECK-NEXT # %bb.1:
; CHECK-NEXT  movaps .LCPI0_0(%rip), %xmm0
; CHECK-NEXT .LBB0_2:
; CHECK-NEXT  addq $32, %rsp
; CHECK-NEXT  popq %rbx
; CHECK-NEXT  retq
}
```

```
define fp128 @TestFabs(fp128 %a) {
    %res = call fp128 @llvm.fabs.f128(fp128 %a)
    ret fp128 %res
; CHECK-LABEL: TestFabs:
;
; CHECK      andps .LCPI1_0(%rip), %xmm0
; CHECK-NEXT retq
}
```

```

define fp128 @TestCopysign(fp128 %a, fp128 %b) {
    %res = call fp128 @llvm.copysign.f128(fp128 %a, fp128 %b)
    ret fp128 %res
; CHECK-LABEL: TestCopysign:
; CHECK      andps .LCPI2_1(%rip), %xmm0
; CHECK-NEXT orps %xmm1, %xmm0
; CHECK-NEXT retq
}

define fp128 @TestFneg(fp128 %a) {
    %mul = fmul fp128 %a, %a
    %res = fsub fp128 0xL00000000000000008000000000000000, %mul
    ret fp128 %res
; CHECK-LABEL: TestFneg:
; CHECK      movaps %xmm0, %xmm1
; CHECK-NEXT callq __multf3
; CHECK-NEXT xorps .LCPI3_0(%rip), %xmm0
; CHECK-NEXT popq %rax
; CHECK-NEXT retq
}

```

## 1.131 bouncycastle-fips 1.0.2

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## 1.133 snake-yaml 1.26

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## 1.139 openssl 1.0.2q

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# 1.141 mitchellh-mapstructure 1.3.0

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## 1.144 go-playground-validator 10.2.0

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## 1.145 gorilla 1.7.4

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procfs provides functions to retrieve system, kernel and process metrics from the pseudo-filesystem proc.

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#

# Please keep the list sorted.

#

# Use the following command to generate the list

#

# git shortlog -se | awk '{print \$2 " " \$3 " " \$4}'

#

# and do appropriate cleanups.

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David Wilkie <dwilkie@gmail.com>  
Seyi Ogunyemi <micrypt@users.noreply.github.com>  
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compiler/cpp/src/generate/t\_cpp\_generator.cc  
compiler/cpp/src/generate/t\_csharp\_generator.cc  
compiler/cpp/src/generate/t\_erb\_generator.cc  
compiler/cpp/src/generate/t\_hs\_generator.cc  
compiler/cpp/src/generate/t\_java\_generator.cc  
compiler/cpp/src/generate/t\_ocaml\_generator.cc  
compiler/cpp/src/generate/t\_perl\_generator.cc  
compiler/cpp/src/generate/t\_php\_generator.cc  
compiler/cpp/src/generate/t\_py\_generator.cc  
compiler/cpp/src/generate/t\_rb\_generator.cc  
compiler/cpp/src/generate/t\_st\_generator.cc  
compiler/cpp/src/generate/t\_xsd\_generator.cc  
compiler/cpp/src/main.cc  
compiler/cpp/src/parse/t\_field.h  
compiler/cpp/src/parse/t\_program.h  
compiler/cpp/src/platform.h  
compiler/cpp/src/thrift.ll  
compiler/cpp/src/thrift.yy  
lib/csharp/src/Protocol/TBinaryProtocol.cs  
lib/csharp/src/Protocol/TField.cs  
lib/csharp/src/Protocol/TList.cs  
lib/csharp/src/Protocol/TMap.cs  
lib/csharp/src/Protocol/TMessage.cs  
lib/csharp/src/Protocol/TMessageType.cs  
lib/csharp/src/Protocol/TProtocol.cs  
lib/csharp/src/Protocol/TProtocolException.cs  
lib/csharp/src/Protocol/TProtocolFactory.cs  
lib/csharp/src/Protocol/TProtocolUtil.cs  
lib/csharp/src/Protocol/TSet.cs  
lib/csharp/src/Protocol/TStruct.cs  
lib/csharp/src/Protocol/TType.cs  
lib/csharp/src/Server/TServer.cs  
lib/csharp/src/Server/TSimpleServer.cs  
lib/csharp/src/Server/TThreadPoolServer.cs  
lib/csharp/src/TApplicationException.cs  
lib/csharp/src/Thrift.csproj  
lib/csharp/src/Thrift.sln  
lib/csharp/src/TProcessor.cs  
lib/csharp/src/Transport/TServerSocket.cs  
lib/csharp/src/Transport/TServerTransport.cs  
lib/csharp/src/Transport/TSocket.cs  
lib/csharp/src/Transport/TStreamTransport.cs  
lib/csharp/src/Transport/TTransport.cs  
lib/csharp/src/Transport/TTransportException.cs  
lib/csharp/src/Transport/TTransportFactory.cs  
lib/csharp/ThriftMSBuildTask/Properties/AssemblyInfo.cs  
lib/csharp/ThriftMSBuildTask/ThriftBuild.cs

lib/csharp/ThriftMSBuildTask/ThriftMSBuildTask.csproj  
lib/rb/lib/thrift.rb  
lib/st/README  
lib/st/thrift.st  
test/OptionalRequiredTest.cpp  
test/OptionalRequiredTest.thrift  
test/ThriftTest.thrift

-----  
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```
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```
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L. Peter Deutsch  
ghost@aladdin.com

```
*/
```

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Protocol Buffers for Go with Gadgets



Go support for Protocol Buffers - Google's data interchange format

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## 1.152 mhash 0.9.9.9-4

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## 1.153 gnutls 3.5.18

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```
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<kirkwood@striderfm.intel.com> port to WindowsNT 3.5
  5. [6]Michael Barone <michael,barone@lmco.com> GPSVME fixes
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  9. [10]Piete Brooks <Piete.Brooks@cl.cam.ac.uk> MSF clock driver,  
Trimble PARSE support
  10. [11]Nelson B Bolyard <nelson@bolyard.me> update and complete  
broadcast and crypto features
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<Jean-Francois.Boudreault@viagenie.qc.ca> IPv6 support
  12. [13]Reg Clemens <reg@dwf.com> Oncore driver (Current maintainer)
  13. [14]Steve Clift <clift@ml.csiro.au> OMEGA clock driver
  14. [15]Casey Crellin <casey@csc.co.za> vxWorks (Tornado) port and help  
with target configuration
  15. [16]Sven Dietrich <sven\_dietrich@trimble.com> Palisade reference  
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  16. [17]John A. Dundas III <dundas@salt.jpl.nasa.gov> Apple A/UX port
  17. [18]Torsten Duwe <duwe@immd4.informatik.uni-erlangen.de> Linux port
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  19. [20]John Hay <jhay@icomtek.csir.co.za> IPv6 support and testing
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26. [27]Hans Lambermont <Hans.Lambermont@nl.origin-it.com> or [28]<H.Lambermont@chello.nl> ntpsweep
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41. [44]Kamal A Mostafa <kamal@whence.com> SCO OpenServer port
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43. [47]Rob Neal <neal@ntp.org> Bancomm refclock and config/parse code maintenance
44. [48]Rainer Pruy <Rainer.Pruy@informatik.uni-erlangen.de> monitoring/trap scripts, statistics file handling
45. [49]Dirce Richards <dirce@zk3.dec.com> Digital UNIX V4.0 port
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49. [53]Ray Schnitzler <schnitz@unipress.com> Unixware1 port
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\* configure.ac, Makefile.am: The original versions were derived from the ones in the XML Catalog Manager project, version 2.2.

Author: Julio Merino <jmmv@users.sourceforge.net>

\* atf-c/ui.c: The format\_paragraph and format\_text functions were derived from the ones in the Monotone project, revision 3a0982da308228d796df35f98d787c5cff2bb5b6.

Author: Julio Merino <jmmv@NetBSD.org>

\* atf-c++/detail/io.hpp, atf-c++/detail/io.cpp, atf-c++/detail/io\_test.cpp: These files were derived from the file\_handle, systembuf, pipe and pistream classes and tests found in the Boost.Process library.

Author: Julio Merino <jmmv84@gmail.com>

\* admin/check-style.sh,  
admin/check-style-common.awk,  
admin/check-style-cpp.awk, admin/check-style-shell.awk: These files, except the first one, were first implemented in the Buildtool project. They were later adapted to be part of Boost.Process and, during that process, the shell script was created.

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-->

<!-- \$Id\$ -->

<!-- Generate ISC copyright comments from Docbook copyright metadata. -->

<xsl:stylesheet version="1.0"

xmlns:xsl="http://www.w3.org/1999/XSL/Transform"

xmlns:xi="http://www.w3.org/2001/XInclude"

xmlns:db="http://docbook.org/ns/docbook">



```

<xsl:template name="isc.copyright.format">
  <xsl:param name="text"/>
  <xsl:value-of select="$isc.copyright.leader"/>
  <xsl:value-of select="normalize-space(substring-before($text, '&#10;'))"/>
  <xsl:text>&#10;</xsl:text>
  <xsl:variable name="rest" select="substring-after($text, '&#10;')"/>
  <xsl:if test="translate($rest, '&#9;&#32;', '')">
    <xsl:call-template name="isc.copyright.format">
      <xsl:with-param
name="text" select="$rest"/>
    </xsl:call-template>
  </xsl:if>
</xsl:template>

```

```

<xsl:variable name="isc.copyright.text">
  <xsl:text>
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    License, v. 2.0. If a copy of the MPL was not distributed with this
    file, You can obtain one at http://mozilla.org/MPL/2.0/.
  </xsl:text>
</xsl:variable>

```

```

<xsl:variable name="isc.copyright">
  <xsl:call-template name="isc.copyright.format">
    <xsl:with-param name="text">
      <xsl:for-each select="book/info/copyright | refentry/docinfo/copyright">
        <xsl:text>Copyright (C) </xsl:text>
        <xsl:call-template name="copyright.years">
          <xsl:with-param name="years" select="year"/>
        </xsl:call-template>
        <xsl:text> </xsl:text>
        <xsl:value-of select="holder"/>
        <xsl:value-of select="$isc.copyright.breakline"/>
        <xsl:text>&#10;</xsl:text>
      </xsl:for-each>
    <xsl:value-of select="$isc.copyright.text"/>
    </xsl:with-param>
  </xsl:call-template>
</xsl:variable>
</xsl:stylesheet>

```

<!--

- Local variables:  
- mode: sgml  
- End:

-->

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## 1.161 libidn 2.0.4

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```

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* /jackson-2-6-1-sources-1-jar/com/mastfrog/jackson/OptionalJavaUtilSerializer.java

```

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 * </p>
 *
 * @param knownSuffixes a set of suffixes that cannot be wild-carded, e.g. { ".com", ".net", ".org" }
 */
```

Found in path(s):

\* /bcpkix-fips-1-0-3-sources-1-jar/org/bouncycastle/est/jcajce/JsseDefaultHostnameAuthorizer.java

## 1.169 nss 3.37.1

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Version 3.1, 31 March 2009

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This is an attempt to acknowledge early contributions to the garbage collector. Later contributions should instead be mentioned in README.changes.

## HISTORY -

Early versions of this collector were developed as a part of research projects supported in part by the National Science Foundation and the Defense Advance Research Projects Agency.

The garbage collector originated as part of the run-time system for the Russell programming language implementation. The first version of the garbage collector was written primarily by Al Demers. It was then refined and mostly rewritten, primarily by Hans-J. Boehm, at Cornell U., the University of Washington, Rice University (where it was first used for C and assembly code), Xerox PARC, SGI, and HP Labs. However, significant contributions have also been made by many others.

Some other contributors:

More recent contributors are mentioned in the modification history in README.changes. My apologies for any omissions.

The SPARC specific code was originally contributed by Mark Weiser.

The Encore Multimax modifications were supplied by Kevin Kenny (kenny@m.cs.uiuc.edu). The adaptation to the IBM PC/RT is largely due to Vernon Lee, on machines made available to Rice by IBM.

Much of the HP specific code and a number of good suggestions for improving the generic code are due to Walter Underwood.

Robert Brazile (brazile@diamond.bbn.com) originally supplied the ULTRIX code. Al Dosser (dosser@src.dec.com) and Regis Cridlig (Regis.Cridlig@cl.cam.ac.uk) subsequently provided updates and information on variation between ULTRIX systems. Parag Patel (parag@netcom.com) supplied the A/UX code.

Jesper Peterson(jep@mtiame.mtia.oz.au), Michel Schinz, and Martin Tauchmann (martintauchmann@bigfoot.com) supplied the Amiga port. Thomas Funke (thf@zelator.in-berlin.de(?)) and

Brian D.Carlstrom (bdc@clark.lcs.mit.edu) supplied the NeXT ports.

Douglas Steel (doug@wg.icl.co.uk) provided ICL DRS6000 code.

Bill Janssen (janssen@parc.xerox.com) supplied

the SunOS dynamic loader  
specific code. Manuel Serrano (serrano@cornas.inria.fr) supplied linux and Sony News specific code. Al Dosser provided Alpha/OSF/1 code. He and Dave Detlefs(detlefs@src.dec.com) also provided several generic bug fixes. Alistair G. Crooks(agc@uts.amdahl.com) supplied the NetBSD and 386BSD ports. Jeffrey Hsu (hsu@soda.berkeley.edu) provided the FreeBSD port. Brent Benson (brent@jade.ssd.csd.harris.com) ported the collector to a Motorola 88K processor running CX/UX (Harris NightHawk). Ari Huttunen (Ari.Huttunen@hut.fi) generalized the OS/2 port to nonIBM development environments (a nontrivial task). Patrick Beard (beard@cs.ucdavis.edu) provided the initial MacOS port. David Chase, then at Olivetti Research, suggested several improvements. Scott Schwartz (schwartz@groucho.cse.psu.edu) supplied some of the code to save and print call stacks for leak detection on a SPARC. Jesse Hull and John Ellis supplied the C++ interface code. Zhong Shao performed much of the experimentation that led to the current typed allocation facility. (His dynamic type inference code hasn't made it into the released version of the collector, yet.)  
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section 10

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The ordinary General Public License therefore permits such linking only if the entire combination fits its criteria of freedom. The Lesser General Public License permits more lax criteria for linking other code with the library.

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libraries. In this case, there is little to gain by limiting the free library to free software only, so we use the Lesser General Public License.

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However,

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If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work.

(Executables containing this object code plus portions of the Library will still fall under Section 6.)

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a copy of the library already present on the user's computer system, rather than copying library functions into the executable, and (2) will operate properly with a modified version of the library, if the user installs one, as long as the modified version is interface-compatible with the version that the work was made with.

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@end iftex

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@center END OF TERMS AND CONDITIONS

@end ifinfo



@page

@appendixsubsec How to Apply These Terms to Your New Libraries

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@smallexample

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@var{signature of Ty Coon}, 1 April 1990

Ty Coon, President of Vice  
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# 1.171 libgpg-error 1.28

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## 1.172 gc 6.4.0

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# 1.173 commons-lang3 3.1

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# 1.176 openssh 7.5p1

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- IDEA is no longer included, its use is deprecated

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However, unrestricted linking of non-free programs would deprive the users of those programs of all benefit from the free status of the libraries themselves. This Library General Public License is intended to permit developers of non-free programs to use free libraries, while preserving your freedom as a user of such programs to change the free libraries that are incorporated in them. (We have not seen how to achieve this as regards changes in header files, but we have achieved it as regards changes in the actual functions of the Library.) The hope is that this will lead to faster development of free libraries.

The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a "work based on the library" and a "work that uses the library". The former contains code derived from the library, while the latter only works together with the library.

Note that it is possible for a library to be covered by the ordinary General Public License rather than by this special one.

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"Source code" for a work means the preferred form of the work for

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This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

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# 1.178 jetty 9.4.16.v20190411

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Eclipse

The following artifacts are EPL.

\* org.eclipse.jetty.orbit:org.eclipse.jdt.core

The following artifacts are EPL and ASL2.

\* org.eclipse.jetty.orbit:javax.security.auth.message

The following artifacts are EPL and CDDL 1.0.

\* org.eclipse.jetty.orbit:javax.mail.glassfish

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The following artifacts are CDDL + GPLv2 with classpath exception.

<https://glassfish.dev.java.net/nonav/public/CDDL+GPL.html>

\* javax.servlet:javax.servlet-api

\* javax.annotation:javax.annotation-api

\* javax.transaction:javax.transaction-api

\* javax.websocket:javax.websocket-api

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## Oracle OpenJDK

If ALPN is used to negotiate HTTP/2 connections, then the following artifacts may be included in the distribution or downloaded when ALPN module is selected.

\* java.sun.security.ssl

These artifacts replace/modify OpenJDK classes. The modifications are hosted at github and both modified and original are under GPL v2 with classpath exceptions.

<http://openjdk.java.net/legal/gplv2+ce.html>

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## OW2

The following artifacts are licensed by the OW2 Foundation according to the terms of <http://asm.ow2.org/license.html>

org.ow2.asm:asm-commons

org.ow2.asm:asm

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## Apache

The following artifacts are ASL2 licensed.

org.apache.taglibs:taglibs-standard-spec

org.apache.taglibs:taglibs-standard-impl

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## MortBay

The following artifacts are ASL2 licensed. Based on selected classes from following Apache Tomcat jars, all ASL2 licensed.

org.mortbay.jasper:apache-jsp

org.apache.tomcat:tomcat-jasper

org.apache.tomcat:tomcat-juli

org.apache.tomcat:tomcat-jsp-api

org.apache.tomcat:tomcat-el-api

org.apache.tomcat:tomcat-jasper-el

org.apache.tomcat:tomcat-api



org.apache.tomcat:tomcat-util-scan  
org.apache.tomcat:tomcat-util

org.mortbay.jasper:apache-el  
org.apache.tomcat:tomcat-jasper-el  
org.apache.tomcat:tomcat-el-api

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Mortbay

The following artifacts are CDDL + GPLv2 with classpath exception.

<https://glassfish.dev.java.net/nonav/public/CDDL+GPL.html>

org.eclipse.jetty.toolchain:jetty-schemas

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Assorted

The UnixCrypt.java code implements the one way cryptography used by Unix systems for simple password protection. Copyright 1996 Aki Yoshida, modified April 2001 by Iris Van den Broeke, Daniel Deville.

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## 1.180 traceback2 1.4.0

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## 1.181 linecache 1.0.0

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## 1.182 linenoise 1.0

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## 1.184 docutils 0.14

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Python was created in the early 1990s by Guido van Rossum at Stichting Mathematisch Centrum (CWI) in the Netherlands as a successor of a language called ABC. Guido is Python's principal author, although it includes many contributions from others. The last version released from CWI was Python 1.2. In 1995, Guido continued his work on Python at the Corporation for National Research Initiatives (CNRI) in Reston, Virginia where he released several versions of the software. Python 1.6 was the last of the versions released by CNRI. In 2000, Guido and the Python core development team moved to BeOpen.com to form the BeOpen PythonLabs team. Python 2.0 was the first and only release from BeOpen.com.

Following the release of Python 1.6, and after Guido van Rossum left CNRI to work with commercial software developers, it became clear that the ability to use Python with software available under the GNU Public License (GPL) was very desirable.

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## 1.186 six 1.11.0

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We call this license the ``Lesser'' General Public License because it does Less to protect the user's freedom than the ordinary General Public License. It also provides other free software developers Less of an advantage over competing non-free programs. These disadvantages are the reason we use the ordinary General Public License for many libraries. However, the Lesser license provides advantages in certain special circumstances.

For example, on rare occasions, there may be a special need to encourage the widest possible use of a certain library, so that it becomes a de-facto standard. To achieve this, non-free programs must be allowed to use the library. A more frequent case is that a free library does the same job as widely used non-free libraries. In this case, there is little to gain by limiting the free library to free software only, so we use the Lesser General Public License.

In other cases, permission to use a particular library in non-free

programs enables a greater number of people to use a large body of free software. For example, permission to use the GNU C Library in non-free programs enables many more people to use the whole GNU operating system, as well as its variant, the GNU/Linux operating system.

Although the Lesser General Public License is Less protective of the users' freedom, it does ensure that the user of a program that is linked with the Library has the freedom and the wherewithal to run that program using a modified version of the Library.

The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a ``work based on the library" and a ``work that uses the library". The former contains code derived from the library, whereas the latter must be combined with the library in order to run.

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A ``library" means a collection of software functions and/or data prepared so as to be conveniently linked with application programs (which use some of those functions and data) to form executables.

The ``Library", below, refers to any such software library or work which has been distributed under these terms. A ``work based on the Library" means either the Library or any derivative work under copyright law: that is to say, a work containing the Library or a portion of it, either verbatim or with modifications and/or translated straightforwardly into another language. (Hereinafter, translation is included without limitation in the term ``modification".)

``Source code" for a work means the preferred form of the work for making modifications to it. For a library, complete source code means all the source code for all modules it contains, plus any associated interface

definition files, plus the scripts used to control compilation and installation of the library.

Activities other than copying, distribution and modification are not covered by this License; they are outside its scope. The act of running a program using the Library is not restricted, and output from such a program is covered only if its contents constitute a work based on the Library (independent of the use of the Library in a tool for writing it). Whether that is true depends on what the Library does and what the program that uses the Library does.

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If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful.

(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

@end enumerate

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based on the Library, the distribution of the whole must be on the terms of this License, whose permissions for other licensees extend to the entire whole, and thus to each and every part regardless of who wrote it.

Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Library.

In addition, mere aggregation of another work not based on the Library with the Library (or with a work based on the Library) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

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You may copy and distribute the Library (or a portion or derivative of it, under Section 2)

in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

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A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a ``work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a ``work that uses the Library" with the Library creates

an executable that is a derivative of the Library (because it contains portions of the Library), rather than a ``work that uses the library". The executable is therefore covered by this License. Section 6 states terms for distribution of such executables.

When a ``work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure

layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

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As an exception to the Sections above, you may also combine or link a ``work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer's own use and reverse engineering for debugging such modifications.

You must give prominent notice with each copy of the work that the Library is used in it and that the Library and its use are covered by this License. You must supply a copy of this License. If the work during execution displays copyright notices, you must include the copyright notice for the Library among them, as well as a reference directing the user to the copy of this License. Also, you must do one of these things:

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Accompany the work with the complete corresponding machine-readable source code for the Library including whatever changes were used in the work (which must be distributed under Sections 1 and 2 above); and, if the work is an executable linked with the Library, with the complete machine-readable ``work that uses the Library", as object code and/or source code, so that the user can modify the Library and then relink to produce a modified executable containing the modified Library. (It is understood that the user who changes the contents of definitions files in the Library will not necessarily be able to recompile the application to use the modified definitions.)

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Use a suitable shared library mechanism for linking with the Library. A

suitable mechanism is one that (1) uses at run time a copy of the library already present on the user's computer system, rather than copying library functions into the executable, and (2) will operate properly with a modified version of the library, if the user installs one, as long as the modified version is interface-compatible with the version that the work was made with.

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Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.

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If distribution of the work is made by offering access to copy from a designated place, offer equivalent access to copy the above specified materials from the same place.

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Verify that the user has already received a copy of these materials or that you have already sent this user a copy.

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For an executable, the required form of the ``work that uses the Library" must include any data and utility programs needed for reproducing the executable from

it. However, as a special exception, the materials to be distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

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that you do these two things:

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Accompany the combined library with a copy of the same work based on the Library, uncombined with any other library facilities. This must be distributed under the terms of the Sections above.

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Give prominent notice with the combined library of the fact that part of it is a work based on the Library, and explaining where to find the accompanying uncombined form of the same work.

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@center How to Apply These Terms to Your New Libraries

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To apply these terms, attach the following notices to the library. It is safest to attach them to the start of each source file to most effectively convey the exclusion of warranty; and each file should have at least the ``copyright" line and a pointer to where the full notice is found.

@format

@t{

<one line to give the library's name and a brief idea of what it does.>

Copyright (C) <year> <name of author>

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```
}  
@end format
```

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You should also get your employer (if you work as a programmer) or your school, if any, to sign a ``copyright disclaimer" for the library, if necessary. Here is a sample; alter the names:

```
@format  
@t{  
Yoyodyne, Inc., hereby disclaims all copyright interest in the  
library `Frob' (a library for tweaking knobs) written by James Random Hacker.  
  
<signature of Ty Coon>, 1 April 1990  
Ty Coon, President of Vice  
}  
@end format
```

That's all there is to it!

@c @bye

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Finally, software patents pose a constant threat to the existence of any free program. We wish to make sure that a company cannot effectively restrict the users of a free program by obtaining a restrictive license from a patent holder. Therefore, we insist that any patent license obtained for a version of the library must be consistent with the full freedom of use specified in this license.

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(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

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\* admin/check-style.sh,  
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-->

<!-- \$Id\$ -->

<!-- Generate ISC copyright comments from Docbook copyright metadata. -->

<xsl:stylesheet version="1.0"

xmlns:xsl="http://www.w3.org/1999/XSL/Transform"

xmlns:xi="http://www.w3.org/2001/XInclude"

xmlns:db="http://docbook.org/ns/docbook">

<xsl:template name="isc.copyright.format">

<xsl:param name="text"/>

<xsl:value-of select="\$isc.copyright.leader"/>

<xsl:value-of select="normalize-space(substring-before(\$text, '&#10;'))"/>

<xsl:text>&#10;</xsl:text>

<xsl:variable name="rest" select="substring-after(\$text, '&#10;')"/>

<xsl:if test="translate(\$rest, '&#9;&#32;', '')">

<xsl:call-template name="isc.copyright.format">

<xsl:with-param

```

name="text" select="$rest"/>
  </xsl:call-template>
</xsl:if>
</xsl:template>

<xsl:variable name="isc.copyright.text">
  <xsl:text>
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    file, You can obtain one at http://mozilla.org/MPL/2.0/.
  </xsl:text>
</xsl:variable>

<xsl:variable name="isc.copyright">
  <xsl:call-template name="isc.copyright.format">
    <xsl:with-param name="text">
      <xsl:for-each select="book/info/copyright | refentry/docinfo/copyright">
        <xsl:text>Copyright (C) </xsl:text>
        <xsl:call-template name="copyright.years">
          <xsl:with-param name="years" select="year"/>
        </xsl:call-template>
        <xsl:text> </xsl:text>
        <xsl:value-of select="holder"/>
        <xsl:value-of select="$isc.copyright.breakline"/>
        <xsl:text>&#10;</xsl:text>
      </xsl:for-each>
      <xsl:value-of select="$isc.copyright.text"/>
    </xsl:with-param>
  </xsl:call-template>
</xsl:variable>
</xsl:stylesheet>

```

<!--

- Local variables:
- mode: sgml
- End:

-->

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# 1.206 commons-lang3 2.6

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## 1.207 asm 5.0.3

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- \*/
- /\*\*
- \* Constructs a new {@link LocalVariableAnnotationNode}. *<i>Subclasses must*
- \* not use this constructor*</i>*. Instead, they must use the
- \* {@link #LocalVariableAnnotationNode(int, TypePath, LabelNode[], LabelNode[], int[], String)}
- \* version.
- \*
- 
- \* @param typeRef
- \* a reference to the annotated type. See {@link TypeReference}.
- \* @param typePath
- \* the path to the annotated type argument, wildcard bound, array
- \* element type, or static inner type within 'typeRef'. May be
- \* `<tt>null</tt>` if the annotation targets 'typeRef' as a whole.
- \* @param start
- \* the first instructions corresponding to the continuous ranges
- \* that make the scope of this local variable (inclusive).
- \* @param end
- \* the last instructions corresponding to the continuous ranges
- \* that make the scope of this local variable (exclusive). This
- \* array must have the same size as the 'start' array.
- \* @param index
- \* the local variable's index in each range. This array must have
- \* the same size as the 'start' array.

```
* @param desc
*         the class descriptor of
the annotation class.
*/
```

Found in path(s):

\* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/LocalVariableAnnotationNode.java

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```
*/
```

```
/**
```

```
* Constructs a new {@link Textifier}. <i>Subclasses must not use this
```

```
* constructor</i>. Instead, they must use the {@link #Textifier(int)}
```

```
* version.
```

```
*
```

```
* @throws IllegalStateException
```

```
* If a subclass calls this constructor.
```

```
*/
```

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\* /asm-5-0-3-sources-7-jar/org/objectweb/asm/signature/package.html  
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\*/

/\*\*

\* Creates a new {@link GeneratorAdapter}. *Subclasses must not use this*

\* constructor*.* Instead, they must use the

\* {@link #GeneratorAdapter(int, MethodVisitor, int, String, String)}

\* version.

\*

\* @param mv

\* the

method visitor to which this adapter delegates calls.

\* @param access

\* the method's access flags (see {@link Opcodes}).

\* @param name

\* the method's name.

\* @param desc

\* the method's descriptor (see {@link Type Type}).

\* @throws IllegalStateException

\* If a subclass calls this constructor.

\*/

Found in path(s):

\* /asm-5-0-3-sources-7-jar/org/objectweb/asm/commons/GeneratorAdapter.java

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\* /asm-5-0-3-sources-7-jar/org/objectweb/asm/xml/SAXClassAdapter.java

\* /asm-5-0-3-sources-7-jar/org/objectweb/asm/xml/SAXAdapter.java

\* /asm-5-0-3-sources-7-jar/org/objectweb/asm/xml/SAXCodeAdapter.java

\* /asm-5-0-3-sources-7-jar/org/objectweb/asm/xml/ASMContentHandler.java

\*

/asm-5-0-3-sources-7-jar/org/objectweb/asm/xml/SAXFieldAdapter.java

\* /asm-5-0-3-sources-7-jar/org/objectweb/asm/xml/SAXAnnotationAdapter.java



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*/
/**
 * Creates a new JSRInliner. <i>Subclasses must not use this
 * constructor</i>. Instead, they must use the
 * {@link #JSRInlinerAdapter(int, MethodVisitor, int, String, String, String, String[])}
 * version.
 *
 * @param mv
 *
 * the <code>MethodVisitor</code> to send the resulting inlined
 * method code to (use <code>null</code> for none).
 * @param access
 * the method's access flags (see {@link Opcodes}). This
 * parameter also indicates if the method is synthetic and/or
 * deprecated.
 * @param name
 * the method's name.
 * @param desc
 * the method's descriptor (see {@link Type}).
 * @param signature
 * the method's signature. May be <tt>null</tt>.
 * @param exceptions
 * the internal names of the method's exception classes (see
 * {@link Type#getInternalName() getInternalName}). May be
 * <tt>null</tt>.
 * @throws IllegalStateException
 * If a subclass calls this constructor.
 */

```

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\* /asm-5-0-3-sources-7-jar/org/objectweb/asm/commons/JSRInlinerAdapter.java

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/\*\*

\* Creates a new {@link AnalyzerAdapter}. *Subclasses must not use this*

\* constructor*.* Instead, they must use the

\* {@link #AnalyzerAdapter(int, String, int, String, String, MethodVisitor)}

\* version.

\*

\* @param owner

\*

the owner's class name.

\* @param access

\* the method's access flags (see {@link Opcodes}).

\* @param name

\* the method's name.

\* @param desc

\* the method's descriptor (see {@link Type Type}).

\* @param mv

\* the method visitor to which this adapter delegates calls. May

\* be `null`.

```
* @throws IllegalStateException
*     If a subclass calls this constructor.
*/
```

Found in path(s):

```
* /asm-5-0-3-sources-7-jar/org/objectweb/asm/commons/AnalyzerAdapter.java
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```

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*/
```

Found in path(s):

```
* /asm-5-0-3-sources-7-jar/org/objectweb/asm/optimizer/ClassOptimizer.java
* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/analysis/Value.java
* /asm-5-0-3-sources-7-jar/org/objectweb/asm/Label.java
* /asm-5-0-3-sources-7-jar/org/objectweb/asm/Item.java
*
* /asm-5-0-3-sources-7-jar/org/objectweb/asm/commons/StaticInitMerger.java
* /asm-5-0-3-sources-7-jar/org/objectweb/asm/optimizer/MethodConstantsCollector.java
* /asm-5-0-3-sources-7-jar/org/objectweb/asm/AnnotationVisitor.java
```

- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/commons/RemappingMethodAdapter.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/analysis/Frame.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/MethodVisitor.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/analysis/BasicValue.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/ClassVisitor.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/ClassWriter.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/commons/Remapper.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/VarInsnNode.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/commons/LocalVariablesSorter.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/AnnotationNode.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/TypeInsnNode.java
- \*
- /asm-5-0-3-sources-7-jar/org/objectweb/asm/util/TraceMethodVisitor.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/Edge.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/commons/Method.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/MethodNode.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/signature/SignatureWriter.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/LocalVariableNode.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/LookupSwitchInsnNode.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/analysis/BasicVerifier.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/FrameNode.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/optimizer/AnnotationConstantsCollector.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/Frame.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/ParameterNode.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/InnerClassNode.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/optimizer/FieldConstantsCollector.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/ClassReader.java
- \*
- /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/MultiANewArrayInsnNode.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/ByteVector.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/InvokeDynamicInsnNode.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/TableSwitchInsnNode.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/commons/RemappingClassAdapter.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/optimizer/JarOptimizer.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/signature/SignatureReader.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/optimizer/Shrinker.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/MethodInsnNode.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/commons/TryCatchBlockSorter.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/util/TraceAnnotationVisitor.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/analysis/Subroutine.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/TryCatchBlockNode.java
- \*
- /asm-5-0-3-sources-7-jar/org/objectweb/asm/util/CheckMethodAdapter.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/LabelNode.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/Context.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/analysis/Interpreter.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/analysis/SmallSet.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/optimizer/Constant.java

- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/analysis/SimpleVerifier.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/analysis/SourceValue.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/MethodWriter.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/InsnNode.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/Type.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/InsnList.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/optimizer/MethodOptimizer.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/InsnNode.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/util/CheckClassAdapter.java
- \*
- /asm-5-0-3-sources-7-jar/org/objectweb/asm/Handler.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/util/CheckFieldAdapter.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/analysis/Analyzer.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/FieldVisitor.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/FieldNode.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/LdcInsnNode.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/LineNumberNode.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/commons/SerialVersionUIDAdder.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/util/TraceSignatureVisitor.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/AnnotationWriter.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/util/TraceClassVisitor.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/util/CheckAnnotationAdapter.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/commons/SimpleRemapper.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/TypeAnnotationNode.java
- \*
- /asm-5-0-3-sources-7-jar/org/objectweb/asm/optimizer/ConstantPool.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/commons/TableSwitchGenerator.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/signature/SignatureVisitor.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/AbstractInsnNode.java
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- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/analysis/AnalyzerException.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/FieldWriter.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/analysis/SourceInterpreter.java
- \*
- /asm-5-0-3-sources-7-jar/org/objectweb/asm/Handle.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/commons/RemappingSignatureAdapter.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/commons/AdviceAdapter.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/Attribute.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/Opcodes.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/util/TraceFieldVisitor.java
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- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/util/Printer.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/optimizer/NameMapping.java

\* /asm-5-0-3-sources-7-jar/org/objectweb/asm/commons/RemappingAnnotationAdapter.java  
\* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/FieldInsnNode.java  
\* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/JumpInsnNode.java  
\* /asm-5-0-3-sources-7-jar/org/objectweb/asm/commons/InstructionAdapter.java  
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/\*\*

\* Constructs a new {@link ClassNode}. *Subclasses must not use this*  
\* constructor*.* Instead, they must use the {@link #ClassNode(int)}  
\* version.  
\*  
\* @throws IllegalStateException  
\* If a subclass calls this constructor.  
\*/

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\* /asm-5-0-3-sources-7-jar/org/objectweb/asm/tree/ClassNode.java

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- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/util/ASMifiable.java
- \* /asm-5-0-3-sources-7-jar/org/objectweb/asm/util/Textifiable.java

## 1.208 commons-logging 1.2

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Found in path(s):

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```

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```

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*/

```

Found in path(s):

```

* /commons-logging-1-1-sources-9-jar/org/apache/commons/logging/impl/AvalonLogger.java
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```

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\* /commons-logging-1-1-sources-9-jar/org/apache/commons/logging/impl/WeakHashtable.java  
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\*/

Found in path(s):

\* /commons-logging-1-1-sources-9-jar/org/apache/commons/logging/LogConfigurationException.java  
\* /commons-logging-1-1-sources-9-jar/org/apache/commons/logging/impl/Log4JLogger.java  
\* /commons-logging-1-1-sources-9-jar/org/apache/commons/logging/impl/LogFactoryImpl.java  
\* /commons-logging-1-1-sources-9-jar/org/apache/commons/logging/impl/Jdk13LumberjackLogger.java  
\*

/commons-logging-1-1-sources-9-jar/org/apache/commons/logging/impl/SimpleLog.java

\* /commons-logging-1-1-sources-9-jar/org/apache/commons/logging/impl/Jdk14Logger.java

\* /commons-logging-1-1-sources-9-jar/org/apache/commons/logging/LogSource.java

\* /commons-logging-1-1-sources-9-jar/org/apache/commons/logging/impl/NoOpLog.java

\* /commons-logging-1-1-sources-9-jar/org/apache/commons/logging/impl/LogKitLogger.java

\* /commons-logging-1-1-sources-9-jar/org/apache/commons/logging/Log.java

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Found in path(s):

- \* /commons-logging-1-1-sources-9-jar/org/apache/commons/logging/package.html
- \* /commons-logging-1-1-sources-9-jar/org/apache/commons/logging/impl/package.html

## 1.209 bcel 2.7.2

### 1.209.1 Available under license :

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```
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 * limitations under the License.
 */

/*
 * $Id: xpath.cup 1225752 2011-12-30 04:12:46Z mrglavas $
 */

/*
 * @author Jacek Ambroziak
 * @author
 * Santiago Pericas-Geertsen
 * @author Morten Jorgensen
 * @author G. Todd Miller
 */
```

package org.apache.xalan.xsltc.compiler;

```

import java.util.Stack;
import java.util.Vector;
import java.io.StringReader;
import java_cup.runtime.*;

import org.apache.xml.dtm.DTM;
import org.apache.xalan.xsltc.DOM;
import org.apache.xml.dtm.Axis;
import org.apache.xalan.xsltc.runtime.Operators;
import org.apache.xalan.xsltc.compiler.util.ErrorMsg;

parser code {
    /**
     * Used by function calls with no args.
     */
    static public final Vector EmptyArgs = new Vector(0);

    /**
     * Reference to non-existing variable.
     */
    static public final VariableRef DummyVarRef = null;

    /**
     * Reference to the Parser class.
     */
    private Parser _parser;
    private XSLTC _xsltc;

    /**
     * String representation of the expression being parsed.
     */
    private String _expression;

    /**
     * Line number where this expression/pattern
    was declared.
     */
    private int _lineNumber = 0;

    /**
     * Reference to the symbol table.
     */
    public SymbolTable _symbolTable;

    public XPathParser(Parser parser) {
        _parser = parser;
        _xsltc = parser.getXSLTC();
    }

```

```

        _symbolTable = parser.getSymbolTable();
    }

    public int getLineNumber() {
        return _lineNumber;
    }

    public QName getQNameIgnoreDefaultNs(String name) {
        return _parser.getQNameIgnoreDefaultNs(name);
    }

    public QName getQName(String namespace, String prefix, String localname) {
        return _parser.getQName(namespace, prefix, localname);
    }

    public void setMultiDocument(boolean flag) {
        _xslt.setMultiDocument(flag);
    }

    public void setCallsNodeset(boolean flag) {
        _xslt.setCallsNodeset(flag);
    }

    public void setHasIdCall(boolean flag) {
        _xslt.setHasIdCall(flag);
    }

    /**
     * This
    method is similar to findNodeType(int, Object) except that it
     * creates a StepPattern instead of just returning a node type. It also
     * differs in the way it handles "{uri}:*" and "{uri}:@*". The last two
     * patterns are expanded as "[namespace-uri() = 'uri']" and
     * "@*[namespace-uri() = 'uri']", respectively. This expansion considerably
     * simplifies the grouping of patterns in the Mode class. For this
     * expansion to be correct, the priority of the pattern/template must be
     * set to -0.25 (when no other predicates are present).
     */
    public StepPattern createStepPattern(int axis, Object test, Vector predicates) {
    int nodeType;

    if (test == null) { // ""
        nodeType = (axis == Axis.ATTRIBUTE) ? NodeTest.ATTRIBUTE :
        (axis == Axis.NAMESPACE) ? -1 : NodeTest.ELEMENT;

        return new StepPattern(axis, nodeType, predicates);
    }

```

```

        else if (test instanceof Integer) {
            nodeType = ((Integer) test).intValue();

        }

        return new StepPattern(axis, nodeType, predicates);
    }
    else {
        QName name = (QName) test;
        boolean setPriority = false;

        if (axis == Axis.NAMESPACE) {
            nodeType = (name.toString().equals("*")) ? -1
                : _xslt.registerNamespacePrefix(name);
        }
        else {
            final String uri = name.getNamespace();
            final String local = name.getLocalPart();
            final QName namespace_uri =
                _parser.getQNameIgnoreDefaultNs("namespace-uri");

            // Expand {uri}:* to *[namespace-uri() = 'uri'] - same for @*
            if (uri != null && (local.equals("") || local.equals("@*"))) {
                if (predicates == null) {
                    predicates = new Vector(2);
                }

                // Priority is set by hand if no other predicates exist
                setPriority = (predicates.size() == 0);

                predicates.add(
                    new Predicate(
                        new EqualityExpr(Operators.EQ,
                            new NamespaceUriCall(namespace_uri),
                            new LiteralExpr(uri))));
            }

            if (local.equals(""))
            {
                nodeType = (axis == Axis.ATTRIBUTE) ? NodeTest.ATTRIBUTE
                    : NodeTest.ELEMENT;
            }
            else if (local.equals("@*")) {
                nodeType = NodeTest.ATTRIBUTE;
            }
            else {
                nodeType = (axis == Axis.ATTRIBUTE) ? _xslt.registerAttribute(name)
                    : _xslt.registerElement(name);
            }
        }
    }

```

```

    }

    final StepPattern result = new StepPattern(axis, nodeType, predicates);

    // Set priority for case prefix:* and prefix:@* (no predicates)
    if (setPriority) {
result.setPriority(-0.25);
    }

    return result;
}
}

public int findNodeType(int axis, Object test) {
if (test == null) { // *
    return (axis == Axis.ATTRIBUTE) ?
NodeTest.ATTRIBUTE :
(axis == Axis.NAMESPACE) ? -1 : NodeTest.ELEMENT;
    }
    else if (test instanceof Integer) {
        return ((Integer)test).intValue();
    }
    else {
        QName name = (QName)test;

        if (axis == Axis.NAMESPACE) {
return (name.toString().equals(""))
? -1
: _xsltc.registerNamespacePrefix(name);
        }

        if (name.getNamespace() == null) {
final String local = name.getLocalPart();

if (local.equals("")) {
            return (axis == Axis.ATTRIBUTE) ? NodeTest.ATTRIBUTE
: NodeTest.ELEMENT;
        }
        else if (local.equals("@*")) {
            return NodeTest.ATTRIBUTE;
        }
        }

        return (axis == Axis.ATTRIBUTE) ? _xsltc.registerAttribute(name)
: _xsltc.registerElement(name);
    }
}
}

```



```

/**
 * Parse the expression passed to the current scanner. If this
 * expression contains references to local variables and it will be
 * compiled in an external module (not in the main class) request
 * the current template to create a new variable stack frame.
 *
 * @param lineNumber Line where the current expression is defined.
 * @param external Set to <tt>true</tt> if this expression is
 *                compiled in a separate module.
 *
 */
public Symbol parse(String expression, int lineNumber) throws Exception {
    try {
        _expression = expression;
        _lineNumber = lineNumber;
        return super.parse();
    }
    catch (IllegalCharException e) {
        ErrorMsg err = new ErrorMsg(ErrorMsg.ILLEGAL_CHAR_ERR,
                                    lineNumber, e.getMessage());
        _parser.reportError(Constants.FATAL, err);
    }
    return null;
}

/**
 * Lookup a variable or parameter in the symbol table given its name.
 *
 * @param name Name of the symbol being looked up.
 */
final SyntaxTreeNode lookupName(QName name) {
    // Is it a local var or param ?
    final SyntaxTreeNode result = _parser.lookupVariable(name);
    if (result != null)
        return(result);
    else
        return(_symbolTable.lookupName(name));
}

public final void addError(ErrorMsg error) {
    _parser.reportError(Constants.ERROR,
error);
}

public void report_error(String message, Object info) {
final ErrorMsg err = new ErrorMsg(ErrorMsg.SYNTAX_ERR, _lineNumber,
    _expression);

```

```

_parser.reportError(Constants.FATAL, err);
}

public void report_fatal_error(String message, Object info) {
    // empty
}

public RelativeLocationPath insertStep(Step step, RelativeLocationPath rlp) {
if (rlp instanceof Step) {
    return new ParentLocationPath(step, (Step) rlp);
}
else if (rlp instanceof ParentLocationPath) {
    final ParentLocationPath plp = (ParentLocationPath) rlp;
    final RelativeLocationPath newrlp = insertStep(step, plp.getPath());
    return new ParentLocationPath(newrlp, plp.getStep());
}
else {
    addError(new ErrorMsg(ErrorMsg.INTERNAL_ERR, "XPathParser.insertStep"));
    return rlp;
}
}

/**
 * Returns true if the axis applies to elements only. The axes
 * child, attribute, namespace, descendant
result in non-empty
 * nodesets only if the context node is of type element.
 */
public boolean isElementAxis(int axis) {
return (axis == Axis.CHILD || axis == Axis.ATTRIBUTE ||
axis == Axis.NAMESPACE || axis == Axis.DESCEDANT);
}
:}

terminal SLASH, DOT, LBRACK, RBRACK, VBAR, LPAREN, RPAREN, STAR, COMMA;
terminal DOLLAR, ATSIGN;
terminal DDOT, DCOLON, DSLASH;
terminal EQ, NE;
terminal LT, GT, LE, GE;
terminal PLUS, MINUS, DIV, MOD, MULT;
terminal String Literal;
terminal String QNAME;
terminal ID, KEY, TEXT, NODE, OR, AND, COMMENT, PI, PIPARAM, PRECEDINGSIBLING;
terminal SELF, PARENT, CHILD, ATTRIBUTE, ANCESTOR, ANCESTORORSELF, DESCENDANT;
terminal DESCENDANTORSELF, FOLLOWING, FOLLOWINGSIBLING, NAMESPACE, PRECEDING;
terminal Double REAL;
terminal Long INT;
terminal PATTERN, EXPRESSION;

```

non terminal SyntaxTreeNode TopLevel;

non terminal Expression Expr, Argument, LocationPath;

non terminal Expression Predicate, FilterExpr, Step;

non

terminal Expression OrExpr, AndExpr, EqualityExpr;

non terminal Expression RelationalExpr, AdditiveExpr;

non terminal Expression MultiplicativeExpr, UnaryExpr;

non terminal Expression VariableReference, FunctionCall;

non terminal Expression PrimaryExpr, UnionExpr, PathExpr, AbbreviatedStep;

non terminal Expression RelativeLocationPath, AbbreviatedRelativeLocationPath;

non terminal Expression AbsoluteLocationPath, AbbreviatedAbsoluteLocationPath;

non terminal Object NodeTest, NameTest;

non terminal IdKeyPattern IdKeyPattern;

non terminal Pattern Pattern;

non terminal Pattern LocationPathPattern;

non terminal StepPattern ProcessingInstructionPattern;

non terminal RelativePathPattern RelativePathPattern;

non terminal StepPattern StepPattern;

non terminal Object NodeTestPattern, NameTestPattern;

non terminal Vector Predicates, NonemptyArgumentList;

non terminal QName QName, FunctionName, VariableName;

non terminal Integer AxisName, AxisSpecifier;

non terminal

Integer ChildOrAttributeAxisSpecifier;

precedence left VBAR;

precedence left OR;

precedence left AND;

precedence nonassoc EQ, NE;

precedence left LT, GT, LE, GE;

precedence left PLUS, MINUS;

precedence left DIV, MOD, MULT;

precedence left DOLLAR;

precedence left ATSIGN;

precedence right DCOLON;

start with TopLevel;

TopLevel ::= PATTERN Pattern:pattern

{: RESULT = pattern; :}

| EXPRESSION Expr:expr

```

{: RESULT = expr; :};

/* ----- Patterns ----- */

Pattern ::= LocationPathPattern:lpp
  {: RESULT = lpp; :}

  | LocationPathPattern:lpp VBAR Pattern:p
  {: RESULT = new AlternativePattern(lpp, p); :};

LocationPathPattern ::= SLASH
  {: RESULT = new AbsolutePathPattern(null); :}

  | SLASH RelativePathPattern:rpp
  {: RESULT = new AbsolutePathPattern(rpp); :}

  | IdKeyPattern:ikp

{: RESULT = ikp; :}

  | IdKeyPattern:ikp SLASH RelativePathPattern:rpp
  {: RESULT = new ParentPattern(ikp, rpp); :}

  | IdKeyPattern:ikp DSLASH RelativePathPattern:rpp
  {: RESULT = new AncestorPattern(ikp, rpp); :}

  | DSLASH RelativePathPattern:rpp
  {: RESULT = new AncestorPattern(rpp); :}

  | RelativePathPattern:rpp
  {: RESULT = rpp; :};

IdKeyPattern ::= ID LPAREN Literal:l RPAREN
  {: RESULT = new IdPattern(l);
   parser.setHasIdCall(true);
  :}

  | KEY LPAREN Literal:l1 COMMA Literal:l2 RPAREN
  {: RESULT = new KeyPattern(l1, l2); :};

ProcessingInstructionPattern ::= PIPARAM LPAREN Literal:l RPAREN
  {: RESULT = new ProcessingInstructionPattern(l); :};

RelativePathPattern ::= StepPattern:sp
  {: RESULT = sp; :}

  | StepPattern:sp SLASH RelativePathPattern:rpp
  {: RESULT

```

```

= new ParentPattern(sp, rpp); :}

| StepPattern:sp DSLASH RelativePathPattern:rpp
{: RESULT = new AncestorPattern(sp, rpp); :};

StepPattern ::= NodeTestPattern:nt
{:
RESULT = parser.createStepPattern(Axis.CHILD, nt, null);
:}

| NodeTestPattern:nt Predicates:pp
{:
RESULT = parser.createStepPattern(Axis.CHILD, nt, pp);
:}

| ProcessingInstructionPattern:pip
{: RESULT = pip; :}

| ProcessingInstructionPattern:pip Predicates:pp
{: RESULT = (ProcessingInstructionPattern)pip.setPredicates(pp); :}

| ChildOrAttributeAxisSpecifier:axis NodeTestPattern:nt
{:
RESULT = parser.createStepPattern(axis.intValue(), nt, null);
:}

| ChildOrAttributeAxisSpecifier:axis
NodeTestPattern:nt Predicates:pp
{:
RESULT = parser.createStepPattern(axis.intValue(), nt, pp);
:}

| ChildOrAttributeAxisSpecifier:axis ProcessingInstructionPattern:pip
{:
RESULT = pip; // TODO: report error if axis is attribute
:}

| ChildOrAttributeAxisSpecifier:axis ProcessingInstructionPattern:pip
Predicates:pp
{:
// TODO: report error if axis is attribute
RESULT = (ProcessingInstructionPattern)pip.setPredicates(pp);
:};

NodeTestPattern ::= NameTestPattern:nt
{: RESULT = nt; :}

| NODE

```

```

{: RESULT = new Integer(NodeTest.ANODE); :}

| TEXT
{: RESULT = new Integer(NodeTest.TEXT); :}

| COMMENT
{: RESULT = new Integer(NodeTest.COMMENT); :}

| PI
{: RESULT = new Integer(NodeTest.PI); :};

NameTestPattern ::= STAR
{: RESULT = null; :}

| QName:qn
{: RESULT = qn; :};

ChildOrAttributeAxisSpecifier ::= ATSIGN

{: RESULT = new Integer(Axis.ATTRIBUTE); :}

| CHILD DCOLON
{: RESULT = new Integer(Axis.CHILD); :}

| ATTRIBUTE DCOLON
{: RESULT = new Integer(Axis.ATTRIBUTE); :};

Predicates ::= Predicate:p
{:
Vector temp = new Vector();
temp.addElement(p);
RESULT = temp;
:}

| Predicate:p Predicates:pp
{: pp.insertElementAt(p, 0); RESULT = pp; :};

Predicate ::= LBRACK Expr:e RBRACK
{:
RESULT = new Predicate(e);
:};

/* ----- Expressions ----- */

Expr ::= OrExpr:ex
{: RESULT = ex; :};

OrExpr ::= AndExpr:ae

```

```

{: RESULT = ae; :}

| OrExpr:oe OR AndExpr:ae
{: RESULT = new LogicalExpr(LogicalExpr.OR, oe, ae); :};

AndExpr ::= EqualityExpr:e
{: RESULT = e; :}

| AndExpr:ae AND EqualityExpr:ee
{: RESULT = new LogicalExpr(LogicalExpr.AND,
ae, ee); :};

EqualityExpr ::= RelationalExpr:re
{: RESULT = re; :}

| EqualityExpr:ee EQ RelationalExpr:re
{: RESULT = new EqualityExpr(Operators.EQ, ee, re); :}

| EqualityExpr:ee NE RelationalExpr:re
{: RESULT = new EqualityExpr(Operators.NE, ee, re); :};

RelationalExpr ::= AdditiveExpr:ae
{: RESULT = ae; :}

| RelationalExpr:re LT AdditiveExpr:ae
{: RESULT = new RelationalExpr(Operators.LT, re, ae); :}

| RelationalExpr:re GT AdditiveExpr:ae
{: RESULT = new RelationalExpr(Operators.GT, re, ae); :}

| RelationalExpr:re LE AdditiveExpr:ae
{: RESULT = new RelationalExpr(Operators.LE, re, ae); :}

| RelationalExpr:re GE AdditiveExpr:ae
{: RESULT = new RelationalExpr(Operators.GE, re, ae); :};

AdditiveExpr ::= MultiplicativeExpr:me
{: RESULT = me; :}

| AdditiveExpr:ae PLUS MultiplicativeExpr:me
{: RESULT = new BinOpExpr(BinOpExpr.PLUS,
ae, me); :}

| AdditiveExpr:ae MINUS MultiplicativeExpr:me
{: RESULT = new BinOpExpr(BinOpExpr.MINUS, ae, me); :};

MultiplicativeExpr ::= UnaryExpr:ue
{: RESULT = ue; :}

```

```

| MultiplicativeExpr:me MULT UnaryExpr:ue
{: RESULT = new BinOpExpr(BinOpExpr.TIMES, me, ue); :}

| MultiplicativeExpr:me DIV UnaryExpr:ue
{: RESULT = new BinOpExpr(BinOpExpr.DIV, me, ue); :}

| MultiplicativeExpr:me MOD UnaryExpr:ue
{: RESULT = new BinOpExpr(BinOpExpr.MOD, me, ue); :};

UnaryExpr ::= UnionExpr:ue
{: RESULT = ue; :}

| MINUS UnaryExpr:ue
{: RESULT = new UnaryOpExpr(ue); :};

UnionExpr ::= PathExpr:pe
{: RESULT = pe; :}

| PathExpr:pe VBAR UnionExpr:rest
{: RESULT = new UnionPathExpr(pe, rest); :};

PathExpr ::= LocationPath:lp
{: RESULT = lp; :}

| FilterExpr:fexp
{: RESULT = fexp; :}

| FilterExpr:fexp
SLASH RelativeLocationPath:rlp
{: RESULT = new FilterParentPath(fexp, rlp); :}

| FilterExpr:fexp DSLASH RelativeLocationPath:rlp
{:
    //
    // Expand '/' into '/descendant-or-self::node()' or
    // into '/descendant-or-self::*/'
    //
    int nodeType = DOM.NO_TYPE;
    if (rlp instanceof Step &&
        parser.isElementAxis(((Step) rlp).getAxis()))
    {
        nodeType = DTM.ELEMENT_NODE;
    }

    final Step step = new Step(Axis.DESCENDANTORSELF, nodeType, null);
    FilterParentPath fpp = new FilterParentPath(fexp, step);
    fpp = new FilterParentPath(fpp, rlp);
    if (fexp instanceof KeyCall == false) {

```



```

        fpp.setDescendantAxis();
    }
    RESULT = fpp;
};

LocationPath ::= RelativeLocationPath:rlp
    {: RESULT = rlp; :}

    | AbsoluteLocationPath:alp
    {: RESULT = alp; :};

RelativeLocationPath ::= Step:step
    {: RESULT
= step; :}

    | RelativeLocationPath:rlp SLASH Step:step
    {:
if (rlp instanceof Step && ((Step) rlp).isAbbreviatedDot()) {
    RESULT = step;    // Remove './' from the middle
}
else if (((Step) step).isAbbreviatedDot()) {
    RESULT = rlp;    // Remove './' from the end
}
else {
    RESULT =
        new ParentLocationPath((RelativeLocationPath) rlp, step);
}
:}

    | AbbreviatedRelativeLocationPath:arlp
    {: RESULT = arlp; :};

AbsoluteLocationPath ::= SLASH
    {: RESULT = new AbsoluteLocationPath(); :}

    | SLASH RelativeLocationPath:rlp
    {: RESULT = new AbsoluteLocationPath(rlp); :}

    | AbbreviatedAbsoluteLocationPath:aalp
    {: RESULT = aalp; :};

AbbreviatedRelativeLocationPath ::= RelativeLocationPath:rlp DSLASH Step:step
    {:
final Step right = (Step)step;
final
int axis = right.getAxis();
final int type = right.getNodeType();
final Vector predicates = right.getPredicates();

```

```

if ((axis == Axis.CHILD) && (type != NodeTest.ATTRIBUTE)) {
    // Compress '//child:E' into 'descendant::E' - if possible
    if (predicates == null) {
        right.setAxis(Axis.DESCENDANT);
        if (rlp instanceof Step && ((Step)rlp).isAbbreviatedDot()) {
            RESULT = right;
        }
        else {
            // Expand 'rlp//child::E' into 'rlp/descendant::E'
            RelativeLocationPath left = (RelativeLocationPath)rlp;
            RESULT = new ParentLocationPath(left, right);
        }
    }
    else {
        // Expand '//step' -> 'descendant-or-self::*/*step'
        if (rlp instanceof Step && ((Step)rlp).isAbbreviatedDot()) {

            Step left = new Step(Axis.DESCENDANTORSELF,
DTM.ELEMENT_NODE, null);
            RESULT = new ParentLocationPath(left, right);
        }
        else {
            // Expand 'rlp//step' -> 'rlp/descendant-or-self::*/*step'
            RelativeLocationPath left = (RelativeLocationPath)rlp;
            Step mid = new Step(Axis.DESCENDANTORSELF,
DTM.ELEMENT_NODE, null);
            ParentLocationPath ppl = new ParentLocationPath(mid, right);
            RESULT = new ParentLocationPath(left, ppl);
        }
    }
}
else if ((axis == Axis.ATTRIBUTE) || (type == NodeTest.ATTRIBUTE)) {
    // Expand 'rlp//step' -> 'rlp/descendant-or-self::*/*step'
    RelativeLocationPath left = (RelativeLocationPath)rlp;
    Step middle = new Step(Axis.DESCENDANTORSELF,
DTM.ELEMENT_NODE, null);

    ParentLocationPath ppl = new ParentLocationPath(middle, right);
    RESULT = new ParentLocationPath(left, ppl);
}
else {
    // Expand 'rlp//step' -> 'rlp/descendant-or-self::node()/step'
    RelativeLocationPath left = (RelativeLocationPath)rlp;
    Step middle = new Step(Axis.DESCENDANTORSELF,
DOM.NO_TYPE, null);
    ParentLocationPath ppl = new ParentLocationPath(middle, right);
    RESULT = new ParentLocationPath(left, ppl);
}

```

```

}
:};

```

AbbreviatedAbsolutePath ::= DSLASH RelativeLocationPath:rlp

```

{:
    //
    // Expand '/' into '/descendant-or-self::node()' or
    // into '/descendant-or-self::*/'
    //
    int nodeType = DOM.NO_TYPE;
    if (rlp instanceof Step &&
        parser.isElementAxis(((Step) rlp).getAxis()))
    {
        nodeType = DTM.ELEMENT_NODE;
    }
    final Step step = new Step(Axis.DESCENDANTORSELF, nodeType, null);
    RESULT =
new AbsoluteLocationPath(parser.insertStep(step,
    (RelativeLocationPath) rlp));
:};

```

Step ::= NodeTest:ntest

```

{:
    if (ntest instanceof Step) {
        RESULT = (Step)ntest;
    }
    else {
RESULT = new Step(Axis.CHILD,
    parser.findNodeType(Axis.CHILD, ntest),
    null);
    }
:}

```

| NodeTest:ntest Predicates:pp

```

{:
    if (ntest instanceof Step) {
        Step step = (Step)ntest;
        step.addPredicates(pp);
        RESULT = (Step)ntest;
    }
    else {
        RESULT = new Step(Axis.CHILD,
            parser.findNodeType(Axis.CHILD, ntest), pp);
    }
:}

```

| AxisSpecifier:axis NodeTest:ntest Predicates:pp

```

{: RESULT = new Step(axis.intValue(),
    parser.findNodeType(axis.intValue(), ntest),
    pp);
:}

```

```

| AxisSpecifier:axis NodeTest:ntest
{: RESULT = new Step(axis.intValue(),
    parser.findNodeType(axis.intValue(), ntest),
    null);
:}

```

```

| AbbreviatedStep:abbrev
{: RESULT = abbrev; :};

```

```

AxisSpecifier ::= AxisName:an DCOLON
{: RESULT = an; :}

```

```

| ATSIGN
{: RESULT = new Integer(Axis.ATTRIBUTE); :};

```

```

AxisName ::= ANCESTOR
{: RESULT = new Integer(Axis.ANCESTOR); :}

```

```

| ANCESTORORSELF
{: RESULT = new Integer(Axis.ANCESTORORSELF); :}

```

```

| ATTRIBUTE
{: RESULT = new Integer(Axis.ATTRIBUTE); :}

```

```

| CHILD
{: RESULT = new Integer(Axis.CHILD); :}

```

```

| DESCENDANT
{: RESULT = new Integer(Axis.DECENDANT); :}

```

```

| DESCENDANTORSELF
{: RESULT = new Integer(Axis.DECENDANTORSELF); :}

```

```

| FOLLOWING
{: RESULT = new
Integer(Axis.FOLLOWING); :}

```

```

| FOLLOWINGSIBLING
{: RESULT = new Integer(Axis.FOLLOWINGSIBLING); :}

```

```

| NAMESPACE
{: RESULT = new Integer(Axis.NAMESPACE); :}

```

```

| PARENT
{: RESULT = new Integer(Axis.PARENT); :}

| PRECEDING
{: RESULT = new Integer(Axis.PRECEDING); :}

| PRECEDINGSIBLING
{: RESULT = new Integer(Axis.PRECEDINGSIBLING); :}

| SELF
{: RESULT = new Integer(Axis.SELF); :};

AbbreviatedStep ::= DOT
{: RESULT = new Step(Axis.SELF, NodeTest.ANODE, null); :}

| DDOT
{: RESULT = new Step(Axis.PARENT, NodeTest.ANODE, null); :};

FilterExpr ::= PrimaryExpr:primary
{: RESULT = primary; :}

| PrimaryExpr:primary Predicates:pp
{: RESULT = new FilterExpr(primary, pp); :};

PrimaryExpr ::= VariableReference:vr
{: RESULT = vr; :}

| LPAREN Expr:ex RPAREN
{: RESULT = ex; :}

| Literal:string
{:
/*
* If the string appears to have the syntax of a QName, store
* namespace info in the literal expression. This is used for
* element-available and function-available functions, among
* others. Also, the default namespace must be ignored.
*/
String namespace = null;
final int index = string.lastIndexOf(':');

if (index > 0) {
    final String prefix = string.substring(0, index);
    namespace = parser._symbolTable.lookupNamespace(prefix);
}
RESULT = (namespace == null) ? new LiteralExpr(string)
: new LiteralExpr(string, namespace);

```

```

:}

| INT:num
{:
long value = num.longValue();
if (value < Integer.MIN_VALUE || value > Integer.MAX_VALUE) {
RESULT = new RealExpr(value);
}
else {
    if (num.doubleValue() == -0)
        RESULT = new RealExpr(num.doubleValue());
    else if (num.intValue() == 0)
        RESULT = new IntExpr(num.intValue());

    else if (num.doubleValue() == 0.0)
        RESULT = new RealExpr(num.doubleValue());
    else
        RESULT = new IntExpr(num.intValue());
}
:}

| REAL:num
{: RESULT = new RealExpr(num.doubleValue()); :}

| FunctionCall:fc
{: RESULT = fc; :};

```

VariableReference ::= DOLLAR VariableName:varName

```

{:
// An empty qname prefix for a variable or parameter reference
// should map to the null namespace and not the default URI.
SyntaxTreeNode node = parser.lookupName(varName);

if (node != null) {
    if (node instanceof Variable) {
        RESULT = new VariableRef((Variable)node);
    }
    else if (node instanceof Param) {
        RESULT = new ParameterRef((Param)node);
    }
    else {
        RESULT = new UnresolvedRef(varName);
    }
}

if (node == null) {
    RESULT = new UnresolvedRef(varName);
}
}

```

};

FunctionCall ::= FunctionName:fname LPAREN RPAREN

```
{:  
  
    if (parser.getQNameIgnoreDefaultNs("current").equals(fname)) {  
        RESULT = new CurrentCall(fname);  
    }  
    else if (parser.getQNameIgnoreDefaultNs("number").equals(fname)) {  
        RESULT = new NumberCall(fname, parser.EmptyArgs);  
    }  
    else if (parser.getQNameIgnoreDefaultNs("string").equals(fname)) {  
        RESULT = new StringCall(fname, parser.EmptyArgs);  
    }  
    else if (parser.getQNameIgnoreDefaultNs("concat").equals(fname)) {  
        RESULT = new ConcatCall(fname, parser.EmptyArgs);  
    }  
    else if (parser.getQNameIgnoreDefaultNs("true").equals(fname)) {  
        RESULT = new BooleanExpr(true);  
    }  
    else if (parser.getQNameIgnoreDefaultNs("false").equals(fname)) {  
  
        RESULT = new BooleanExpr(false);  
    }  
    else if (parser.getQNameIgnoreDefaultNs("name").equals(fname)) {  
        RESULT = new NameCall(fname);  
    }  
    else if (parser.getQNameIgnoreDefaultNs("generate-id").equals(fname)) {  
        RESULT = new GenerateIdCall(fname, parser.EmptyArgs);  
    }  
    else if (parser.getQNameIgnoreDefaultNs("string-length").equals(fname)) {  
        RESULT = new StringLengthCall(fname, parser.EmptyArgs);  
    }  
    else if (parser.getQNameIgnoreDefaultNs("position").equals(fname)) {  
        RESULT = new PositionCall(fname);  
    }  
    else if (parser.getQNameIgnoreDefaultNs("last").equals(fname)) {  
        RESULT = new LastCall(fname);  
    }  
    else if (parser.getQNameIgnoreDefaultNs("local-name").equals(fname)) {  
        RESULT = new LocalNameCall(fname);  
    }  
    else if (parser.getQNameIgnoreDefaultNs("namespace-uri").equals(fname)) {  
        RESULT = new NamespaceUriCall(fname);  
    }  
    else {  
        RESULT = new FunctionCall(fname, parser.EmptyArgs);  
    }  
}
```

```

}
:}

| FunctionName:fname LPAREN NonemptyArgumentList:argl RPAREN
{
  if (parser.getQNameIgnoreDefaultNs("concat").equals(fname)) {
    RESULT = new ConcatCall(fname, argl);
  }
  else if (parser.getQNameIgnoreDefaultNs("number").equals(fname)) {
    RESULT = new NumberCall(fname, argl);
  }
  else if (parser.getQNameIgnoreDefaultNs("document").equals(fname)) {
    parser.setMultiDocument(true);
    RESULT = new DocumentCall(fname, argl);
  }
  else if (parser.getQNameIgnoreDefaultNs("string").equals(fname)) {
    RESULT = new StringCall(fname, argl);
  }
  else if (parser.getQNameIgnoreDefaultNs("boolean").equals(fname)) {
    RESULT = new BooleanCall(fname, argl);
  }
  else if (parser.getQNameIgnoreDefaultNs("name").equals(fname)) {

    RESULT = new NameCall(fname, argl);
  }
  else if (parser.getQNameIgnoreDefaultNs("generate-id").equals(fname)) {
    RESULT = new GenerateIdCall(fname, argl);
  }
  else if (parser.getQNameIgnoreDefaultNs("not").equals(fname)) {
    RESULT = new NotCall(fname, argl);
  }
  else if (parser.getQNameIgnoreDefaultNs("format-number").equals(fname)) {
    RESULT = new FormatNumberCall(fname, argl);
  }
  else if (parser.getQNameIgnoreDefaultNs("unparsed-entity-uri").equals(fname)) {
    RESULT = new UnparsedEntityUriCall(fname, argl);
  }
  else if (parser.getQNameIgnoreDefaultNs("key").equals(fname)) {
    RESULT = new KeyCall(fname, argl);
  }
  else if (parser.getQNameIgnoreDefaultNs("id").equals(fname)) {
    RESULT = new KeyCall(fname, argl);
    parser.setHasIdCall(true);
  }
  else if (parser.getQNameIgnoreDefaultNs("ceiling").equals(fname))
{
    RESULT = new CeilingCall(fname, argl);
  }
}

```



```

        else if (parser.getQNameIgnoreDefaultNs("round").equals(fname)) {
            RESULT = new RoundCall(fname, argl);
        }
        else if (parser.getQNameIgnoreDefaultNs("floor").equals(fname)) {
            RESULT = new FloorCall(fname, argl);
        }
        else if (parser.getQNameIgnoreDefaultNs("contains").equals(fname)) {
            RESULT = new ContainsCall(fname, argl);
        }
        else if (parser.getQNameIgnoreDefaultNs("string-length").equals(fname)) {
            RESULT = new StringLengthCall(fname, argl);
        }
        else if (parser.getQNameIgnoreDefaultNs("starts-with").equals(fname)) {
            RESULT = new StartsWithCall(fname, argl);
        }
        else if (parser.getQNameIgnoreDefaultNs("function-available").equals(fname)) {
            RESULT = new FunctionAvailableCall(fname, argl);
        }
        else if (parser.getQNameIgnoreDefaultNs("element-available").equals(fname))
        {
            RESULT = new ElementAvailableCall(fname, argl);
        }
        else if (parser.getQNameIgnoreDefaultNs("local-name").equals(fname)) {
            RESULT = new LocalNameCall(fname, argl);
        }
        else if (parser.getQNameIgnoreDefaultNs("lang").equals(fname)) {
            RESULT = new LangCall(fname, argl);
        }
        else if (parser.getQNameIgnoreDefaultNs("namespace-uri").equals(fname)) {
            RESULT = new NamespaceUriCall(fname, argl);
        }
        else if (parser.getQName(Constants.TRANSLET_URI, "xslt", "cast").equals(fname)) {
            RESULT = new CastCall(fname, argl);
        }
        // Special case for extension function nodeset()
        else if (fname.getLocalPart().equals("nodeset") || fname.getLocalPart().equals("node-set")) {
            parser.setCallsNodeset(true); // implies MultiDOM
            RESULT = new FunctionCall(fname, argl);
        }
        else {
            RESULT = new FunctionCall(fname, argl);
        }
    };

```

NonemptyArgumentList

```

::= Argument:arg
{
    Vector temp = new Vector();

```

```

    temp.addElement(arg);
    RESULT = temp;
:}

```

```

| Argument:arg COMMA NonemptyArgumentList:argl
{: argl.insertElementAt(arg, 0); RESULT = argl; :};

```

FunctionName ::= QName:fname

```

{:
    RESULT = fname;
:};

```

VariableName ::= QName:vname

```

{:
    RESULT = vname;
:};

```

Argument ::= Expr:ex

```

{: RESULT = ex; :};

```

NodeTest ::= NameTest:nt

```

{: RESULT = nt; :}

```

```

| NODE

```

```

{: RESULT = new Integer(NodeTest.ANODE); :}

```

```

| TEXT

```

```

{: RESULT = new Integer(NodeTest.TEXT); :}

```

```

| COMMENT

```

```

{: RESULT = new Integer(NodeTest.COMMENT); :}

```

```

| PIPARAM LPAREN Literal:l RPAREN

```

```

{:
    QName name = parser.getQNameIgnoreDefaultNs("name");
    Expression exp = new EqualityExpr(Operators.EQ,
                                     new NameCall(name),
                                     new LiteralExpr(l));
    Vector predicates = new Vector();
    predicates.addElement(new Predicate(exp));
    RESULT = new Step(Axis.CHILD, NodeTest.PI, predicates);
:}

```

```

| PI

```

```

{: RESULT = new Integer(NodeTest.PI); :};

```

NameTest ::= STAR

```

{: RESULT = null; :}

```

```

    | QName:qn
    {: RESULT = qn; :};

QName ::= QName:qname
    {: RESULT = parser.getQNameIgnoreDefaultNs(qname); :}

| DIV
    {: RESULT = parser.getQNameIgnoreDefaultNs("div"); :}

| MOD
    {: RESULT = parser.getQNameIgnoreDefaultNs("mod"); :}

| KEY
    {: RESULT = parser.getQNameIgnoreDefaultNs("key"); :}

| ANCESTOR
    {: RESULT = parser.getQNameIgnoreDefaultNs("child"); :}

| ANCESTORORSELF
    {: RESULT = parser.getQNameIgnoreDefaultNs("ancestor-or-self"); :}

| ATTRIBUTE
    {: RESULT
= parser.getQNameIgnoreDefaultNs("attribute"); :}

| CHILD
    {: RESULT = parser.getQNameIgnoreDefaultNs("child"); :}

| DESCENDANT
    {: RESULT = parser.getQNameIgnoreDefaultNs("decendant"); :}

| DESCENDANTORSELF
    {: RESULT = parser.getQNameIgnoreDefaultNs("decendant-or-self"); :}

| FOLLOWING
    {: RESULT = parser.getQNameIgnoreDefaultNs("following"); :}

| FOLLOWINGSIBLING
    {: RESULT = parser.getQNameIgnoreDefaultNs("following-sibling"); :}

| NAMESPACE
    {: RESULT = parser.getQNameIgnoreDefaultNs("namespace"); :}

| PARENT
    {: RESULT = parser.getQNameIgnoreDefaultNs("parent"); :}

| PRECEDING

```

```
{: RESULT = parser.getQNameIgnoreDefaultNs("preceding"); :}
```

```
| PRECEDINGSIBLING
```

```
{: RESULT = parser.getQNameIgnoreDefaultNs("preceding-sibling"); :}
```

```
| SELF
```

```
{: RESULT = parser.getQNameIgnoreDefaultNs("self"); :}
```

```
| ID
```

```
{: RESULT = parser.getQNameIgnoreDefaultNs("id"); :};
```

Found in path(s):

\* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/xpath.cup

No license file was found, but licenses were detected in source scan.

```
/*
```

```
* Licensed to the Apache Software Foundation (ASF) under one
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* distributed with this work for additional information
* regarding copyright ownership. The ASF licenses this file
* to you under the Apache License, Version 2.0 (the "License");
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*
* http://www.apache.org/licenses/LICENSE-2.0
*
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* distributed under the License is distributed on an "AS IS" BASIS,
* WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
* See the License for the specific language governing permissions and
* limitations under the License.
```

```
*/
```

```
/**
```

```
* Major version number.
* Version number. This changes only when there is a
* significant, externally apparent
enhancement from
* the previous release. 'n' represents the n'th
* version.
*
* Clients should carefully consider the implications
* of new versions as external interfaces and behaviour
* may have changed.
*/
```

Found in path(s):

\* /xalan-2-7-2-sources-jar/org/apache/xml/serializer/Version.java

\* /xalan-2-7-2-sources-jar/org/apache/xalan/processor/XSLProcessorVersion.java

\* /xalan-2-7-2-sources-jar/org/apache/xalan/Version.java

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\*/

/\*\*

\* This is a special exception that is used to stop parsing when

\* search for an element. For instance, when searching

for xml:stylesheet

\* PIs, it is used to stop the parse once the document element is found.

\* @see StylesheetPIHandler

\* @xsl.usage internal

\*/

Found in path(s):

\* /xalan-2-7-2-sources-jar/org/apache/xml/utils/StopParseException.java

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```

* limitations under the License.
*/
/*
* $Id: xpath.lex 1225752 2011-12-30 04:12:46Z mrglavas $
*/

/*
* @author Jacek Ambroziak
* @author
Santiago Pericas-Geertsen
* @author Morten Jorgensen
*
*/

package org.apache.xalan.xsltc.compiler;

import java_cup.runtime.Symbol;

%%
%cup
%unicode
%class XPathLexer
%yyeof

%{
    int last;

    void initialize() {
        last = -1;
    }

    static boolean isWhitespace(int c) {
        return (c == ' ' || c == '\t' || c == '\r' || c == '\n' || c == '\f');
    }
}

/**
 * If symbol is not followed by '::' or '(', then treat it as a
 * name instead of an axis or function (Jira-1912).
 */
Symbol disambiguateAxisOrFunction(int ss) throws Exception {
    // Peek in the input buffer without changing the internal state
    int index = yy_buffer_index;

    // Skip whitespace
    while (index < yy_buffer_read && isWhitespace(yy_buffer[index])) {
        index++;
    }

    // If end of buffer, can't disambiguate :(

```

```

if (index >= yy_buffer_read) {
    // Can't disambiguate, so return as symbol
    return new Symbol(ss);
}

// Return symbol if next token is ':' or '('
return (yy_buffer[index] == ':' && yy_buffer[index+1] == ':' ||
        yy_buffer[index] == '(') ?
    newSymbol(ss) : newSymbol(sym.QNAME, yytext());
}

/**
 * If symbol is first token or if it follows any of the operators
 * listed in http://www.w3.org/TR/xpath#exprlex then treat as a
 * name instead of a keyword (Jira-1912).
 */
Symbol disambiguateOperator(int ss) throws Exception {
    switch (last) {
        case -1: // first token
        case sym.ATSIGN:
        case sym.DCOLON:
        case sym.LPAREN:
        case sym.LBRACK:
        case sym.COMMA:
        case sym.AND:
        case sym.OR:
        case
sym.MOD:
        case sym.DIV:
        case sym.MULT:
        case sym.SLASH:
        case sym.DSLASH:
        case sym.VBAR:
        case sym.PLUS:
        case sym.MINUS:
        case sym.EQ:
        case sym.NE:
        case sym.LT:
        case sym.LE:
        case sym.GT:
        case sym.GE:
            return newSymbol(sym.QNAME, yytext());
    }
    return newSymbol(ss);
}

/**

```

- \* If symbol is first token or if it follows any of the operators
  - \* listed in <http://www.w3.org/TR/xpath#exprlex> then treat as a
  - \* wildcard instead of a multiplication operator
- \*/

Symbol disambiguateStar() throws Exception {

```

    switch (last) {
    case -1: // first token
    case sym.ATSIGN:
    case sym.DCOLON:
    case sym.LPAREN:
    case sym.LBRACK:
    case sym.COMMA:

```

```

case sym.AND:

```

```

    case sym.OR:
    case sym.MOD:
    case sym.DIV:
    case sym.MULT:
    case sym.SLASH:
    case sym.DSLASH:
    case sym.VBAR:
    case sym.PLUS:
    case sym.MINUS:
    case sym.EQ:
    case sym.NE:
    case sym.LT:
    case sym.LE:
    case sym.GT:
    case sym.GE:
        return newSymbol(sym.STAR);
    }
    return newSymbol(sym.MULT);
}

```

Symbol newSymbol(int ss) {

```

    last = ss;
    return new Symbol(ss);
}

```

Symbol newSymbol(int ss, String value) {

```

    last = ss;
    return new Symbol(ss, value);
}

```

Symbol newSymbol(int ss, Long value) {

```

    last = ss;
    return new Symbol(ss, value);
}

```



```

Symbol newSymbol(int ss, Double value) {
    last = ss;
    return new
Symbol(ss, value);
}
%}

```

```

%eofval{
return newSymbol(sym.EOF);
%eofval}

```

```

%yylexthrow{
Exception
%yylexthrow}

```

```
Letter={BaseChar}|{Ideographic}
```

```

BaseChar=[\u0041-\u005A\u0061-\u007A\u00C0-\u00D6\u00D8-\u00F6\u00F8-\u00FF\u0100-\u0131\u0134-
\u013E\u0141-\u0148\u014A-\u017E\u0180-\u01C3\u01CD-\u01F0\u01F4-\u01F5\u01FA-\u0217\u0250-
\u02A8\u02BB-\u02C1\u0386\u0388-\u038A\u038C\u038E-\u03A1\u03A3-\u03CE\u03D0-
\u03D6\u03DA\u03DC\u03DE\u03E0\u03E2-\u03F3\u0401-\u040C\u040E-\u044F\u0451-\u045C\u045E-
\u0481\u0490-\u04C4\u04C7-\u04C8\u04CB-\u04CC\u04D0-\u04EB\u04EE-\u04F5\u04F8-\u04F9\u0531-
\u0556\u0559\u0561-\u0586\u05D0-\u05EA\u05F0-\u05F2\u0621-\u063A\u0641-\u064A\u0671-\u06B7\u06BA-
\u06BE\u06C0-\u06CE\u06D0-\u06D3\u06D5\u06E5-\u06E6\u0905-\u0939\u093D\u0958-\u0961\u0985-
\u098C\u098F-\u0990\u0993-\u09A8\u09AA-\u09B0\u09B2\u09B6-\u09B9\u09DC-\u09DD\u09DF-
\u09E1\u09F0-\u09F1\u0A05-\u0A0A\u0A0F-\u0A10\u0A13-\u0A28\u0A2A-\u0A30\u0A32-\u0A33\u0A35-
\u0A36\u0A38-\u0A39\u0A59-\u0A5C\u0A5E\u0A72-\u0A74\u0A85-\u0A8B\u0A8D\u0A8F-\u0A91\u0A93-
\u0AA8\u0AAA-\u0AB0\u0AB2-\u0AB3\u0AB5-\u0AB9\u0ABD\u0AE0\u0B05-\u0B0C\u0B0F-\u0B10\u0B13-
\u0B28\u0B2A-\u0B30\u0B32-\u0B33\u0B36-\u0B39\u0B3D\u0B5C-\u0B5D\u0B5F-\u0B61\u0B85-
\u0B8A\u0B8E-\u0B90\u0B92-\u0B95\u0B99-\u0B9A\u0B9C\u0B9E-\u0B9F\u0BA3-\u0BA4\u0BA8-
\u0BAA\u0BAE-\u0BB5\u0BB7-\u0BB9\u0C05-\u0C0C\u0C0E-\u0C10\u0C12-\u0C28\u0C2A-\u0C33\u0C35-
\u0C39\u0C60-\u0C61\u0C85-\u0C8C\u0C8E-\u0C90\u0C92-\u0CA8\u0CAA-\u0CB3\u0CB5-
\u0CB9\u0CDE\u0CE0-\u0CE1\u0D05-\u0D0C\u0D0E-\u0D10\u0D12-\u0D28\u0D2A-\u0D39\u0D60-
\u0D61\u0E01-\u0E2E\u0E30\u0E32-\u0E33\u0E40-\u0E45\u0E81-\u0E82\u0E84\u0E87-
\u0E88\u0E8A\u0E8D\u0E94-\u0E97\u0E99-\u0E9F\u0EA1-\u0EA3\u0EA5\u0EA7\u0EAA-\u0EAB\u0EAD-
\u0EAE\u0EB0\u0EB2-\u0EB3\u0EBD\u0EC0-\u0EC4\u0F40-\u0F47\u0F49-\u0F69\u10A0-\u10C5\u10D0-
\u10F6\u1100\u1102-\u1103\u1105-\u1107\u1109\u110B-\u110C\u110E-
\u1112\u113C\u113E\u1140\u114C\u114E\u1150\u1154-\u1155\u1159\u115F-
\u1161\u1163\u1165\u1167\u1169\u116D-\u116E\u1172-\u1173\u1175\u119E\u11A8\u11AB\u11AE-
\u11AF\u11B7-\u11B8\u11BA\u11BC-\u11C2\u11EB\u11F0\u11F9\u1E00-\u1E9B\u1EA0-\u1EF9\u1F00-
\u1F15\u1F18-\u1F1D\u1F20-\u1F45\u1F48-\u1F4D\u1F50-\u1F57\u1F59\u1F5B\u1F5D\u1F5F-\u1F7D\u1F80-
\u1FB4\u1FB6-\u1FBC\u1FBE\u1FC2-\u1FC4\u1FC6-\u1FCC\u1FD0-\u1FD3\u1FD6-\u1FDB\u1FE0-
\u1FEC\u1FF2-\u1FF4\u1FF6-\u1FFC\u2126\u212A-\u212B\u212E\u2180-\u2182\u3041-\u3094\u30A1-
\u30FA\u3105-\u312C\uAC00-\uD7A3]

```

```
Ideographic=[\u4E00-\u9FA5\u3007\u3021-\u3029]
```

CombiningChar=[\u0300-\u0345\u0360-\u0361\u0483-\u0486\u0591-\u05A1\u05A3-\u05B9\u05BB-\u05BD\u05BF\u05C1-\u05C2\u05C4\u064B-\u0652\u0670\u06D6-\u06DC\u06DD-\u06DF\u06E0-\u06E4\u06E7-\u06E8\u06EA-\u06ED\u0901-\u0903\u093C\u093E-\u094C\u094D\u0951-\u0954\u0962-\u0963\u0981-\u0983\u09BC\u09BE\u09BF\u09C0-\u09C4\u09C7-\u09C8\u09CB-\u09CD\u09D7\u09E2-\u09E3\u0A02\u0A3C\u0A3E\u0A3F\u0A40-\u0A42\u0A47-\u0A48\u0A4B-\u0A4D\u0A70-\u0A71\u0A81-\u0A83\u0ABC\u0ABE-\u0AC5\u0AC7-\u0AC9\u0ACB-\u0ACD\u0B01-\u0B03\u0B3C\u0B3E-\u0B43\u0B47-\u0B48\u0B4B-\u0B4D\u0B56-\u0B57\u0B82-\u0B83\u0BBE-\u0BC2\u0BC6-\u0BC8\u0BCA-\u0BCD\u0BD7\u0C01-\u0C03\u0C3E-\u0C44\u0C46-\u0C48\u0C4A-\u0C4D\u0C55-\u0C56\u0C82-\u0C83\u0CBE-\u0CC4\u0CC6-\u0CC8\u0CCA-\u0CCD\u0CD5-\u0CD6\u0D02-\u0D03\u0D3E-\u0D43\u0D46-\u0D48\u0D4A-\u0D4D\u0D57\u0E31\u0E34-\u0E3A\u0E47-\u0E4E\u0EB1\u0EB4-\u0EB9\u0EBB-\u0EBC\u0EC8-\u0ECD\u0F18-\u0F19\u0F35\u0F37\u0F39\u0F3E\u0F3F\u0F71-\u0F84\u0F86-\u0F8B\u0F90-\u0F95\u0F97\u0F99-\u0FAD\u0FB1-\u0FB7\u0FB9\u20D0-\u20DC\u20E1\u302A-\u302F\u3099\u309A]

Digit=[\u0030-\u0039\u0660-\u0669\u06F0-\u06F9\u0966-\u096F\u09E6-\u09EF\u0A66-\u0A6F\u0AE6-\u0AEF\u0B66-\u0B6F\u0BE7-\u0BEF\u0C66-\u0C6F\u0CE6-\u0CEF\u0D66-\u0D6F\u0E50-\u0E59\u0ED0-\u0ED9\u0F20-\u0F29]

Extender=[\u00B7\u02D0\u02D1\u0387\u0640\u0E46\u0EC6\u3005\u3031-\u3035\u309D-\u309E\u30FC-\u30FE]

NCName=({Letter}|"\_"|{NCNameStartChar})({NCNameChar})\*

NCNameChar={Letter}|{Digit}|"."-"\_"|{CombiningChar}|{Extender}|{NCNameStartChar}|\u00B7 | [\u0300-\u036F] | [\u203F-\u2040] | [\u0130-\u0136]

NCNameStartChar=[\u0041-\u005A\u0061-\u007A\u00C0-\u00D6\u00D8-\u00F6\u00F8-\u02FF\u0370-\u037D\u037F-\u1FFF\u200C-\u200D\u2070-\u218F\u2C00-\u2FEF\u3001-\uD7FF\uF900-\uFDCF\uFDF0-\uFFFFD] | \u005F |({HighSurrogate}{LowSurrogate})

HighSurrogate=[\uD800-\uDBFF]

LowSurrogate=[\uDC00-\uDFFF]

%%

```
"*"      { return disambiguateStar(); }
"/"      { return newSymbol(sym.SLASH); }
"+"      { return newSymbol(sym.PLUS); }
"-"      { return newSymbol(sym.MINUS); }
"div"    { return disambiguateOperator(sym.DIV); }
"mod"    { return disambiguateOperator(sym.MOD); }
"::"     { return newSymbol(sym.DCOLON); }
","      { return newSymbol(sym.COMMA); }
"@ "     { return newSymbol(sym.ATSIGN); }
".. "    { return newSymbol(sym.DDOT); }
"| "     { return newSymbol(sym.PIPE); }
```

```

    { return newSymbol(sym.VBAR); }
"$"          { return newSymbol(sym.DOLLAR); }
"//"          { return newSymbol(sym.DSLASH); }
"="          { return newSymbol(sym.EQ); }
"!="         { return newSymbol(sym.NE); }
"<"          { return newSymbol(sym.LT); }
">"          { return newSymbol(sym.GT); }
"<="         { return newSymbol(sym.LE); }
">="         { return newSymbol(sym.GE); }
"id"          { return disambiguateAxisOrFunction(sym.ID); }
"key"         { return disambiguateAxisOrFunction(sym.KEY); }
"text()"      { return newSymbol(sym.TEXT); }
"text"+[ \t\r\n\f]+"()" { return newSymbol(sym.TEXT); }
"node()"      { return newSymbol(sym.NODE); }
"node"+[ \t\r\n\f]+"()" { return newSymbol(sym.NODE); }
"comment()"   { return newSymbol(sym.COMMENT); }
"comment"+[ \t\r\n\f]+"()" { return newSymbol(sym.COMMENT); }
"processing-instruction"
    { return disambiguateAxisOrFunction(sym.PIPARAM); }
"processing-instruction()" { return newSymbol(sym.PI); }
"processing-instruction"+[ \t\r\n\f]+"()" { return newSymbol(sym.PI); }
"or"          { return disambiguateOperator(sym.OR); }
"and"         { return disambiguateOperator(sym.AND); }
"child"       { return disambiguateAxisOrFunction(sym.CHILD); }
"attribute"   { return disambiguateAxisOrFunction(sym.ATTRIBUTE); }
"ancestor"    { return disambiguateAxisOrFunction(sym.ANCESTOR); }
"ancestor-or-self" { return disambiguateAxisOrFunction(sym.ANCESTORORSELF); }
"descendant"  { return disambiguateAxisOrFunction(sym.DESCENDANT); }
"descendant-or-self" { return disambiguateAxisOrFunction(sym.DESCENDANTORSELF); }
"following"   { return disambiguateAxisOrFunction(sym.FOLLOWING); }
"following-sibling" { return disambiguateAxisOrFunction(sym.FOLLOWINGSIBLING); }
}
"namespace"   { return disambiguateAxisOrFunction(sym.NAMESPACE); }
"parent"      { return disambiguateAxisOrFunction(sym.PARENT); }
"preceding"   { return disambiguateAxisOrFunction(sym.PRECEDING); }
"preceding-sibling" { return disambiguateAxisOrFunction(sym.PRECEDINGSIBLING); }
"self"        { return disambiguateAxisOrFunction(sym.SELF); }
"["           { return newSymbol(sym.LBRACK); }
"]"           { return newSymbol(sym.RBRACK); }
"("           { return newSymbol(sym.LPAREN); }
")"           { return newSymbol(sym.RPAREN); }
"<PATTERN>"   { initialize(); return new Symbol(sym.PATTERN); }
"<EXPRESSION>" { initialize(); return new Symbol(sym.EXPRESSION); }
\[^\]]*\[     { return newSymbol(sym.Literal,
    yytext().substring(1, yytext().length() - 1)); }
\[^\]]*\[     { return newSymbol(sym.Literal,
    yytext().substring(1,

```

```

yytext().length() - 1)); }
{Digit}+      { return newSymbol(sym.INT, new Long(yytext())); }
{Digit}+"."{Digit}*? { return newSymbol(sym.REAL, new Double(yytext())); }
"."{Digit}+    { return newSymbol(sym.REAL, new Double(yytext())); }
"."           { return newSymbol(sym.DOT); }
({NCName}":")?{NCName} { return newSymbol(sym.QNAME, yytext()); }
({NCName}":")?"*"      { return newSymbol(sym.QNAME, yytext()); }
({NCName}":")?"@"*     { return newSymbol(sym.QNAME, yytext()); }
[ \t\r\n\f]      { /* ignore white space. */ }
.                { throw new Exception(yytext()); }

```

Found in path(s):

\* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/xpath.lex

No license file was found, but licenses were detected in source scan.

```

/*
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 * regarding copyright ownership. The ASF licenses this file
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 * distributed under the License is distributed on an "AS IS" BASIS,
 * WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
 * See the License for the specific language governing permissions and
 * limitations under the License.
 */
// Proprietary, built in functions
/** current function string (Proprietary). */

```

Found in path(s):

\* /xalan-2-7-2-sources-jar/org/apache/xpath/compiler/Keywords.java

No license file was found, but licenses were detected in source scan.

```

/*
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 * distributed with this work for additional information
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 * to you under the Apache License, Version 2.0 (the "License");
 * you may not use this file except in compliance with the License.
 * You may obtain a copy of the License at
 *

```

```

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* distributed under the License is distributed on an "AS IS" BASIS,
* WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
* See the License for the specific language governing permissions and
* limitations under the License.
*/
// is found, then throw a special exception in order to terminate

```

Found in path(s):

```

* /xalan-2-7-2-sources-jar/org/apache/xalan/processor/TransformerFactoryImpl.java
No license file was found, but licenses were detected in source scan.

```

```

/*
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* Unless required by applicable law or agreed to in writing, software
* distributed under the License is distributed on an "AS IS" BASIS,
* WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
* See the License for the specific language governing permissions and
* limitations under the License.
*/

```

Found in path(s):

```

* /xalan-2-7-2-sources-jar/org/apache/xalan/transformer/QueuedEvents.java
* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/XslAttribute.java
*
* /xalan-2-7-2-sources-jar/org/apache/xml/dtm/ref/NodeLocator.java
* /xalan-2-7-2-sources-jar/org/apache/xml/serializer/ToStream.java
* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/runtime/MessageHandler.java
* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/dom/KeyIndex.java
* /xalan-2-7-2-sources-jar/org/apache/xml/utils/ElemDesc.java
* /xalan-2-7-2-sources-jar/org/apache/xalan/templates/ElemForEach.java
* /xalan-2-7-2-sources-jar/org/apache/xpath/patterns/ContextMatchStepPattern.java
* /xalan-2-7-2-sources-jar/org/apache/xpath/res/XPATHErrorResources_zh.java
* /xalan-2-7-2-sources-jar/org/apache/xpath/functions/FuncBoolean.java
* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/util/NodeSetType.java
* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/CurrentCall.java
* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/trax/TransformerHandlerImpl.java

```

- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/When.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/util/SecuritySupport.java
- \*
- /xalan-2-7-2-sources-jar/org/apache/xpath/axes/WalkingIteratorSorted.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/templates/ElemWhen.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/serializer/utils/SerializerMessages\_ja.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/utils/StylesheetPIHandler.java
- \* /xalan-2-7-2-sources-jar/org/apache/xpath/functions/FuncSubstring.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/trax/TrAXFilter.java
- \* /xalan-2-7-2-sources-jar/org/apache/xpath/functions/FuncConcat.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/serializer/utils/SerializerMessages\_zh\_CN.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/util/ErrorMessageMessages\_ko.java
- \* /xalan-2-7-2-sources-jar/org/apache/xpath/functions/Function.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/trax/XSLTSource.java
- \* /xalan-2-7-2-sources-jar/org/apache/xpath/axes/AttributeIterator.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/utils/StringToIntTable.java
- \*
- /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/dom/LoadDocument.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/runtime/ObjectFactory.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/transformer/NumeratorFormatter.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/serializer/utils/SerializerMessages\_hu.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/runtime/SecuritySupport.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/util/ErrorMessageMessages\_zh.java
- \* /xalan-2-7-2-sources-jar/org/apache/xpath/operations/Equals.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/Pattern.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/processor/ProcessorExsltFuncResult.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/DOMEnhancedForDTM.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/serializer/SecuritySupport.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/dom/MatchingIterator.java
- \* /xalan-2-7-2-sources-jar/org/apache/xpath/functions/FuncNot.java
- \*
- /xalan-2-7-2-sources-jar/org/apache/xalan/processor/XSLTAttributeDef.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/utils/StringToStringTableVector.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/If.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/dom/ObjectFactory.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/serializer/SerializerTraceWriter.java
- \* /xalan-2-7-2-sources-jar/org/apache/xpath/operations/Lt.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/utils/PrefixResolver.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/res/XSLTErrorResources\_en.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/serializer/ToTextSAXHandler.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/utils/res/StringArrayWrapper.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/Choose.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/templates/ElemFallback.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/transformer/XalanProperties.java
- \*
- /xalan-2-7-2-sources-jar/org/apache/xpath/functions/FuncUnparsedEntityURI.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/transformer/KeyIterator.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/utils/DOM2Helper.java

- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/runtime/Hashtable.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/dom/UnionIterator.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/dom/NthIterator.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/Stylesheet.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/res/XSLTErrorResources\_sk.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/XSLTC.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/runtime/ErrorMessage\_pt\_BR.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/res/XSLMessages.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/dtm/ref/DTMNodeProxy.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/StartsWithCall.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/serializer/ElemContext.java
- \*
- /xalan-2-7-2-sources-jar/org/apache/xpath/XPathProcessorException.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/util/NodeCounterGenerator.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/util/ErrorMessage\_zh\_TW.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/utils/res/XResources\_he.java
- \* /xalan-2-7-2-sources-jar/org/apache/xpath/functions/FuncRound.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/util/MethodGenerator.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/IntExpr.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/Fallback.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/runtime/ErrorMessage\_ja.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/utils/DOMOrder.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/LangCall.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/extensions/ExtensionsTable.java
- \* /xalan-2-7-2-sources-jar/org/apache/xpath/operations/Minus.java
- \*
- /xalan-2-7-2-sources-jar/org/apache/xml/utils/res/CharArrayWrapper.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/CastExpr.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/runtime/ErrorMessage\_pl.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/extensions/ExtensionNamespaceSupport.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/utils/ObjectFactory.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/TransletException.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/utils/StringBufferPool.java
- \* /xalan-2-7-2-sources-jar/org/apache/xpath/operations/And.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/serializer/ToSAXHandler.java
- \* /xalan-2-7-2-sources-jar/org/apache/xpath/res/XPATHErrorResources\_ca.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/res/XSLTErrorResources\_pl.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/serializer/utils/SerializerMessages\_zh\_TW.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/serializer/utils/SerializerMessages.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/templates/AVTPartXPath.java
- \*
- /xalan-2-7-2-sources-jar/org/apache/xml/serializer/ExtendedLexicalHandler.java
- \* /xalan-2-7-2-sources-jar/org/apache/xpath/XPathVisitable.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/templates/WhiteSpaceInfo.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/trace/EndSelectionEvent.java
- \* /xalan-2-7-2-sources-jar/org/apache/xpath/functions/FuncLang.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/trax/DOM2SAX.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/utils/res/XResources\_ka.java

- \* /xalan-2-7-2-sources-jar/org/apache/xalan/transformer/TransformerIdentityImpl.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/utils/IntVector.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/processor/ProcessorGlobalVariableDecl.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/res/XMLErrorResources\_tr.java
- \* /xalan-2-7-2-sources-jar/org/apache/xpath/axes/PredicatedNodeTest.java
- \* /xalan-2-7-2-sources-jar/org/apache/xpath/compiler/OpCodes.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/utils/res/XResources\_hy.java
- \*
- /xalan-2-7-2-sources-jar/org/apache/xalan/templates/ElemTemplateElement.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/LiteralElement.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/templates/ElemTextLiteral.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/serializer/utils/SerializerMessages\_de.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/Step.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/util/IntegerArray.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/util/ErrorMessage\_pt\_BR.java
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- \* /xalan-2-7-2-sources-jar/org/apache/xpath/FoundIndex.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/serializer/dom3/DOMStringListImpl.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/res/XSLTErrorResources\_it.java
- \* /xalan-2-7-2-sources-jar/org/apache/xpath/functions/FuncExtElementAvailable.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/dtm/DTMIterator.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/ArgumentList.java
- \* /xalan-2-7-2-sources-jar/org/apache/xpath/objects/DTMXRTreeFrag.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/AnccestorPattern.java
- \* /xalan-2-7-2-sources-jar/org/apache/xpath/axes/WalkingIterator.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/EqualityExpr.java
- \* /xalan-2-7-2-sources-jar/org/apache/xpath/res/XPATHTErrorResources\_en.java
- \* /xalan-2-7-2-sources-jar/org/apache/xpath/axes/ChildTestIterator.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/ForEach.java
- \*
- /xalan-2-7-2-sources-jar/org/apache/xpath/res/XPATHTErrorResources\_de.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/utils/StringComparable.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/Expression.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/templates/XSLTVisitor.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/LiteralExpr.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/ApplyImports.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/lib/sql/ConnectionPoolManager.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/processor/ProcessorAttributeSet.java
- \* /xalan-2-7-2-sources-jar/org/apache/xpath/operations/Quo.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/utils/NSInfo.java
- \* /xalan-2-7-2-sources-jar/org/apache/xalan/extensions/ExtensionHandlerJavaClass.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/serializer/dom3/DOMConstants.java
- \* /xalan-2-7-2-sources-jar/org/apache/xml/dtm/ref/ExpandedNameTable.java
- \*



/xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/QName.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xml/dtm/DTMManager.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/GenerateIdCall.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xml/utils/QName.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xalan/transformer/TransformSnapshot.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xml/serializer/utils/SerializerMessages\_ca.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xalan/lib/sql/QueryParameter.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/util/ErrorMessages\_es.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xalan/processor/ProcessorOutputElem.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/Param.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/AttributeValueTemplate.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xalan/extensions/ObjectFactory.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xpath/res/XPATHErrorResources\_ru.java  
 \*  
 /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/util/SlotAllocator.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/Number.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xml/utils/res/XResources\_el.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xalan/transformer/TransformerHandlerImpl.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/trax/DOM2TO.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xalan/templates/Stylesheet.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xpath/VariableStack.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xml/dtm/DTMWSFilter.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xpath/axes/FilterExprIteratorSimple.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xalan/res/XSLTErrorsResources\_zh\_CN.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/dom/MultiValuedNodeHeapIterator.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xalan/res/XSLTErrorsResources\_zh\_TW.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xalan/templates/ElemElement.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/ConcatCall.java  
 \*  
 /xalan-2-7-2-sources-jar/org/apache/xalan/res/XSLTErrorsResources\_de.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xalan/transformer/ResultNameSpace.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xalan/processor/ProcessorLRE.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xml/serializer/utils/SerializerMessages\_fr.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/trax/ObjectFactory.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xml/utils/res/XResources\_ja\_JP\_A.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xpath/operations/Gt.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xml/res/XMLErrorResources\_fr.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xml/res/XMLErrorResources\_cs.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xml/dtm/DTMConfigurationException.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xml/dtm/ref/DTMNodeList.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xml/dtm/Axis.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xalan/templates/XUnresolvedVariable.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xpath/functions/FuncFalse.java  
 \*  
 /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/SecuritySupport.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/util/ErrorMessages\_sl.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/dom/AbsoluteIterator.java  
 \* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/dom/CurrentNodeListIterator.java

\* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/IllegalCharException.java

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\*

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\* /xalan-2-7-2-sources-jar/org/apache/xalan/client/package.html

\* /xalan-2-7-2-sources-jar/org/apache/xalan/processor/package.html

\* /xalan-2-7-2-sources-jar/org/apache/xalan/lib/package.html

\* /xalan-2-7-2-sources-jar/org/apache/xpath/domapi/package.html

\* /xalan-2-7-2-sources-jar/org/apache/xalan/templates/package.html

\* /xalan-2-7-2-sources-jar/org/apache/xml/serializer/package.html

\* /xalan-2-7-2-sources-jar/org/apache/xalan/extensions/package.html

\* /xalan-2-7-2-sources-jar/org/apache/xpath/operations/package.html

\* /xalan-2-7-2-sources-jar/org/apache/xpath/compiler/package.html

\* /xalan-2-7-2-sources-jar/org/apache/xpath/patterns/package.html

\* /xalan-2-7-2-sources-jar/org/apache/xpath/package.html

\* /xalan-2-7-2-sources-jar/org/apache/xalan/lib/sql/package.html

\* /xalan-2-7-2-sources-jar/org/apache/xalan/xslt/package.html

\* /xalan-2-7-2-sources-jar/org/apache/xalan/res/package.html

\* /xalan-2-7-2-sources-jar/org/apache/xml/utils/package.html

\*

/xalan-2-7-2-sources-jar/org/apache/xpath/objects/package.html

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*/
/*
* $Id: Version.src 468654 2006-10-28 07:09:23Z minchau $
*/
package org.apache.xml.serializer;

/**
 * Administrative class to keep track of the version number of
 * the Serializer release.
 * <P>This class implements the upcoming standard of having
 * org.apache.project-name.Version.getVersion() be a standard way
 * to get version information.</P>
 * @xsl.usage general
 */
public final class Version
{

    /**
     * Get the basic version string for the current Serializer.
     * Version String formatted like
     * <CODE>"<B>Serializer</B> <B>Java</B> v.r[.dd| <B>D</B>nn]"</CODE>.
     *
     * Futurework: have this read version info from jar manifest.
     *
     * @return String denoting our current version
     */
    public static String getVersion()
    {
        return getProduct()+" "+getImplementationLanguage()+" "
            +getMajorVersionNum()+"."+getReleaseVersionNum()+"."
            +( (getDevelopmentVersionNum() > 0) ?
                ("D"+getDevelopmentVersionNum()) : (""+getMaintenanceVersionNum()));
    }
}

```

```

/**
 * Print the processor version to the command
line.
 *
 * @param argv command line arguments, unused.
 */
public static void main(String argv[])
{
    System.out.println(getVersion());
}

/**
 * Name of product: Serializer.
 */
public static String getProduct()
{
    return "Serializer";
}

/**
 * Implementation Language: Java.
 */
public static String getImplementationLanguage()
{
    return "Java";
}

/**
 * Major version number.
 * Version number. This changes only when there is a
 *     significant, externally apparent enhancement from
 *     the previous release. 'n' represents the n'th
 *     version.
 *
 *     Clients should carefully consider the implications
 *     of new versions as external interfaces and behaviour
 *     may have changed.
 */
public static int getMajorVersionNum()
{
    return @version.VERSION@;
}

/**
 * Release Number.
 * Release number. This

```

changes when:

- \* - a new set of functionality is to be added, eg,
- \* implementation of a new W3C specification.
- \* - API or behaviour change.
- \* - its designated as a reference release.

\*/

```
public static int getReleaseVersionNum()
```

```
{  
    return @version.RELEASE@;  
}
```

/\*\*

\* Maintenance Drop Number.

\* Optional identifier used to designate maintenance

- \* drop applied to a specific release and contains
- \* fixes for defects reported. It maintains compatibility
- \* with the release and contains no API changes.
- \* When missing, it designates the final and complete
- \* development drop for a release.

\*/

```
public static int getMaintenanceVersionNum()
```

```
{  
    return @version.MINOR@;  
}
```

/\*\*

\* Development Drop Number.

\* Optional identifier designates development drop of

\* a specific release. D01 is the first development

drop

\* of a new release.

\*

- \* Development drops are works in progress towards a
- \* completed, final release. A specific development drop
- \* may not completely implement all aspects of a new
- \* feature, which may take several development drops to
- \* complete. At the point of the final drop for the
- \* release, the D suffix will be omitted.

\*

- \* Each 'D' drops can contain functional enhancements as
- \* well as defect fixes. 'D' drops may not be as stable as
- \* the final releases.

\*/

```
public static int getDevelopmentVersionNum()
```

```
{  
    try {  
        if ((new String("@version.DEVELOPER@")).length() == 0)  
            return 0;
```

```

else
    return Integer.parseInt("@version.DEVELOPER@");
} catch (NumberFormatException nfe) {
    return 0;
}
}
}
}

```

Found in path(s):

\* /xalan-2-7-2-sources-jar/org/apache/xml/serializer/Version.src

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 * PURPOSE.
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 */

```

Found in path(s):

\* /xalan-2-7-2-sources-jar/org/apache/xpath/domapi/XPathStylesheetDOM3Exception.java

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 * limitations under the License.
 */
// Proprietary
/** The 'document-location()' id (Proprietary). */

```

Found in path(s):

\* /xalan-2-7-2-sources-jar/org/apache/xpath/compiler/FunctionTable.java

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\*/

/\*

\* \$Id: XSLProcessorVersion.src 468640 2006-10-28 06:53:53Z minchau \$

\*/

package org.apache.xalan.processor;

/\*\*

\* Administrative class to keep track of the version number of  
\* the Xalan release.  
\* <P>See also: org/apache/xalan/res/XSLTInfo.properties</P>  
\* @deprecated To be replaced by org.apache.xalan.Version.getVersion()  
\* @xsl.usage general

\*/

public class XSLProcessorVersion  
{

/\*\*

\* Print the processor version to the command line.  
\*  
\* @param argv command line arguments, unused.

\*/

public static void main(String argv[])  
{  
    System.out.println(S\_VERSION);  
}

/\*\*

\* Constant name of product.

```

*/
public static final String PRODUCT = "Xalan";

/**
 * Implementation Language.
 */
public static final String LANGUAGE = "Java";

/**
 * Major version number.
 * Version number. This changes only when there is a
 *     significant, externally apparent enhancement from
 *     the previous release. 'n' represents the n'th
 *     version.
 *
 *     Clients should carefully consider
the implications
 *     of new versions as external interfaces and behaviour
 *     may have changed.
 */
public static final int VERSION = @version.VERSION@;

/**
 * Release Number.
 * Release number. This changes when:
 *     - a new set of functionality is to be added, eg,
 *       implementation of a new W3C specification.
 *     - API or behaviour change.
 *     - its designated as a reference release.
 */
public static final int RELEASE = @version.RELEASE@;

/**
 * Maintenance Drop Number.
 * Optional identifier used to designate maintenance
 *     drop applied to a specific release and contains
 *     fixes for defects reported. It maintains compatibility
 *     with the release and contains no API changes.
 *     When missing, it designates the final and complete
 *     development drop for a release.
 */
public static final int MAINTENANCE
= @version.MINOR@;

/**
 * Development Drop Number.
 * Optional identifier designates development drop of
 *     a specific release. D01 is the first development drop

```



```

*      of a new release.
*
*      Development drops are works in progress towards a
*      completed, final release. A specific development drop
*      may not completely implement all aspects of a new
*      feature, which may take several development drops to
*      complete. At the point of the final drop for the
*      release, the D suffix will be omitted.
*
*      Each 'D' drops can contain functional enhancements as
*      well as defect fixes. 'D' drops may not be as stable as
*      the final releases.
*/
public static final int DEVELOPMENT = 0;

/**
 * Version String like <CODE>"<B>Xalan</B> <B>Language</B>
 * v.r[.dd| <B>D</B>nn]"</CODE>.
 * <P>Semantics of the version string are
 identical to the Xerces project.</P>
 */
public static final String S_VERSION = PRODUCT+" "+LANGUAGE+" "
    +VERSION+"."+RELEASE+"."
    +(DEVELOPMENT > 0 ? ("D"+DEVELOPMENT)
    : (""+MAINTENANCE));

}

```

Found in path(s):

\* /xalan-2-7-2-sources-jar/org/apache/xalan/processor/XSLProcessorVersion.src

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*/

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\*/  
// Attribution to: "Voytenko, Dimitry" <DVoytenko@SECTORBASE.COM>

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\* /xalan-2-7-2-sources-jar/org/apache/xml/serializer/ToHTMLStream.java

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Found in path(s):

\* /xalan-2-7-2-sources-jar/org/apache/xml/serializer/Encodings.properties  
\* /xalan-2-7-2-sources-jar/org/apache/xml/serializer/XMLEntities.properties  
\* /xalan-2-7-2-sources-jar/org/apache/xml/serializer/output\_text.properties  
\* /xalan-2-7-2-sources-jar/org/apache/xalan/res/XSLTInfo.properties  
\* /xalan-2-7-2-sources-jar/org/apache/xml/serializer/output\_xml.properties  
\* /xalan-2-7-2-sources-jar/org/apache/xalan/xsltc/compiler/Makefile.inc  
\* /xalan-2-7-2-sources-jar/org/apache/xml/serializer/output\_unknown.properties  
\* /xalan-2-7-2-sources-jar/org/apache/xml/serializer/HTMLEntities.properties  
\* /xalan-2-7-2-sources-jar/org/apache/xml/serializer/output\_html.properties

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* WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
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* limitations under the License.
*/
/**
* Execute the proprietary document-location() function, which returns
* a node set of documents.
* @xsl.usage advanced
*/

```

Found in path(s):

\* /xalan-2-7-2-sources-jar/org/apache/xpath/functions/FuncDoclocation.java

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*/
/*
* $Id: Version.src 1225426 2011-12-29 04:13:08Z mrglavas $
*/
package org.apache.xalan;

/**

```

```

* Administrative
class to keep track of the version number of
* the Xalan release.
* <P>This class implements the upcoming standard of having
* org.apache.project-name.Version.getVersion() be a standard way
* to get version information. This class will replace the older
* org.apache.xalan.processor.Version class.</P>
* <P>See also: org/apache/xalan/res/XSLTInfo.properties for
* information about the version of the XSLT spec we support.</P>
* @xsl.usage general
*/

public class Version
{

    /**
     * Get the basic version string for the current Xalan release.
     * Version String formatted like
     * <CODE>"<B>Xalan</B> <B>Java</B> v.r[.dd| <B>D</B>nn]"</CODE>.
     *
     * Futurework: have this read version info from jar manifest.
     *
     * @return String denoting our current version
     */
    public static String getVersion()
    {
        return getProduct()+" "+getImplementationLanguage()+" "
            +getMajorVersionNum()+"."+getReleaseVersionNum()+"."

            +( (getDevelopmentVersionNum() > 0) ?
                ("D"+getDevelopmentVersionNum()) : (""+getMaintenanceVersionNum()));
    }

    /**
     * Print the processor version to the command line.
     *
     * @param argv command line arguments, unused.
     */
    public static void main(String argv[])
    {
        System.out.println(getVersion());
    }

    /**
     * Name of product: Xalan.
     */
    public static String getProduct()
    {
        return "Xalan";
    }

```

```

}

/**
 * Implementation Language: Java.
 */
public static String getImplementationLanguage()
{
    return "Java";
}

/**
 * Major version number.
 * Version number. This changes only when there is a
 *     significant, externally apparent enhancement from
 *     the previous release. 'n' represents the n'th
 *     version.
 *
 * Clients should carefully consider the implications
 * of new versions as external interfaces and behaviour
 *
 *     may have changed.
 */
public static int getMajorVersionNum()
{
    return @version.VERSION@;
}

/**
 * Release Number.
 * Release number. This changes when:
 *     - a new set of functionality is to be added, eg,
 *       implementation of a new W3C specification.
 *     - API or behaviour change.
 *     - its designated as a reference release.
 */
public static int getReleaseVersionNum()
{
    return @version.RELEASE@;
}

/**
 * Maintenance Drop Number.
 * Optional identifier used to designate maintenance
 *     drop applied to a specific release and contains
 *     fixes for defects reported. It maintains compatibility
 *     with the release and contains no API changes.

```

```

*      When missing, it designates the final and complete
*      development drop for a release.
*/
public static int getMaintenanceVersionNum()
{
    return
    @version.MINOR@;
}

/**
* Development Drop Number.
* Optional identifier designates development drop of
*      a specific release. D01 is the first development drop
*      of a new release.
*
*      Development drops are works in progress towards a
*      completed, final release. A specific development drop
*      may not completely implement all aspects of a new
*      feature, which may take several development drops to
*      complete. At the point of the final drop for the
*      release, the D suffix will be omitted.
*
*      Each 'D' drops can contain functional enhancements as
*      well as defect fixes. 'D' drops may not be as stable as
*      the final releases.
*/
public static int getDevelopmentVersionNum()
{
    try {
        if ((new String("@version.DEVELOPER@")).length() == 0)
            return 0;
        else
            return Integer.parseInt("@version.DEVELOPER@");
    } catch (NumberFormatException nfe) {
        return 0;
    }
}
}

Found in path(s):
* /xalan-2-7-2-sources-jar/org/apache/xalan/Version.src

```

## 1.210 commons-lang3 3.4

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## 1.211 jakarta-annotation-api 1.3.4

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Found in path(s):

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 \* /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/analysis/Subroutine.java  
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 /javassist-3-22-0-cr2-sources-4-jar/javassist/runtime/Cflow.java  
 \* /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/AnnotationImpl.java  
 \* /javassist-3-22-0-cr2-sources-4-jar/javassist/util/proxy/FactoryHelper.java  
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 \* /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/SyntheticAttribute.java  
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 \* /javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/SyntaxError.java  
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- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/CtMember.java
- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/ByteArray.java
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- /javassist-3-22-0-cr2-sources-4-jar/javassist/expr/MethodCall.java
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- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/CtNewClass.java
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- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/SourceFileAttribute.java
- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/stackmap/MapMaker.java

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* /javassist-3-22-0-cr2-sources-4-jar/javassist/ClassPath.java
* /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/analysis/Analyzer.java
* /javassist-3-22-0-cr2-sources-4-jar/javassist/CtClassType.java
* /javassist-3-22-0-cr2-sources-4-jar/javassist/tools/reflect/CannotInvokeException.java
*
/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/AnnotationsAttribute.java
* /javassist-3-22-0-cr2-sources-4-jar/javassist/util/HotSwapper.java
* /javassist-3-22-0-cr2-sources-4-jar/javassist/tools/reflect/Compiler.java
* /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/LongVector.java
* /javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/ast/FieldDecl.java
* /javassist-3-22-0-cr2-sources-4-jar/javassist/tools/web/BadHttpRequest.java
* /javassist-3-22-0-cr2-sources-4-jar/javassist/CtNewConstructor.java
* /javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/ast/CastExpr.java
* /javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/Javac.java
* /javassist-3-22-0-cr2-sources-4-jar/javassist/SerialVersionUID.java
* /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/MethodInfo.java
* /javassist-3-22-0-cr2-sources-4-jar/javassist/tools/reflect/Metaobject.java
* /javassist-3-22-0-cr2-sources-4-jar/javassist/convert/TransformAfter.java
*
/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/Descriptor.java
* /javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/ast/CallExpr.java
* /javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/ast/IntConst.java

```

- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/AnnotationDefaultAttribute.java
- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/convert/TransformBefore.java
- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/JvstTypeChecker.java
- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/LoaderClassPath.java
- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/ParameterAnnotationsAttribute.java
- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/ast/Variable.java
- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/CtNewMethod.java
- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/ast/ASTree.java
- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/Mnemonic.java
- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/ClassPool.java
- \*

- /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/ExceptionsAttribute.java
- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/URLClassPath.java
- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/scopedpool/ScopedClassPoolFactory.java
- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/ast/ArrayInit.java
- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/tools/reflect/Loader.java
- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/convert/TransformFieldAccess.java
- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/DuplicateMemberException.java
- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/ast/CondExpr.java
- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/ast/ASTList.java
- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/ast/Keyword.java
- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/convert/TransformWriteField.java
- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/ConstPool.java
- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/analysis/Type.java
- \*

- /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/StackMapTable.java
- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/util/HotSwapAgent.java
- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/MemberCodeGen.java
- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/ClassMap.java
- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/CompileError.java
- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/tools/rmi/RemoteException.java
- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/ConstantAttribute.java
- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/compiler/AccessorMaker.java
- \* /javassist-3-22-0-cr2-sources-4-jar/javassist/util/proxy/SerializedProxy.java

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```
/*
 * Javassist, a Java-bytecode translator toolkit.
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Found in path(s):

\* /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/FloatMemberValue.java  
\* /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/StringMemberValue.java  
\* /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/ClassMemberValue.java  
\*  
/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/Annotation.java  
\* /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/ShortMemberValue.java  
\* /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/DoubleMemberValue.java  
\* /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/EnumMemberValue.java  
\* /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/AnnotationMemberValue.java  
\* /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/ArrayMemberValue.java  
\* /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/ByteMemberValue.java  
\* /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/MemberValue.java  
\* /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/BooleanMemberValue.java  
\* /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/IntegerMemberValue.java  
\* /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/MemberValueVisitor.java  
\*  
/javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/CharMemberValue.java  
\* /javassist-3-22-0-cr2-sources-4-jar/javassist/bytecode/annotation/LongMemberValue.java

## 1.213 commons-codec 1.9

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`src/test/org/apache/commons/codec/language/DoubleMetaphoneTest.java`

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Metadata-Version: 1.0

Name: clang

Version: 6.0.0

Summary: UNKNOWN

Home-page: <https://github.com/ethanhs/clang>

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\* <https://github.com/eclipse-ee4j/jaxrs-api>

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- \* org.eclipse.jetty.orbit:javafx.security.auth.message

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- \* org.eclipse.jetty.orbit:javafx.mail.glassfish

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<https://glassfish.dev.java.net/nonav/public/CDDL+GPL.html>

- \* javax.servlet:javax.servlet-api
- \* javax.annotation:javax.annotation-api
- \* javax.transaction:javax.transaction-api
- \* javax.websocket:javax.websocket-api

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## Oracle OpenJDK

If ALPN is used to negotiate HTTP/2 connections, then the following artifacts may be included in the distribution or downloaded when ALPN module is selected.

- \* java.sun.security.ssl

These artifacts replace/modify OpenJDK classes. The modifications are hosted at github and both modified and original are under GPL v2 with classpath exceptions.

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The following artifacts are licensed by the OW2 Foundation according to the terms of <http://asm.ow2.org/license.html>

- org.ow2.asm:asm-commons
- org.ow2.asm:asm

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The following artifacts are ASL2 licensed.

org.apache.taglibs:taglibs-standard-spec  
org.apache.taglibs:taglibs-standard-impl

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org.mortbay.jasper:apache-jsp  
org.apache.tomcat:tomcat-jasper  
org.apache.tomcat:tomcat-juli  
org.apache.tomcat:tomcat-jsp-api  
org.apache.tomcat:tomcat-el-api  
org.apache.tomcat:tomcat-jasper-el  
org.apache.tomcat:tomcat-api  
org.apache.tomcat:tomcat-util-scan  
org.apache.tomcat:tomcat-util

org.mortbay.jasper:apache-el  
org.apache.tomcat:tomcat-jasper-el  
org.apache.tomcat:tomcat-el-api

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org.eclipse.jetty.toolchain:jetty-schemas

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## Assorted

The UnixCrypt.java code implements the one way cryptography used by Unix systems for simple password protection. Copyright 1996 Aki Yoshida, modified April 2001 by Iris Van den Broeke, Daniel Deville.  
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## Source Code

The project maintains the following source code repositories:

\* <https://github.com/eclipse-ee4j/jersey>

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* /xmlunit-legacy-2-3-0-sources-1-jar/org/custommonkey/xmlunit/NodeDetail.java  
* /xmlunit-legacy-2-3-0-sources-1-jar/org/custommonkey/xmlunit/ComparisonController.java  
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Found in path(s):

- \* /xmlunit-legacy-2-3-0-sources-1-jar/org/custommonkey/xmlunit/ElementNameAndTextQualifier.java
- \* /xmlunit-legacy-2-3-0-sources-1-jar/org/custommonkey/xmlunit/ElementQualifier.java

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Found in path(s):

- \* /xmlunit-legacy-2-3-0-sources-1-jar/org/custommonkey/xmlunit/ElementNameAndAttributeQualifier.java
- \* /xmlunit-legacy-2-3-0-sources-1-jar/org/custommonkey/xmlunit/ElementNameQualifier.java

## 1.227 jetty-continuation 9.2.13.v20150730

### 1.227.1 Available under license :

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- \* /jetty-continuation-9-2-13-v20150730-sources-1-jar/org/eclipse/jetty/continuation/ContinuationThrowable.java
- \* /jetty-continuation-9-2-13-v20150730-sources-1-jar/org/eclipse/jetty/continuation/ContinuationSupport.java
- \* /jetty-continuation-9-2-13-v20150730-sources-1-jar/org/eclipse/jetty/continuation/package-info.java
- \* /jetty-continuation-9-2-13-v20150730-sources-1-jar/org/eclipse/jetty/continuation/ContinuationListener.java
- \* /jetty-continuation-9-2-13-v20150730-sources-1-jar/org/eclipse/jetty/continuation/Continuation.java

\*

/jetty-continuation-9-2-13-v20150730-sources-1-jar/org/eclipse/jetty/continuation/Servlet3Continuation.java

\* /jetty-continuation-9-2-13-v20150730-sources-1-jar/org/eclipse/jetty/continuation/FauxContinuation.java

\* /jetty-continuation-9-2-13-v20150730-sources-1-jar/org/eclipse/jetty/continuation/ContinuationFilter.java

## 1.228 wiremock-standalone 2.5.1

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Found in path(s):

\* /wiremock-standalone-2-5-1-sources-1-

jar/com/github/tomakehurst/wiremock/jetty9/JettyFaultInjectorFactory.java

\* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/servlet/FaultInjectorFactory.java

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```
/*!  
* https://github.com/es-shims/es5-shim  
* @license es5-shim Copyright 2009-2015 by contributors, MIT License  
* see https://github.com/es-shims/es5-shim/blob/master/LICENSE  
*/  
  
// object is free to use the argument key to filter its  
// for more details.  
/**  
* Sets metadata for `func`.  
*  
* ***Note:*** If this function becomes hot, i.e. is invoked a lot in a short  
* period of time, it will trip its breaker and transition to an identity function  
* to avoid garbage collection pauses in V8. See [V8 issue  
2070](https://code.google.com/p/v8/issues/detail?id=2070)  
* for more details.  
*  
* @private  
* @param {Function} func The function to associate metadata with.  
* @param {*} data The metadata.  
* @returns {Function} Returns `func`.  
*/  
/*!  
*  
* Copyright 2009-2012 Kris Kowal under the terms of the MIT  
* license found at http://github.com/kriskowal/q/raw/master/LICENSE  
*  
* With parts by Tyler Close  
* Copyright  
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* at http://www.opensource.org/licenses/mit-license.html  
* Forked at ref_send.js version: 2009-05-11  
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```

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\*/

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\* /wiremock-standalone-2-5-1-sources-1-jar/assets/swagger-ui/swagger-ui.js  
No license file was found, but licenses were detected in source scan.

/\*! JSON Editor v0.7.22 - JSON Schema -> HTML Editor  
\* By Jeremy Dorn - <https://github.com/jdorn/json-editor/>  
\* Released under the MIT license  
\*  
\* Date: 2015-08-12  
\*/

Found in path(s):

\* /wiremock-standalone-2-5-1-sources-1-jar/assets/swagger-ui/lib/jsoneditor.min.js  
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/\*  
jQuery Wiggle  
Author: WonderGroup, Jordan Thomas  
URL: <http://labs.wondergroup.com/demos/mini-ui/index.html>  
License: MIT ([http://en.wikipedia.org/wiki/MIT\\_License](http://en.wikipedia.org/wiki/MIT_License))  
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/\*!  
\* <https://github.com/es-shims/es5-shim>  
\* @license es5-shim Copyright 2009-2015 by contributors, MIT License  
\* see <https://github.com/es-shims/es5-shim/blob/master/LICENSE>  
\*/  
// object is free to use the argument key to filter its

Found in path(s):

\* /wiremock-standalone-2-5-1-sources-1-jar/assets/swagger-ui/lib/es5-shim.js  
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/\*  
\* jQuery BBQ: Back Button & Query Library - v1.2.1 - 2/17/2010  
\* <http://benalman.com/projects/jquery-bbq-plugin/>  
\*  
\* Copyright (c) 2010 "Cowboy" Ben Alman  
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\* /wiremock-standalone-2-5-1-sources-1-

jar/com/github/tomakehurst/wiremock/servlet/WireMockWebContextListener.java

\* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/standalone/MappingsLoader.java

\*

/wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/client/HttpAdminClient.java

\* /wiremock-standalone-2-5-1-sources-1-

jar/com/github/tomakehurst/wiremock/common/VeryShortIdGenerator.java

\* /wiremock-standalone-2-5-1-sources-1-

jar/com/github/tomakehurst/wiremock/admin/tasks/ResetScenariosTask.java

\* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/common/Notifier.java

\* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/admin/Paginator.java

\* /wiremock-standalone-2-5-1-sources-1-

jar/com/github/tomakehurst/wiremock/matching/CustomMatcherDefinition.java

\* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/BasicResponseRenderer.java

\* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/admin/tasks/ResetTask.java

\* /wiremock-standalone-2-5-1-sources-1-

jar/com/github/tomakehurst/wiremock/admin/tasks/FindUnmatchedRequestsTask.java

\* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/Body.java

\*

/wiremock-standalone-2-5-1-sources-1-

jar/com/github/tomakehurst/wiremock/servlet/NotImplementedContainer.java

\* /wiremock-standalone-2-5-1-sources-1-

jar/com/github/tomakehurst/wiremock/matching/RequestMatcherExtension.java

\* /wiremock-standalone-2-5-1-sources-1-

jar/com/github/tomakehurst/wiremock/verification/InMemoryRequestJournal.java

```

* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/admin/tasks/GetStubMappingTask.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/core/Container.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/admin/RequestSpec.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/servlet/TrailingSlashFilter.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/client/BasicCredentials.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/admin/tasks/RemoveStubMappingTask.java
*
/wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/common/Encoding.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/common/ConsoleNotifier.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/matching/RequestPattern.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/core/StubServer.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/extension/ResponseTransformer.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/admin/AdminUriTemplate.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/core/WireMockApp.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/client/VerificationException.java
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* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/UniformDistribution.java
*
/wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/core/FaultInjector.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/client/CountMatchingStrategy.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/common/HttpsSettings.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/matching/UrlPattern.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/common/Json.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/common/Slf4jNotifier.java
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jar/com/github/tomakehurst/wiremock/admin/tasks/ShutdownServerTask.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/client/ScenarioMappingBuilder.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/ResponseDefinition.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/stubbing/ServeEvent.java
*
/wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/matching/MultiValuePattern.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/Request.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/verification/FindServeEventsResult.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/admin/AdminRoutes.java
* /wiremock-standalone-2-5-1-sources-1-
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* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/common/Urls.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/matching/RequestPatternBuilder.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/admin/model/SingleStubMappingResult.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/admin/tasks/FindRequestsTask.java
*

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/wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/LogNormal.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/verification/RequestJournal.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/matching/MatchesXPathPattern.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/MimeType.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/RequestHandler.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/global/GlobalSettingsHolder.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/admin/NotFoundException.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/servlet/ContentTypeSettingFilter.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/common/BiPredicate.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/verification/NearMiss.java
*
/wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/junit/WireMockStaticRule.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/common/ContentTypes.java
* /wiremock-standalone-2-5-1-sources-1-
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* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/common/TextFile.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/matching/RegexPattern.java
* /wiremock-standalone-2-5-1-sources-1-
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* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/standalone/MappingsSource.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/common/KeyStoreSettings.java
*
/wiremock-standalone-2-5-1-sources-1-
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* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/verification/LoggedRequest.java
* /wiremock-standalone-2-5-1-sources-1-
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* /wiremock-standalone-2-5-1-sources-1-
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* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/common/AdminException.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/matching/EqualToXmlPattern.java
* /wiremock-standalone-2-5-1-sources-1-
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* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/matching/AbstractRegexPattern.java
*
/wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/QueryParameter.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/matching/UrlPathPattern.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/admin/tasks/GetAllStubMappingsTask.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/admin/tasks/FindNearMissesForUnmatchedTask.java

```

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* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/standalone/JsonFileMappingsSource.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/verification/DisabledRequestJournal.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/common/HttpClientUtils.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/RequestMethod.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/admin/tasks/FindNearMissesForRequestPatternTask.java
*
/wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/extension/Parameters.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/http/HttpHeadersJsonDeserializer.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/matching/MatchResult.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/common/SingleRootFileSource.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/DelayDistribution.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/ContentTypeHeader.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/MultiValue.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/servlet/NotImplementedMappingsSaver.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/verification/NearMissCalculator.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/stubbing/SortedConcurrentMappingSet.java
*
/wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/extension/Extension.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/jetty9/CustomizedSslContextFactory.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/matching/EqualToPattern.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/common/BinaryFile.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/Fault.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/extension/AbstractTransformer.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/common/LocalNotifier.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/standalone/WireMockServerRunner.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/global/GlobalSettings.java
*
/wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/core/ConfigurationException.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/global/RequestDelaySpec.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/Response.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/servlet/NoFaultInjectorFactory.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/CaseInsensitiveKey.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/admin/tasks/GlobalSettingsUpdateTask.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/WireMockServer.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/AbstractRequestHandler.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/matching/EagerMatchResult.java
* /wiremock-standalone-2-5-1-sources-1-

```

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jar/com/github/tomakehurst/wiremock/admin/tasks/CreateStubMappingTask.java
*
/wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/servlet/WireMockHandlerDispatchingServlet.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/client/ResponseDefinitionBuilder.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/common/IdGenerator.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/servlet/WireMockHttpServletRequestAdapter.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/HttpHeader.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/RequestEventSource.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/servlet/NoFaultInjector.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/verification/Diff.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/admin/model/SingleItemResult.java
*
/wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/verification/FindNearMissesResult.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/junit/WireMockRule.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/admin/tasks/FindNearMissesForRequestTask.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/verification/VerificationResult.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/admin/tasks/GetAllRequestsTask.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/common/AbstractFileSource.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/admin/model/PaginatedResult.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/core/Admin.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/common/JettySettings.java
*
/wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/junit/Stubbing.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/matching/StringValuePatternJsonDeserializer.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/stubbing/StubMappingJsonRecorder.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/matching/NamedValueMatcher.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/StubRequestHandler.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/admin/model/GetServeEventsResult.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/client/MappingBuilder.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/verification/RequestJournalDisabledException.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/common/Strings.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/stubbing/Scenario.java
*
/wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/admin/tasks/RootTask.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/matching/AbsentPattern.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/StubResponseRenderer.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/stubbing/StubMapping.java

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\* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/stubbing/StubMappings.java  
 \* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/admin/Conversions.java  
 \* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/common/ProxySettings.java  
 \* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/jetty9/JettyFaultInjector.java  
 \* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/core/Options.java  
 \* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/Cookie.java  
 \*  
 /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/client/BasicMappingBuilder.java  
 \* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/admin/AdminTask.java  
 \* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/matching/MatchesJsonPathPattern.java  
 \* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/GenericHttpRequest.java  
 \* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/client/CountMatchingMode.java  
 \* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/HttpServerFactory.java  
 \* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/ResponseRenderer.java  
 \* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/ProxyResponseRenderer.java  
 \* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/matching/RequestMatcher.java  
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 /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/jetty9/JettyUtils.java  
 \* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/admin/tasks/ResetToDefaultMappingsTask.java  
 \* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/HttpClientFactory.java  
 \* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/admin/model/SingleServedStubResult.java  
 \* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/core/WireMockConfiguration.java  
 \* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/AdminRequestHandler.java  
 \* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/RequestListener.java  
 \* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/matching/AnythingPattern.java  
 \* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/extension/ResponseDefinitionTransformer.java  
 \* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/junit/WireMockClassRule.java  
 \*  
 /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/jetty9/JettyHttpServer.java  
 \* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/matching/StringValuePatternJsonSerializer.java  
 \* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/extension/ExtensionLoader.java  
 \* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/core/MappingsSaver.java  
 \* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/admin/tasks/OldCreateStubMappingTask.java  
 \* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/matching/EqualToJsonPattern.java  
 \* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/common/FatalStartupException.java  
 \* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/admin/tasks/GetRequestCountTask.java  
 \* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/admin/tasks/OldEditStubMappingTask.java  
 \*

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/wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/common/Gzip.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/matching/ContainsPattern.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/client/WireMock.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/common/Dates.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/admin/model/PathParams.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/jetty9/JettyHttpServerFactory.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/matching/StringValuePattern.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/common/UniqueFilenameGenerator.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/admin/tasks/OldResetRequestsTask.java
*
/wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/common/Exceptions.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/HttpServer.java
* /wiremock-standalone-2-5-1-sources-1-
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* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/jetty9/JettyHttpsFaultInjector.java
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jar/com/github/tomakehurst/wiremock/common/ServletContextFileSource.java
* /wiremock-standalone-2-5-1-sources-1-
jar/com/github/tomakehurst/wiremock/admin/tasks/NotFoundAdminTask.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/common/Xml.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/HttpHeaders.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/http/HttpHeadersJsonSerializer.java
* /wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/common/ClasspathFileSource.java
*
/wiremock-standalone-2-5-1-sources-1-jar/com/github/tomakehurst/wiremock/matching/NegativeRegexPattern.java
No license file was found, but licenses were detected in source scan.

```

```

(function(){function
e){e.history=e.history||[],e.history.push(arguments),this.console&&console.log(Array.prototype.slice.call(argument
s)[0])}!function(){var
e=Handlebars.template,t=Handlebars.templates=Handlebars.templates||{};t.apikey_auth=e({1:function(e,t,n,r,i){var
a;return'

class="key_auth__value">'+(null!=(a=(n.sanitize||t&&
t.sanitize||n.helperMissing).call(null!=t?t:{},null!=t?t.value:t,
{name:"sanitize",hash:{},data:i}))?a:"")+</span>\n"},3:function(e,t,n,r,i){return'

class="key_auth__value">'+(null!=(a=(n.escape||t&&
t.escape||s).call(o,null!=t?t.name:t,{name:"escape",hash:{},dat
a:i}))?a:"")+</span>\n
</div>\n


class="key_auth__label">in:</span>\n

class="key_auth__value">'+(null!=(a=(n.escape||t&&
t.escape||s).call(o,null!=t?t["in"]:t,{name:"escape",hash:{},dat
a:i}))?a:"")+</span>\n
</div>\n


```

```

class="key_auth__label">value:</span>\n'+(null!=(a=n["if"].call(o,null!=t?t.isLogout:t,{name:"if",hash:{},fn:e.program(1,i,0),inverse:e.program(3,i,0),data:i}))?a:"")+</div>\n
</div>\n</div>\n"},useData:!0)),t.auth_button=e({compiler:[7,">= 4.0.0"],main:function(e,t,n,r,i){return"<a
class='authorize__btn'
href=\"#\">>Authorize</a>\n"},useData:!0)),t.auth_button_operation=e({1:function(e,t,n,r,i){return"
authorize__btn_operation_login\n"},3:function(e,t,n,r,i){return"
authorize__btn_operation_logout\n"},5:function(e,t,n,r,i){var a;return"
scopes">\n'+(null!=(a=n.each.call(null!=t?t:{},null!=t?t.scopes:t,{name:"each",hash:{},fn:e.program(6,i,0),inverse:e
.noop,data:i}))?a:"")+</ul>\n"},6:function(e,t,n,r,i){var a,o=null!=t?t:{},s=n.helperMissing;return'
<li class="authorize__scope"
title=""'+(null!=(a=(n.escape||t&&t.escape||s).call(o,null!=t?t.description:t,{name:"escape",hash:{},data:i}))?a:"")+""
>'+(null!=(a=(n.escape||t&&t.escape||s).call(o,null!=t?t.scope:t,{name:"escape",hash:{},data:i}))?a:"")+</li>\n"},co
mpiler:[7,">= 4.0.0"],main:function(e,t,n,r,i){var a,o=null!=t?t:{};return'<div class="authorize__btn
authorize__btn_operation\n'+(null!=(a=n["if"].call(o,null!=t?t.isLogout:t,{name:"if",hash:{},fn:e.program(1,i,0),inv
erse:e.program(3,i,0),data:i}))?a:"")+"">\n'+(null!=(a=n["if"].call(o,null!=t?t.scopes:t,{name:"if",hash:{},fn:e.progra
m(5,i,0),inverse:e.noop,data:i}))?a:"")+</div>\n"},useData:!0)),t.auth_view=e({1:function(e,t,n,r,i){return'
<button type="button" class="auth__button auth_submit__button" data-sw-
translate>Authorize</button>\n'},3:function(e,t,n,r,i){return'
<button type="button" class="auth__button
auth_logout__button" data-sw-translate>Logout</button>\n'},compiler:[7,">= 4.0.0"],main:function(e,t,n,r,i){var
a,o=null!=t?t:{};return'<div class="auth_container">\n\n
<div class="auth_inner"></div>\n
<div
class="auth_submit">\n'+(null!=(a=n.unless.call(o,null!=t?t.isLogout:t,{name:"unless",hash:{},fn:e.program(1,i,0),i
nverse:e.noop,data:i}))?a:"")+</div>\n'+(null!=(a=n["if"].call(o,null!=t?t.isAuthorized:t,{name:"if",hash:{},fn:e.program(3,i,0
),inverse:e.noop,data:i}))?a:"")+</div>\n\n</div>\n"},useData:!0)),t.basic_auth=e({1:function(e,t,n,r,i){return' -
authorized"},3:function(e,t,n,r,i){var a;return'
<span
class="basic_auth__value">'+(null!=(a=(n.escape||t&&t.escape||n.helperMissing).call(null!=t?t:{},null!=t?t.usernam
e:t,{name:"escape",hash:{},data:i}))?a:"")+</span>\n"},5:function(e,t,n,r,i){return'
<input required
placeholder="username" class="basic_auth__username auth_input" name="username"
type="text"/>\n'},7:function(e,t,n,r,i){return'
<div class="auth_label">\n
<span
class="basic_auth__label" data-sw-translate>password:</span>\n
<input required placeholder="password"
class="basic_auth__password auth_input" name="password" type="password"/></label>\n
</div>\n'},compiler:[7,">= 4.0.0"],main:function(e,t,n,r,i){var a,o=null!=t?t:{};return'<div
class='basic_auth_container'>\n
<h3 class=\"auth__title\">Basic
authentication'+(null!=(a=n["if"].call(o,null!=t?t.isLogout:t,{name:"if",hash:{},fn:e.program(1,i,0),inverse:e.noop,d
ata:i}))?a:"")+</h3>\n
<form class="basic_input_container">\n
<div
class="auth__description">'+(null!=(a=(n.sanitize||t&&t.sanitize||n.helperMissing).call(o,null!=t?t.description:t,{na
me:"sanitize",hash:{},data:i}))?a:"")+</div>\n
<div class="auth_label">\n
<span class="basic_auth__label" data-sw-
translate>username:</span>\n'+(null!=(a=n["if"].call(o,null!=t?t.isLogout:t,{name:"if",hash:{},fn:e.program(3,i,0),i
nverse:e.program(5,i,0),data:i}))?a:"")+
</div>\n'+(null!=(a=n.unless.call(o,null!=t?t.isLogout:t,{name:"unless",hash:{},fn:e.program(7,i,0),inverse:e.noop,
data:i}))?a:"")+</form>\n</div>\n"},useData:!0)),t.content_type=e({1:function(e,t,n,r,i){var a;return
null!=(a=n.each.call(null!=t?t:{},null!=t?t.produces:t,{name:"each",hash:{},fn:e.program(2,i,0),inverse:e.noop,data:
i}))?a:""},2:function(e,t,n,r,i){var a,o=null!=t?t:{},s=n.helperMissing;return't<option
value=""'+(null!=(a=(n.sanitize||t&&t.sanitize||s).call(o,t,{name:"sanitize",hash:{},data:i}))?a:"")+"">'+(null!=(a=(n.s
anitize||t&&t.sanitize||s).call(o,t,{name:"sanitize",hash:{},data:i}))?a:"")+</option>\n"},4:function(e,t,n,r,i){return'
<option value="application/json">application/json</option>\n'},compiler:[7,">=
4.0.0"],main:function(e,t,n,r,i){var a,o=null!=t?t:{},s=n.helperMissing;return'<label data-sw-translate

```



```

for=""+(null!=(a=(n.escape||t&& escape||s).call(o,null!=t?t.contentType:t,{name:"escape",hash:{},data:i}))?a:"")+
">Response Content Type</label>\n<select name="content Type"
id=""+(null!=(a=(n.escape||t&& escape||s).call(o,null!=t?t.contentType:t,{name:"escape",hash:{},data:i}))?a:"")+
">\n'+(null!=(a=n["if"].call(o,null!=t?t.produces:t,{name:"if",hash:{},fn:e.program(1,i,0),inverse:e.program(4,i,0),d
ata:i}))?a:"")+"</select>\n"},useData:!0)),t.main=e({1:function(e,t,n,r,i){var
a,o=null!=t?t:{},s=n.helperMissing;return' <div
class="info_title">'+(null!=(a=(n.sanitize||t&& sanitize||s).call(o,null!=(a=null!=t?t.info:t)?a.title:a,{name:"sanitize"
,hash:{},data:i}))?a:"")+</div>\n <div class="info_description
markdown">'+(null!=(a=(n.sanitize||t&& sanitize||s).call(o,null!=(a=null!=t?t.info:t)?a.description:a,{name:"sanitiz
e",hash:{},data:i}))?a:"")+"</div>\n'+(null!=(a=n["if"].call(o,null!=t?t.externalDocs:t,{name:"if",hash:{},fn:e.progr
am(2,i,0),inverse:e.noop,data:i}))?a:"")+"
"+(null!=(a=n["if"].call(o,null!=(a=null!=t?t.info:t)?a.termsOfServiceUrl:a,{name:"if",hash:{},fn:e.program(4,i,0),in
verse:e.noop,data:i}))?a:"")+"\n
"+(null!=(a=n["if"].call(o,null!=(a=null!=(a=null!=t?t.info:t)?a.contact:a)?a.name:a,{name:"if",hash:{},fn:e.program
(6,i,0),inverse:e.noop,data:i}))?a:"")+"\n
"+(null!=(a=n["if"].call(o,null!=(a=null!=(a=null!=t?t.info:t)?a.contact:a)?a.url:a,{name:"if",hash:{},fn:e.program(8,
i,0),inverse:e.noop,data:i}))?a:"")+"\n
"+(null!=(a=n["if"].call(o,null!=(a=null!=(a=null!=t?t.info:t)?a.contact:a)?a.email:a,{name:"if",hash:{},fn:e.program
(10,i,0),inverse:e.noop,data:i}))?a:"")+"\n
"+(null!=(a=n["if"].call(o,null!=(a=null!=t?t.info:t)?a.license:a,{name:"if",hash:{},fn:e.program(12,i,0),inverse:e.no
op,data:i}))?a:"")+"\n"},2:function(e,t,n,r,i){var
a,o=null!=t?t:{},s=n.helperMissing;return"
<p>'+(null!=(a=(n.sanitize||t&& sanitize||s).call(o,null!=(a=null!=t?t.externalDocs:t)?a.description:a,{name:"sanitiz
e",hash:{},data:i}))?a:"")+'</p>\n <a
href=""+(null!=(a=(n.escape||t&& escape||s).call(o,null!=(a=null!=t?t.externalDocs:t)?a.url:a,{name:"escape",hash:{
},data:i}))?a:"")+"
target="_blank">'+(null!=(a=(n.escape||t&& escape||s).call(o,null!=(a=null!=t?t.externalDocs:t)?a.url:a,{name:"esc
ape",hash:{},data:i}))?a:"")+'</a>\n"},4:function(e,t,n,r,i){var a;return'<div class="info_tos"><a target="_blank"
href=""+(null!=(a=(n.escape||t&& escape||n.helperMissing).call(null!=t?t:{},null!=(a=null!=t?t.info:t)?a.termsOfSer
viceUrl:a,{name:"escape",hash:{},data:i}))?a:"")+" data-sw-translate>Terms of
service</a></div>',6:function(e,t,n,r,i){var a;return"<div><div class='info_name' style=\"display: inline\" data-sw-
translate>Created by </div>
'+(null!=(a=(n.escape||t&& escape||n.helperMissing).call(null!=t?t:{},null!=(a=null!=(a=null!=t?t.info:t)?a.contact:
a)?a.name:a,{name:"escape",hash:{},data:i}))?a:"")+'</div>',8:function(e,t,n,r,i){var
a,o=null!=t?t:{},s=n.helperMissing;return'<div class="info_url" data-sw-translate>See more at <a
href=""+(null!=(a=(n.escape||t&& escape||s).call(o,null!=(a=null!=(a=null!=t?t.info:t)?a.contact:a)?a.url:a,{name:"
escape",hash:{},data:i}))?a:"")+'>'+(null!=(a=(n.escape||t&& escape||s).call(o,null!=(a=null!=(a=null!=t?t.info:t)?a
.contact:a)?a.url:a,{name:"escape",hash:{},data:i}))?a:"")+'</a></div>',10:function(e,t,n,r,i){var
a,o=null!=t?t:{},s=n.helperMissing;return'<div class="info_email"><a target="_parent"
href="mailto:'+(null!=(a=(n.escape||t&& escape||s).call(o,null!=(a=null!=(a=null!=t?t.info:t)?a.contact:a)?a.email:a,
{name:"escape",hash:{},data:i}))?a:"")+'?subject="'+(null!=(a=(n.escape||t&& escape||s).call(o,null!=(a=null!=t?t.i
nfo:t)?a.title:a,{name:"escape",hash:{},data:i}))?a:"")+' data-sw-translate>Contact
the developer</a></div>',12:function(e,t,n,r,i){var a,o=null!=t?t:{},s=n.helperMissing;return'<div
class="info_license"><a target="_blank"
href=""+(null!=(a=(n.escape||t&& escape||s).call(o,null!=(a=null!=(a=null!=t?t.info:t)?a.license:a)?a.url:a,{name:"es
cape",hash:{},data:i}))?a:"")+'>'+(null!=(a=(n.escape||t&& escape||s).call(o,null!=(a=null!=(a=null!=t?t.info:t)?a.l
icense:a)?a.name:a,{name:"escape",hash:{},data:i}))?a:"")+'</a></div>',14:function(e,t,n,r,i){var a;return'
<span style="font-variant: small-caps" data-sw-translate>api version</span>:

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+(null!=(a=(n.escape||t&& t.escape||n.helperMissing).call(null!=t?t:{},null!=(a=null!=t?t.info:t)?a.version:a,{name:"
escape",hash:{},data:i})))?a:"")+("\n    ",16:function(e,t,n,r,i){var a,o=null!=t?t:{},s=n.helperMissing;return'<span
style="float:right"><a target="_blank"
href="'+(null!=(a=(n.escape||t&& t.escape||s).call(o,null!=t?t.validatorUrl:t,{name:"escape",hash:{},data:i})))?a:"")+"/
debug?url="'+(null!=(a=(n.escape||t&& t.escape||s).call(o,null!=t?t.url:t,{name:"escape",hash:{},data:i})))?a:"")+"'><
img
id="validator"
src="'+(null!=(a=(n.escape||t&& t.escape||s).call(o,null!=t?t.validatorUrl:t,{name:"escape",hash:{},data:i})))?a:"")+"'
url="'+(null!=(a=(n.escape||t&& t.escape||s).call(o,null!=t?t.url:t,{name:"escape",hash:{},data:i})))?a:"")+"'></a>\n
</span>\n'},compiler:[7,">= 4.0.0"],main:function(e,t,n,r,i){var a,o=null!=t?t:{};return"<div class='info'
id='api_info'>\n"+(null!=(a=n["if"].call(o,null!=t?t.info:t,{name:"if",hash:{},fn:e.program(1,i,0),inverse:e.noop,data
:i})))?a:"")+("</div>\n<div class='container' id='resources_container'>\n  <div class='authorize-wrapper'></div>\n\n
<ul id='resources'></ul>\n\n  <div class='\"footer\"'>\n    <h4 style='\"color: #999\"'>[ <span style='\"font-variant:
small-caps\"'>base url</span>:
"+(null!=(a=(n.escape||t&& t.escape||n.helperMissing).call(o,null!=t?t.basePath:t,{name:"escape",hash:{},data:i})))?a
:("')+("\n"+(null!=(a=n["if"].call(o,null!=(a=null!=t?t.info:t)?a.version:a,{name:"if",hash:{},fn:e.program(14,i,0),inve
rse:e.noop,data:i})))?a:"")+("\n"+(null!=(a=n["if"].call(o,null!=t?t.validatorUrl:t,{name:"if",hash:{},fn:e.program(16,
i,0),inverse:e.noop,data:i})))?a:"")+("
  </h4>\n  </div>\n</div>\n"}),useData:!0)),t.oauth2=e({1:function(e,t,n,r,i){var
a,o=null!=t?t:{},s=n.helperMissing;return'<li>\n      <input class="oauth-scope" type="checkbox"
data-scope="'+(null!=(a=(n.escape||t&& t.escape||s).call(o,null!=t?t.scope:t,{name:"escape",hash:{},data:i})))?a:"")+"'
oauthtype="'+(null!=(a=(n.escape||t&& t.escape||s).call(o,null!=t?t.OAuthSchemeKey:t,{name:"escape",hash:{},data
:i})))?a:"")+"'>\n
<label>'+(null!=(a=(n.escape||t&& t.escape||s).call(o,null!=t?t.scope:t,{name:"escape",hash:{},data:i})))?a:"")+("</labe
l><br/>\n      <span class="api-scope-
desc">'+(null!=(a=(n.escape||t&& t.escape||s).call(o,null!=t?t.description:t,{name:"escape",hash:{},data:i})))?a:"")+("\
n"+(null!=(a=n["if"].call(o,null!=t?t.OAuthSchemeKey:t,{name:"if",hash:{},fn:e.program(2,i,0),inverse:e.noop,data
:i})))?a:"")+("
      </span>\n      </li>\n"}),2:function(e,t,n,r,i){var a;return"
("+(null!=(a=(n.escape||t&& t.escape||n.helperMissing).call(null!=t?t:{},null!=t?t.OAuthSchemeKey:t,{name:"escap
e",hash:{},data:i})))?a:"")+("\n"},compiler:[7,">= 4.0.0"],main:function(e,t,n,r,i){var
a,o=null!=t?t:{},s=n.helperMissing;return'<div>\n  <h3 class="auth__title">Select OAuth2.0 Scopes</h3>\n
<p>'+(null!=(a=(n.sanitize||t&& t.sanitize||s).call(o,null!=t?t.description:t,{name:"sanitize",hash:{},data:i})))?a:"")+("<
/p>\n  <p>Scopes are used to grant an application different levels of access to data on behalf of the end user. Each
API may declare one or more scopes.\n    <a href="#">Learn how to use</a>\n  </p>\n  <p><strong>
'+(null!=(a=(n.escape||t&& t.escape||s).call(o,null!=t?t.appName:t,{name:"escape",hash:{},data:i})))?a:"")+("
</strong> API requires the following scopes.
Select which ones you want to grant to Swagger UI.</p>\n  <p>Authorization URL:
"+(null!=(a=(n.sanitize||t&& t.sanitize||s).call(o,null!=t?t.authorizationUrl:t,{name:"sanitize",hash:{},data:i})))?a:"")+
"</p>\n  <p>flow:
"+(null!=(a=(n.escape||t&& t.escape||s).call(o,null!=t?t.flow:t,{name:"escape",hash:{},data:i})))?a:"")+("</p>\n  <ul
class="api-popup-
scopes">\n'+(null!=(a=n.each.call(o,null!=t?t.scopes:t,{name:"each",hash:{},fn:e.program(1,i,0),inverse:e.noop,data
:i})))?a:"")+("
</ul>\n</div>"}),useData:!0)),t.operation=e({1:function(e,t,n,r,i){return"deprecated"},3:function(e,t,n,r,i){return"
<h4><span data-sw-translate>Warning: Deprecated</span></h4>\n"},5:function(e,t,n,r,i){var a;return'
<h4><span data-sw-translate>Implementation Notes</span></h4>\n  <div
class="markdown">'+(null!=(a=(n.sanitize||t&& t.sanitize||n.helperMissing).call(null!=t?t:{},null!=t?t.description:t,{

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name:"sanitize",hash:{},data:i)))?a:"")+</div>\n"},7:function(e,t,n,r,i){return"
    <div class='authorize-wrapper authorize-wrapper_operation'></div>\n"},9:function(e,t,n,r,i){var
a,o=null!=t?t:{},return'    <div class="response-class">\n        <h4><span data-sw-translate>Response
Class</span> (<span data-sw-translate>Status</span>
'+(null!=(a=(n.escape||t&&t.escape||n.helperMissing).call(o,null!=t?t.successCode:t,{name:"escape",hash:{},data:i)
)?a:"")+</h4>\n
"+(null!=(a=n["if"].call(o,null!=t?t.successDescription:t,{name:"if",hash:{},fn:e.program(10,i,0),inverse:e.noop,data
:i}))?a:"")+<\n        <p><span class="model-signature" /></p>\n            <br/>\n            <div class="response-
content-type" />\n            </div>\n'},10:function(e,t,n,r,i){var a;return'<div
class="markdown">'+(null!=(a=(n.sanitize||t&&t.sanitize||n.helperMissing).call(null!=t?t:{},null!=t?t.successDescri
ption:t,{name:"sanitize",hash:{},data:i}))?a:"")+</div>"},12:function(e,t,n,r,i){var a;return'    <h4 data-sw-
translate>Headers</h4>\n
    <table class="headers">\n        <thead>\n            <tr>\n                <th style="width: 100px; max-width:
100px" data-sw-translate>Header</th>\n                <th style="width: 310px; max-width: 310px" data-sw-
translate>Description</th>\n                <th style="width: 200px; max-width: 200px" data-sw-translate>Type</th>\n
                <th style="width: 320px; max-width: 320px" data-sw-translate>Other</th>\n            </tr>\n
        </thead>\n
        <tbody>\n'+(null!=(a=n.each.call(null!=t?t:{},null!=t?t.headers:t,{name:"each",hash:{},fn:e.program(13,i,0),inverse
:e.noop,data:i}))?a:"")+
        </tbody>\n        </table>\n"},13:function(e,t,n,r,i){var
a,o,s=null!=t?t:{},l=n.helperMissing;return"    <tr>\n
        <td>"+e.escapeExpression((o=null!=(o=n.key||i&&i.key)?o:l,"function"===typeof
o?o.call(s,{name:"key",hash:{},data:i}):o))+</td>\n
        <td>"+(null!=(a=(n.sanitize||t&&t.sanitize||l).call(s,null!=t?t.description:t,{name:"sanitize",hash:{},data:i}))?a:"")+
        </td>\n
        <td>"+(null!=(a=(n.escape||t&&t.escape||l).call(s,null!=t?t.type:t,{name:"escape",hash:{},data:i}))?a:"")+</td>\n
        <td>"+(null!=(a=(n.escape||t&&t.escape||l).call(s,null!=t?t.other:t,{name:"escape",hash:{},data:i}))?a:"")+</td>\n
    </tr>\n"},15:function(e,t,n,r,i){return'    <h4 data-sw-translate>Parameters</h4>\n    <table
class='\fullwidth parameters'\>\n        <thead>\n            <tr>\n                <th style="width: 100px; max-width: 100px"
data-sw-translate>Parameter</th>\n                <th style="width: 310px; max-width: 310px" data-sw-
translate>Value</th>\n                <th style="width: 200px; max-width: 200px" data-sw-translate>Description</th>\n
                <th style="width: 100px; max-width: 100px" data-sw-translate>Parameter Type</th>\n                <th style="width:
220px; max-width: 230px" data-sw-translate>Data Type</th>\n            </tr>\n        </thead>\n
        <tbody class="operation-params">\n\n        </tbody>\n    </table>\n"},17:function(e,t,n,r,i){return"    <div
style='margin:0;padding:0;display:inline'></div>\n    <h4 data-sw-translate>Response Messages</h4>\n
    <table class='fullwidth response-messages'>\n        <thead>\n            <tr>\n                <th data-sw-translate>HTTP
Status Code</th>\n                <th data-sw-translate>Reason</th>\n                <th data-sw-translate>Response
Model</th>\n                <th data-sw-translate>Headers</th>\n            </tr>\n        </thead>\n        <tbody
class='\operation-status'\>\n            </tbody>\n    </table>\n"},19:function(e,t,n,r,i){return""},21:function(e,t,n,r,i){return"    <div class='sandbox_header'>\n
    <input class='submit' type='submit' value='Try it out!' data-sw-translate/>\n        <a href='#'
class='response_hider' style='display:none' data-sw-translate>Hide Response</a>\n        <span
class='response_throbber'
style='display:none'></span>\n    </div>\n"},23:function(e,t,n,r,i){return"    <h4 data-sw-translate>Request
Headers</h4>\n    <div class='block request_headers'></div>\n"},compiler:[7,">=
4.0.0"],main:function(e,t,n,r,i){var a,o=null!=t?t:{},s=n.helperMissing,l=e.escapeExpression;return"    <ul
class='operations' >\n        <li
class=''>"+(null!=(a=(n.escape||t&&t.escape||s).call(o,null!=t?t.method:t,{name:"escape",hash:{},data:i}))?a:"")+
        operation'

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id=""+(null!=(a=(n.escape||t&& t.escape||s).call(o,null!=t?t.parentId:t,{name:"escape",hash:{},data:i}))?a:"")+_ +(n
ull!=(a=(n.escape||t&& t.escape||s).call(o,null!=t?t.nickname:t,{name:"escape",hash:{},data:i}))?a:"")+>\n    <div
class='heading'>\n        <h3>\n            <span class='http_method'>\n                <a
href='#/'!'+l((n.sanitize||t&& t.sanitize||s).call(o,null!=t?t.encodedParentId:t,{name:"sanitize",hash:{},data:i}))+"/"+l(
(n.sanitize||t&& t.sanitize||s).call(o,null!=t?t.nickname:t,{name:"sanitize",hash:{},data:i}))+'\
class="toggleOperation">'+(null!=(a=(n.escape||t&& t.escape||s).call(o,null!=t?t.method:t,{name:"escape",hash:{},da
ta:i}))?a:"")+</a>\n            </span>\n            <span class='path'>\n                <a
href='#/'!'+l((n.sanitize||t&& t.sanitize||s).call(o,null!=t?t.encodedParentId:t,{name:"sanitize",hash:{},data:i}))+"/"+l(
(n.sanitize||t&& t.sanitize||s).call(o,null!=t?t.nickname:t,{name:"sanitize",hash:{},data:i}))+''
class="\toggleOperation
"+(null!=(a=n["if"].call(o,null!=t?t.deprecated:t,{name:"if",hash:{},fn:e.program(1,i,0),inverse:e.noop,data:i}))?a:""
)+>'+(null!=(a=(n.escape||t&& t.escape||s).call(o,null!=t?t.path:t,{name:"escape",hash:{},data:i}))?a:"")+</a>\n
        </span>\n        </h3>\n        <ul class='options'>\n            <li>\n                <a
href='#/'!'+l((n.sanitize||t&& t.sanitize||s).call(o,null!=t?t.encodedParentId:t,{name:"sanitize",hash:{},data:i}))+"/"+l(
(n.sanitize||t&& t.sanitize||s).call(o,null!=t?t.nickname:t,{name:"sanitize",hash:{},data:i}))+'\
class="toggleOperation"><span
class="markdown">'+(null!=(a=(n.escape||t&& t.escape||s).call(o,null!=t?t.summary:t,{name:"escape",hash:{},data:i
}))?a:"")+</span></a>\n            </li>\n        </ul>\n    </div>\n    <div class='content'
id=""+l((n.sanitize||t&& t.sanitize||s).call(o,null!=t?t.encodedParentId:t,{name:"sanitize",hash:{},data:i}))+_ +(n.s
anitize||t&& t.sanitize||s).call(o,null!=t?t.nickname:t,{name:"sanitize",hash:{},data:i}))+_ _content'
style='display:none'>\n        +(null!=(a=n["if"].call(o,null!=t?t.deprecated:t,{name:"if",hash:{},fn:e.program(3,i,0),inver
se:e.noop,data:i}))?a:"")+ (null!=(a=n["if"].call(o,null!=t?t.description:t,{name:"if",hash:{},fn:e.program(5,i,0),inver
se:e.noop,data:i}))?a:"")+ (null!=(a=n["if"].call(o,null!=t?t.security:t,{name:"if",hash:{},fn:e.program(7,i,0),inverse:
e.noop,data:i}))?a:"")+ (null!=(a=n["if"].call(o,null!=t?t.type:t,{name:"if",hash:{},fn:e.program(9,i,0),inverse:e.noop
,data:i}))?a:"")+ \n        +(null!=(a=n["if"].call(o,null!=t?t.headers:t,{name:"if",hash:{},fn:e.program(12,i,0),inverse:e.n
oop,data:i}))?a:"")+ \n
        <form accept-charset='UTF-8' class='sandbox'>\n            <div
style='margin:0;padding:0;display:inline'></div>\n            +(null!=(a=n["if"].call(o,null!=t?t.parameters:t,{name:"if",hash:
{ },fn:e.program(15,i,0),inverse:e.noop,data:i}))?a:"")+ (null!=(a=n["if"].call(o,null!=t?t.responseMessages:t,{name:"
if",hash:{ },fn:e.program(17,i,0),inverse:e.noop,data:i}))?a:"")+ (null!=(a=n["if"].call(o,null!=t?t.isReadOnly:t,{name
:"if",hash:{ },fn:e.program(19,i,0),inverse:e.noop,data:i}))?a:"")+ \n            </form>\n            <div
class='response' style='display:none'>\n                <h4 class='curl'>Curl</h4>\n                <div class='block curl'></div>\n
                <h4 data-sw-translate>Request URL</h4>\n                <div class='block
request_url'></div>\n            +(null!=(a=n["if"].call(o,null!=t?t.showRequestHeaders:t,{name:"if",hash:{ },fn:e.program(23
,i,0),inverse:e.noop,data:i}))?a:"")+ \n                <h4 data-sw-translate>Response Body</h4>\n
                <div class='block response_body'></div>\n                <h4 data-sw-translate>Response Code</h4>\n                <div
class='block response_code'></div>\n                <h4 data-sw-translate>Response Headers</h4>\n                <div
class='block response_headers'></div>\n            </div>\n        </div>\n    </li>\n
</ul>\n"},useData:!0)),t.param=e({1:function(e,t,n,r,i){var a;return
null!=(a=n["if"].call(null!=t?t:{ },null!=t?t.isFile:t,{name:"if",hash:{ },fn:e.program(2,i,0),inverse:e.noop,data:i,da
ta:i}))?a:""},2:function(e,t,n,r,i){var a,o=null!=t?t:{ },s=n.helperMissing;return'\t\t\t<input type="file"
name="'+(null!=(a=(n.escape||t&& t.escape||s).call(o,null!=t?t.name:t,{name:"escape",hash:{ },data:i}))?a:"")+''
id=""+(null!=(a=(n.escape||t&& t.escape||s).call(o,null!=t?t.valueId:t,{name:"escape",hash:{ },data:i}))?a:"")+'\t\t\t'>\n\t\t\t
\t\t\t<div class="parameter-content-type" />\n\t\t\t',4:function(e,t,n,r,i){var a;return
null!=(a=n["if"].call(null!=t?t:{ },null!=t?t["default"]:t,{name:"if",hash:{ },fn:e.program(5,i,0),inverse:e.noop,data:i,
0),data:i}))?a:""},5:function(e,t,n,r,i){var a;return
a,o=null!=t?t:{ },s=n.helperMissing;return'\t\t\t\t\t<div class="\editor_holder"></div>\n\t\t\t\t\t<textarea class="body-
textarea'

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name=""+(null!=(a=(n.escape||t&&$.escape||s).call(o,null!=t?t.name:t,{name:"escape",hash:{},data:i}))?a:"")+""
id=""+(null!=(a=(n.escape||t&&$.escape||s).call(o,null!=t?t.valueId:t,{name:"escape",hash:{},data:i}))?a:"")+"">"+(n
ull!=(a=(n.escape||t&&$.escape||s).call(o,null!=t?t["default"]:t,{name:"escape",hash:{},data:i}))?a:"")+</textarea>\n
    <br />\n    <div class="parameter-content-type" />\n',7:function(e,t,n,r,i){var
a,o=null!=t?t:{},s=n.helperMissing;return"\t\t\t\t<textarea class='body-textarea'
name=""+(null!=(a=(n.escape||t&&$.escape||s).call(o,null!=t?t.name:t,{name:"escape",hash:{},data:i}))?a:"")+""
id=""+(null!=(a=(n.escape||t&&$.escape||s).call(o,null!=t?t.valueId:t,{name:"escape",hash:{},data:i}))?a:"")+</tex
taarea>\n\t\t\t\t<div class="editor_holder"></div>\n\t\t\t\t<br
/>\n\t\t\t\t<div class="parameter-content-type" />\n',9:function(e,t,n,r,i){var a;return
null!=(a=n["if"].call(null!=t?t:{},null!=t?t.isFile:t,{name:"if",hash:{},fn:e.program(2,i,0),inverse:e.program(10,i,0),
data:i}))?a:""},10:function(e,t,n,r,i){var a;return
null!=(a=(n.renderTextParam||t&&$.renderTextParam||n.helperMissing).call(null!=t?t:{},t,{name:"renderTextParam
",hash:{},fn:e.program(11,i,0),inverse:e.noop,data:i}))?a:""},11:function(e,t,n,r,i){return""},compiler:[7,">=
4.0.0"],main:function(e,t,n,r,i){var a,o=null!=t?t:{},s=n.helperMissing;return"<td class='code'><label
for=""+(null!=(a=(n.escape||t&&$.escape||s).call(o,null!=t?t.valueId:t,{name:"escape",hash:{},data:i}))?a:"")+"">"+(n
ull!=(a=(n.escape||t&&$.escape||s).call(o,null!=t?t.name:t,{name:"escape",hash:{},data:i}))?a:"")+</label></td>\n<
td>\n\n"+(null!=(a=n["if"].call(o,null!=t?t.isBody:t,{name:"if",hash:{},fn:e.program(1,i,0),inverse:e.program(9,i,0),
data:i}))?a:"")+<\n</td>\n<td
class="markdown">'+(null!=(a=(n.sanitize||t&&$.sanitize||s).call(o,null!=t?t.description:t,{name:"sanitize",hash:{},d
ata:i}))?a:"")+</td>\n<td>"+(null!=(a=(n.escape||t&&$.escape||s).call(o,null!=t?t.paramType:t,{name:"escape",hash
: {},data:i}))?a:"")+</td>\n<td>\n\t<span
class="model-signature"></span>\n</td>\n',useData:!0}),t.param_list=e({1:function(e,t,n,r,i){return"
required"},3:function(e,t,n,r,i){return' multiple="multiple"',5:function(e,t,n,r,i){return" required
"},7:function(e,t,n,r,i){var a;return"    <option
"+(null!=(a=n.unless.call(null!=t?t:{},null!=t?t.hasDefault:t,{name:"unless",hash:{},fn:e.program(8,i,0),inverse:e.no
op,data:i}))?a:"")+< value=""></option>\n'},8:function(e,t,n,r,i){return' selected="" ',10:function(e,t,n,r,i){var
a,o=null!=t?t:{},s=n.helperMissing;return"\n    <option
"+(null!=(a=n["if"].call(o,null!=t?t.isDefault:t,{name:"if",hash:{},fn:e.program(11,i,0),inverse:e.noop,data:i}))?a:"")
+"
value=""+(null!=(a=(n.sanitize||t&&$.sanitize||s).call(o,null!=t?t.value:t,{name:"sanitize",hash:{},data:i}))?a:"")+>
"+(null!=(a=(n.sanitize||t&&$.sanitize||s).call(o,null!=t?t.value:t,{name:"sanitize",hash:{},data:i}))?a:"")+>
"+(null!=(a=n["if"].call(o,null!=t?t.isDefault:t,{name:"if",hash:{},fn:e.program(13,i,0),inverse:e.noop,data:i}))?a:"")
+"</option>\n\n"},11:function(e,t,n,r,i){return' selected="" ',13:function(e,t,n,r,i){return" (default)
"},15:function(e,t,n,r,i){return"<strong>"},17:function(e,t,n,r,i){return"</strong>"},compiler:[7,">=
4.0.0"],main:function(e,t,n,r,i){var a,o,s=null!=t?t:{},l=n.helperMissing;return"<td
class='code'"+(null!=(a=n["if"].call(s,null!=t?t.required:t,{name:"if",hash:{},fn:e.program(1,i,0),inverse:e.noop,data:
i}))?a:"")+><label
for=""+(null!=(a=(n.escape||t&&$.escape||l).call(s,null!=t?t.valueId:t,{name:"escape",hash:{},data:i}))?a:"")+>"+(n
ull!=(a=(n.sanitize||t&&$.sanitize||l).call(s,null!=t?t.name:t,{name:"sanitize",hash:{},data:i}))?a:"")+</label></td>\n
n<td>\n <select
"+(null!=(a=(n.isArray||t&&$.isArray||l).call(s,t,{name:"isArray",hash:{},fn:e.program(3,i,0),inverse:e.noop,data:i)
)?a:"")+<
class="parameter
'+(null!=(a=n["if"].call(s,null!=t?t.required:t,{name:"if",hash:{},fn:e.program(5,i,0),inverse:e.noop,data:i}))?a:"")+>
name=""+(null!=(a=(n.sanitize||t&&$.sanitize||l).call(s,null!=t?t.name:t,{name:"sanitize",hash:{},data:i}))?a:"")+>
id=""+(null!=(a=(n.escape||t&&$.escape||l).call(s,null!=t?t.valueId:t,{name:"escape",hash:{},data:i}))?a:"")+>\n\n'+
(null!=(a=n.unless.call(s,null!=t?t.required:t,{name:"unless",hash:{},fn:e.program(7,i,0),inverse:e.noop,data:i}))?a:"
")+>\n\n"+(null!=(a=n.each.call(s,null!=t?t.allowableValues:t)?a.descriptiveValues:a,{name:"each",hash:{},f

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n:e.program(10,i,0),inverse:e.noop,data:i)))?a:"")+'\n </select>\n</td>\n<td
class="markdown">'+(null!=(a=n["if"].call(s,null!=t?t.required:t,{name:"if",hash:{},fn:e.program(15,i,0),inverse:e.
noop,data:i)))?a:"")+((null!=(o=null!=(o=n.description||(null!=t?t.description:t))?o:l,a="function"===typeof
o?o.call(s,{name:"description",hash:{},data:i}):o)?a:"")+((null!=(a=n["if"].call(s,null!=t?t.required:t,{name:"if",hash
:},{fn:e.program(17,i,0),inverse:e.noop,data:i)))?a:"")+</td>\n<td>'+(null!=(a=(n.escape||t&&t.escape||l).call(s,nul
l!=t?t.paramType:t,{name:"escape",hash:{},data:i}))?a:"")+</td>\n<td><span
class="model-signature"></span></td>\n'),useData:!0)),t.param_readonly=e({1:function(e,t,n,r,i){var
a,o=null!=t?t:{},s=n.helperMissing;return"    <textarea class='body-textarea' readonly='readonly'
name='"+(null!=(a=(n.sanitize||t&&t.sanitize||s).call(o,null!=t?t.name:t,{name:"sanitize",hash:{},data:i}))?a:"")+""
id='"+(null!=(a=(n.escape||t&&t.escape||s).call(o,null!=t?t.valueId:t,{name:"escape",hash:{},data:i}))?a:"")+"">'+(n
ull!=(a=(n.sanitize||t&&t.sanitize||s).call(o,null!=t?t["default"]:t,{name:"sanitize",hash:{},data:i}))?a:"")+</textarea
>\n    <div class="parameter-content-type" />\n'},3:function(e,t,n,r,i){var a;return
null!=(a=n["if"].call(null!=t?t:{},null!=t?t["default"]:t,{name:"if",hash:{},fn:e.program(4,i,0),inverse:e.program(6,i,
0),data:i}))?a:""},4:function(e,t,n,r,i){var
a;return"
'+(null!=(a=(n.sanitize||t&&t.sanitize||n.helperMissing).call(null!=t?t:{},null!=t?t["default"]:t,{name:"sanitize",hash
:},{data:i}))?a:"")+<n",6:function(e,t,n,r,i){return"    (empty)\n"},compiler:[7,">=
4.0.0"],main:function(e,t,n,r,i){var a,o=null!=t?t:{},s=n.helperMissing;return"<td class='code'><label
for='"+(null!=(a=(n.escape||t&&t.escape||s).call(o,null!=t?t.valueId:t,{name:"escape",hash:{},data:i}))?a:"")+"">'+(n
ull!=(a=(n.sanitize||t&&t.sanitize||s).call(o,null!=t?t.name:t,{name:"sanitize",hash:{},data:i}))?a:"")+</label></td>\
n<td>\n'+(null!=(a=n["if"].call(o,null!=t?t.isBody:t,{name:"if",hash:{},fn:e.program(1,i,0),inverse:e.program(3,i,0),
data:i}))?a:"")+</td>\n<td
class="markdown">'+(null!=(a=(n.sanitize||t&&t.sanitize||s).call(o,null!=t?t.description:t,{name:"sanitize",hash:{},d
ata:i}))?a:"")+</td>\n<td>'+(null!=(a=(n.escape||t&&t.escape||s).call(o,null!=t?t.paramType:t,{name:"escape",hash
:},{data:i}))?a:"")+</td>\n<td><span
class="model-signature"></span></td>\n'),useData:!0)),t.param_readonly_required=e({1:function(e,t,n,r,i){var
a,o=null!=t?t:{},s=n.helperMissing;return"    <textarea class='body-textarea' readonly='readonly'
placeholder='(required)'
name='"+(null!=(a=(n.sanitize||t&&t.sanitize||s).call(o,null!=t?t.name:t,{name:"sanitize",hash:{},data:i}))?a:"")+""
id='"+(null!=(a=(n.escape||t&&t.escape||s).call(o,null!=t?t.valueId:t,{name:"escape",hash:{},data:i}))?a:"")+"">'+(n
ull!=(a=(n.sanitize||t&&t.sanitize||s).call(o,null!=t?t["default"]:t,{name:"sanitize",hash:{},data:i}))?a:"")+</textarea
>\n'},3:function(e,t,n,r,i){var a;return
null!=(a=n["if"].call(null!=t?t:{},null!=t?t["default"]:t,{name:"if",hash:{},fn:e.program(4,i,0),inverse:e.program(6,i,
0),data:i}))?a:""},4:function(e,t,n,r,i){var a;return"
'+(null!=(a=(n.sanitize||t&&t.sanitize||n.helperMissing).call(null!=t?t:{},null!=t?t["default"]:t,{name:"sanitize",hash
:},{data:i}))?a:"")+<n",6:function(e,t,n,r,i){
return"
    (empty)\n"},compiler:[7,">= 4.0.0"],main:function(e,t,n,r,i){var
a,o=null!=t?t:{},s=n.helperMissing;return"<td class='code required'><label
for='"+(null!=(a=(n.escape||t&&t.escape||s).call(o,null!=t?t.valueId:t,{name:"escape",hash:{},data:i}))?a:"")+"">'+(n
ull!=(a=(n.sanitize||t&&t.sanitize||s).call(o,null!=t?t.name:t,{name:"sanitize",hash:{},data:i}))?a:"")+</label></td>\
n<td>\n'+(null!=(a=n["if"].call(o,null!=t?t.isBody:t,{name:"if",hash:{},fn:e.program(1,i,0),inverse:e.program(3,i,0),
data:i}))?a:"")+</td>\n<td
class="markdown">'+(null!=(a=(n.sanitize||t&&t.sanitize||s).call(o,null!=t?t.description:t,{name:"sanitize",hash:{},d
ata:i}))?a:"")+</td>\n<td>'+(null!=(a=(n.escape||t&&t.escape||s).call(o,null!=t?t.paramType:t,{name:"escape",hash
:},{data:i}))?a:"")+</td>\n<td><span class="model-
signature"></span></td>\n'),useData:!0)),t.param_required=e({1:function(e,t,n,r,i){var a;return

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null!=(a=n["if"].call(null!=t?t:{},null!=t?t.isFile:t,{name:"if",hash:{},fn:e.program(2,i,0),inverse:e.program(4,i,0),data:i}))?a:"",2:function(e,t,n,r,i){var a,o=null!=t?t:{},s=n.helperMissing;return"\t\t\t<input type='file' name='"+(null!=(a=(n.escape||t&& t.escape||s).call(o,null!=t?t.name:t,{name:"escape",hash:{},data:i})))?a:"")+ "id='"+(null!=(a=(n.escape||t&& t.escape||s).call(o,null!=t?t.valueId:t,{name:"escape",hash:{},data:i})))?a:"')+"/>\n"},4:function(e,t,n,r,i){var a;return null!=(a=n["if"].call(null!=t?t:{},null!=t?t["default"]:t,{name:"if",hash:{},fn:e.program(5,i,0),inverse:e.program(7,i,0),data:i})))?a:"",5:function(e,t,n,r,i){var a,o=null!=t?t:{},s=n.helperMissing;return"\t\t\t\t<div class='\neditor_holder'\n"></div>\n\t\t\t\t\t<textarea class='body-textarea required' placeholder='(required)' name='"+(null!=(a=(n.sanitize||t&& t.sanitize||s).call(o,null!=t?t.name:t,{name:"sanitize",hash:{},data:i})))?a:"')+ "id='"+(null!=(a=(n.escape||t&& t.escape||s).call(o,null!=t?t.valueId:t,{name:"escape",hash:{},data:i})))?a:"')+ ">'+(n null!=(a=(n.sanitize||t&& t.sanitize||s).call(o,null!=t?t["default"]:t,{name:"sanitize",hash:{},data:i})))?a:")+'</textarea >\n\n      <div class='parameter-content-type' />\n'},7:function(e,t,n,r,i){var a,o=null!=t?t:{},s=n.helperMissing;return"\t\t\t\t\t<textarea class='body-textarea required' placeholder='(required)' name='"+(null!=(a=(n.sanitize||t&& t.sanitize||s).call(o,null!=t?t.name:t,{name:"sanitize",hash:{},data:i})))?a:"')+ "id='"+(null!=(a=(n.escape||t&& t.escape||s).call(o,null!=t?t.valueId:t,{name:"escape",hash:{},data:i})))?a:"')+\n"></textarea>\n\t\t\t\t\t<div class='editor_holder'\n"></div>\n\t\t\t\t\t\t<br />\n\t\t\t\t\t\t\t<div class='parameter-content-type' />\n'},9:function(e,t,n,r,i){var a;return null!=(a=n["if"].call(null!=t?t:{},null!=t?t.isFile:t,{name:"if",hash:{},fn:e.program(10,i,0),inverse:e.program(12,i,0),data:i})))?a:"",10:function(e,t,n,r,i){var a,o=null!=t?t:{},s=n.helperMissing;return"\t\t\t\t<input class='parameter' class='required' type='file' name='"+(null!=(a=(n.sanitize||t&& t.sanitize||s).call(o,null!=t?t.name:t,{name:"sanitize",hash:{},data:i})))?a:"')+ "id='"+(null!=(a=(n.escape||t&& t.escape||s).call(o,null!=t?t.valueId:t,{name:"escape",hash:{},data:i})))?a:"')+ "/>\n"},12:function(e,t,n,r,i){var a;return null!=(a=(n.renderTextParam||t&& t.renderTextParam||n.helperMissing).call(null!=t?t:{},t,{name:"renderTextParam ",hash:{},fn:e.program(13,i,0),inverse:e.noop,data:i})))?a:"",13:function(e,t,n,r,i){return""},compiler:[7,">= 4.0.0"],main:function(e,t,n,r,i){var a,o=null!=t?t:{},s=n.helperMissing;return"<td class='code required'\n"><label for='"+(null!=(a=(n.escape||t&& t.escape||s).call(o,null!=t?t.valueId:t,{name:"escape",hash:{},data:i})))?a:"')+ ">'+(n ull!=(a=(n.escape||t&& t.escape||s).call(o,null!=t?t.name:t,{name:"escape",hash:{},data:i})))?a:"')+ "</label></td>\n"><td>\n'+(null!=(a=n["if"].call(o,null!=t?t.isBody:t,{name:"if",hash:{},fn:e.program(1,i,0),inverse:e.program(9,i,0),data:i})))?a:')+'</td>\n"><td>\n\t<strong><span class='markdown'\n">'+(null!=(a=(n.sanitize||t&& t.sanitize||s).call(o,null!=t?t.description:t,{name:"sanitize",hash:{},data:i})))?a:")+'</span></strong>\n"></td>\n"><td>\n'+(null!=(a=(n.escape||t&& t.escape||s).call(o,null!=t?t.paramType:t,{name:"escape",hash:{},data:i})))?a:")+'</td>\n"><td><span class='model-signature'\n"></span></td>\n'},useData:!0)),t.parameter_content_type=e({1:function(e,t,n,r,i){var a;return null!=(a=n.each.call(null!=t?t:{},null!=t?t.consumes:t,{name:"each",hash:{},fn:e.program(2,i,0),inverse:e.noop,data:i})))?a:"",2:function(e,t,n,r,i){var a,o=null!=t?t:{},s=n.helperMissing;return' <option value='"+(null!=(a=(n.sanitize||t&& t.sanitize||s).call(o,t,{name:"sanitize",hash:{},data:i})))?a:"')+ ">'+(null!=(a=(n.sanitize||t&& t.sanitize||s).call(o,t,{name:"sanitize",hash:{},data:i})))?a:")+'</option>\n'},4:function(e,t,n,r,i){return' <option value='application/json'>application/json</option>\n'},compiler:[7,">= 4.0.0"],main:function(e,t,n,r,i){var a,o,s=null!=t?t:{},l=n.helperMissing;return'<label for='"+e.escapeExpression((o=null!=(o=n.parameterContentTypeId||(null!=t?t.parameterContentTypeId:t))?o:l,"function")==typeof o?o.call(s,{name:"parameterContentTypeId",hash:{},data:i}):o))+ " data-sw-translate>Parameter content type:</label>\n"><select name='parameterContentType' id='"+(null!=(a=(n.sanitize||t&& t.sanitize||l).call(s,null!=t?t.parameterContentTypeId:t,{name:"sanitize",hash:{},data:i})))?a:")+' ">\n'+(null!=(a=n["if"].call(s,null!=t?t.consumes:t,{name:"if",hash:{},fn:e.program(1,i,0),inverse:e.program(4,i,0),data:i})))?a:')+'</select>\n'},useData:!0)),t.popup=e({compiler:[7,">= 4.0.0"],main:function(e,t,n,r,i){var a;return'<div class='api-popup-dialog-wrapper'\n"><div class='api-popup-

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title">'+e.escapeExpression((a=null!=(a=n.title||(null!=t?t.title:t))?a:n.helperMissing,"function"==typeof
a?a.call(null!=t?t:{},{name:"title",hash:{},data:i}):a))+'/</div>\n <div class="api-popup-content"></div>\n <p
class="error-msg"></p>\n
<div class="api-popup-actions">\n <button class="api-popup-cancel api-button gray"
type="button">Cancel</button>\n </div>\n</div>\n<div class="api-popup-dialog-
shadow"></div>'},useData:!0)),t.resource=e({1:function(e,t,n,r,i){return":",3:function(e,t,n,r,i){var a;return"
<li>\n <a
href=""+(null!=(a=(n.sanitize||t&&u.sanitize||n.helperMissing).call(null!=t?t:{},null!=t?t.url:t,{name:"sanitize",hash:
{ },data:i}))?a:"")+"" data-sw-translate>Raw</a>\n </li>\n"},compiler:[7,">= 4.0.0"],main:function(e,t,n,r,i){var
a,o,s,l=null!=t?t:{},u=n.helperMissing,c=""<div class='heading'>\n <h2>\n <a
href="#!/"+(null!=(a=(n.sanitize||t&&u.sanitize||u).call(l,null!=t?t.id:t,{name:"sanitize",hash:{ },data:i}))?a:"")+'\
class="toggleEndpointList" data-
id=""+(null!=(a=(n.sanitize||t&&u.sanitize||u).call(l,null!=t?t.id:t,{name:"sanitize",hash:{ },data:i}))?a:"")+"">(null!
=(a=(n.sanitize||t&&u.sanitize||u).call(l,null!=t?t.name:t,{name:"sanitize",hash:{ },data:i}))?a:"")+""</a>
";return
o=null!=(o=n.summary||(null!=t?t.summary:t))?o:u,s={name:"summary",hash:{ },fn:e.program(1,i,0),inverse:e.noop,
data:i},a="function"==typeof
o?o.call(l,s):o,n.summary||(a=n.blockHelperMissing.call(t,a,s)),null!=a&&(c+=a),c+(null!=(a=(n.sanitize||t&&u.sanit
ize||u).call(l,null!=t?t.summary:t,{name:"sanitize",hash:{ },data:i}))?a:"")+""\n </h2>\n <ul class='options'>\n
<li>\n <a
href="#!/"+(null!=(a=(n.sanitize||t&&u.sanitize||u).call(l,null!=t?t.id:t,{name:"sanitize",hash:{ },data:i}))?a:"")+""
id='endpointListToggle_'+(null!=(a=(n.sanitize||t&&u.sanitize||u).call(l,null!=t?t.id:t,{name:"sanitize",hash:{ },data:i
})))?a:"")+'\ class="toggleEndpointList" data-
id=""+(null!=(a=(n.sanitize||t&&u.sanitize||u).call(l,null!=t?t.id:t,{name:"sanitize",hash:{ },data:i}))?a:"")+"" data-sw-
translate>Show/Hide</a>\n </li>\n <li>\n <a href='\#\' class="collapseResource" data-
id=""+(null!=(a=(n.sanitize||t&&u.sanitize||u).call(l,null!=t?t.id:t,{name:"sanitize",hash:{ },data:i}))?a:"")+""
data-sw-translate>\n List Operations\n </a>\n </li>\n <li>\n <a href='\#\' class="expandResource"
data-id=""+(null!=(a=(n.sanitize||t&&u.sanitize||u).call(l,null!=t?t.id:t,{name:"sanitize",hash:{ },data:i}))?a:"")+""
data-sw-translate>\n Expand Operations\n </a>\n
</li>\n'+(null!=(a=n["if"].call(l,null!=t?t.url:t,{name:"if",hash:{ },fn:e.program(3,i,0),inverse:e.noop,data:i}))?a:"")+
" </ul>\n</div>\n<ul class='endpoints'
id=""+(null!=(a=(n.sanitize||t&&u.sanitize||u).call(l,null!=t?t.id:t,{name:"sanitize",hash:{ },data:i}))?a:"")+""_endpoint
_list' style='display:none'>\n\n</ul>\n"},useData:!0)),t.response_content_type=e({1:function(e,t,n,r,i){var a;return
null!=(a=n.each.call(null!=t?t:{},null!=t?t.produces:t,{name:"each",hash:{ },fn:e.program(2,i,0),inverse:e.noop,data:
i}))?a:""},2:function(e,t,n,r,i){var a,o=null!=t?t:{},s=n.helperMissing;return' <option
value=""+(null!=(a=(n.sanitize||t&&u.sanitize||s).call(o,t,{name:"sanitize",hash:{ },data:i}))?a:"")+"">(null!=(a=(n.s
anitize||t&&u.sanitize||s).call(o,t,{name:"sanitize",hash:{ },data:i}))?a:"")+""</option>\n"},4:function(e,t,n,r,i){return'
<option value="application/json">application/json</option>\n'},compiler:[7,">=
4.0.0"],main:function(e,t,n,r,i){var
a,o,s=null!=t?t:{},l=n.helperMissing,u="function",c=e.escapeExpression;return'<label data-sw-translate
for=""+c((o=null!=(o=n.responseContentTypeId||(null!=t?t.responseContentTypeId:t))?o:l,typeof
o===u?o.call(s,{name:"responseContentTypeId",hash:{ },data:i}):o))+"">Response Content Type</label>\n<select
name="responseContentType"
id=""+c((o=null!=(o=n.responseContentTypeId||(null!=t?t.responseContentTypeId:t))?o:l,typeof
o===u?o.call(s,{name:"responseContentTypeId",hash:{ },data:i}):o))+"">\n'+(null!=(a=n["if"].call(s,null!=t?t.produc
es:t,{name:"if",hash:{ },fn:e.program(1,i,0),inverse:e.program(4,i,0),data:i}))?a:"")+""</select>\n"},useData:!0)),t.sig
nature=e({1:function(e,t,n,r,i){var a,o=null!=t?t:{};return'\n<div>\n<ul

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class="signature-nav">\n <li><a class="description-link" href="#" data-sw-translate>Model</a></li>\n <li><a
class="snippet-link" href="#" data-sw-translate>Example Value</a></li>\n</ul>\n<div>\n\n<div class="signature-
container">\n <div class="description">\n
'+e.escapeExpression((n.sanitize||t&&e.sanitize||n.helperMissing).call(o,null!=t?t.signature:t,{name:"sanitize",hash:{
},data:i}))+'\n </div>\n\n <div
class="snippet">\n'+(null!=(a=n["if"].call(o,null!=t?t.sampleJSON:t,{name:"if",hash:{},fn:e.program(2,i,0),inverse:
e.noop,data:i})))?a:"")+ (null!=(a=n["if"].call(o,null!=t?t.sampleXML:t,{name:"if",hash:{},fn:e.program(5,i,0),invers
e:e.noop,data:i})))?a:"")+ </div>\n</div>\n",2:function(e,t,n,r,i){var a,o=null!=t?t:{};return' <div
class="snippet_json">\n
<pre><code>'+(null!=(a=(n.escape||t&&e.escape||n.helperMissing).call(o,null!=t?t.sampleJSON:t,{name:"escape",ha
sh:{},data:i})))?a:"")+</code></pre>\n
'+(null!=(a=n["if"].call(o,null!=t?t.isParam:t,{name:"if",hash:{},fn:e.program(3,i,0),inverse:e.noop,data:i})))?a:"")+
\n
</div>\n",3:function(e,t,n,r,i){return'<small class="notice" data-sw-
translate></small>',5:function(e,t,n,r,i){var a,o=null!=t?t:{};return' <div class="snippet_xml">\n
<pre><code>'+(null!=(a=(n.escape||t&&e.escape||n.helperMissing).call(o,null!=t?t.sampleXML:t,{name:"escape",ha
sh:{},data:i})))?a:"")+</code></pre>\n
'+(null!=(a=n["if"].call(o,null!=t?t.isParam:t,{name:"if",hash:{},fn:e.program(3,i,0),inverse:e.noop,data:i})))?a:"")+
\n </div>\n",7:function(e,t,n,r,i){var a;return
'+(null!=(a=(n.escape||t&&e.escape||n.helperMissing).call(null!=t?t:{},null!=t?t.signature:t,{name:"escape",hash:{},
data:i})))?a:"")+<n",compiler:[7,">= 4.0.0"],main:function(e,t,n,r,i){var a;return
null!=(a=(n.ifCond||t&&e.ifCond||n.helperMissing).call(null!=t?t:{},null!=t?t.sampleJSON:t,"||",null!=t?t.sampleXM
L:t,{name:"ifCond",hash:{},fn:e.program(1,i,0),inverse:e.program(7,i,0),data:i})))?a:""},useData:!0)),t.status_code=
e({1:function(e,t,n,r,i){var
a,o,s=null!=t?t:{},l=n.helperMissing;return' <tr>\n
<td>"+e.escapeExpression((o=null!=(o=n.key||i&&e.key)?o:l,"function"==typeof
o?o.call(s,{name:"key",hash:{},data:i}):o))+</td>\n
<td>"+(null!=(a=(n.sanitize||t&&e.sanitize||l).call(s,null!=t?t.description:t,{name:"sanitize",hash:{},data:i})))?a:"")+
</td>\n
<td>"+(null!=(a=(n.escape||t&&e.escape||l).call(s,null!=t?t.type:t,{name:"escape",hash:{},data:i})))?a:"")+</td>\n
</tr>\n",compiler:[7,">= 4.0.0"],main:function(e,t,n,r,i){var a,o=null!=t?t:{},s=n.helperMissing;return"<td
width='15%'
class='code'>"+(null!=(a=(n.escape||t&&e.escape||s).call(o,null!=t?t.code:t,{name:"escape",hash:{},data:i})))?a:"")+
</td>\n<td
class="markdown">'+(null!=(a=(n.escape||t&&e.escape||s).call(o,null!=t?t.message:t,{name:"escape",hash:{},data:i}
)))?a:"')+</td>\n<td width='50%'><span class="model-signature" /></td>\n<td class="headers">\n <table>\n
<tbody>\n'+(null!=(a=n.each.call(o,null!=t?t.headers:t,{name:"each",hash:{},fn:e.program(1,i,0),inverse:e.noop,data
:i})))?a:"")+
</tbody>\n </table>\n</td>"},useData:!0})),(function(){$.fn.vAlign=function(){return
this.each(function(){var e=$(this).height(),t=$(this).parent().height(),n=(t-e)/2;$(this).css("margin-
top",n)}),$.fn.stretchFormtasticInputWidthToParent=function(){return this.each(function(){var
e=$(this).closest("form").innerWidth(),t=parseInt($(this).closest("form").css("padding-
left"),10)+parseInt($(this).closest("form").css("padding-right"),10),n=parseInt($(this).css("padding-
left"),10)+parseInt($(this).css("padding-right"),10);$(this).css("width",e-t-n)}),$("form.formtastic li.string input,
form.formtastic textarea").stretchFormtasticInputWidthToParent(),$("ul.downplayed li div.content
p").vAlign(),$("form.sandbox").submit(function(){var e=!0;return
$(this).find("input.required").each(function(){$(this).removeClass("error"),""===$(this).val()&&$(this).addClass("
error"),$(this).wiggle(),e=!1})),e})),Function.prototype.bind&&console&&"object"==typeof

```

```

console.log&&["log","info","warn","error","assert","dir","clear","profile","profileEnd"].forEach(function(e){consol
e[e]=this.bind(console[e],console)},Function.prototype.call),window.Docs={shebang:function(){var
e=$.param.fragment().split("/");switch(e.shift(),e.length){case 1:if(e[0].length>0){var
t="resource_"+e[0];Docs.expandEndpointListForResource(e[0]),$("#"+t).slideto({highlight:!1})}break;case
2:Docs.expandEndpointListForResource(e[0]),$("#"+t).slideto({highlight:!1});var
n=e.join("_"),r=n+"_content";Docs.expandOperation($("#"+r)),($("#"+n).slideto({highlight:!1})),toggleEndpointLi
stForResource:function(e){var t=$("#li#resource_"+Docs.escapeResourceName(e)+"
ul.endpoints");t.is(":visible")?($.bbq.pushState("#/",2),Docs.collapseEndpointListForResource(e)):($.bbq.pushState(
"#/"+e,2),Docs.expandEndpointListForResource(e)),expandEndpointListForResource:function(e){var
e=Docs.escapeResourceName(e);if("")==e)return void $(".resource
ul.endpoints").slideDown();$("#li#resource_"+e).addClass("active");var t=$("#li#resource_"+e+"
ul.endpoints");t.slideDown(),collapseEndpointListForResource:function(e){var
e=Docs.escapeResourceName(e);if("")==e)return void $(".resource
ul.endpoints").slideUp();$("#li#resource_"+e).removeClass("active");var t=$("#li#resource_"+e+"
ul.endpoints");t.slideUp(),expandOperationsForResource:function(e){return
Docs.expandEndpointListForResource(e),""==e?void $(".resource ul.endpoints li.operation
div.content").slideDown():void $(".li#resource_"+Docs.escapeResourceName(e)+" li.operation
div.content").each(function(){Docs.expandOperation($(this))}},collapseOperationsForResource:function(e){return
Docs.expandEndpointListForResource(e),""==e?void $(".resource ul.endpoints li.operation
div.content").slideUp():void $(".li#resource_"+Docs.escapeResourceName(e)+" li.operation
div.content").each(function(){Docs.collapseOperation($(this))}},escapeResourceName:function(e){return
e.replace(/['!"#%&'()*+,-./:;<=>?@[\]\^`{}~]/g,"\\$&")},expandOperation:function(e){e.slideDown(),collapseO
peration:function(e){e.slideUp()}},function(e,t){"use
strict";"function"==typeof define&&define.amd?define(t):"object"==typeof
exports?module.exports=t():e.returnExports=t()}(this,function(){var
e,t,n=Array,r=n.prototype,i=Object,a=i.prototype,o=Function,s=o.prototype,l=String,u=l.prototype,c=Number,p=c.p
rototype,h=r.slice,f=r.splice,d=r.push,m=r.unshift,g=r.concat,y=r.join,v=s.call,b=s.apply,w=Math.max,_=Math.min,
x=a.toString,A="function"==typeof Symbol&&"symbol"==typeof
Symbol.toStringTag,S=Function.prototype.toString,j=/^s*class /,E=function(e){try{var
t=S.call(e),n=t.replace(/\\./g,""),r=n.replace(/\\s[.\\s]*\\./g,""),i=r.replace(/\\n/gm," ").replace(/ {2}/g,"
");return j.test(i)}catch(a){return!1}},O=function(e){try{return!E(e)&&(S.call(e),!0)}catch(t){return!1}},k="[object
Function]",T="[object GeneratorFunction]",e=function(e){if(!e)return!1;if("function"!=typeof e&&"object"!=typeof
e)return!1;if(A)return O(e);if(E(e))return!1;var t=x.call(e);return
t===k||t===T},C=RegExp.prototype.exec,I=function(e){try{return C.call(e,!0)}catch(t){return!1}},D="[object
RegExp]";t=function(e){return"object"==typeof e&&(A?I(e):x.call(e)===D)};var
L,M=String.prototype.valueOf,R=function(e){try{return M.call(e,!0)}catch(t){return!1}},U="[object
String]";L=function(e){return"string"==typeof e||"object"==typeof e&&(A?R(e):x.call(e)===U)};var
P=i.defineProperty&&function(){try{var e={};i.defineProperty(e,"x",{enumerable:!1,value:e});for(var t in
e)return!1;return e.x===e}catch(n){return!1}}(),q=function(e){var t;return t=P?function(e,t,n,r){!r&&t in
e||i.defineProperty(e,t,{configurable:!0,enumerable:!1,writable:!0,value:n}):function(e,t,n,r){!r&&t in
e||(e[t]=n)},function(n,r,i){for(var a in r)e.call(r,a)&&t(n,a,r[a],i)}(a.hasOwnProperty),B=function(e){var t=typeof
e;return null===e||"object"!=t&&"function"!=t},N=c.isNaN||function(e){return
e!==e},z={ToInteger:function(e){var
t+=e;return N(t)?t=0:0!==(t&&t!==(1/0)&&t!==(1/0)&&(t=(t>0?-
1)*Math.floor(Math.abs(t))),t),ToPrimitive:function(t){var n,r,i;if(B(t))return
t;if(r=t.valueOf,e(r)&&(n=r.call(t),B(n)))return n;if(i=t.toString,e(i)&&(n=i.call(t),B(n)))return n;throw new
TypeError},ToObject:function(e){if(null==e)throw new TypeError("can't convert "+e+" to object");return
i(e)},ToUint32:function(e){return e>>>0}},$=function(){};q(s,{bind:function(t){var n=this;if(!e(n))throw new

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TypeError("Function.prototype.bind called on incompatible "+n);for(var r,a=h.call(arguments,1),s=function(){if(this
instanceof r){var e=b.call(n,this,g.call(a,h.call(arguments)));return i(e)===e?e:this}return
b.call(n,t,g.call(a,h.call(arguments)))},l=w(0,n.length-a.length),u=[],c=0;c<l;c++)d.call(u,"$"+c);return
r=o("binder","return function ("+y.call(u,"")+"){ return binder.apply(this, arguments);
}")(s),n.prototype&&$.prototype=n.prototype,r.prototype=new $,$.prototype=null,r}});var
F=v.bind(a.hasOwnProperty),V=v.bind(a.toString),H=v.bind(h),Y=b.bind(h),J=v.bind(u.slice),W=v.bind(u.split),Q=
v.bind(u.indexOf),G=v.bind(d),K=v.bind(a.propertyIsEnumerable),X=v.bind(r.sort),Z=n.isArray||function(e){return
"[object
Array]"===V(e)},ee=1!==[].unshift(0);q(r,{unshift:function(){return
m.apply(this,arguments),this.length}},ee),q(n,{isArray:Z});var te=i("a"),ne="a"!==te[0]||!(0 in
te),re=function(e){var t=!0,n=!0,r=!1;if(e)try{e.call("foo",function(e,n,r){{"object"!==typeof
r&&(t=!1)}),e.call([1],function(){ "use strict";n="string"===typeof
this,"x"})}catch(i){r=!0}return!e&&!r&&t&&n};q(r,{forEach:function(t){var
n,r=z.ToObject(this),i=ne&&L(this)?W(this,""):r,a=-
1,o=z.ToUint32(i.length);if(arguments.length>1&&(n=arguments[1]),!e(t))throw new
TypeError("Array.prototype.forEach callback must be a function");for(;++a<o;a in i&&("undefined"===typeof
n?t(i[a],a,r):t.call(n,i[a],a,r))},!re(r.forEach)),q(r,{map:function(t){var
r,i=z.ToObject(this),a=ne&&L(this)?W(this,""):i,o=z.ToUint32(a.length),s=n(o);if(arguments.length>1&&(r=argum
ents[1]),!e(t))throw
new TypeError("Array.prototype.map callback must be a function");for(var l=0;l<o;l++)l in
a&&("undefined"===typeof r?s[l]=t(a[l],l,i):s[l]=t.call(r,a[l],l,i));return s}},!re(r.map)),q(r,{filter:function(t){var
n,r,i=z.ToObject(this),a=ne&&L(this)?W(this,""):i,o=z.ToUint32(a.length),s=[];if(arguments.length>1&&(r=argum
ents[1]),!e(t))throw new TypeError("Array.prototype.filter callback must be a function");for(var l=0;l<o;l++)l in
a&&(n=a[l],("undefined"===typeof r?t(n,l,i):t.call(r,n,l,i))&&G(s,n));return
s}},!re(r.filter)),q(r,{every:function(t){var
n,r=z.ToObject(this),i=ne&&L(this)?W(this,""):r,a=z.ToUint32(i.length);if(arguments.length>1&&(n=arguments[1]
),!e(t))throw new TypeError("Array.prototype.every callback must be a function");for(var o=0;o<a;o++)if(o in
i&&!("undefined"===typeof n?t(i[o],o,r):t.call(n,i[o],o,r)))return!1;return!0}},!re(r.every)),q(r,{some:function(t){var
n,r=z.ToObject(this),i=ne&&L(this)?W(this,""):r,a=z.ToUint32(i.length);if(arguments.length>1&&(n=arguments[1]
),!e(t))throw
new TypeError("Array.prototype.some callback must be a function");for(var o=0;o<a;o++)if(o in
i&&("undefined"===typeof n?t(i[o],o,r):t.call(n,i[o],o,r)))return!0;return!1}},!re(r.some));var
ie=!1;r.reduce&&(ie="object"===typeof r.reduce.call("es5",function(e,t,n,r){return r})),q(r,{reduce:function(t){var
n=z.ToObject(this),r=ne&&L(this)?W(this,""):n,i=z.ToUint32(r.length);if(!e(t))throw new
TypeError("Array.prototype.reduce callback must be a function");if(0===i&&1===arguments.length)throw new
TypeError("reduce of empty array with no initial value");var a,o=0;if(arguments.length>=2)a=arguments[1];else
for(;;){if(o in r){a=r[o++];break}if(++o>=i)throw new TypeError("reduce of empty array with no initial
value")}}for(o<i;o++)o in r&&(a=t(a,r[o],o,n));return a}},!ie);var ae=!1;r.reduceRight&&(ae="object"===typeof
r.reduceRight.call("es5",function(e,t,n,r){return r})),q(r,{reduceRight:function(t){var
n=z.ToObject(this),r=ne&&L(this)?W(this,""):n,i=z.ToUint32(r.length);if(!e(t))throw
new TypeError("Array.prototype.reduceRight callback must be a
function");if(0===i&&1===arguments.length)throw new TypeError("reduceRight of empty array with no initial
value");var a,o=i-1;if(arguments.length>=2)a=arguments[1];else for(;;){if(o in r){a=r[o--];break}if(--o<0)throw new
TypeError("reduceRight of empty array with no initial value")}if(o<0)return a;do o in r&&(a=t(a,r[o],o,n));while(o-
-);return a}},!ae);var oe=r.indexOf&&[0,1].indexOf(1,2)!==1;q(r,{indexOf:function(e){var
t=ne&&L(this)?W(this,""):z.ToObject(this),n=z.ToUint32(t.length);if(0===n)return-1;var
r=0;for(arguments.length>1&&(r=z.ToInteger(arguments[1])),r=r>=0?r:w(0,n+r);r<n;r++)if(r in
t&&t[r]===e)return r;return-1}},oe);var se=r.lastIndexOf&&[0,1].lastIndexOf(0,-3)!==1;

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1;q(r,{lastIndexOf:function(e){var
t=ne&&L(this)?W(this,""):z.ToObject(this),n=z.ToUint32(t.length);if(0===n)return-1;var r=n-
1;for(arguments.length>1&&(r=_((r,z.ToInteger(arguments[1]))),r=r>=0?r:n-Math.abs(r);r>=0;r--))if(r
in t&&e===t[r])return r;return-1}},se);var le=function(){var e=[1,2],t=e.splice();return
2===e.length&&Z(t)&&0===t.length};q(r,{splice:function(e,t){return
0===arguments.length?f.apply(this,arguments)}},!le);var ue=function(){var e={};return
r.splice.call(e,0,0,1),1===e.length};q(r,{splice:function(e,t){if(0===arguments.length)return[];var
n=arguments;return this.length=w(z.ToInteger(this.length),0),arguments.length>0&&"number"!=typeof
t&&(n=H(arguments),n.length<2?G(n,this.length-e):n[1]=z.ToInteger(t)),f.apply(this,n)}},!ue);var
ce=function(){var e=new n(1e5);return e[8]="x",e.splice(1,1),7===e.indexOf("x")}(),pe=function(){var
e=256,t=[];return t[e]="a",t.splice(e+1,0,"b"),"a"===t[e]}();q(r,{splice:function(e,t){for(var
n,r=z.ToObject(this),i=[],a=z.ToUint32(r.length),o=z.ToInteger(e),s=o<0?w(a+o,0):_(o,a),u=_(w(z.ToInteger(t),0),a
-s),c=0;c<u;n=l(s+c),F(r,n)&&(i[c]=r[n]),c+=1;var p,h=H(arguments,2),f=h.length;if(f<u){c=s;for(var d=a-
u;c<d;n=l(c+u),p=l(c+f),F(r,n)?r[p]=r[n]:delete
r[p],c+=1;c=a;for(var m=a-u+f;c>m;)delete r[c-1],c=1}else if(f>u)for(c=a-u;c>s;n=l(c+u-1),p=l(c+f-
1),F(r,n)?r[p]=r[n]:delete r[p],c=1;c=s;for(var g=0;g<h.length;++g)r[c]=h[g],c+=1;return r.length=a-
u+f,i}},!ce,!pe);var
he,fe=r.join;try{he="1,2,3"===Array.prototype.join.call("123","")}catch(de){he=!0}he&&q(r,{join:function(e){var
t="undefined"===typeof e?"":e;return fe.call(L(this)?W(this,""):this,t)},he);var me="1,2"===[1,2].join(void
0);me&&q(r,{join:function(e){var t="undefined"===typeof e?"":e;return fe.call(this,t)},me);var
ge=function(e){for(var
t=z.ToObject(this),n=z.ToUint32(t.length),r=0;r<arguments.length;t[n+r]=arguments[r],r+=1;return
t.length=n+r,n+r},ye=function(){var e={},t=Array.prototype.push.call(e,void 0);return
1!==t||1===e.length?"undefined"!=typeof e[0]||F(e,0)}();q(r,{push:function(e){return
Z(this)?d.apply(this,arguments):ge.apply(this,arguments)}},ye);var ve=function(){var e=[],t=e.push(void 0);return
1!==t||1===e.length?"undefined"!=typeof
e[0]||F(e,0)}();q(r,{push:ge},ve),q(r,{slice:function(e,t){var n=L(this)?W(this,""):this;return
Y(n,arguments)}},ne);var
be=function(){try{return[1,2].sort(null),[1,2].sort({}),!0}catch(e){}return!1}(),we=function(){try{return[1,2].sort(/a
/),!1}catch(e){}return!0}(),_e=function(){try{return[1,2].sort(void
0),!0}catch(e){}return!1}();q(r,{sort:function(t){if("undefined"===typeof t)return X(this);if(!e(t))throw new
TypeError("Array.prototype.sort callback must be a function");return X(this,t)},be,!_e,!we);var
xe=!K({toString:null},"toString"),Ae=K(function(){},"prototype"),Se=!F("x","0"),je=function(e){var
t=e.constructor;return
t&&t.prototype===e},Ee={$window:!0,$console:!0,$parent:!0,$self:!0,$frame:!0,$frames:!0,$frameElement:!0,$we
bkitIndexedDB:!0,$webkitStorageInfo:!0,$external:!0},Oe=function(){if("undefined"===typeof
window)return!1;for(var e in window)try{!Ee["$"+e]&&F(window,e)&&null!==window[e]&&"object"===typeof
window[e]&&je(window[e])}catch(t){return!0}return!1}(),ke=function(e){if("undefined"===typeof
window||!Oe)return je(e);try{return
je(e)}catch(t){return!1}},Te=["toString","toLocaleString","valueOf","hasOwnProperty","isPrototypeOf","propertyIs
Enumerable","constructor"],Ce=Te.length,Ie=function(e){return"[object
Arguments]"===V(e)},De=function(t){return null!==t&&"object"===typeof t&&"number"===typeof
t.length&&t.length>=0&&!Z(t)&&e(t.callee)},Le=Ie(arguments)?Ie:De;q(i,{keys:function(t){var
n=e(t),r=Le(t),i=null!==t&&"object"===typeof t,a=i&&L(t);if(!i&&!n&&!r)throw new TypeError("Object.keys
called on a non-object");var o=[],s=Ae&&n;if(a&&Se||r)for(var u=0;u<t.length;++u)G(o,l(u));if(!r)for(var c in
t)s&&"prototype"===c||!F(t,c)||G(o,l(c));if(xe)for(var p=ke(t),h=0;h<Ce;h++){var
f=Te[h];p&&"constructor"===f||!F(t,f)||G(o,f)}return o}});var Me=i.keys&&function(){return
2===i.keys(arguments).length}(1,2),Re=i.keys&&function(){var e=i.keys(arguments);return

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1!==arguments.length||1!==e.length||1!==e[0]}(1),Ue=i.keys;q(i,{keys:function(e){return
Ue(Le(e)?H(e):e)}},!Me||Re);var
Pe,qe,Be=0!==new Date((-0xc782b5b342b24)).getUTCMonth(),Ne=new Date((-0x55d318d56a724)),ze=new
Date(14496624e5),$e="Mon, 01 Jan -45875 11:59:59
GMT"!==Ne.toUTCString(),Fe=Ne.getTimezoneOffset();Fe<-720?(Pe="Tue Jan 02 -
45875"!==Ne.toDateString(),qe=!/^Thu Dec 10 2015 \d\d:\d\d:\d\d GMT[-\+]\d\d\d\d(?
:|$)/.test(ze.toString())):(Pe="Mon Jan 01 -45875"!==Ne.toDateString(),qe=!/^Wed Dec 09 2015 \d\d:\d\d:\d\d
GMT[-\+]\d\d\d\d(? :|$)/.test(ze.toString()));var
Ve=v.bind(Date.prototype.getFullYear),He=v.bind(Date.prototype.getMonth),Ye=v.bind(Date.prototype.getDate),Je
=v.bind(Date.prototype.getUTCFullYear),We=v.bind(Date.prototype.getUTCMonth),Qe=v.bind(Date.prototype.get
UTCDate),Ge=v.bind(Date.prototype.getUTCDate),Ke=v.bind(Date.prototype.getUTCHours),Xe=v.bind(Date.proto
type.getUTCMinutes),Ze=v.bind(Date.prototype.getUTCSeconds),et=v.bind(Date.prototype.getUTCMilliseconds),tt
=["Sun","Mon","Tue","Wed","Thu","Fri","Sat"],nt=["Jan","Feb","Mar","Apr","May","Jun","Jul","Aug","Sep","Oct
","Nov","Dec"],rt=function(e,t){return
Ye(new Date(t,e,0));q(Date.prototype,{getFullYear:function(){if(!(this&&this instanceof Date))throw new
TypeError("this is not a Date object.");var e=Ve(this);return
e<0&&He(this)>11?e+1:e},getMonth:function(){if(!(this&&this instanceof Date))throw new TypeError("this is not
a Date object.");var e=Ve(this),t=He(this);return e<0&&t>11?0:t},getDate:function(){if(!(this&&this instanceof
Date))throw new TypeError("this is not a Date object.");var
e=Ve(this),t=He(this),n=Ye(this);if(e<0&&t>11){if(12===t)return n;var r=rt(0,e+1);return r-n+1}return
n},getUTCFullYear:function(){if(!(this&&this instanceof Date))throw new TypeError("this is not a Date
object.");var e=Je(this);return e<0&&We(this)>11?e+1:e},getUTCMonth:function(){if(!(this&&this instanceof
Date))throw new TypeError("this is not a Date object.");var e=Je(this),t=We(this);return
e<0&&t>11?0:t},getUTCDate:function(){if(!(this&&this instanceof Date))throw new TypeError("this
is not a Date object.");var e=Je(this),t=We(this),n=Qe(this);if(e<0&&t>11){if(12===t)return n;var
r=rt(0,e+1);return r-n+1}return n}},Be),q(Date.prototype,{toUTCString:function(){if(!(this&&this instanceof
Date))throw new TypeError("this is not a Date object.");var
e=Ge(this),t=Qe(this),n=We(this),r=Je(this),i=Ke(this),a=Xe(this),o=Ze(this);return tt[e]+" "+(t<10?"0"+t:t)+"
"+nt[n]+" "+r+" "+(i<10?"0"+i:i)+":"++(a<10?"0"+a:a)+":"++(o<10?"0"+o:o)+"
GMT"}},Be||$e),q(Date.prototype,{toDateString:function(){if(!(this&&this instanceof Date))throw new
TypeError("this is not a Date object.");var
e=this.getDay(),t=this.getDate(),n=this.getMonth(),r=this.getFullYear();return tt[e]+" "+nt[n]+" "+(t<10?"0"+t:t)+"
"+r}},Be||Pe),(Be||qe)&&(Date.prototype.toString=function(){if(!(this&&this instanceof Date))throw new
TypeError("this is not a Date object.");var
e=this.getDay(),t=this.getDate(),n=this.getMonth(),r=this.getFullYear(),i=this.getHours(),a=this.getMinutes(),o=this
.getSeconds(),s=this.getTimezoneOffset(),l=Math.floor(Math.abs(s)/60),u=Math.floor(Math.abs(s)%60);return
tt[e]+" "+nt[n]+" "+(t<10?"0"+t:t)+" "+r+" "+(i<10?"0"+i:i)+":"++(a<10?"0"+a:a)+":"++(o<10?"0"+o:o)+"
GMT"+(s>0?"-
":"+")+(l<10?"0"+l:l)+(u<10?"0"+u:u)},P&&i.defineProperty(Date.prototype,"toString",{configurable:!0,enumerabl
e:!1,writable:!0}));var it=-621987552e5,at="-000001",ot=Date.prototype.toISOString&&new
Date(it).toISOString().indexOf(at)===-1,st=Date.prototype.toISOString&&"1969-12-31T23:59:59.999Z"!==new
Date((-
1)).toISOString(),lt=v.bind(Date.prototype.getTime);q(Date.prototype,{toISOString:function(){if(!isFinite(this)||!isF
inite(lt(this)))throw new RangeError("Date.prototype.toISOString called on non-finite value.");var
e=Je(this),t=We(this);e+=Math.floor(t/12),t=(t%12+12)%12;var
n=[t+1,Qe(this),Ke(this),Xe(this),Ze(this)];e=(e<0?"-":e>9999?"+": "")+J("00000"+Math.abs(e),0<=e&&e<=9999?-
4:-6);for(var r=0;r<n.length;++r)n[r]=J("00"+n[r],-2);return e+"-"+H(n,0,2).join("-
")+"T"+H(n,2).join(":")+J("000"+et(this),-3)+"Z"}},ot||st);var

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ut=function(){try{return Date.prototype.toJSON&&null===new Date(NaN).toJSON()&&new
Date(it).toJSON().indexOf(at)!==
1&&Date.prototype.toJSON.call({toISOString:function(){return!0}})}catch(e){return!1}}();ut||(Date.prototype.toJ
SON=function(t){var n=i(this),r=z.ToPrimitive(n);if("number"===typeof r&&!isFinite(r))return null;var
a=n.toISOString;if(!e(a))throw new TypeError("toISOString property is not callable");return a.call(n)});var
ct=1e15===Date.parse("+033658-09-27T01:46:40.000Z"),pt=!isNaN(Date.parse("2012-04-
04T24:00:00.500Z"))||!isNaN(Date.parse("2012-11-31T23:59:59.000Z"))||!isNaN(Date.parse("2012-12-
31T23:59:60.000Z")),ht=isNaN(Date.parse("2000-01-01T00:00:00.000Z"));if(ht||pt||!ct){var ft=Math.pow(2,31)-
1,dt=N(new Date(1970,0,1,0,0,0,ft+1).getTime());Date=function(e){var t=function(n,r,i,a,o,s,u){var
c,p=arguments.length;if(this instanceof e){var h=s,f=u;if(dt&&p>=7&&u>ft){var
d=Math.floor(u/ft)*ft,m=Math.floor(d/1e3);h+=m,f=-1e3*m}c=1===p&&l(n)===n?new
e(t.parse(n)):p>=7?new e(n,r,i,a,o,h,f):p>=6?new e(n,r,i,a,o,h):p>=5?new e(n,r,i,a,o):p>=4?new e(n,r,i,a):p>=3?new
e(n,r,i):p>=2?new e(n,r):p>=1?new e(n instanceof e?+n:n):new e;
}else c=e.apply(this,arguments);return B(c)||q(c,{constructor:t,!0},c),n=new RegExp("^(\\d{4})[+\\-]\\d{6})(?:-
(\\d{2})(?:-(\\d{2})(?:T(\\d{2}):?(\\d{2})(?::(\\d{2})(?:\\.\\d{1,})?)?(Z|(?![
+])\\d{2}):?(\\d{2}))?)?)?$"),r=[0,31,59,90,120,151,181,212,243,273,304,334,365],i=function(e,t){var
n=t>1?1:0;return r[t]+Math.floor((e-1969+n)/4)-Math.floor((e-1901+n)/100)+Math.floor((e-1601+n)/400)+365*(e-
1970)},a=function(t){var n=0,r=t;if(dt&&r>ft){var i=Math.floor(r/ft)*ft,a=Math.floor(i/1e3);n+=a,r=-1e3*a}return
c(new e(1970,0,1,0,0,n,r))};for(var o in
e)F(e,o)&&(t[o]=e[o]);q(t,{now:e.now,UTC:e.UTC,!0},t.prototype=e.prototype,q(t.prototype,{constructor:t,!0});va
r s=function(t){var r=n.exec(t);if(r){var o,s=c(r[1]),l=c(r[2])||1,u=c(r[3])||1-
1,p=c(r[4])||0,h=c(r[5])||0,f=c(r[6])||0,d=Math.floor(1e3*c(r[7])||0),m=Boolean(r[4]&&!r[8]),g="-"===r[9]?1:-
1,y=c(r[10])||0,v=c(r[11])||0,b=h>0||f>0||d>0;return
p<(b?24:25)&&h<60&&f<60&&d<1e3&&l>-1&&l<12&&y<24&&v<60&&u>-1&&u<i(s,l+1)-
i(s,l)&&(o=60*(24*(i(s,l)+u)+p+y*g),o=1e3*(60*(o+h+v*g)+f)+d,m&&(o=a(o)),
864e13<=o&&o<=864e13)?o:NaN}return e.parse.apply(this,arguments)};return
q(t,{parse:s}),t)(Date)}Date.now||(Date.now=function(){return(new Date).getTime()});var
mt=p.toFixed&&("0.000"!==8e-
5.toFixed(3)||"1"!==.9.toFixed(0)||"1.25"!==1.255.toFixed(2)||"10000000000000000128"!==(0xde0b6b3a7640080).to
Fixed(0)),gt={base:1e7,size:6,data:[0,0,0,0,0,0],multiply:function(e,t){for(var n=-
1,r=t;+n<gt.size;)r+=e*gt.data[n],gt.data[n]=r%gt.base,r=Math.floor(r/gt.base)},divide:function(e){for(var
t=gt.size,n=0;--t>=0;)n+=gt.data[t],gt.data[t]=Math.floor(n/e),n=n%e*gt.base},numToString:function(){for(var
e=gt.size,t="";--e>=0;)if(!t||0===e||0!==gt.data[e]){var n=l(gt.data[e]);t=n===t?t+n:t+=J("0000000",0,7-
n.length)+n}return t},pow:function Ut(e,t,n){return
0===t?t:n%2===1?Ut(e,t-1,n*e):Ut(e*t/2,n)},log:function(e){for(var
t=0,n=e;n>=4096;t+=12,n/=4096;for(;n>=2;t+=1,n/=2;return t)},yt=function(e){var
t,n,r,i,a,o,s,u;if(t=c(e),t=N(t)?0:Math.floor(t),t<0||t>20)throw new RangeError("Number.toFixed called with invalid
number of decimals");if(n=c(this),N(n))return"NaN";if(n<=-1e21||n>=1e21)return l(n);if(r="",n<0&&(r="-",n=-
n),i="0",n>1e-21)if(a=gt.log(n*gt.pow(2,69,1))-69,o=a<0?n*gt.pow(2,-
a,1):n/gt.pow(2,a,1),o*=4503599627370496,a=52-a,a>0){for(gt.multiply(0,o),s=t;s>=7;)gt.multiply(1e7,0),s-
=7;for(gt.multiply(gt.pow(10,s,1),0),s=a-1;s>=23;)gt.divide(1<<23),s-
=23;gt.divide(1<<s),gt.multiply(1,1),gt.divide(2),i=gt.numToString()}else gt.multiply(0,o),gt.multiply(1<<-
a,0),i=gt.numToString()+J("0.00000000000000000000",2,2+t);return
t>0?(u=i.length,i=u<=t?r+J("0.00000000000000000000",0,t-u+2)+i:r+J(i,0,u-t)+i)+J(i,u-
t):i=r+i,i;q(p,{toFixed:yt,mt});var vt=function(){try{return"1"===1..toPrecision(void
0)}catch(e){return!0}}(),bt=p.toPrecision;q(p,{toPrecision:function(e){return"undefined"===typeof
e?bt.call(this):bt.call(this,e)}},vt),2!=="ab".split(/(?:ab)*/).length||4!==".".split(/(?:.)/).length||"t"===
"tesst".split(/(s)*/)[1]||4!=="test".split(/(?:)/,-1).length||"".split(/(?:)/).length||"".split(/()/).length>1?!function(){var

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e="undefined"==typeof()/?.exec("")[1],n=Math.pow(2,32)-1;u.split=function(r,i){var
a=String(this);if("undefined"==typeof r&&0===i)return[];if(!t(r))return W(this,r,i);var
o,s,l,u,c=[],p=(r.ignoreCase?"i":"")+ (r.multiline?"m":"")+ (r.unicode?"u":"")+ (r.sticky?"y":""),h=0,f=new
RegExp(r.source,p+"g");e||(o=new RegExp("^"+f.source+"$(?!\\s)",p));var m="undefined"==typeof
i?n:z.ToUint32(i);for(s=f.exec(a);s&&(l=s.index+s[0].length,! (l>h&&(G(c,J(a,h,s.index)),!e&&s.length>1&&s[0].r
eplace(o,function(){for(var e=1;e<arguments.length-2;e++)"undefined"==typeof arguments[e]&&(s[e]=void
0)})),s.length>1&&s.index<a.length&&d.apply(c,H(s,1)),u=s[0].length,h=l,c.length>=m));f.lastIndex===s.index&
&f.lastIndex++,s=f.exec(a);return
h===a.length?!u&&f.test("")||G(c,""):G(c,J(a,h)),c.length>m?H(c,0,m):c}}():"0".split(void
0,0).length&&(u.split=function(e,t){return"undefined"==typeof e&&0===t?[]:W(this,e,t)});var
wt=u.replace,_t=function(){var
e=[];return"x".replace(/x./g,function(t,n){G(e,n)}),1===e.length&&"undefined"==typeof
e[0]}();_t|(u.replace=function(n,r){var i=e(r),a=t(n)&&^\[ *?]/.test(n.source);if(i&&a){var o=function(e){var
t=arguments.length,i=n.lastIndex;n.lastIndex=0;var a=n.exec(e)||[];return n.lastIndex=i,G(a,arguments[t-
2],arguments[t-1]),r.apply(this,a)};return wt.call(this,n,o)}return wt.call(this,n,r)});var
xt=u.substr,At=""_.substr&&"b"!="0b".substr(-1);q(u,{substr:function(e,t){var n=e;return
e<0&&(n=w(this.length+e,0)),xt.call(this,n,t)}},At);var St="\t\n\x0B\f\r
\u2028\u2029\u2013",jt="",Et="["+St+"]",Ot=new RegExp("^"+Et+Et+"*"),kt=new
RegExp(Et+Et+"*$"),Tt=u.trim&&(St.trim()||!t.trim());q(u,{trim:function(){if("undefined"==typeof
this||null===this)throw new TypeError("can't convert "+this+" to object");return
l(this).replace(Ot,"").replace(kt,"")},Tt);var
Ct=v.bind(String.prototype.trim),It=u.lastIndexOf&&"abc".lastIndexOf("",2)!=-
1;q(u,{lastIndexOf:function(e){if("undefined"==typeof this||null===this)throw new TypeError("can't convert
"+this+" to object");for(var
t=l(this),n=l(e),r=arguments.length>1?c(arguments[1]):NaN,i=N(r)?1/0:z.ToInteger(r),a=_ (w(i,0),t.length),o=n.lengt
h,s=a+o;s>0;){s=w(0,s-o);var u=Q(J(t,s,a+o),n);if(u!==-1)return s+u}return-1}},It);var
Dt=u.lastIndexOf;if(q(u,{lastIndexOf:function(e){return
Dt.apply(this,arguments)}},1!=u.lastIndexOf.length),8===parseInt(St+"08")&&22===parseInt(St+"0x16"))|(parseI
nt=function(e){var t=/^[-+]?0[xX]/;return function(n,r){var i=Ct(String(n)),a=c(r)|| (t.test(i)?16:10);return
e(i,a)}(parseInt)),1/parseFloat("-0")!==(1/0)&&(parseFloat=function(e){return function(t){var
n=Ct(String(t)),r=e(n);return 0===r&&"-"===J(n,0,1)?-0:r}(parseFloat)),"RangeError:
test"!=String(new RangeError("test"))){var Lt=function(){if("undefined"==typeof this||null===this)throw new
TypeError("can't convert "+this+" to object");var e=this.name,"undefined"==typeof e?e="Error":"string"!=typeof
e&&(e=l(e));var t=this.message;return"undefined"==typeof t?t="":"string"!=typeof t&&(t=l(t)),e?t?e+":
"+t:e:t};Error.prototype.toString=Lt;if(P){var Mt=function(e,t){if(K(e,t)){var
n=Object.getOwnPropertyDescriptor(e,t);n.configurable&&(n.enumerable=!1,Object.defineProperty(e,t,n))};Mt(Er
ror.prototype,"message"),""!=Error.prototype.message&&(Error.prototype.message=""),Mt(Error.prototype,"name
");if("/a/gim"!=String(/a/gim)){var Rt=function(){var e="/" +this.source+"/";return
this.global&&(e+="g"),this.ignoreCase&&(e+="i"),this.multiline&&(e+="m"),e};RegExp.prototype.toString=Rt}}
),Handlebars.registerHelper("sanitize",function(e){var t;return void
0===e?"":(t=sanitizeHtml(e,{allowedTags:["div","span","b","i","em","strong","a"],allowedAttributes:{div:["class"],
span:["class"],a:["href"]}}),new
Handlebars.SafeString(t)}),Handlebars.registerHelper("renderTextParam",function(e){var
t,n="text",r="",i=e.type||e.schema&&e.schema.type||"",a="array"===i.toLowerCase()||e.allowMultiple,o=a&&Array
.isArray(e["default"])?e["default"].join("\n"):e["default"],s=Handlebars.Utils.escapeExpression(e.name),l=Handleba
rs.Utils.escapeExpression(e.valueId);i=Handlebars.Utils.escapeExpression(i);var
u=Object.keys(e).filter(function(e){return null!=e.match(/^X-data-/)}).reduce(function(t,n){return t+="
"+n.substring(2,n.length)+"="+e[n]+"",""});if(e.format&&"password"===e.format&&(n="password"),l&&(r="

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id="" + l + """,o=o?sanitizeHtml(o):""",a)t="<textarea class="body-textarea" + (e.required?" required":"") + ""
name="" + s + "" + r + u, t += " placeholder='Provide multiple values in new lines' + (e.required?" (at least one
required).": ".") + ">", t += o + "</textarea>"; else { var c = "parameter"; e.required && (c += " required"), t = "<input
class="" + c + "" minlength="" + (e.required?1:0) + """, t += "
name="" + s + "" placeholder="" + (e.required?"(required)":"") + "" + r + u, t += " type="" + n + "" value="" + o + "" />"} return new
Handlebars.SafeString(t)), Handlebars.registerHelper("ifCond", function(e, t, n, r) { switch(t) { case "===": return
e === n?r.fn(this):r.inverse(this); case "==": return e === n?r.fn(this):r.inverse(this); case "<": return
e < n?r.fn(this):r.inverse(this); case "<=": return e <= n?r.fn(this):r.inverse(this); case ">": return
e > n?r.fn(this):r.inverse(this); case ">=": return e >= n?r.fn(this):r.inverse(this); case "&&": return
e && n?r.fn(this):r.inverse(this); case "||": return e || n?r.fn(this):r.inverse(this); default: return
r.inverse(this) } }), Handlebars.registerHelper("escape", function(e) { var
t = Handlebars.Utils.escapeExpression(e); return new Handlebars.SafeString(t)}, function(e) { if("object" === typeof
exports && "undefined" !== typeof module) module.exports = e; else if("function" === typeof
define && define.amd) define([], e); else { var t; t = "undefined" !== typeof window?window:"undefined" !== typeof
global?global:"undefined" !== typeof
self?self:this, t.sanitizeHtml = e() } (function() { return function e(t, n, r) { function i(o, s) { if(!n[o]) { if(!t[o]) { var
l = "function" === typeof require && require; if(!s && l) return l(o, !0); if(a) return a(o, !0); var u = new Error("Cannot find
module "" + o + ""); throw u.code = "MODULE_NOT_FOUND", u } var
c = n[o] = { exports: {} }; t[o][0].call(c.exports, function(e) { var n = t[o][1][e]; return i(n?n:e) }, c, c.exports, e, t, n, r) return
n[o].exports } for(var a = "function" === typeof require && require, o = 0; o < r.length; o++) i(r[o]); return
i}({ 1: [function(e, t, n) { function r(e, t) { e && Object.keys(e).forEach(function(n) { t(e[n], n) }) } function
i(e, t) { return { }.hasOwnProperty.call(e, t) } function a(e, t, n) { function c(e, t) { var
n = this; this.tag = e, this.attrs = t || { }, this.tagPosition = d.length, this.text = "", this.updateParentNodeText = function() { if(x.l
ength) { var e = x[x.length - 1]; e.text += n.text } } function p(e) { return "string" !== typeof
e && (e += "") }, e.replace(/&/g, "&amp;").replace(/</g, "&lt;").replace(/>/g, "&gt;").replace(/"/g, "&quot;") } function
h(e, n) { n = n.replace(/[\x00-\x20]+/g, ""), n = n.replace(/<!--.*?-->/g, ""); var r = n.match(/^(a-zA-
Z)+/); if(!r) return !1; var a = r[1].toLowerCase(); return
i(t.allowedSchemesByTag[e]?t.allowedSchemesByTag[e].indexOf(a) === -
1: !t.allowedSchemes || t.allowedSchemes.indexOf(a) === -1 } function f(e, t) { return
t?(e = e.split(/\s+/), e.filter(function(e) { return t.indexOf(e) !== -1 }).join(" ")): e } var
d = ""; t?(t = s(a.defaults, t), t.parser? t.parser = s(u, t.parser): t.parser = u): (t = a.defaults, t.parser = u); var
m, g, y = t.nonTextTags || ["script", "style", "textarea"]; t.allowedAttributes && (m = { }, g = { }, r(t.allowedAttributes, function
(e, t) { m[t] = []; var
n = []; e.forEach(function(e) { e.indexOf("*") >= 0? n.push(l(e).replace(/\\*/g, ".*")): m[t].push(e) }); g[t] = new
RegExp("^(" + n.join("|") + ")$")); var
v = { }; r(t.allowedClasses, function(e, t) { m && (i(m, t) || (m[t] = []), m[t].push("class")), v[t] = e }); var
b, w = { }; r(t.transformTags, function(e, t) { var n; "function" === typeof e? n = e: "string" === typeof
e && (n = a.simpleTransform(e)), "*" === t? b = n: w[t] = n }); var _ = 0, x = [], A = { }, S = { }, j = !1, E = 0, O = new
o.Parser({ onopentag: function(e, n) { if(j) return void E++; var a = new c(e, n); x.push(a); var
o, s = !1, l = !1; a.text; i(w, e) && (o = w[e](e, n), a.attrs = n.o.attrs, void
0 !== o.text && (a.innerHTML = o.text), e !== o.tagName && (a.name = e.o.tagName, S[_] = o.tagName)), b && (o = b(e, n), a.att
ribs = n.o.attrs, e !== o.tagName && (a.name = e.o.tagName, S[_] = o.tagName)), t.allowedTags && t.allowedTags.index
Of(e) === -1 && (s = !0, y.indexOf(e) !== -
1 && (j = !0, E = 1), A[_] = !0), _++, s || (d += "<" + e, (!m || i(m, e)) || m["*"]) && r(n, function(t, n) { if(!m || i(m, e) && m[e].indexOf(n
) !== -1 || m["*"] && m["*"].indexOf(n) !== -
1 || i(g, e) && g[e].test(n) || g["*"] && g["*"].test(n)) { if(("href" === n || "src" === n) && h(e, t)) return void delete
a.attrs[n]; if("class" === n && (t = f(t, v[e]), !t.length)) return void delete a.attrs[n]; d += "
" + n, t.length && (d += " " + p(t) + "") } else delete a.attrs[n] } ), t.selfClosing.indexOf(e) !== -1? d += "

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/>";(d+=">",!a.innerText||!t.textFilter||(d+=a.innerText))),ontext:function(e){if(!j){var n,r=x[x.length-1];if(r&&(n=r.tag,e=void 0!==(r.innerText?r.innerText:e),"script"===n||"style"===n)d+=e}else{var i=p(e);d+=t.textFilter?t.textFilter(i):i;if(x.length){var a=x[x.length-1];a.text+=e}}} ,onclosetag:function(e){if(j){if(E--,E)return;j=!1}var n=x.pop();if(n){if(j=!1,--,A[_])return delete A[_],void n.updateParentNodeText();if(S[_]&&(e=S[_],delete S[_],t.exclusiveFilter&&t.exclusiveFilter(n))return void(d=d.substr(0,n.tagPosition));n.updateParentNodeText(),t.selfClosing.indexOf(e)===-1&&(d+="</"+e+">"))},t.parser);return O.write(e),O.end(),d}var o=e("htmlparser2"),s=e("xtend"),l=e("regexp-quote");t.exports=a;var u={decodeEntities:!0};a.defaults={allowedTags:["h3","h4","h5","h6","blockquote","p","a","ul","ol","li","b","i","strong","em","strike","code","hr","br","div","table","thead","caption","tbody","tr","th","td","pre"],allowedAttributes:{a:["href","name","target"],img:["src"]},selfClosing:["img","br","hr","area","base","basefont","input","link","meta"],allowedSchemes:["http","https","ftp","mailto"],allowedSchemesByTag:{},a.simpleTransform=function(e,t,n){return n=void 0===n||n,t=t||{,function(r,i){var a;if(n)for(a in t)i[a]=t[a];else i=t;return{tagName:e,attrs:i}}},{htmlparser2:36,"regexp-quote":54,xtend:58}],2:[function(e,t,n){"use strict";function r(){for(var e="ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789+/",t=0,n=e.length;t<n;++t)l[t]=e[t],u[e.charCodeAtAt(t)]=t;u["-".charCodeAt(0)]=62,u["_".charCodeAt(0)]=63}function i(e){var t,n,r,i,a,o,s=e.length;if(s%4>0)throw new Error("Invalid string. Length must be a multiple of 4");a=""===e[s-2]?2:""===e[s-1]?1:0,o=new c(3*s/4-a),r=a>0?s-4:s;var l=0;for(t=0,n=0;t<r;t+=4,n+=3)i=u[e.charCodeAtAt(t)]<<18|u[e.charCodeAtAt(t+1)]<<12|u[e.charCodeAtAt(t+2)]<<6|u[e.charCodeAtAt(t+3)],o[l++]=i>>16&255,o[l++]=i>>8&255,o[l++]=255&i;return 2===a?(i=u[e.charCodeAtAt(t)]<<2|u[e.charCodeAtAt(t+1)]>>4,o[l++]=255&i):1===a&&(i=u[e.charCodeAtAt(t)]<<10|u[e.charCodeAtAt(t+1)]<<4|u[e.charCodeAtAt(t+2)]>>2,o[l++]=i>>8&255,o[l++]=255&i),o}function a(e){return l[e>>18&63]+l[e>>12&63]+l[e>>6&63]+l[63&e]}function o(e,t,n){for(var r,i=[],o=t;o<n;o+=3)r=(e[o]<<16)+(e[o+1]<<8)+e[o+2],i.push(a(r));return i.join("")}function s(e){for(var t,n=e.length,r=n%3,i="",a=[],s=16383,u=0,c=n-r;u<c;u+=s)a.push(o(e,u,u+s>c?c:u+s));return 1===r?(t=e[n-1],i+=l[t>>2],i+=l[t<<4&63],i+=""):2===r&&(t=(e[n-2]<<8)+e[n-1],i+=l[t>>10],i+=l[t>>4&63],i+=l[t<<2&63],i+=""),a.push(i),a.join("")}n.toByteArray=i,n.fromByteArray=s;var l=[],u=[],c="undefined"! =typeof Uint8Array?Uint8Array:Array;r(),{,},3:[function(e,t,n){,},4:[function(e,t,n){(function(t){"use strict";var r=e("buffer"),i=r.Buffer,a=r.SlowBuffer,o=r.kMaxLength|2147483647;n.alloc=function(e,t,n){if("function"===typeof i.alloc)return i.alloc(e,t,n);if("number"===typeof n)throw new TypeError("encoding must not be number");if("number"!==typeof e)throw new TypeError("size must be a number");if(e>o)throw new RangeError("size is too large");var r=n,a=t;void 0===a&&(r=void 0,a=0);var s=new i(e);if("string"===typeof a)for(var l=new i(a,r),u=l.length,c=-1;++c<e;s[c]=l[c%u]);else s.fill(a);return s},n.allocUnsafe=function(e){if("function"===typeof i.allocUnsafe)return i.allocUnsafe(e);if("number"!==typeof e)throw new TypeError("size must be a number");if(e>o)throw new RangeError("size is too large");return new i(e)},n.from=function(e,n,r){if("function"===typeof i.from&&(!t.Uint8Array|Uint8Array.from!==i.from))return i.from(e,n,r);if("number"===typeof e)throw new TypeError("'value' argument must not be a number");if("string"===typeof e)return new i(e,n);if("undefined"!==typeof ArrayBuffer&&e instanceof ArrayBuffer){var a=n;if(1===arguments.length)return new i(e);"undefined"===typeof a&&(a=0);var o=r;if("undefined"===typeof o&&(o=e.byteLength-a),a>e.byteLength)throw new RangeError("'offset' is out of bounds");if(o>e.byteLength-a)throw new RangeError("'length' is out of bounds");return new i(e.slice(a,a+o))}if(i.isBuffer(e)){var s=new i(e.length);return e.copy(s,0,0,e.length),s}if(e){if(Array.isArray(e)||"undefined"!==typeof ArrayBuffer&&e.buffer instanceof ArrayBuffer||"length"in e)return new i(e);if("Buffer"===e.type&&Array.isArray(e.data))return new i(e.data)}throw new TypeError("First argument must be a string, Buffer, ArrayBuffer, Array, or array-like

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object.")),n.allocUnsafeSlow=function(e){if("function"===typeof i.allocUnsafeSlow)return
i.allocUnsafeSlow(e);if("number"!==typeof e)throw new TypeError("size must be a number");if(e>=o)throw new
RangeError("size is too large");return new a(e)}}).call(this,"undefined"!==typeof global?global:"undefined"!==typeof
self?self:"undefined"!==typeof window?window:{}},{buffer:5}],5:[function(e,t,n){(function(t){"use strict";function
r(){try{var e=new Uint8Array(1);return e.__proto__={__proto__:Uint8Array.prototype,foo:function(){return
42}},42===e.foo()&&"function"===typeof
e.subarray&&0===e.subarray(1,1).byteLength}catch(t){return!1}}function i(){return
o.TYPED_ARRAY_SUPPORT?2147483647:1073741823}function a(e,t){if(i()<t)throw new RangeError("Invalid
typed array length");return
o.TYPED_ARRAY_SUPPORT?(e=new Uint8Array(t),e.__proto__=o.prototype):(null===e&&(e=new
o(t)),e.length=t),e}function o(e,t,n){if(!(o.TYPED_ARRAY_SUPPORT||this instanceof o))return new
o(e,t,n);if("number"===typeof e){if("string"===typeof t)throw new Error("If encoding is specified then the first
argument must be a string");return c(this,e)}return s(this,e,t,n)}function s(e,t,n,r){if("number"===typeof t)throw new
TypeError("'value' argument must not be a number");return"undefined"!==typeof ArrayBuffer&&t instanceof
ArrayBuffer?f(e,t,n,r):"string"===typeof t?p(e,t,n):d(e,t)}function l(e){if("number"!==typeof e)throw new
TypeError("'size' argument must be a number");if(e<0)throw new RangeError("'size' argument must not be
negative")}function u(e,t,n,r){return l(t),t<=0?a(e,t):void 0!==(n?"string"===typeof
r?a(e,t).fill(n,r):a(e,t).fill(n):a(e,t))}function c(e,t){if(l(t),e=a(e,t<0?0:0|m(t)),!o.TYPED_ARRAY_SUPPORT)for(var
n=0;n<t;++n)e[n]=0;return e}function p(e,t,n){if("string"===typeof n&&""!==n||(n="utf8"),!o.isEncoding(n))throw
new TypeError("'encoding' must be a valid string encoding");var r=0|y(t,n);e=a(e,r);var i=e.write(t,n);return
i===r&&(e=e.slice(0,i)),e}function h(e,t){var n=t.length<0?0:0|m(t.length);e=a(e,n);for(var
r=0;r<n;r+=1)e[r]=255&t[r];return e}function f(e,t,n,r){if(t.byteLength,n<0||t.byteLength<n)throw new
RangeError("'offset' is out of bounds");if(t.byteLength<n+(r||0))throw new RangeError("'length' is out of
bounds");return t=void 0===n&&void 0===r?new Uint8Array(t):void 0===r?new Uint8Array(t,n):new
Uint8Array(t,n,r),o.TYPED_ARRAY_SUPPORT?(e=t,e.__proto__=o.prototype):e=h(e,t),e}function
d(e,t){if(o.isBuffer(t)){var n=0|m(t.length);return
e=a(e,n),0===e.length?e:(t.copy(e,0,0,n),e)}if(t){if("undefined"!==typeof ArrayBuffer&&t.buffer instanceof
ArrayBuffer||"length"in t)return"number"!==typeof
t.length||G(t.length)?a(e,0):h(e,t);if("Buffer"===t.type&&Z(t.data))return h(e,t.data)}throw new TypeError("First
argument must be a string, Buffer, ArrayBuffer,
Array, or array-like object.")}function m(e){if(e>=i())throw new RangeError("Attempt to allocate Buffer larger
than maximum size: 0x"+i().toString(16)+" bytes");return 0|e}function
g(e){return+e!=e&&(e=0),o.alloc(+e)}function y(e,t){if(o.isBuffer(e))return e.length;if("undefined"!==typeof
ArrayBuffer&&"function"===typeof ArrayBuffer.isView&&(ArrayBuffer.isView(e)||e instanceof
ArrayBuffer))return e.byteLength;"string"!==typeof e&&(e=""+e);var n=e.length;if(0===n)return 0;for(var
r=1;;)switch(t){case"ascii":case"latin1":case"binary":return n;case"utf8":case"utf-8":case void 0:return
H(e).length;case"ucs2":case"ucs-2":case"utf16le":case"utf-16le":return 2*n;case"hex":return
n>>>1;case"base64":return W(e).length;default:if(r)return H(e).length;t=""+t.toLowerCase(),r=!0}}function
v(e,t,n){var r=!1;if((void 0===t||t<0)&&(t=0),t>this.length)return"";if((void
0===n||n>this.length)&&(n=this.length),n<=0)return"";if(n>>>=0,t>>>=0,n<=t)return"";for(e||(e="utf8");;)switch(e){
case"hex":return L(this,t,n);case"utf8":case"utf-8":return
T(this,t,n);case"ascii":return I(this,t,n);case"latin1":case"binary":return D(this,t,n);case"base64":return
k(this,t,n);case"ucs2":case"ucs-2":case"utf16le":case"utf-16le":return M(this,t,n);default:if(r)throw new
TypeError("Unknown encoding: "+e);e=(e+"").toLowerCase(),r=!0}}function b(e,t,n){var
r=e[t];e[t]=e[n],e[n]=r}function w(e,t,n,r,i){if(0===e.length)return-1;if("string"===typeof
n?(r=n,n=0):n>2147483647?n=2147483647:n<-2147483648&&(n=-
2147483648),n+=n,isNaN(n)&&(n=i?0:e.length-1),n<0&&(n=e.length+n),n>=e.length){if(i)return-1;n=e.length-
1}else if(n<0){if(!i)return-1;n=0}if("string"===typeof t&&(t=o.from(t,r)),o.isBuffer(t))return 0===t.length?-

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1:_(e,t,n,r,i);if("number"==typeof t)return t=255&t,o.TYPED_ARRAY_SUPPORT&&"function"==typeof
Uint8Array.prototype.indexOf?i?Uint8Array.prototype.indexOf.call(e,t,n):Uint8Array.prototype.lastIndexOf.call(e,t
,n):_(e,[t],n,r,i);throw new TypeError("val must be string, number or Buffer")}function _(e,t,n,r,i){function
a(e,t){return 1===o?e[t]:e.readUInt16BE(t*o)}var o=1,s=e.length,l=t.length;if(void
0!==r&&(r=String(r).toLowerCase(),"ucs2"===r||"ucs-2"===r||"utf16le"===r||"utf-
16le"===r)){if(e.length<2||t.length<2)return-1;o=2,s/=2,l/=2,n/=2}var u;if(i){var c=-
1;for(u=n;u<s;u++)if(a(e,u)===a(t,c===-1?0:u-c)){if(c===-1&&(c=u),u-c+1===l)return c*o}else c!==-1&&(u-=u-
c),c=-1}else for(n+l>s&&(n=s-l),u=n;u>=0;u--){for(var
p=!0,h=0;h<l;h++)if(a(e,u+h)!==a(t,h)){p=!1;break}if(p)return u}return-1}function x(e,t,n,r){n=Number(n)||0;var
i=e.length-n;r?(r=Number(r),r>i&&(r=i)):r=i;var a=t.length;if(a%2!==0)throw new TypeError("Invalid hex
string");r>a/2&&(r=a/2);for(var o=0;o<r;++o){var s=parseInt(t.substr(2*o,2),16);if(isNaN(s))return
o;e[n+o]=s}return o}function A(e,t,n,r){return Q(H(t,e.length-n),e,n,r)}function S(e,t,n,r){return
Q(Y(t),e,n,r)}function j(e,t,n,r){return S(e,t,n,r)}function E(e,t,n,r){return Q(W(t),e,n,r)}function O(e,t,n,r){return
Q(J(t,e.length-n),e,n,r)}function k(e,t,n){return
0===t&&n===e.length?K.fromByteArray(e):K.fromByteArray(e.slice(t,n))}function
T(e,t,n){n=Math.min(e.length,n);for(var r=[],i=t;i<n;i++){var
a=e[i],o=null,s=a>239?4:a>223?3:a>191?2:1;if(i+s<=n){var l,u,c,p;switch(s){case 1:a<128&&(o=a);break;case
2:l=e[i+1],128===(192&l)&&(p=(31&a)<<6|63&l,p>127&&(o=p));break;case
3:l=e[i+1],u=e[i+2],128===(192&l)&&128===(192&u)&&(p=(15&a)<<12|(63&l)<<6|63&u,p>2047&&(p<55296|
p>57343)&&(o=p));break;case
4:l=e[i+1],u=e[i+2],c=e[i+3],128===(192&l)&&128===(192&u)&&128===(192&c)&&(p=(15&a)<<18|(63&l)<<
12|(63&u)<<6|63&c,p>65535&&p<1114112&&(o=p))}null===o?(o=65533,s=1):o>65535&&(o-
=65536,r.push(o>>>10&1023|55296),o=56320|1023&o),r.push(o),i+=s}return C(r)}function C(e){var
t=e.length;if(t<=ee)return String.fromCharCode.apply(String,e);for(var
n="",r=0;r<t;n+=String.fromCharCode.apply(String,e.slice(r,r+=ee));return n}function I(e,t,n){var
r="";n=Math.min(e.length,n);for(var i=t;i<n;++i)r+=String.fromCharCode(127&e[i]);return r}function D(e,t,n){var
r="";n=Math.min(e.length,n);for(var
i=t;i<n;++i)r+=String.fromCharCode(e[i]);return r}function L(e,t,n){var
r=e.length;(!t||t<0)&&(t=0),(!n||n<0||n>r)&&(n=r);for(var i="",a=t;a<n;++a)i+=V(e[a]);return i}function
M(e,t,n){for(var r=e.slice(t,n),i="",a=0;a<r.length;a+=2)i+=String.fromCharCode(r[a]+256*r[a+1]);return
i}function R(e,t,n){if(e%1!==0|e<0)throw new RangeError("offset is not uint");if(e+t>n)throw new
RangeError("Trying to access beyond buffer length")}function U(e,t,n,r,i,a){if(!o.isBuffer(e))throw new
TypeError("'buffer' argument must be a Buffer instance");if(t>i||t<a)throw new RangeError("'value' argument is out
of bounds");if(n+r>e.length)throw new RangeError("Index out of range")}function
P(e,t,n,r){t<0&&(t=65535+t+1);for(var i=0,a=Math.min(e.length-n,2);i<a;++i)e[n+i]=(t&255<<8*(r?i:1-
i))>>>8*(r?i:1-i)}function q(e,t,n,r){t<0&&(t=4294967295+t+1);for(var i=0,a=Math.min(e.length-
n,4);i<a;++i)e[n+i]=t>>>8*(r?i:3-i)&255}function B(e,t,n,r,i,a){if(n+r>e.length)throw new RangeError("Index
out of range");if(n<0)throw new RangeError("Index out of range")}function N(e,t,n,r,i){return
i||B(e,t,n,4,3.4028234663852886e38,-3.4028234663852886e38),X.write(e,t,n,r,23,4),n+4}function z(e,t,n,r,i){return
i||B(e,t,n,8,1.7976931348623157e308,-1.7976931348623157e308),X.write(e,t,n,r,52,8),n+8}function
$(e){if(e=F(e).replace(te,""),e.length<2)return"";for(;e.length%4!==0;)e+=" ";return e}function F(e){return
e.trim?e.trim():e.replace(/^\s+|\s+$/g,"")}function V(e){return e<16?"0"+e.toString(16):e.toString(16)}function
H(e,t){t=t||1/0;for(var
n,r=e.length,i=null,a=[],o=0;o<r;++o){if(n=e.charCodeAtAt(o),n>55295&&n<57344){if(!i){if(n>56319){(t-=3)>-
1&&a.push(239,191,189);continue}if(o+1===r){(t-=3)>-
1&&a.push(239,191,189);continue}i=n;continue}if(n<56320){(t-=3)>-1&&a.push(239,191,189),i=n;continue}n=(i-
55296<<10|n-56320)+65536}else i&&(t-=3)>-1&&a.push(239,191,189);if(i=null,n<128){if((t-
=1)<0)break;a.push(n)}else if(n<2048){if((t-=2)<0)break;a.push(n>>6|192,63&n|128)}else if(n<65536){if((t-

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=3)<0)break;a.push(n>>12|224,n>>6&63|128,63&n|128)}else{if(!(n<1114112))throw
new Error("Invalid code point");if((t-
=4)<0)break;a.push(n>>18|240,n>>12&63|128,n>>6&63|128,63&n|128)}}return a}function Y(e){for(var
t=[],n=0;n<e.length;++n)t.push(255&e.charCodeAtAt(n));return t}function J(e,t){for(var
n,r,i,a=[],o=0;o<e.length&&((t=2)<0);++o)n=e.charCodeAtAt(o),r=n>>8,i=n%256,a.push(i),a.push(r);return
a}function W(e){return K.toByteArray($(e))}function Q(e,t,n,r){for(var
i=0;i<r&&!(i+n>=t.length||i>=e.length);++i)t[i+n]=e[i];return i}function G(e){return e!==e}var K=e("base64-
js"),X=e("ieee754"),Z=e("isarray");n.Buffer=o,n.SlowBuffer=g,n.INSPECT_MAX_BYTES=50,o.TYPED_ARRAY_
Y_SUPPORT=void
0!==(t.TYPED_ARRAY_SUPPORT?t.TYPED_ARRAY_SUPPORT:r()),n.kMaxLength=i(),o.poolSize=8192,o._aug
ment=function(e){return e.__proto__=o.prototype,e},o.from=function(e,t,n){return
s(null,e,t,n)},o.TYPED_ARRAY_SUPPORT&&(o.prototype.__proto__=Uint8Array.prototype,o.__proto__=Uint8
Array,"undefined"!==typeof
Symbol&&Symbol.species&&o[Symbol.species]===o&&Object.defineProperty(o,Symbol.species,{value:null,conf
igurable:!0})),o.alloc=function(e,t,n){return
u(null,e,t,n)},o.allocUnsafe=function(e){return c(null,e)},o.allocUnsafeSlow=function(e){return
c(null,e)},o.isBuffer=function(e){return!(null==e||!e._isBuffer)},o.compare=function(e,t){if(!o.isBuffer(e)||!o.isBuff
er(t))throw new TypeError("Arguments must be Buffers");if(e===t)return 0;for(var
n=e.length,r=t.length,i=0,a=Math.min(n,r);i<a;++i)if(e[i]!==t[i]){n=e[i],r=t[i];break}return n<r?-
1:r<n?1:0},o.isEncoding=function(e){switch(String(e).toLowerCase()){case"hex":case"utf8":case"utf-
8":case"ascii":case"latin1":case"binary":case"base64":case"ucs2":case"ucs-2":case"utf16le":case"utf-
16le":return!0;default:return!1}},o.concat=function(e,t){if(!Z(e))throw new TypeError("'list' argument must be an
Array of Buffers");if(0===e.length)return o.alloc(0);var n;if(void
0===t)for(t=0,n=0;n<e.length;++n)t+=e[n].length;var r=o.allocUnsafe(t),i=0;for(n=0;n<e.length;++n){var
a=e[n];if(!o.isBuffer(a))throw new TypeError("'list' argument must be an Array of
Buffers");a.copy(r,i),i+=a.length}return
r},o.byteLength=y,o.prototype._isBuffer=!0,o.prototype.swap16=function(){var e=this.length;if(e%2!==0)throw
new RangeError("Buffer size must be a multiple of 16-bits");for(var t=0;t<e;t+=2)b(this,t,t+1);return
this},o.prototype.swap32=function(){var e=this.length;if(e%4!==0)throw new RangeError("Buffer size must be a
multiple of 32-bits");for(var t=0;t<e;t+=4)b(this,t,t+3),b(this,t+1,t+2);return
this},o.prototype.swap64=function(){var e=this.length;if(e%8!==0)throw new RangeError("Buffer size must be a
multiple of 64-bits");for(var t=0;t<e;t+=8)b(this,t,t+7),b(this,t+1,t+6),b(this,t+2,t+5),b(this,t+3,t+4);return
this},o.prototype.toString=function(){var e=0|this.length;return
0===e?"":0===arguments.length?T(this,0,e):v.apply(this,arguments)},o.prototype.equals=function(e){if(!o.isBuffer
(e))throw new TypeError("Argument must be a Buffer");return
this===e||0===o.compare(this,e)},o.prototype.inspect=function(){var e="",t=n.INSPECT_MAX_BYTES;return
this.length>0&&(e=this.toString("hex",0,t).match(/.{2}/g).join(" "),this.length>t&&(e+=" ... ")),<Buffer
"+e+">",o.prototype.compare=function(e,t,n,r,i){if(!o.isBuffer(e))throw new TypeError("Argument must be a
Buffer");if(void 0===t&&(t=0),void 0===n&&(n=e.length:0),void 0===r&&(r=0),void
0===i&&(i=this.length),t<0||n>e.length||r<0||i>this.length)throw new RangeError("out of range
index");if(r>=i&&t>=n)return 0;if(r>=i)return-1;if(t>=n)return
1;if(t>>>=0,n>>>=0,r>>>=0,i>>>=0,this===e)return 0;for(var a=i-r,s=n-
t,l=Math.min(a,s),u=this.slice(r,i),c=e.slice(t,n),p=0;p<l;++p)if(u[p]!==c[p]){a=u[p],s=c[p];break}return a<s?-
1:s<a?1:0},o.prototype.includes=function(e,t,n){return this.indexOf(e,t,n)!==
-1},o.prototype.indexOf=function(e,t,n){return w(this,e,t,n,!0)},o.prototype.lastIndexOf=function(e,t,n){return
w(this,e,t,n,!1)},o.prototype.write=function(e,t,n,r){if(void 0===t)r="utf8",n=this.length,t=0;else
if(void 0===n&&"string"===typeof t)r=t,n=this.length,t=0;else{if(!isFinite(t))throw new Error("Buffer.write(string,
encoding, offset[, length]) is no longer supported");t=0|t,isFinite(n)?(n=0|n,void 0===r&&(r="utf8")):(r=n,n=void

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0)}var i=this.length-t;if((void 0===n||n>i)&&(n=i),e.length>0&&(n<0||t<0)||t>this.length)throw new
RangeError("Attempt to write outside buffer bounds");r||(r="utf8");for(var a=!1;;)switch(r){case"hex":return
x(this,e,t,n);case"utf8":case"utf-8":return A(this,e,t,n);case"ascii":return
S(this,e,t,n);case"latin1":case"binary":return j(this,e,t,n);case"base64":return E(this,e,t,n);case"ucs-
2":case"utf16le":case"utf-16le":return O(this,e,t,n);default:if(a)throw new TypeError("Unknown encoding:
"+r);r=(""+r).toLowerCase(),a=!0}},o.prototype.toJSON=function(){return{type:"Buffer",data:Array.prototype.slice
.call(this._arr||this,0)}};var ee=4096;o.prototype.slice=function(e,t){var n=this.length;e=~e,t=void
0===t?t:n;~~t,e<0?(e+=n,e<0&&(e=0)):e>n&&(e=n),t<0?(t+=n,t<0&&(t=0)):t>n&&(t=n),t<e&&(t=e);var
r;if(o.TYPED_ARRAY_SUPPORT)r=this.subarray(e,t),r.__proto__=o.prototype;else{var i=t-e;r=new o(i,(void
0));for(var a=0;a<i;++a)r[a]=this[a+e]}return
r},o.prototype.readUIntLE=function(e,t,n){e=0|e,t=0|t,n||R(e,t,this.length);for(var
r=this[e],i=1,a=0;++a<t&&(i*=256);)r+=this[e+a]*i;return
r},o.prototype.readUIntBE=function(e,t,n){e=0|e,t=0|t,n||R(e,t,this.length);for(var r=this[e--
t],i=1;t>0&&(i*=256);)r+=this[e+--t]*i;return r},o.prototype.readUInt8=function(e,t){return
t||R(e,1,this.length),this[e]},o.prototype.readUInt16LE=function(e,t){return
t||R(e,2,this.length),this[e]|this[e+1]<<8},o.prototype.readUInt16BE=function(e,t){return
t||R(e,2,this.length),this[e]<<8|this[e+1]},o.prototype.readUInt32LE=function(e,t){return
t||R(e,4,this.length),(this[e]|this[e+1]<<8|this[e+2]<<16)+16777216*this[e+3]},o.prototype.readUInt32BE=function
(e,t){return
t||R(e,4,this.length),16777216*this[e]+(this[e+1]<<16|this[e+2]<<8|this[e+3])},o.prototype.readIntLE=function(e,t,n
){e=0|e,t=0|t,n||R(e,t,this.length);for(var
r=this[e],i=1,a=0;++a<t&&(i*=256);)r+=this[e+a]*i;return i*=128,r>=i&&(r-
=Math.pow(2,8*t)),r},o.prototype.readIntBE=function(e,t,n){e=0|e,t=0|t,n||R(e,t,this.length);for(var
r=t,i=1,a=this[e+--r];r>0&&(i*=256);)a+=this[e+--r]*i;return i*=128,a>=i&&(a-
=Math.pow(2,8*t)),a},o.prototype.readInt8=function(e,t){return t||R(e,1,this.length),128&this[e]?(255-this[e]+1)*-
1:this[e]},o.prototype.readInt16LE=function(e,t){t||R(e,2,this.length);var n=this[e]|this[e+1]<<8;return
32768&n?4294901760|n:n},o.prototype.readInt16BE=function(e,t){t||R(e,2,this.length);var
n=this[e+1]|this[e]<<8;return 32768&n?4294901760|n:n},o.prototype.readInt32LE=function(e,t){return
t||R(e,4,this.length),this[e]|this[e+1]<<8|this[e+2]<<16|this[e+3]<<24},o.prototype.readInt32BE=function(e,t){retur
n
t||R(e,4,this.length),this[e]<<24|this[e+1]<<16|this[e+2]<<8|this[e+3]},o.prototype.readFloatLE=function(e,t){return
t||R(e,4,this.length),X.read(this,e,!0,23,4)},o.prototype.readFloatBE=function(e,t){return
t||R(e,4,this.length),X.read(this,e,!1,23,4)},o.prototype.readDoubleLE=function(e,t){return
t||R(e,8,this.length),X.read(this,e,!0,52,8)},o.prototype.readDoubleBE=function(e,t){
return
t||R(e,8,this.length),X.read(this,e,!1,52,8)},o.prototype.writeUIntLE=function(e,t,n,r){if(e+=e,t=0|t,n=0|n,!r){var
i=Math.pow(2,8*n)-1;U(this,e,t,n,i,0)}var a=1,o=0;for(this[t]=255&e;++o<n&&(a*=256);)this[t+o]=e/a&255;return
t+n},o.prototype.writeUIntBE=function(e,t,n,r){if(e+=e,t=0|t,n=0|n,!r){var i=Math.pow(2,8*n)-
1;U(this,e,t,n,i,0)}var a=n-1,o=1;for(this[t+a]=255&e;--a>=0&&(o*=256);)this[t+a]=e/o&255;return
t+n},o.prototype.writeInt8=function(e,t,n){return
e+=e,t=0|t,n||U(this,e,t,1,255,0),o.TYPED_ARRAY_SUPPORT||(e=Math.floor(e)),this[t]=255&e,t+1},o.prototype.
writeInt16LE=function(e,t,n){return
e+=e,t=0|t,n||U(this,e,t,2,65535,0),o.TYPED_ARRAY_SUPPORT?(this[t]=255&e,this[t+1]=e>>>8):P(this,e,t,!0),t+
2},o.prototype.writeInt16BE=function(e,t,n){return
e+=e,t=0|t,n||U(this,e,t,2,65535,0),o.TYPED_ARRAY_SUPPORT?(this[t]=e>>>8,this[t+1]=255&e):P(this,e,t,!1),t+
2},o.prototype.writeInt32LE=function(e,t,n){return
e+=e,t=0|t,n||U(this,e,t,4,4294967295,0),o.TYPED_ARRAY_SUPPORT?(this[t+3]=e>>>24,this[t+2]=e>>>16,this[t
+1]=e>>>8,this[t]=255&e):q(this,e,t,!0),t+4},o.prototype.writeInt32BE=function(e,t,n){return

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e+=e,t=0|t,n||U(this,e,t,4,4294967295,0),o.TYPED_ARRAY_SUPPORT?(this[t]=e>>>24,this[t+1]=e>>>16,this[t+2]=e>>>8,this[t+3]=255&e):q(this,e,t,!1),t+4},o.prototype.writeIntLE=function(e,t,n,r){if(e+=e,t=0|t,r){var i=Math.pow(2,8*n-1);U(this,e,t,n,i-1)}var a=0,o=1,s=0;for(this[t]=255&e;++a<n&&(o*=256));e<0&&0===s&&0!==this[t+a-1]&&(s=1),this[t+a]=(e/o>>>0)-s&255;return t+n},o.prototype.writeIntBE=function(e,t,n,r){if(e+=e,t=0|t,r){var i=Math.pow(2,8*n-1);U(this,e,t,n,i-1)}var a=n-1,o=1,s=0;for(this[t+a]=255&e;--a>=0&&(o*=256));e<0&&0===s&&0!==this[t+a+1]&&(s=1),this[t+a]=(e/o>>>0)-s&255;return t+n},o.prototype.writeInt8=function(e,t,n){return e+=e,t=0|t,n||U(this,e,t,1,127,-128),o.TYPED_ARRAY_SUPPORT||(e=Math.floor(e)),e<0&&(e=255+e+1),this[t]=255&e,t+1},o.prototype.writeInt16LE=function(e,t,n){return e+=e,t=0|t,n||U(this,e,t,2,32767,-32768),o.TYPED_ARRAY_SUPPORT?(this[t]=255&e,this[t+1]=e>>>8):P(this,e,t,!0),t+2},o.prototype.writeInt16BE=function(e,t,n){return e+=e,t=0|t,n||U(this,e,t,2,32767,-32768),o.TYPED_ARRAY_SUPPORT?(this[t]=e>>>8,this[t+1]=255&e):P(this,e,t,!1),t+2},o.prototype.writeInt32LE=function(e,t,n){return e+=e,t=0|t,n||U(this,e,t,4,2147483647,-2147483648),o.TYPED_ARRAY_SUPPORT?(this[t]=255&e,this[t+1]=e>>>8,this[t+2]=e>>>16,this[t+3]=e>>>24):q(this,e,t,!0),t+4},o.prototype.writeInt32BE=function(e,t,n){return e+=e,t=0|t,n||U(this,e,t,4,2147483647,-2147483648),e<0&&(e=4294967295+e+1),o.TYPED_ARRAY_SUPPORT?(this[t]=e>>>24,this[t+1]=e>>>16,this[t+2]=e>>>8,this[t+3]=255&e):q(this,e,t,!1),t+4},o.prototype.writeFloatLE=function(e,t,n){return N(this,e,t,!0,n)},o.prototype.writeFloatBE=function(e,t,n){return N(this,e,t,!1,n)},o.prototype.writeDoubleLE=function(e,t,n){return z(this,e,t,!0,n)},o.prototype.writeDoubleBE=function(e,t,n){return z(this,e,t,!1,n)},o.prototype.copy=function(e,t,n,r){if(n||(n=0),r||0===r||(r=this.length),t>=e.length&&(t=e.length),t|t=0),r>0&&r<n&&(r=n),r===n)return 0;if(0===e.length||0===this.length)return 0;if(t<0)throw new RangeError("targetStart out of bounds");if(n<0||n>=this.length)throw new RangeError("sourceStart out of bounds");if(r<0)throw new RangeError("sourceEnd out of bounds");r>this.length&&(r=this.length),e.length-t<r-n&&(r=e.length-t+n);var i,a=r-n;if(this===e&&n<t&&t<r)for(i=a-1;i>=0;--i)e[i+t]=this[i+n];else if(a<1e3||!o.TYPED_ARRAY_SUPPORT)for(i=0;i<a;++i)e[i+t]=this[i+n];else Uint8Array.prototype.set.call(e,this.subarray(n,n+a),t);return a},o.prototype.fill=function(e,t,n,r){if("string"===typeof e){if("string"===typeof t?(r=t,t=0,n=this.length):"string"===typeof n&&(r=n,n=this.length),1===e.length){var i=e.charCodeAt(0);i<256&&(e=i)}if(void 0!==r&&"string"!==typeof r)throw new TypeError("encoding must be a string");if("string"===typeof r&&!o.isEncoding(r))throw new TypeError("Unknown encoding: "+r)}else"number"===typeof e&&(e=255&e);if(t<0||this.length<t||this.length<n)throw new RangeError("Out of range index");if(n<=t)return this;t>>>=0,n=void 0===n?this.length:n>>>0,e||(e=0);var a;if("number"===typeof e)for(a=t;a<n;++a)this[a]=e;else{var s=o.isBuffer(e)?e:H(new o(e,r).toString()),l=s.length;for(a=0;a<n-t;++a)this[a+t]=s[a%l]}return this};var te=/[\^+\V0-9A-Za-z-_]/g).call(this,"undefined"!==typeof global?global:"undefined"!==typeof self?self:"undefined"!==typeof window?window:{}),{"base64-js":2,ieee754:37,isarray:40}},6:[function(e,t,n){(function(e){function t(e){return Array.isArray?Array.isArray(e):"[object Array]"===g(e)}function r(e){return"boolean"===typeof e}function i(e){return null===e}function a(e){return null===e}function o(e){return"number"===typeof e}function s(e){return"string"===typeof e}function l(e){return"symbol"===typeof e}function u(e){return void 0===e}function c(e){return"[object RegExp]"===g(e)}function p(e){return"object"===typeof e&&null!==e}function h(e){return"[object Date]"===g(e)}function f(e){return"[object Error]"===g(e)||e instanceof Error}function d(e){return"function"===typeof e}function m(e){return null===e||"boolean"===typeof e||"number"===typeof e||"string"===typeof e||"symbol"===typeof e||"undefined"===typeof e}function g(e){return

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Object.prototype.toString.call(e)}n.isArray=t,n.isBoolean=r,n.isNull=i,n.isNullOrUndefined=a,n.isNumber=o,n.isString=s,n.isSymbol=l,n.isUndefined=u,n.isRegExp=c,n.isObject=p,n.isDate=h,n.isError=f,n.isFunction=d,n.isPrimitive=m,n.isBuffer=e.isBuffer)).call(this,{isBuffer:e("../is-buffer/index.js")}),{"../is-buffer/index.js":39}],7:[function(e,t,n){function r(e,t){if(e){var n,r="";for(var i in e)n=e[i],r&&(r+=""),r+="!n&&p[i]?i:'+'+(t.decodeEntities?c.encodeXML(n):n)+'";return r}}function i(e,t){"svg"===e.name&&(t={decodeEntities:t.decodeEntities,xmlMode:!0});var n="<"+e.name,i=r(e.attrs,t);return i&&(n+=" "+i),!t.xmlMode||e.children&&0!==e.children.length?(n+=">",e.children&&(n+=d(e.children,t)),f[e.name]&&!t.xmlMode||(n+="</"+e.name+">")):n+=">",n}function a(e){return"<"+e.data+">"}function o(e,t){var n=e.data||"";return!t.decodeEntities||e.parent&&e.parent.name in h||(n=c.encodeXML(n)),n}function s(e){return"<![CDATA["+e.children[0].data+"]>"}function l(e){return"<!--"+e.data+"-->"}var u=e("domelementtype"),c=e("entities"),p={__proto__:null,allowfullscreen:!0,async:!0,autofocus:!0,autoplay:!0,checked:!0,controls:!0,"default":!0,defer:!0,disabled:!0,hidden:!0,ismap:!0,loop:!0,multiple:!0,muted:!0,open:!0,readonly:!0,required:!0,reversed:!0,scoped:!0,seamless:!0,selected:!0,typemustmatch:!0},h={__proto__:null,style:!0,script:!0,xmp:!0,iframe:!0,noembed:!0,noframes:!0,plaintext:!0,noscript:!0},f={__proto__:null,area:!0,base:!0,basefont:!0,br:!0,col:!0,command:!0,embed:!0,frame:!0,hr:!0,img:!0,input:!0,isindex:!0,keygen:!0,link:!0,meta:!0,param:!0,source:!0,track:!0,wbr:!0},d=t.exports=function(e,t){Array.isArray(e)||e.cheerio||(e=[e]),t=t||{};for(var n="",r=0;r<e.length;r++){var c=e[r],n+="root"===c.type?d(c.children,t):u.isTag(c)?i(c,t):c.type===u.Directive?a(c):c.type===u.Comment?l(c):c.type===u.CDATA?s(c):o(c,t)}return n},{domelementtype:8,entities:20}],8:[function(e,t,n){t.exports={Text:"text",Directive:"directive",Comment:"comment",Script:"script",Style:"style",Tag:"tag",CDATA:"cdata",isTag:function(e){return"tag"===e.type||"script"===e.type||"style"===e.type}},{}],9:[function(e,t,n){t.exports={Text:"text",Directive:"directive",Comment:"comment",Script:"script",Style:"style",Tag:"tag",CDATA:"cdata",Doctype:"doctype",isTag:function(e){return"tag"===e.type||"script"===e.type||"style"===e.type}},{}],10:[function(e,t,n){function r(e,t,n){"object"===typeof e?(n=t,e=null):"function"===typeof e&&(n=t,t=l),this._callback=e,this._options=t||l,this._elementCB=n,this.dom=[],this._done=!1,this._tagStack=[],this._parser=this._parser||null}var i=e("domelementtype"),a=/s+/g,o=e("../lib/node"),s=e("../lib/element"),l={normalizeWhitespace:!1,withStartIndices:!1};r.prototype.onparserinit=function(e){this._parser=e},r.prototype.onreset=function(){r.call(this,this._callback,this._options,this._elementCB)},r.prototype.onend=function(){this._done||(this._done=!0,this._parser=null,this._handleCallback(null))},r.prototype._handleCallback=r.prototype.onerror=function(e){if("function"===typeof this._callback)this._callback(e,this.dom);else if(e)throw e},r.prototype.unclosetag=function(){var e=this._tagStack.pop();this._elementCB&&this._elementCB(e)},r.prototype._addDomElement=function(e){var t=this._tagStack[this._tagStack.length-1],n=t?t.children:this.dom,r=n[n.length-1];e.next=null,this._options.withStartIndices&&(e.startIndex=this._parser.startIndex),this._options.withDomLevel1&&(e.__proto__="tag"===e.type?s:o),r?(e.prev=r,r.next=e):e.prev=null,n.push(e),e.parent=t||null},r.prototype.onopentag=function(e,t){var n={type:"script"===e?i.Script:"style"===e?i.Style:i.Tag,name:e,attrs:t,children:[]};this._addDomElement(n),this._tagStack.push(n)},r.prototype.ontext=function(e){var t,n=this._options.normalizeWhitespace||this._options.ignoreWhitespace;!this._tagStack.length&&this.dom.length&&(t=this.dom[this.dom.length-1]).type===i.Text?n?t.data=(t.data+e).replace(a,""):t.data+=e:this._tagStack.length&&(t=this._tagStack[this._tagStack.length-1])&&(t=t.children[t.children.length-1])&&t.type===i.Text?n?t.data=(t.data+e).replace(a,""):t.data+=e:(n&&(e=e.replace(a,"")),this._addDomElement({data:e,type:i.Text})),r.prototype.oncomment=function(e){var t=this._tagStack[this._tagStack.length-1];if(t&&t.type===i.Comment)return void(t.data+=e);var n={data:e,type:i.Comment};this._addDomElement(n),this._tagStack.push(n)},r.prototype.ondatastart=function(){var

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e={children:[{data:"",type:i.Text},type:i.CDATA};this._addDomElement(e,this._tagStack.push(e)),r.prototype.on
commentend=r.prototype.oncdataend=function(){this._tagStack.pop()},r.prototype.onprocessinginstruction=functio
n(e,t){this._addDomElement({name:e,data:t,type:i.Directive}),t.exports=r},{"/lib/element":11,"/lib/node":12,dome
lementtype:9}],11:[function(e,t,n){var
r=e("/node"),i=t.exports=Object.create(r),a={tagName:"name"};Object.keys(a).forEach(function(e){var
t=a[e];Object.defineProperty(i,e,{get:function(){return this[t]||null},set:function(e){return
this[t]=e,e}})}),{"/node":12}],12:[function(e,t,n){var r=t.exports={get firstChild(){var e=this.children;return
e&&e[0]||null},get lastChild(){var e=this.children;return e&&e[e.length-1]||null},get nodeType(){return
a[this.type]||a.element}},i={tagName:"name",childNodes:"children",parentNode:"parent",previousSibling:"prev",ne
xtSibling:"next",nodeValue:"data"},a={element:1,text:3,cdata:4,comment:8};Object.keys(i).forEach(function(e){va
r t=i[e];Object.defineProperty(r,e,{get:function(){return this[t]||null},set:function(e){return
this[t]=e,e}})}),{}/},13:[function(e,t,n){var
r=t.exports,[e("/lib/stringify"),e("/lib/traversal"),e("/lib/manipulation"),e("/lib/querying"),e("/lib/legacy"),e("/lib/
helpers")].forEach(function(e){Object.keys(e).forEach(function(t){r[t]=e[t].bind(r)}))},{"/lib/helpers":14,"/lib/leg
acy":15,"/lib/manipulation":16,"/lib/querying":17,"/lib/stringify":18,"/lib/traversal":19}],14:[function(e,t,n){n.rem
oveSubsets=function(e){for(var t,n,r,i=e.length;--i>-1;){for(t=n=e[i],e[i]=null,r=!0;n;){if(e.indexOf(n)>-
1){r=!1,e.splice(i,1);break}n=n.parent}r&&(e[i]=t)}return e};var
r={DISCONNECTED:1,PRECEDING:2,FOLLOWING:4,CONTAINS:8,CONTAINED_BY:16},i=n.compareDocu
mentPosition=function(e,t){var n,i,a,o,s,l,u=[],c=[];if(e===t)return
0;for(n=e;n;u.unshift(n),n=n.parent;for(n=t;n;c.unshift(n),n=n.parent;for(l=0;u[l]===c[l];)l++;return
0===l?r.DISCONNECTED:(i=u[l-
1],a=i.children,o=u[l],s=c[l],a.indexOf(o)>a.indexOf(s)?i===t?r.FOLLOWING|r.CONTAINED_BY:r.FOLLOWIN
G:i===e?r.PRECEDING|r.CONTAINS:r.PRECEDING));n.uniqueSort=function(e){var
t,n,a=e.length;for(e=e.slice();--a>-1;)t=e[a],n=e.indexOf(t),n>-1&&n<a&&e.splice(a,1);return
e.sort(function(e,t){var n=i(e,t);return n&r.PRECEDING?-
1:n&r.FOLLOWING?1:0}),e},{}/},15:[function(e,t,n){function r(e,t){return"function"===typeof
t?function(n){return n.attrs&&t(n.attrs[e]):function(n){return n.attrs&&n.attrs[e]===t}}function
i(e,t){return function(n){return e(n)||t(n)}}var
a=e("domelementtype"),o=n.isTag=a.isTag;n.testElement=function(e,t){for(var n in
e)if(e.hasOwnProperty(n)){if("tag_name"===n){if(!o(t)||e.tag_name(t.name))return!1}else
if("tag_type"===n){if(!e.tag_type(t.type))return!1}else
if("tag_contains"===n){if(o(t)||!e.tag_contains(t.data))return!1}else
if(!t.attrs||!e[n](t.attrs[n]))return!1}else{return!0};var s={tag_name:function(e){return"function"===typeof
e?function(t){return o(t)&&e(t.name)}:"*"===e?o:function(t){return
o(t)&&t.name===e}},tag_type:function(e){return"function"===typeof e?function(t){return
e(t.type)}:function(t){return
t.type===e}},tag_contains:function(e){return"function"===typeof
e?function(t){return!o(t)&&e(t.data)}:function(t){return!o(t)&&t.data===e}}};n.getElements=function(e,t,n,a){var
o=Object.keys(e).map(function(t){var n=e[t];return t in s?s[t](n):r(t,n)});return
0===o.length?[]:this.filter(o.reduce(i),t,n,a)},n.getElementById=function(e,t,n){return
Array.isArray(t)||(t=[t]),this.findOne(r("id",e),t,n!==!1)},n.getElementsByTagName=function(e,t,n,r){return
this.filter(s.tag_name(e),t,n,r)},n.getElementsByTagType=function(e,t,n,r){return
this.filter(s.tag_type(e),t,n,r)},{domelementtype:9}],16:[function(e,t,n){n.removeElement=function(e){if(e.prev&
&(e.prev.next=e.next),e.next&&(e.next.prev=e.prev),e.parent){var
t=e.parent.children;t.splice(t.lastIndexOf(e),1)},n.replaceElement=function(e,t){var
n=t.prev=e.prev;n&&(n.next=t);var r=t.next=e.next;r&&(r.prev=t);var i=t.parent=e.parent;if(i){var
a=i.children;a[a.lastIndexOf(e)]=t},n.appendChild=function(e,t){if(t.parent=e,1===e.children.push(t)){var

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n=e.children[e.children.length-2];n.next=t,t.prev=n,t.next=null}},n.append=function(e,t){var
n=e.parent,r=e.next;if(t.next=r,t.prev=e,e.next=t,t.parent=n,r){if(r.prev=t,n){var
i=n.children;i.splice(i.lastIndexOf(r),0,t)}else n&& n.children.push(t)},n.prepend=function(e,t){var
n=e.parent;if(n){var
r=n.children;r.splice(r.lastIndexOf(e),0,t)}e.prev&&(e.prev.next=t),t.parent=n,t.prev=e.prev,t.next=e,e.prev=t}},{}},
17:[function(e,t,n){function r(e,t,n,r){return Array.isArray(t)||t===t,"number"===typeof
r&&isFinite(r)||r===1/0,i(e,t,n,!1,r)}function i(e,t,n,r){for(var
a,o=[],s=0,l=t.length;s<l&&!(e(t[s]))&&(o.push(t[s]),--
r<=0))&&(a=t[s].children,!n&&a&&a.length>0&&(a=i(e,a,n,r),o=o.concat(a),r=a.length,r<=0));s++);return
o}function a(e,t){for(var n=0,r=t.length;n<r;n++)if(e(t[n]))return t[n];return null}function o(e,t){for(var
n=null,r=0,i=t.length;r<i&&!n;r++)u(t[r])&&(e(t[r])?n=t[r]:t[r].children.length>0&&(n=o(e,t[r].children)));return
n}function s(e,t){for(var
n=0,r=t.length;n<r;n++)if(u(t[n])&&(e(t[n])||t[n].children.length>0&&s(e,t[n].children)))return!0;return!1}function
l(e,t){for(var
n=[],r=0,i=t.length;r<i;r++)u(t[r])&&(e(t[r])&&n.push(t[r]),t[r].children.length>0&&(n=n.concat(l(e,t[r].children)))
);return n}var
u=e("domelementtype").isTag;t.exports={filter:r,find:i,findOneChild:a,findOne:o,existsOne:s,findAll:l}},{domelem
enttype:9}],18:[function(e,t,n){function r(e,t){return e.children?e.children.map(function(e){return
o(e,t)}).join(""):""}function i(e){return
Array.isArray(e)?e.map(i).join(""):s(e)||e.type===a.CDATA?i(e.children):e.type===a.Text?e.data:""}var
a=e("domelementtype"),o=e("dom-
serializer"),s=a.isTag;t.exports={getInnerHTML:r,getOuterHTML:o,getText:i}},{"dom-
serializer":7,domelementtype:9}],19:[function(e,t,n){var r=n.getChildren=function(e){return
e.children},i=n.getParent=function(e){return e.parent};n.getSiblings=function(e){var t=i(e);return
t?t[r]:[e]},n.getAttributeValue=function(e,t){return
e.attrs&&e.attrs[t]},n.hasAttr=function(e,t){return!!e.attrs&&hasOwnProperty.call(e.attrs,t)},n.getName=f
unction(e){return
e.name}},{}},20:[function(e,t,n){var
r=e("./lib/encode.js"),i=e("./lib/decode.js");n.decode=function(e,t){return(!t||t<=0?i.XML:i.HTML)(e)},n.decodeStri
ct=function(e,t){return(!t||t<=0?i.XML:i.HTMLStrict)(e)},n.encode=function(e,t){return(!t||t<=0?r.XML:r.HTML)(
e)},n.encodeXML=r.XML,n.encodeHTML4=n.encodeHTML5=n.encodeHTML=r.HTML,n.decodeXML=n.decode
XMLStrict=i.XML,n.decodeHTML4=n.decodeHTML5=n.decodeHTML=i.HTML,n.decodeHTML4Strict=n.decode
HTML5Strict=n.decodeHTMLStrict=i.HTMLStrict,n.escape=r.escape},{"/lib/decode.js":21,"./lib/encode.js":23}],2
1:[function(e,t,n){function r(e){var t=Object.keys(e).join(""),n=a(e);t+="#[xX][\\da-fA-F]+#[\\d+]"var r=new
RegExp("&(?:"+t+");","g");return function(e){return String(e).replace(r,n)}}function i(e,t){return e<t?1:-1}function
a(e){return
function(t){return"#====t.charAt(1)?u("X"===t.charAt(2))||"x"===t.charAt(2)?parseInt(t.substr(3),16):parseInt(t.sub
str(2),10)):e[t.slice(1,-1)]}}var
o=e("../maps/entities.json"),s=e("../maps/legacy.json"),l=e("../maps/xml.json"),u=e("../decode_codepoint.js"),c=r(l),p
=r(o),h=function(){function e(e){return";"===e.substr(-1)&&(e+="");c(e)}for(var
t=Object.keys(s).sort(i),n=Object.keys(o).sort(i),r=0,l=0;r<n.length;r++)t[l]===n[r]?n[r]+=";"?:n[r]+="";var
u=new RegExp("&(?:"+n.join("|")+"#[xX][\\da-fA-F]+#[\\d+];)","g"),c=a(o);return function(t){return
String(t).replace(u,e)}};t.exports={XML:c,HTML:h,HTMLStrict:p}},{"../maps/entities.json":25,"../maps/legacy.js
on":26,"../maps/xml.json":27,"./decode_codepoint.js":22}],22:[function(e,t,n){function
r(e){if(e>=55296&&e<=57343||e>1114111)return"";e in i&&(e=i[e]);var t="";return e>65535&&(e-
=65536,t+=String.fromCharCode(e>>>10&1023|55296),e=56320|1023&e),t+=String.fromCharCode(e)}var
i=e("../maps/decode.json");t.exports=r},{"/maps/decode.json":24}],23:[function(e,t,n){function r(e){return
Object.keys(e).sort().reduce(function(t,n){return

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t[e[n]]="&"+n+";",t},{})}function i(e){var t=[],n=[];return
Object.keys(e).forEach(function(e){1===e.length?t.push("\\"+e):n.push(e)}),n.unshift("[ "+t.join(" ")+" ]"),new
RegExp(n.join("|"),"g")}function a(e){return"&#x"+e.charCodeAt(0).toString(16).toUpperCase()+";" }function
o(e){var t=e.charCodeAt(0),n=e.charCodeAt(1),r=1024*(t-55296)+n-
56320+65536;return"&#x"+r.toString(16).toUpperCase()+";" }function s(e,t){function n(t){return e[t]}return
function(e){return e.replace(t,n).replace(d,o).replace(f,a)} }function l(e){return
e.replace(m,a).replace(d,o).replace(f,a)}var u=r(e("../maps/xml.json")),c=i(u);n.XML=s(u,c);var
p=r(e("../maps/entities.json")),h=i(p);n.HTML=s(p,h);var f=/[\^0-\x7F]/g,d=/[\uD800-\uDBFF][\uDC00-
\uDFFF]/g,m=i(u);n.escape=l},{ "../maps/entities.json":25,"../maps/xml.json":27}],24:[function(e,t,n){t.exports={0:6
5533,128:8364,130:8218,131:402,132:8222,133:8230,134:8224,135:8225,136:710,137:8240,138:352,139:8249,140
:338,142:381,145:8216,146:8217,147:8220,148:8221,149:8226,150:8211,151:8212,152:732,153:8482,154:353,155:
8250,156:339,158:382,159:376}},{}],25:[function(e,t,n){t.exports={Aacute:"",aacute:"",Abreve:"",abreve:"",ac:"",a
cd:"",acE:"",Acirc:"",acirc:"",acute:"",Acy:"",acy:"",AElig:"",aelig:"",af:"",Afr:"",afr:"",Agrave:"",agrave:"",alefsy
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ckwiseContourIntegral:"",CloseCurlyDoubleQuote:"",CloseCurlyQuote:"",clubs:"",clubsuit:"",colon:"",Colon:"",C
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ge:"","DoubleContourIntegral:"","DoubleDot:"","DoubleDownArrow:"","DoubleLeftArrow:"","DoubleLeftRightArrow:"","DoubleLeftTee:"","DoubleLongLeftArrow:"","DoubleLongLeftRightArrow:"","DoubleLongRightArrow:"","DoubleRightArrow:"","DoubleRightTee:"","DoubleUpArrow:"","DoubleUpDownArrow:"","DoubleVerticalBar:"","DownArrowBar:"","downarrow:"","DownArrow:"","Downarrow:"","DownArrowUpArrow:"","DownBreve:"","downarrowbar:"","downharpoonleft:"","downharpoonright:"","DownLeftRightVector:"","DownLeftTeeVector:"","DownLeftVectorBar:"","DownLeftVector:"","DownRightTeeVector:"","DownRightVectorBar:"","DownRightVector:"","DownTeeArrow:"","DownTee:"","drbkarow:"","drcorn:"","drcrop:"","Dscr:"","dscr:"","DScy:"","dscy:"","dsol:"","Dstrok:"","dstrok:"","dtdot:"","dtri:"","dtrif:"","duarr:"","duhar:"","dwangle:"","DZcy:"","dzcy:"","dzigrarr:"","Eacute:"","eacute:"","easter:"","Ecaron:"","ecaron:"","Ecirc:"","ecirc:"","ecir:"","ecolon:"","Ecy:"","ecy:"","eDDot:"","Edot:"","edot:"","eDot:"","ee:"","efDot:"","Efr:"","efr:"","eg:"","Egrave:"","egrave:"","egs:"","egsdot:"","el:"","Element:"","elinters:"","ell:"","els:"","elsdot:"","Emacr:"","emacr:"","empty:"","emptyset:"","EmptySmallSquare:"","emptyv:"","EmptyVerySmallSquare:"","emsp13:"","emsp14:"","emsp:"","ENG:"","eng:"","ensp:"","Eogon:"","eogon:"","Eopf:"","eopf:"","epar:"","eparl:"","eplus:"","epsi:"","Epsilon:"","epsilon:"","epsiv:"","eqcirc:"","eqcolon:"","eqsim:"","eqslantgtr:"","eqslantless:"","Equal:"","equals:"","EqualTilde:"","equest:"","Equilibrium:"","equiv:"","equivDD:"","eqvparl:"","erarr:"","erDot:"","escr:"","Escr:"","esdot:"","Esim:"","esim:"","Eta:"","eta:"","ETH:"","eth:"","Euml:"","euml:"","euro:"","excl:"","exist:"","Exists:"","expectation:"","exponentiale:"","ExponentialE:"","fallingdotseq:"","Fcy:"","fcy:"","female:"","fflig:"","fflig:"","fflig:"","Ffr:"","ffr:"","filig:"","FilledSmallSquare:"","FilledVerySmallSquare:"","fjlig:"","fjlig:"","flat:"","flig:"","fltns:"","fnof:"","Fopf:"","fopf:"","forall:"","ForAll:"","fork:"","forkv:"","Fouriertf:"","fpartint:"","frac12:"","frac13:"","frac14:"","frac15:"","frac16:"","frac18:"","frac23:"","frac25:"","frac34:"","frac35:"","frac38:"","frac45:"","frac56:"","frac58:"","frac78:"","frasl:"","frown:"","fscr:"","Fscr:"","gacute:"","Gamma:"","gamma:"","Gammad:"","gammad:"","gap:"","Gbreve:"","gbreve:"","Gcedil:"","Gcirc:"","gcirc:"","Gcy:"","gcy:"","Gdot:"","gdot:"","ge:"","gE:"","gEl:"","gel:"","geq:"","geqq:"","geqslant:"","gescc:"","ges:"","gesdot:"","gesdoto:"","gesdoto:"","gesl:"","gesles:"","Gfr:"","gfr:"","gg:"","Gg:"","ggg:"","gimel:"","GJcy:"","gjcy:"","gla:"","gl:"","glE:"","glj:"","gnap:"","gnapprox:"","gne:"","gnE:"","gneq:"","gneqq:"","gnsim:"","Gopf:"","gopf:"","grave:"","GreaterEqual:"","GreaterEqualLess:"","GreaterFullEqual:"","GreaterGreater:"","GreaterLess:"","GreaterSlantEqual:"","GreaterTilde:"","Gscr:"","gscr:"","gsim:"","gsime:"","gsiml:"","gtcc:"","gtcir:"","gt:"","GT:"","Gt:"","gtdot:"","gtlPar:"","gtquest:"","gtrapprox:"","gtrarr:"","gtrdot:"","gtreqless:"","gtreqqless:"","gtrless:"","gtrsim:"","gvertneqq:"","gvnE:"","Hacek:"","hairsp:"","half:"","hamilt:"","HARDcy:"","hardcy:"","harrcir:"","harr:"","hArr:"","hArrw:"","Hat:"","hbar:"","Hcirc:"","hcirc:"","hearts:"","heartsuit:"","hellip:"","hercon:"","hfr:"","Hfr:"","HilbertSpace:"","hksearow:"","hkswarow:"","hoarr:"","homtht:"","hookleftarrow:"","hookrightarrow:"","hopf:"","Hopf:"","horbar:"","HorizontalLine:"","hscr:"","Hscr:"","hslash:"","Hstrok:"","hstrok:"","HumpDownHump:"","HumpEqual:"","hybull:"","hyphen:"","Iacute:"","iacute:"","ic:"","Icirc:"","icirc:"","Icy:"","icy:"","Idot:"","IEcy:"","iecy:"","iexcl:"","iff:"","ifr:"","Ifr:"","Igrave:"","igrave:"","ii:"","iiiint:"","iiint:"","iinfin:"","iiota:"","IJlig:"","ijlig:"","Imacr:"","imacr:"","image:"","ImaginaryI:"","imagline:"","imagpart:"","imath:"","Im:"","imof:"","imped:"","Implies:"","incare:"","in:"","infin:"","infintie:"","inodot:"","intcal:"","int:"","Int:"","integers:"","Integral:"","intercal:"","Intersection:"","intlarhk:"","intprod:"","InvisibleComma:"","InvisibleTimes:"","IOcy:"","iocy:"","Iogon:"","iogon:"","Iopf:"","iopf:"","Iota:"","iota:"","iprod:"","iquest:"","iscr:"","Iscr:"","isin:"","isindot:"","isinE:"","isins:"","isinsv:"","isinv:"","it:"","Itilde:"","itilde:"","Iukcy:"","iukcy:"","Iuml:"","iuml:"","Jcirc:"","jcirc:"","Jcy:"","jcy:"","Jfr:"","jfr:"","jmath:"","Jopf:"","jopf:"","Jscr:"","jscr:"","Jsercy:"","jsercy:"","Jukcy:"","jukcy:"","Kappa:"","kappa:"","kappav:"","Kcedil:"","kcedil:"","Kcy:"","kcy:"","Kfr:"","kfr:"","kgreen:"","KHcy:"","khcy:"","KJcy:"","kjcy:"","Kopf:"","kopf:"","Kscr:"","kscr:"","lAarr:"","Lacute:"","lacute:"","laemptyv:"","lagran:"","Lambda:"","lambda:"","lang:"","Lang:"","langd:"","langle:"","lap:"","Laplacetrans:"","laquo:"","larrb:"","larrbfs:"","larr:"","Larr:"","lArr:"","lArrfs:"","larrhk:"","larrlp:"","larrpl:"","larrsim:"","larrtl:"","latail:"","lAtail:"","lat:"","late:"","lates:"","lbarr:"","lBarr:"","lbrk:"","lbrack:"","lbrke:"","lbrksld:"","lbrkslu:"","Lcaron:"","lcaron:"","Lcedil:"","lcedil:"","lceil:"","lcub:"","lcy:"","lcy:"","ldca:"","ldquo:"","ldquor:"","ldrhar:"","ldrushar:"","ldsh:"","le:"","lE:"","LeftAngleBracket:"","LeftArrowBar:"","leftarrow:"","LeftArrow:"","Leftarrow:"","LeftArrowRightArrow:"","leftarrowtail:"","LeftCeiling:"","LeftDoubleBracket:"","LeftDownTeeVector:"","LeftDownVectorBar:"","LeftDownVector:"","LeftFloor:"","leftharpoondown:"","leftharpoonup:"","leftleftarrows:"","leftrightarrow:"","LeftRightArrow:"","leftrightarrow:"","leftrightharpoons:"","leftrightsquigarrow:"","LeftRightVector:"","LeftTeeArrow:"","LeftTee:"","LeftTeeVector:"","leftthreetimes:"","LeftTriangleBar:"","LeftTriangle:"","LeftTriangleEqual:"","LeftUpDownVector:"","LeftUpTeeVector:"","LeftUpVectorBar:"","LeftUpVector:"","LeftVectorBar:"","LeftVector:"","lEg:"","leg:"","leq:"","leqq:"","leqslant:"","lescc:"","les:"","lesdot:"","lesdoto:"","lesdotor:"","lesg:"","lesges:"","lessapprox:"","lessdot:"","lesseqgtr:"","lesseqqgtr:"","LessEqualGreater:"","

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 ongLeftRightArrow:"",Longlefttrightharpoon:"",longmapsto:"",longrightarrow:"",LongRightArrow:"",Longrightarrow:  
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","yfr:"","Ylcy:"","yicy:"","Yopf:"","yopf:"","Yscr:"","yscr:"","YUcy:"","yucy:"","Yuml:"","Yuml:"","Zacute:"","zacut:"","Zcar  
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}],27:[function(e,t,n){t.exports={amp:""&","apos:"","gt:"">","lt:""<","quot:""}},{}],28:[function(e,t,n){function  
r(){this.\_events=this.\_events||{};this.\_maxListeners=this.\_maxListeners||void 0}function  
i(e){return"function"===typeof e}function a(e){return"number"===typeof e}function o(e){return"object"===typeof  
e&&null!==e}function s(e){return void 0===e}t.exports=r,r.EventEmitter=r,r.prototype.\_events=void  
0,r.prototype.\_maxListeners=void  
0,r.defaultMaxListeners=10,r.prototype.setMaxListeners=function(e){if(!a(e)||e<0||isNaN(e))throw TypeError("n  
must be a positive number");return this.\_maxListeners=e,this},r.prototype.emit=function(e){var  
t,n,r,a,l,u;if(this.\_events||(this.\_events={}),this.\_events.error||o(this.\_events.error)&&!this.\_events.  
error.length){if(t=arguments[1],t instanceof Error)throw t;var c=new Error("Uncaught, unspecified "error" event.  
('"+t+"')");throw c.context=t,c}if(n=this.\_events[e],s(n))return!1;if(i(n))switch(arguments.length){case  
1:n.call(this);break;case 2:n.call(this,arguments[1]);break;case  
3:n.call(this,arguments[1],arguments[2]);break;default:a=Array.prototype.slice.call(arguments,1),n.apply(this,a)}els  
e  
if(o(n))for(a=Array.prototype.slice.call(arguments,1),u=n.slice(),r=u.length,l=0;l<r;l++)u[l].apply(this,a);return!0},r.  
prototype.addListener=function(e,t){var n;if(!i(t))throw TypeError("listener must be a function");return  
this.\_events||(this.\_events={}),this.\_events.newListener&&this.emit("newListener",e,i(t.listener)?t.listener:t),this.\_e  
vents[e]?o(this.\_events[e])?this.\_events[e].push(t):this.\_events[e]=[this.\_events[e],t]:this.\_events[e]=t,o(this.\_events  
[e])&&!this.\_events[e].warned&&(n=s(this.\_maxListeners)?r.defaultMaxListeners:this.\_maxListeners,n&&n>0&&  
this.\_events[e].length>n&&(this.\_events[e].warned=!0,console.error("(node) warning: possible EventEmitter  
memory leak detected. %d listeners added. Use emitter.setMaxListeners() to increase  
limit.",this.\_events[e].length),"function"===typeof  
console.trace&&console.trace()),this},r.prototype.on=r.prototype.addListener,r.prototype.once=function(e,t){functi  
on n(){this.removeListener(e,n),r||(r=!0,t.apply(this,arguments))}if(!i(t))throw TypeError("listener must be a

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function");var r=!1;return n.listener=t,this.on(e,n),this},r.prototype.removeListener=function(e,t){var
n,r,a,s;if(!i(t))throw TypeError("listener must be a function");if(!this._events||!this._events[e])return
this;if(n=this._events[e],a=n.length,r=-1,n===t||i(n.listener)&&n.listener===t)delete
this._events[e],this._events.removeListener&&this.emit("removeListener",e,t);else if(o(n)){for(s=a;s--
>0);if(n[s]===t||n[s].listener&&n[s].listener===t){r=s;break}if(r<0)return this;1===n.length?(n.length=0,delete
this._events[e]):n.splice(r,1),this._events.removeListener&&this.emit("removeListener",e,t)}return
this},r.prototype.removeAllListeners=function(e){var t,n;if(!this._events)return
this;if(!this._events.removeListener)return 0===arguments.length?this._events={}:this._events[e]&&delete
this._events[e],this;if(0===arguments.length){for(t in
this._events)"removeListener"!==t&&this.removeAllListeners(t);return
this.removeAllListeners("removeListener"),this._events={},this}if(n=this._events[e],i(n))this.removeListener(e,n);e
lse if(n)for(;n.length;)this.removeListener(e,n[n.length-1]);return delete
this._events[e],this},r.prototype.listeners=function(e){var t;return
t=this._events&&this._events[e]?i(this._events[e]?[this._events[e]]:this._events[e].slice():[]),r.prototype.listenerCo
unt=function(e){if(this._events){var t=this._events[e];if(i(t))return 1;if(t)return t.length}return
0},r.listenerCount=function(e,t){return e.listenerCount(t)}},{}},29:[function(e,t,n){function
r(e){this._cbs=e||{},this.events=[]}t.exports=r;var
i=e("./").EVENTS;Object.keys(i).forEach(function(e){if(0===i[e])e="on"+e,r.prototype[e]=function(){this.events.p
ush([e]),this._cbs[e]&&this._cbs[e]()};else
if(1===i[e])e="on"+e,r.prototype[e]=function(t){this.events.push([e,t]),this._cbs[e]&&this._cbs[e](t)};else{if(2!==i
[e])throw
Error("wrong number of
arguments");e="on"+e,r.prototype[e]=function(t,n){this.events.push([e,t,n]),this._cbs[e]&&this._cbs[e](t,n)}}},r.pr
ototype.onreset=function(){this.events=[],this._cbs.onreset&&this._cbs.onreset()},r.prototype.restart=function(){thi
s._cbs.onreset&&this._cbs.onreset();for(var e=0,t=this.events.length;e<t;e++)if(this._cbs[this.events[e][0]]){var
n=this.events[e].length;1===n?this._cbs[this.events[e][0]]():2===n?this._cbs[this.events[e][0]](this.events[e][1]):thi
s._cbs[this.events[e][0]](this.events[e][1],this.events[e][2])}},{"./":36}],30:[function(e,t,n){function
r(e,t){this.init(e,t)}function i(e,t){return c.getElementsByTagName(e,t,!0)}function a(e,t){return
c.getElementsByTagName(e,t,!0,1)[0]}function o(e,t,n){return
c.getText(c.getElementsByTagName(e,t,n,1)).trim()}function s(e,t,n,r,i){var a=o(n,r,i);a&&(e[t]=a)}var
l=e("./index.js"),u=l.DomHandler,c=l.DomUtils;e("inherits")(r,u),r.prototype.init=u;var
p=function(e){return"rss"===e||"feed"===e||"rdf:RDF"===e};r.prototype.onend=function(){var
e,t,n={},r=a(p,this.dom);r&&("feed"===r.name?(t=r.children,n.type="atom",s(n,"id","id",t),s(n,"title","title",t),(e=a(
"link",t))&&(e=e.attrs)&&(e=e.href)&&(n.link=e),s(n,"description","subtitle",t),(e=o("updated",t))&&(n.updated
=new Date(e)),s(n,"author","email",t,!0),n.items=i("entry",t).map(function(e){var t,n={};return
e=e.children,s(n,"id","id",e),s(n,"title","title",e),(t=a("link",e))&&(t=t.attrs)&&(t=t.href)&&(n.link=t),(t=o("summ
ary",e))||o("content",e))&&(n.description=t),(t=o("updated",e))&&(n.pubDate=new
Date(t),n)):t=a("channel",r.children).children,n.type=r.name.substr(0,3),n.id="",s(n,"title","title",t),s(n,"link","lin
k",t),s(n,"description","description",t),(e=o("lastBuildDate",t))&&(n.updated=new
Date(e)),s(n,"author","managingEditor",t,!0),n.items=i("item",r.children).map(function(e){var t,n={};return
e=e.children,s(n,"id","guid",e),s(n,"title","title",e),s(n,"link","link",e),s(n,"description","description",e),(t=o("pubDat
e",e))&&(n.pubDate=new
Date(t),n)})),this.dom=n,u.prototype._handleCallback.call(this,r?null:Error("couldn't find root of
feed"))},t.exports=r},{"./index.js":36,inherits:38}],31:[function(e,t,n){function
r(e,t){this._options=t||{},this._cbs=e||{},this._tagname="",this._attribname="",this._attribvalue="",this._attrs=null,
this._stack=[],this.startIndex=0,this endIndex=null,this._lowerCaseTagNames="lowerCaseTags"in
this._options?!this._options.lowerCaseTags:!this._options.xmlMode,this._lowerCaseAttributeNames="lowerCaseA
ttributeNames"in

```

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this._options?!this._options.lowerCaseAttributeNames:!this._options.xmlMode,this._options.Tokenizer&&(i=this._
options.Tokenizer),this._tokenizer=new i(this._options,this),this._cbs.onparserinit&&this._cbs.onparserinit(this)}var
i=e("./Tokenizer.js"),a={input:!0,option:!0,optgroup:!0,select:!0,button:!0,datalist:!0,textarea:!0},o={tr:{!0,th:!0,t
d:!0},th:{th:!0},td:{thead:!0,th:!0,td:!0},body:{head:!0,link:!0,script:!0},li:{li:!0},p:{p:!0},h1:{p:!0},h2:{p:!0},h3:{
p:!0},h4:{p:!0},h5:{p:!0},h6:{p:!0},select:a,input:a,output:a,button:a,datalist:a,textarea:a,option:{option:!0},optgrou
p:{optgroup:!0}},s={__proto__:null,area:!0,base:!0,basefont:!0,br:!0,col:!0,command:!0,embed:!0,frame:!0,hr:!0,im
g:!0,input:!0,isindex:!0,keygen:!0,link:!0,meta:!0,param:!0,source:!0,track:!0,wbr:!0,path:!0,circle:!0,ellipse:!0,line:
!0,rect:!0,use:!0,stop:!0,polyline:!0,polygon:!0},l=/\s|\/;/e("inherits")(r,e("events").EventEmitter),r.prototype._updat
ePosition=function(e){null===this.endIndex?this._tokenizer._sectionStart<=e?this.startIndex=0:this.startIndex=this.
_tokenizer._sectionStart-
e:this.startIndex=this.endIndex+1,this.endIndex=this._tokenizer.getAbsoluteIndex()},r.prototype.oncontext=function(e)
{this._updatePosition(1),this.endIndex--
,this._cbs.oncontext&&this._cbs.oncontext(e)},r.prototype.onopentagname=function(e){if(this._lowerCaseTagNames&&(e
=e.toLowerCase()),this._tagname=e,!this._options.xmlMode&&e
in o)for(var
t;(t=this._stack[this._stack.length-1])in o[e];this.onclosetag(t));!this._options.xmlMode&&e in
s||this._stack.push(e),this._cbs.onopentagname&&this._cbs.onopentagname(e),this._cbs.onopentag&&(this._attrs=
{})),r.prototype.onopentagend=function(){this._updatePosition(1),this._attrs&&(this._cbs.onopentag&&this._cbs.
onopentag(this._tagname,this._attrs),this._attrs=null),!this._options.xmlMode&&this._cbs.onclosetag&&this._ta
gname in
s&&this._cbs.onclosetag(this._tagname),this._tagname=""},r.prototype.onclosetag=function(e){if(this._updatePositi
on(1),this._lowerCaseTagNames&&(e=e.toLowerCase()),!this._stack.length||e in
s&&!this._options.xmlMode)this._options.xmlMode||"br"!=e&&"p"!=e||(this.onopentagname(e),this._closeCurre
ntTag());else{var t=this._stack.lastIndexOf(e);if(t!==-1)if(this._cbs.onclosetag)for(t=this._stack.length-t;t--
;)this._cbs.onclosetag(this._stack.pop());else
this._stack.length=t;else"p"!=e||this._options.xmlMode||(this.onopentagname(e),this._closeCurrentTag())}},r.protot
ype.onselfclosingtag=function(){this._options.xmlMode||this._options.recognizeSelfClosing?this._closeCurrentTag(
):this.onopentagend(),r.prototype._closeCurrentTag=function(){var
e=this._tagname;this.onopentagend(),this._stack[this._stack.length-
1]==e&&(this._cbs.onclosetag&&this._cbs.onclosetag(e),this._stack.pop())},r.prototype.onattribname=function(e)
{this._lowerCaseAttributeNames&&(e=e.toLowerCase()),this._attribname=e,r.prototype.onattribdata=function(e){
this._attribvalue+=e},r.prototype.onattribend=function(){this._cbs.onattribute&&this._cbs.onattribute(this._attribna
me,this._attribvalue),this._attrs&&!Object.prototype.hasOwnProperty.call(this._attrs,this._attribname)&&(this._
attrs[this._attribname]=this._attribvalue),this._attribname="",this._attribvalue="",r.prototype._getInstructionNam
e=function(e){var t=e.search(l),n=t<0?e:e.substr(0,t);return
this._lowerCaseTagNames&&(n=n.toLowerCase()),n},r.prototype.ondeclaration=function(e){if(this._cbs.onprocess
inginstruction){var
t=this._getInstructionName(e);this._cbs.onprocessinginstruction("!"+"t","!"+"e)}},r.prototype.onprocessinginstruction=
function(e){if(this._cbs.onprocessinginstruction){var
t=this._getInstructionName(e);this._cbs.onprocessinginstruction("?"+"t","?"+"e)}},r.prototype.oncomment=function(e)
{this._updatePosition(4),this._cbs.oncomment&&this._cbs.oncomment(e),this._cbs.oncommentend&&this._cbs.onc
ommentend(),r.prototype.oncdata=function(e){this._updatePosition(1),this._options.xmlMode||this._options.recogn
izeCDATA?(this._cbs.oncdatastart&&this._cbs.oncdatastart(),this._cbs.oncontext&&this._cbs.oncontext(e),this._cbs.oncda
taend&&this._cbs.oncdataend());this.oncomment("[CDATA["+"e+"]"])}},r.prototype.onerror=function(e){this._cbs.o
nerror&&this._cbs.onerror(e)},r.prototype.onend=function(){if(this._cbs.onclosetag)for(var
e=this._stack.length;e>0;this._cbs.onclosetag(this._stack[--
e]));this._cbs.onend&&this._cbs.onend(),r.prototype.reset=function(){this._cbs.onreset&&this._cbs.onreset(),this._
tokenizer.reset(),this._tagname="",this._attribname="",this._attrs=null,this._stack=[],this._cbs.onparserinit&&this.

```



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_cbs.onparserinit(this)},r.prototype.parseComplete=function(e){this.reset(),this.end(e)},r.prototype.write=function(e)
){this._tokenizer.write(e)},r.prototype.end=function(e){this._tokenizer.end(e)},r.prototype.pause=function(){this._t
okenizer.pause()},r.prototype.resume=function(){this._tokenizer.resume()},r.prototype.parseChunk=r.prototype.writ
e,r.prototype.done=r.prototype.end,t.exports=r},{"/Tokenizer.js":34,events:28,inherits:38}],32:[function(e,t,n){func
tion
r(e){this._cbs=e||{}}t.exports=r;var
i=e("./").EVENTS;Object.keys(i).forEach(function(e){if(0===i[e])e="on"+e,r.prototype[e]=function(){this._cbs[e]
&&this._cbs[e]()};else
if(1===i[e])e="on"+e,r.prototype[e]=function(t){this._cbs[e]&&this._cbs[e](t)};else{if(2!==i[e])throw
Error("wrong number of
arguments");e="on"+e,r.prototype[e]=function(t,n){this._cbs[e]&&this._cbs[e](t,n)}}}),{"/":36}],33:[function(e,t,
n){function
r(e){a.call(this,new i(this),e)}function i(e){this.scope=e}t.exports=r;var
a=e("./WritableStream.js");e("inherits")(r,a),r.prototype.readable=!0;var
o=e("./").EVENTS;Object.keys(o).forEach(function(e){if(0===o[e])i.prototype["on"+e]=function(){this.scope.emit
(e)};else if(1===o[e])i.prototype["on"+e]=function(t){this.scope.emit(e,t)};else{if(2!==o[e])throw Error("wrong
number of
arguments!");i.prototype["on"+e]=function(t,n){this.scope.emit(e,t,n)}}}),{"/":36,"./WritableStream.js":35,inheri
t:38}],34:[function(e,t,n){function r(e){return" "===e||"\n"===e||"\t"===e||"\f"===e||"\r"===e}function i(e,t){return
function(n){n===e&&(this._state=t)}}function a(e,t,n){var r=e.toLowerCase();return
e===r?function(e){e===r?this._state=t:(this._state=n,this._index--
)}:function(i){i===r||i===e?this._state=t:(this._state=n,this._index--)}}function o(e,t){var n=e.toLowerCase();return
function(r){r===n||r===e?this._state=t:(this._state=m,this._index--)}}function
s(e,t){this._state=f,this._buffer="",this._sectionStart=0,this._index=0,this._bufferOffset=0,this._baseState=f,this._sp
ecial=me,this._cbs=t,this._running=!0,this._ended=!1,this._xmlMode=!(e||e.xmlMode),this._decodeEntities=!(e||
e.decodeEntities)}t.exports=s;var
l=e("entities/lib/decode_codepoint.js"),u=e("entities/maps/entities.json"),c=e("entities/maps/legacy.json"),p=e("entit
ies/maps/xml.json"),h=0,f=h++,d=h++,m=h++,g=h++,y=h++,v=h++,b=h++,w=h++,_h=h++,x=h++,A=h++,S=h++,j
=h++,E=h++,O=h++,k=h++,T=h++,C=h++,I=h++,D=h++,L=h++,M=h++,R=h++,U=h++,P=h++,q=h++,B=h++,N=
h++,z=h++,$=h++,F=h++,V=h++,H=h++,Y=h++,J=h++,W=h++,Q=h++,G=h++,K=h++,X=h++,Z=h++,ee=h++,te=
h++,ne=h++,re=h++,ie=h++,ae=h++,oe=h++,se=h++,le=h++,ue=h++,ce=h++,pe=h++,he=h++,fe=h++,de=0,me=de
++,ge=de++,ye=de++;s.prototype._stateText=function(e){"<"===e?(this._index>this._sectionStart&&this._cbs.ontex
t(this._getSection()),this._state=d,this._sectionStart=this._index):this._decodeEntities&&this._special===me&&
"&"===e&&(this._index>this._sectionStart&&this._cbs.ontext(this._getSection()),this._baseState=f,this._state=ue,th
is._sectionStart=this._index)},s.prototype._stateBeforeTagName=function(e){"/"===e?this._state=y:"<"===e?(this.
_cbs.ontext(this._getSection()),this._sectionStart=this._index):">"===e||this._special!==me||r(e)?this._state=f:"!"==
=e?(this._state=O,this._sectionStart=this._index+1):"? "===e?(this._state=T,this._sectionStart=this._index+1):(this._
state=this._xmlMode||"s"!==e&&"S"!==e?m:F,this._sectionStart=this._index)},s.prototype._stateInTagName=funct
ion(e){("/"===e||">"===e||r(e))&&(this._emitToken("onopentagname"),this._state=w,this._index--
)},s.prototype._stateBeforeCloseingTagName=function(e){r(e)||(">"===e?this._state=f:this._special!==me?"s"===e
||"S"===e?this._state=V:(this._state=f,this._index--
)}:(this._state=v,this._sectionStart=this._index)},s.prototype._stateInCloseingTagName=function(e){(">"===e||r(e)
&&(this._emitToken("onclosetag"),this._state=b,this._index--
)},s.prototype._stateAfterCloseingTagName=function(e){">"===e&&(this._state=f,this._sectionStart=this._index+1
)},s.prototype._stateBeforeAttributeName=function(e){">"===e?(this._cbs.onopentagend(),this._state=f,this._sectio
nStart=this._index+1):"/"===e?this._state=g:r(e)||this._state=_this._sectionStart=this._index)},s.prototype._stateIn
SelfClosingTag=function(e){">"===e?(this._cbs.onselfclosingtag(),this._state=f,this._sectionStart=this._index+1):r(
e)||this._state=w,this._index--
}

```

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    ),s.prototype._stateInAttributeName=function(e){("====e||"/"===e||">"===e||r(e))&&(this._cbs.onattribname(this
._getSection()),this._sectionStart=-1,this._state=x,this._index--
    ),s.prototype._stateAfterAttributeName=function(e){"====e?this._state=A:"/"===e||">"===e?(this._cbs.onattribe
nd(),this._state=w,this._index--
    ):r(e)||((this._cbs.onattribend(),this._state=_this._sectionStart=this._index)),s.prototype._stateBeforeAttributeValue=
function(e){""===e?(this._state=S,this._sectionStart=this._index+1):""===e?(this._state=j,this._sectionStart=this._i
ndex+1):r(e)||((this._state=E,this._sectionStart=this._index,this._index--
    )),s.prototype._stateInAttributeValueDoubleQuotes=function(e){""===e?(this._emitToken("onattribdata"),this._cbs.
onattribend(),this._state=w):this._decodeEntities&&"&"===e&&(this._emitToken("onattribdata"),this._baseState=t
his._state,this._state=ue,this._sectionStart=this._index)),s.prototype._stateInAttributeValueSingleQuotes=function(e
){""===e?(this._emitToken("onattribdata"),this._cbs.onattribend(),this._state=w):this._decodeEntities&&"&"===e
&&(this._emitToken("onattribdata"),this._baseState=this._state,this._state=ue,this._sectionStart=this._index)),s.prot
otype._stateInAttributeValueNoQuotes=function(e){r(e)||">"===e?(this._emitToken("onattribdata"),this._cbs.onattri
bend(),this._state=w,this._index--
    ):this._decodeEntities&&"&"===e&&(this._emitToken("onattribdata"),this._baseState=this._state,this._state=ue,thi
s._sectionStart=this._index)),s.prototype._stateBeforeDeclaration=function(e){this._state="["===e?M:"-
"===e?C:k},s.prototype._stateInDeclaration=function(e){">"===e&&(this._cbs.ondeclaration(this._getSection()),th
is._state=f,this._sectionStart=this._index+1)},s.prototype._stateInProcessingInstruction=function(e){">"===e&&(th
is._cbs.onprocessinginstruction(this._getSection()),this._state=f,this._sectionStart=this._index+1)},s.prototype._stat
eBeforeComment=function(e){"-
"===e?(this._state=I,this._sectionStart=this._index+1):this._state=k},s.prototype._stateInComment=function(e){"-
"===e&&(this._state=D)},s.prototype._stateAfterComment1=function(e){"-
"===e?this._state=L:this._state=I},s.prototype._stateAfterComment2=function(e){">"===e?(this._cbs.oncomment(t
his._buffer.substring(this._sectionStart,this._index-2)),this._state=f,this._sectionStart=this._index+1):-
"!===e&&(this._state=I)},s.prototype._stateBeforeCdata1=a("C",R,k),s.prototype._stateBeforeCdata2=a("D",U,k),s.
prototype._stateBeforeCdata3=a("A",P,k),s.prototype._stateBeforeCdata4=a("T",q,k),s.prototype._stateBeforeCdata
5=a("A",B,k),s.prototype._stateBeforeCdata6=function(e){["===e?(this._state=N,this._sectionStart=this._index+1)
:(this._state=k,this._index--
    )),s.prototype._stateInCdata=function(e){"]"===e&&(this._state=z)},s.prototype._stateAfterCdata1=i("]",s),s.protot
ype._stateAfterCdata2=function(e){">"===e?(this._cbs.oncdata(this._buffer.substring(this._sectionStart,this._index-
2)),this._state=f,this._sectionStart=this._index+1):"]"!===e&&(this._state=N)},s.prototype._stateBeforeSpecial=func
tion(e){"c"===e||"C"===e?this._state=H:"t"===e||"T"===e?this._state=te:(this._state=m,this._index--
    )),s.prototype._stateBeforeSpecialEnd=function(e){this._special!==ge||"c"!===e&&"C"!===e?this._special!==ye||"t"!
===e&&"T"!===e?this._state=f:this._state=ae:this._state=G},s.prototype._stateBeforeScript1=o("R",Y),s.prototype._s
tateBeforeScript2=o("I",J),s.prototype._stateBeforeScript3=o("P",W),s.prototype._stateBeforeScript4=o("T",Q),s.pr
ototype._stateBeforeScript5=function(e){("/"===e||">"===e||r(e))&&(this._special=ge),this._state=m,this._index--
    },s.prototype._stateAfterScript1=a("R",K,f),s.prototype._stateAfterScript2=a("I",X,f),s.prototype._stateAfterScript3
=a("P",Z,f),s.prototype._stateAfterScript4=a("T",ee,f),s.prototype._stateAfterScript5=function(e){
">"===e||r(e)?(this._special=me,this._state=v,this._sectionStart=this._index-6,this._index--
    ):this._state=f},s.prototype._stateBeforeStyle1=o("Y",ne),s.prototype._stateBeforeStyle2=o("L",re),s.prototype._stat
eBeforeStyle3=o("E",ie),s.prototype._stateBeforeStyle4=function(e){("/"===e||">"===e||r(e))&&(this._special=ye),
this._state=m,this._index--
    },s.prototype._stateAfterStyle1=a("Y",oe,f),s.prototype._stateAfterStyle2=a("L",se,f),s.prototype._stateAfterStyle3=
a("E",le,f),s.prototype._stateAfterStyle4=function(e){">"===e||r(e)?(this._special=me,this._state=v,this._sectionStar
t=this._index-5,this._index--
    ):this._state=f},s.prototype._stateBeforeEntity=a("#",ce,pe),s.prototype._stateBeforeNumericEntity=a("X",fe,he),s.p
rototype._parseNamedEntityStrict=function(){if(this._sectionStart+1<this._index){var

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e=this._buffer.substring(this._sectionStart+1,this._index),t=this._xmlMode?p:u;t.hasOwnProperty(e)&&(this._emit
Partial(t[e]),this._sectionStart=this._index+1)}},s.prototype._parseLegacyEntity=function(){var
e=this._sectionStart+1,t=this._index-e;for(t>6&&(t=6);t>=2;){var
n=this._buffer.substr(e,t);if(c.hasOwnProperty(n))return this._emitPartial(c[n]),void(this._sectionStart+=t+1);t--
}},s.prototype._stateInNamedEntity=function(e){";"===e?(this._parseNamedEntityStrict(),this._sectionStart+1<this
._index&&this._xmlMode&&this._parseLegacyEntity(),this._state=this._baseState):(e<"a"||e>"z")&&(e<"A"||e>"Z
")&&(e<"0"||e>"9")&&(this._xmlMode||this._sectionStart+1===this._index||(this._baseState!==f?"!="e&&this._
parseNamedEntityStrict():this._parseLegacyEntity(),this._state=this._baseState,this._index--
)),s.prototype._decodeNumericEntity=function(e,t){var n=this._sectionStart+e;if(n!==this._index){var
r=this._buffer.substring(n,this._index),i=parseInt(r,t);this._emitPartial(l(i)),this._sectionStart=this._index}else
this._sectionStart--
};this._state=this._baseState},s.prototype._stateInNumericEntity=function(e){";"===e?(this._decodeNumericEntity(2
,10),this._sectionStart++):(e<"0"||e>"9")&&(this._xmlMode?this._state=this._baseState:this._decodeNumericEntity(
2,10),this._index--
)},s.prototype._stateInHexEntity=function(e){";"===e?(this._decodeNumericEntity(3,16),this._sectionStart++):(e<"
a"||e>"f")&&(e<"A"||e>"F")&&(e<"0"||e>"9")&&(this._xmlMode?this._state=this._baseState:this._decodeNumeric
Entity(3,16),this._index--
)},s.prototype._cleanup=function(){this._sectionStart<0?(this._buffer="",this._index=0,this._bufferOffset+=this._in
dex):this._running&&(this._state===f?(this._sectionStart!==this._index&&this._cbs.oncontext(this._buffer.substr(this
._sectionStart)),this._buffer="",this._bufferOffset+=this._index,this._index=0):this._sectionStart===this._index?(this
._buffer="",this._bufferOffset+=this._index,this._index=0):(this._buffer=this._buffer.substr(this._sectionStart),this._
index-
=this._sectionStart,this._bufferOffset+=this._sectionStart),this._sectionStart=0)},s.prototype.write=function(e){this
._ended&&this._cbs.onerror(Error(".write(
after
done!"))),this._buffer+=e,this._parse()},s.prototype._parse=function(){for(;this._index<this._buffer.length&&this._r
unning;){var
e=this._buffer.charAt(this._index);this._state===f?this._stateText(e):this._state===d?this._stateBeforeTagName(e):t
his._state===m?this._stateInTagName(e):this._state===y?this._stateBeforeClosingTagName(e):this._state===v?th
is._stateInClosingTagName(e):this._state===b?this._stateAfterClosingTagName(e):this._state===g?this._stateInS
elfClosingTag(e):this._state===w?this._stateBeforeAttributeName(e):this._state===_?this._stateInAttributeName(e)
:this._state===x?this._stateAfterAttributeName(e):this._state===A?this._stateBeforeAttributeValue(e):this._state=
=S?this._stateInAttributeValueDoubleQuotes(e):this._state===j?this._stateInAttributeValueSingleQuotes(e):this._st
ate===E?this._stateInAttributeValueNoQuotes(e):this._state===O?this._stateBeforeDeclaration(e):this._state===k?
this._stateInDeclaration(e):this._state===T?this._stateInProcessingInstruction(e):this._state===C?this._stateBefore
Comment(e):this._state===I?this._stateInComment(e):this._state===D?this._stateAfterComment1(e):this._state===
L?this._stateAfterComment2(e):this._state===M?this._stateBeforeCdata1(e):this._state===R?this._stateBeforeCdat
a2(e):this._state===U?this._stateBeforeCdata3(e):this._state===P?this._stateBeforeCdata4(e):this._state===q?this._
stateBeforeCdata5(e):this._state===B?this._stateBeforeCdata6(e):this._state===N?this._stateInCdata(e):this._state=
=z?this._stateAfterCdata1(e):this._state===S?this._stateAfterCdata2(e):this._state===F?this._stateBeforeSpecial(e
):this._state===V?this._stateBeforeSpecialEnd(e):this._state===H?this._stateBeforeScript1(e):this._state===Y?this
._stateBeforeScript2(e):this._state===J?this._stateBeforeScript3(e):this._state===W?this._stateBeforeScript4(e):this
._state===Q?this._stateBeforeScript5(e):this._state===G?this._stateAfterScript1(e):this._state===K?this._stateAfter
Script2(e):this._state===X?this._stateAfterScript3(e):this._state===Z?this._stateAfterScript4(e):this._state===ee?th
is._stateAfterScript5(e):this._state===te?this._stateBeforeStyle1(e):this._state===ne?this._stateBeforeStyle2(e):this
._state===re?this._stateBeforeStyle3(e):this._state===ie?this._stateBeforeStyle4(e):this._state===ae?this._stateAfter
Style1(e):this._state===oe?this._stateAfterStyle2(e):this._state===se?this._stateAfterStyle3(e):this._state===le?this
._stateAfterStyle4(e):this._state===ue?this._stateBeforeEntity(e):this._state===ce?this._stateBeforeNumericEntity(e

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):this._state===pe?this._stateInNamedEntity(e):this._state===he?this._stateInNumericEntity(e):this._state===fe?thi
s._stateInHexEntity(e):this._cbs.onerror(Error("unknown
_state"),this._state),this._index++}this._cleanup(),s.prototype.pause=function(){this._running=!1},s.prototype.resu
me=function(){this._running=!0,this._index<this._buffer.length&&this._parse(),this._ended&&this._finish(),s.prot
otype.end=function(e){this._ended&&this._cbs.onerror(Error(".end()
after
done!"))),e&&this.write(e),this._ended=!0,this._running&&this._finish(),s.prototype._finish=function(){this._sectio
nStart<this._index&&this._handleTrailingData(),this._cbs.onend(),s.prototype._handleTrailingData=function(){var
e=this._buffer.substr(this._sectionStart);this._state===N||this._state===z||this._state===S?this._cbs.oncdata(e):this._
state===I||this._state===D||this._state===L?this._cbs.oncomment(e):this._state!==pe||this._xmlMode?this._state!==
he||this._xmlMode?this._state!==fe||this._xmlMode?this._state!==m&&this._state!==w&&this._state!==A&&this._
state!==x&&this._state!==_&&this._state!==j&&this._state!==S&&this._state!==E&&this._state!==v&&this._cbs.
ontext(e):(this._decodeNumericEntity(3,16),this._sectionStart<this._index&&(this._state=this._baseState,this._hand
leTrailingData())):(this._decodeNumericEntity(2,10),this._sectionStart<this._index&&(this._state=this._baseState,th
is._handleTrailingData())):(this._parseLegacyEntity(),this._sectionStart<this._index&&(this._state=this._baseState,t
his._handleTrailingData()))},s.prototype.reset=function(){s.call(this,{xmlMode:this._xmlMode,decodeEntities:this.
_decodeEntities},this._cbs)},s.prototype.getAbsoluteIndex=function(){return
this._bufferOffset+this._index},s.prototype._getSection=function(){return
this._buffer.substring(this._sectionStart,this._index)},s.prototype._emitToken=function(e){this._cbs[e](this._getSect
ion()),this._sectionStart=
1},s.prototype._emitPartial=function(e){this._baseState!==f?this._cbs.onattribdata(e):this._cbs.ontext(e)},{"entitie
s/lib/decode_codepoint.js":22,"entities/maps/entities.json":25,"entities/maps/legacy.json":26,"entities/maps/xml.json
":27}],35:[function(e,t,n){function r(e,t){var n=this._parser=new i(e,t),r=this._decoder=new
o;a.call(this,{decodeStrings:!1}),this.once("finish",function(){n.end(r.end())})}t.exports=r;var
i=e("./Parser.js"),a=e("stream").Writable||e("readable-
stream").Writable,o=e("string_decoder").StringDecoder,s=e("buffer").Buffer;e("inherits")(r,a),a.prototype._write=fun
ction(e,t,n){e instanceof
s&&(e=this._decoder.write(e)),this._parser.write(e,n)},{"./Parser.js":31,buffer:5,inherits:38,"readable-
stream":3,stream:55,string_decoder:56}],36:[function(e,t,n){function r(e,n){return delete
t.exports[e],t.exports[e]=n,n}var
i=e("./Parser.js"),a=e("domhandler");t.exports={Parser:i,Tokenizer:e("./Tokenizer.js"),ElementType:e("domelement
type"),DomHandler:a.getFeedHandler(){return r("FeedHandler",e("./FeedHandler.js"))},getStream(){return
r("Stream",e("./Stream.js"))},getWritableStream(){return r("WritableStream",e("./WritableStream.js"))},get
ProxyHandler(){return r("ProxyHandler",e("./ProxyHandler.js"))},getDomUtils(){return
r("DomUtils",e("domutils"))},getCollectingHandler(){return
r("CollectingHandler",e("./CollectingHandler.js"))},DefaultHandler:a.get
RssHandler(){return r("RssHandler",this.FeedHandler)},parseDOM:function(e,t){var n=new a(t);return new
i(n,t).end(e),n.dom},parseFeed:function(e,n){var r=new t.exports.FeedHandler(n);return new
i(r,n).end(e),r.dom},createDomStream:function(e,t,n){var r=new a(e,t,n);return new
i(r,t)},EVENTS:{attribute:2,cdatastart:0,cdataend:0,text:1,processinginstruction:2,comment:1,commentend:0,closeta
g:1,opentag:2,opentagname:1,error:1,end:0}},{"./CollectingHandler.js":29,"./FeedHandler.js":30,"./Parser.js":31,"./
ProxyHandler.js":32,"./Stream.js":33,"./Tokenizer.js":34,"./WritableStream.js":35,domelementtype:9,domhandler:10
,domutils:13}],37:[function(e,t,n){n.read=function(e,t,n,r,i){var a,o,s=8*i-r-1,l=(1<<s)-1,u=l>>1,c=-7,p=n?i-
1:0,h=n?-1:1,f=e[t+p];for(p+=h,a=f&(1<<c)-1,f>>=-c,c+=s;c>0;a=256*a+e[t+p],p+=h,c-=8;for(o=a&(1<<c)-
1,a>>=-c,c+=r;c>0;o=256*o+e[t+p],p+=h,c-=8;if(0===a)a=1-u;else if(a===l)return o?NaN:(f?-
1:1)*(1/0);o+=Math.pow(2,r),a-=u)return(f?-1:1)*o*Math.pow(2,a-r)},n.write=function(e,t,n,r,i,a){var
o,s,l,u=8*a-i-1,c=(1<<u)-1,p=c>>1,h=23===i?Math.pow(2,-24)-Math.pow(2,-77):0,f=r?0:a-1,d=r?1:-
1,m=t<0||0===t&&1/t<0?1:0;for(t=Math.abs(t),isNaN(t)||t===1/0?(s=isNaN(t)?1:0,o=c):(o=Math.floor(Math.log(t)/

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Math.LN2),t*(l=Math.pow(2,-o))<1&&(o--,l*=2),t+=o+p>=1?h/l:h*Math.pow(2,1-
p),t*l>=2&&(o++,l/=2),o+p>=c?(s=0,o=c):o+p>=1?(s=(t*l-1)*Math.pow(2,i),o+=p):(s=t*Math.pow(2,p-
1)*Math.pow(2,i),o=0));i>=8;e[n+f]=255&s,f+=d,s/=256,i-
=8);for(o=o<<i|s,u+=i;u>0;e[n+f]=255&o,f+=d,o/=256,u-=8);e[n+f-
d]=128*m}},{}],38:[function(e,t,n){"function"==typeof
Object.create?t.exports=function(e,t){e.super_=t,e.prototype=Object.create(t.prototype,{constructor:{value:e,enume
rable:!1,writable:!0,configurable:!0}}):t.exports=function(e,t){e.super_=t;var
n=function(){n.prototype=t.prototype,e.prototype=new
n,e.prototype.constructor=e}},{}],39:[function(e,t,n){function r(e){return!!e.constructor&&"function"==typeof
e.constructor.isBuffer&&e.constructor.isBuffer(e)}function
i(e){return"function"==typeof e.readFloatLE&&"function"==typeof
e.slice&&r(e.slice(0,0))}t.exports=function(e){return
null!=e&&(r(e)||i(e)||!e._isBuffer)}},{}],40:[function(e,t,n){var
r={}.toString;t.exports=Array.isArray||function(e){return"[object
Array]"==r.call(e)}},{}],41:[function(e,t,n){(function(e){"use strict";function n(t,n,r,i){if("function"!=typeof
t)throw new TypeError("callback" argument must be a function");var a,o,s=arguments.length;switch(s){case 0:case
1:return e.nextTick(t);case 2:return e.nextTick(function(){t.call(null,n)});case 3:return
e.nextTick(function(){t.call(null,n,r)});case 4:return e.nextTick(function(){t.call(null,n,r,i)});default:for(a=new
Array(s-1),o=0;o<a.length;a[o++]=arguments[o];return
e.nextTick(function(){t.apply(null,a)}))!e.version||0===e.version.indexOf("v0.")||0===e.version.indexOf("v1.")&
&0!==e.version.indexOf("v1.8.")?t.exports=n:t.exports=e.nextTick}).call(this,e("_process"))},{}],42:[fu
nction(e,t,n){function r(){throw
new Error("setTimeout has not been defined")}function i(){throw new Error("clearTimeout has not been
defined")}function a(e){if(p===setTimeout)return setTimeout(e,0);if((p===r||!p)&&setTimeout)return
p=setTimeout,setTimeout(e,0);try{return p(e,0)}catch(t){try{return p.call(null,e,0)}catch(t){return
p.call(this,e,0)}}}function o(e){if(h===clearTimeout)return clearTimeout(e);if((h===i||!h)&&clearTimeout)return
h=clearTimeout,clearTimeout(e);try{return h(e)}catch(t){try{return h.call(null,e)}catch(t){return
h.call(this,e)}}}function s(){g&&d&&(g=!1,d.length?m=d.concat(m):y=-1,m.length&&l())}function l(){if(!g){var
e=a(s);g=!0;for(var t=m.length;t){for(d=m,m=[];++y<t;)d&&d[y].run();y=-
1,t=m.length}d=null,g=!1,o(e)}}function u(e,t){this.fun=e,this.array=t}function c(){var
p,h,f=t.exports={};!function(){try{p="function"==typeof
setTimeout?setTimeout:r}catch(e){p=r}try{h="function"==typeof
clearTimeout?clearTimeout:i}catch(e){h=i}}();var d,m=[],g=!1,y=-1,f.nextTick=function(e){var t=new
Array(arguments.length-1);if(arguments.length>1)for(var n=1;n<arguments.length;n++)t[n-
1]=arguments[n];m.push(new
u(e,t)),!1===m.length||g||a(l)},u.prototype.run=function(){this.fun.apply(null,this.array)},f.title="browser",f.browser=
!0,f.env={},f.argv=[],f.version="",f.versions={},f.on=c,f.addListener=c,f.once=c,f.off=c,f.removeListener=c,f.remo
veAllListeners=c,f.emit=c,f.binding=function(e){throw new Error("process.binding is not
supported")},f.cwd=function(){return"/"},f.chdir=function(e){throw new Error("process.chdir is not
supported")},f.umask=function(){return
0}},{}],43:[function(e,t,n){t.exports=e("./lib/_stream_duplex.js")},{}],44:[function(e,t,n)
){"use strict";function r(e){return this instanceof
r?(u.call(this,e),c.call(this,e),e&&e.readable===!1&&(this.readable=!1),e&&e.writable===!1&&(this.writable=!1),t
his.allowHalfOpen=!0,e&&e.allowHalfOpen===!1&&(this.allowHalfOpen=!1),void this.once("end",i)):new
r(e)}function i(){this.allowHalfOpen||this._writableState.ended||s(a,this)}function
a(e){e.end()}var o=Object.keys||function(e){var t=[];for(var n in e)t.push(n);return t};t.exports=r;var s=e("process-
nexttick-args"),l=e("core-util-is");l.inherits=e("inherits");var
u=e("./_stream_readable"),c=e("./_stream_writable");l.inherits(r,u);for(var

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p=o(c.prototype),h=0;h<p.length;h++){var
f=p[h];r.prototype[f]||(r.prototype[f]=c.prototype[f])},{"/_stream_readable":46,"/_stream_writable":48,"core-util-
is":6,inherits:38,"process-nexttick-args":41}},45:[function(e,t,n){"use strict";function r(e){return this instanceof
r?void i.call(this,e):new r(e)}t.exports=r;var i=e("/_stream_transform"),a=e("core-util-
is");a.inherits=e("inherits"),a.inherits(r,i),r.prototype._transform=function(e,t,n){n(null,e)},{"/_stream_transform":
47,"core-util-is":6,inherits:38}},46:[function(e,t,n){(function(n){"use strict";function
r(e,t,n){return"function"===typeof
e.prependListener?e.prependListener(t,n):void(e._events&&e._events[t]?C(e._events[t])?e._events[t].unshift(n):e._e
vents[t]=[n,e._events[t]]:e.on(t,n))}function
i(t,n){N=N||e("/_stream_duplex"),t=t||{}},this.objectMode=!!t.objectMode,n instanceof
N&&(this.objectMode=this.objectMode||!!t.readableObjectMode);var
r=t.highWaterMark,i=this.objectMode?16:16384;this.highWaterMark=r||0===r?r:i,this.highWaterMark=~this.high
WaterMark,this.buffer=new
B,this.length=0,this.pipes=null,this.pipesCount=0,this.flowing=null,this.ended=!1,this.endEmitted=!1,this.reading=!
1,this.sync=!0,this.needReadable=!1,this.emittedReadable=!1,this.readableListening=!1,this.resumeScheduled=!1,th
is.defaultEncoding=t.defaultEncoding||"utf8",this.ranOut=!1,this.awaitDrain=0,this.readingMore=!1,this.decoder=n
ull,this.encoding=null,t.encoding&&(q=(q=e("string_decoder/")).StringDecoder),this.decoder=new
q(t.encoding),this.encoding=t.encoding)}function a(t){return N=N||e("/_stream_duplex"),this instanceof
a?(this._readableState=new i(t,this),this.readable=!0,t&&"function"===typeof t.read&&(this._read=t.read),void
I.call(this));new
a(t)}function o(e,t,n,r,i){var a=c(t,n);if(a)e.emit("error",a);else if(null===n)t.reading=!1,p(e,t);else
if(t.objectMode||n&&n.length>0)if(t.ended&&!i){var o=new Error("stream.push() after
EOF");e.emit("error",o)}else if(t.endEmitted&&i){var l=new Error("stream.unshift() after end
event");e.emit("error",l)}else{var
u;!t.decoder||i||r||(n=t.decoder.write(n),u=!t.objectMode&&0===n.length),i||(t.reading=!1),u||(t.flowing&&0===t.len
gth&&!t.sync?(e.emit("data",n),e.read(0)):(t.length+=t.objectMode?1:n.length,i?t.buffer.unshift(n):t.buffer.push(n),t
.needReadable&&h(e))),d(e,t)}else i||(t.reading=!1);return s(t)}function
s(e){return!e.ended&&(e.needReadable||e.length<e.highWaterMark||0===e.length)}function l(e){return
e>=z?e=z:(e--,e|=e>>>1,e|=e>>>2,e|=e>>>4,e|=e>>>8,e|=e>>>16,e++),e}function u(e,t){return
e<=0||0===t.length&&t.ended?0:t.objectMode?1:e!==e?t.flowing&&t.length?t.buffer.head.data.length:t.length:(e>t.
highWaterMark&&(t.highWaterMark=l(e)),e<=t.length?e:t.ended?t.length:(t.needReadable=!0,0))}function
c(e,t){var n=null;return L.isBuffer(t)||"string"===typeof t||null===t||void 0===t||e.objectMode||(n=new
TypeError("Invalid non-string/buffer chunk")),n}function p(e,t){if(!t.ended){if(t.decoder){var
n=t.decoder.end();n&&n.length&&(t.buffer.push(n),t.length+=t.objectMode?1:n.length)}t.ended=!0,h(e)}function
h(e){var
t=e._readableState;t.needReadable=!1,t.emittedReadable||(P("emitReadable",t.flowing),t.emittedReadable=!0,t.sync
?T(f,e):f(e))}function f(e){P("emit readable"),e.emit("readable"),w(e)}function
d(e,t){t.readingMore||(t.readingMore=!0,T(m,e,t))}function m(e,t){for(var
n=t.length;!t.reading&&t.flowing&&!t.ended&&t.length<t.highWaterMark&&(P("maybeReadMore read
0"),e.read(0),n!==t.length);n=t.length;t.readingMore=!1)}function g(e){return function(){var
t=e._readableState;P("pipeOnDrain",t.awaitDrain),t.awaitDrain&&t.awaitDrain--
,0===t.awaitDrain&&D(e,"data")&&(t.flowing=!0,w(e))}}function y(e){P("readable nexttick read
0"),e.read(0)}function v(e,t){t.resumeScheduled||(t.resumeScheduled=!0,T(b,e,t))}function
b(e,t){t.reading||(P("resume read
0"),e.read(0)),t.resumeScheduled=!1,t.awaitDrain=0,e.emit("resume"),w(e),t.flowing&&!t.reading&&e.read(0)}func
tion w(e){var t=e._readableState;for(P("flow",t.flowing);t.flowing&&null!==e.read(););}function
_(e,t){if(0===t.length)return null;var n;return
t.objectMode?n=t.buffer.shift():!e||e>=t.length?(n=t.decoder?t.buffer.join(""):1===t.buffer.length?t.buffer.head.data:

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t.buffer.concat(t.length),t.buffer.clear():n=x(e,t.buffer,t.decoder),n}function x(e,t,n){var r;return
e<t.head.data.length?(r=t.head.data.slice(0,e),t.head.data=t.head.data.slice(e)):r=e===t.head.data.length?t.shift():n?A
(e,t):S(e,t),r}function A(e,t){var n=t.head,r=1,i=n.data;for(e=i.length;n=n.next;){var
a=n.data,o=e>a.length?a.length:e;if(i+=o===a.length?a.slice(0,e),e-
=o,0===e){o===a.length?(++r,n.next?t.head=n.next:t.head=t.tail=null):(t.head=n,n.data=a.slice(o));break}++r}retur
n t.length-=r,i}function S(e,t){var n=M.allocUnsafe(e),r=t.head,i=1;for(r.data.copy(n),e-
=r.data.length;r=r.next;){var
a=r.data,o=e>a.length?a.length:e;if(a.copy(n,n.length-e,0,o),e-
=o,0===e){o===a.length?(++i,r.next?t.head=r.next:t.head=t.tail=null):(t.head=r,r.data=a.slice(o));break}++i}return
t.length-=i,n}function j(e){var t=e._readableState;if(t.length>0)throw new Error("'endReadable()' called on non-
empty stream");t.endEmitted||(t.ended=!0,T(E,t,e))}function
E(e,t){e.endEmitted||0!==e.length||(e.endEmitted=!0,t.readable=!1,t.emit("end"))}function O(e,t){for(var
n=0,r=e.length;n<r;n++)t(e[n],n)}function k(e,t){for(var n=0,r=e.length;n<r;n++)if(e[n]===t)return n;return-
1}t.exports=a;var T=e("process-nexttick-args"),C=e("isArray");a.ReadableState=i;var
I,D=(e("events").EventEmitter,function(e,t){return
e.listeners(t).length});!function(){try{I=e("stream")}catch(t){}finally{I||(I=e("events").EventEmitter)}()}();var
L=e("buffer").Buffer,M=e("buffer-shims"),R=e("core-util-is");R.inherits=e("inherits");var U=e("util"),P=void
0;P=U&&U.debuglog?U.debuglog("stream"):function(){};var
q,B=e("./internal/streams/BufferList");R.inherits(a,I);var N,N;a.prototype.push=function(e,t){var
n=this._readableState;return n.objectMode?"string"!==typeof
e||(t=t||n.defaultEncoding,t!==n.encoding&&(e=M.from(e,t,t===t)),o(this,n,e,t,!1)),a.prototype.unshift=function(e){
var t=this._readableState;return o(this,t,e,"",!0)},a.prototype.isPaused=function(){return
this._readableState.flowing===!1},a.prototype.setEncoding=function(t){return
q||(q=e("string_decoder").StringDecoder),this._readableState.decoder=new
q(t),this._readableState.encoding=t,this};var
z=8388608;a.prototype.read=function(e){P("read",e),e=parseInt(e,10);var
t=this._readableState,n=e;if(0!==e&&(t.emittedReadable=!1),0===e&&t.needReadable&&(t.length>=t.highWater
Mark||t.ended))return P("read:
emitReadable",t.length,t.ended),0===t.length&&t.ended?j(this):h(this),null;if(e=u(e,t),0===e&&t.ended)return
0===t.length&&j(this),null;var r=t.needReadable;P("need readable",r),(0===t.length||t.length-
e<t.highWaterMark)&&(r=!0,P("length
less than watermark",r)),t.ended||t.reading?(r=!1,P("reading or ended",r)):r&&(P("do
read"),t.reading=!0,t.sync=!0,0===t.length&&(t.needReadable=!0),this._read(t.highWaterMark),t.sync=!1,t.reading|
|(e=u(n,t)));var i;return i=e>0?_(e,t):null,null===i?(t.needReadable=!0,e=0):t.length-
=e,0===t.length&&(t.ended||(t.needReadable=!0),n!==e&&t.ended&&j(this)),null!==i&&this.emit("data",i,i),a.pr
ototype._read=function(e){this.emit("error",new Error("not
implemented"))},a.prototype.pipe=function(e,t){function i(e){P("onunpipe"),e===h&&o()}function
a(){P("onend"),e.end()}function
o(){P("cleanup"),e.removeListener("close",u),e.removeListener("finish",c),e.removeListener("drain",y),e.removeLis
tener("error",l),e.removeListener("unpipe",i),h.removeListener("end",a),h.removeListener("end",o),h.removeListene
r("data",s),v=!0,!f.awaitDrain||e._writableState&&!e._writableState.needDrain||y)}function
s(t){P("ondata"),b=!1;var
n=e.write(t);!1!==n||b||((1===f.pipesCount&&f.pipes===e||f.pipesCount>1&&k(f.pipes,e)!==-1)&&!v&&(P("false
write response, pause",h._readableState.awaitDrain),h._readableState.awaitDrain++,b=!0),h.pause()))}function
l(t){P("onerror",t),p(),e.removeListener("error",l),0===D(e,"error")&&e.emit("error",t)}function
u(){e.removeListener("finish",c),p()}function c(){P("onfinish"),e.removeListener("close",u),p()}function
p(){P("unpipe"),h.unpipe(e)}var h=this,f=this._readableState;switch(f.pipesCount){case 0:f.pipes=e;break;case
1:f.pipes=[f.pipes,e];break;default:f.pipes.push(e)}f.pipesCount+=1,P("pipe count=%d opts=%j",f.pipesCount,t);var

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d=(!t||t.end!==1)&&e!==n.stdout&&e!==n.stderr,m=d?a:o;f.endEmitted?T(m):h.once("end",m),e.on("unpipe",i);va
r y=g(h);e.on("drain",y);var v=!1,b=!1;return
h.on("data",s),r(e,"error",l),e.once("close",u),e.once("finish",c),e.emit("pipe",h),f.flowing||(P("pipe
resume"),h.resume()),e},a.prototype.unpipe=function(e){var t=this._readableState;if(0===t.pipesCount)return
this;if(1===t.pipesCount)return
e&&e!==t.pipes?this:(e||(e=t.pipes),t.pipes=null,t.pipesCount=0,t.flowing=!1,e&&e.emit("unpipe",this),this);if(!e){
var n=t.pipes,r=t.pipesCount;t.pipes=null,t.pipesCount=0,t.flowing=!1;for(var
i=0;i<r;i++)n[i].emit("unpipe",this);return this}var a=k(t.pipes,e);return a===-
1?this:(t.pipes.splice(a,1),t.pipesCount-
=1,1===t.pipesCount&&(t.pipes=t.pipes[0]),e.emit("unpipe",this),this)},a.prototype.on=function(e,t){var
n=I.prototype.on.call(this,e,t);if("data"===e)this._readableState.flowing!==1&&this.resume();else
if("readable"===e){var
r=this._readableState;r.endEmitted||r.readableListening||(r.readableListening=r.needReadable=!0,r.emittedReadable
=!1,r.reading?r.length&&h(this,r):T(y,this))}return
n},a.prototype.addListener=a.prototype.on,a.prototype.resume=function(){var e=this._readableState;return
e.flowing||(P("resume"),e.flowing=!0,v(this,e)),this},a.prototype.pause=function(){return P("call pause
flowing=%j",this._readableState.flowing),!1===this._readableState.flowing&&(P("pause"),this._readableState.flowi
ng=!1,this.emit("pause")),this},a.prototype.wrap=function(e){var
t=this._readableState,n=!1,r=this;e.on("end",function(){if(P("wrapped end"),t.decoder&&!t.ended){var
e=t.decoder.end();e&&e.length&&r.push(e)}r.push(null)}),e.on("data",function(i){if(P("wrapped
data"),t.decoder&&(i=t.decoder.write(i)),(!t.objectMode||null!==i&&void
0!==i)&&(t.objectMode||i&&i.length)){var a=r.push(i);a||(n=!0,e.pause())}});for(var i in e)void
0===this[i]&&"function"===typeof e[i]&&(this[i]=function(t){return function(){return
e[t].apply(e,arguments)}}(i));var a=["error","close","destroy","pause","resume"];return
O(a,function(t){e.on(t,r.emit.bind(r,t))}),r._read=function(t){P("wrapped
_read",t),n&&(n=!1,e.resume()),r},a._fromList=_).call(this,e("_process")),{"./_stream_duplex":44,"./internal/str
eams/BufferList":49,_process:42,buffer:5,"buffer-shims":4,"core-util-is":6,events:28,inherits:38,isarray:40,"process-
nexttick-args":41,"string_decoder/":56,util:3},47:[function(e,t,n){"use
strict";function r(e){this.afterTransform=function(t,n){return
i(e,t,n)},this.needTransform=!1,this.transforming=!1,this.writecb=null,this.writechunk=null,this.writeencoding=null
}function i(e,t,n){var r=e._transformState;r.transforming=!1;var i=r.writecb;if(!i)return e.emit("error",new Error("no
writecb in Transform class"));r.writechunk=null,r.writecb=null,null!==n&&void 0!==n&&e.push(n),i(t);var
a=e._readableState;a.reading=!1,(a.needReadable||a.length<a.highWaterMark)&&e._read(a.highWaterMark)}functi
on a(e){if(!(this instanceof a))return new a(e);s.call(this,e),this._transformState=new r(this);var
t=this;this._readableState.needReadable=!0,this._readableState.sync=!1,e&&("function"===typeof
e.transform&&(this._transform=e.transform),"function"===typeof
e.flush&&(this._flush=e.flush)),this.once("prefinish",function(){ "function"===typeof
this._flush?this._flush(function(e){o(t,e)}):o(t)}))function o(e,t){if(t)return e.emit("error",t);var
n=e._writableState,r=e._transformState;if(n.length)throw
new Error("Calling transform done when ws.length != 0");if(r.transforming)throw new Error("Calling transform
done when still transforming");return e.push(null)}t.exports=a;var s=e("./_stream_duplex"),l=e("core-util-
is");l.inherits=e("inherits"),l.inherits(a,s),a.prototype.push=function(e,t){return
this._transformState.needTransform=!1,s.prototype.push.call(this,e,t)},a.prototype._transform=function(e,t,n){throw
new Error("Not implemented")},a.prototype._write=function(e,t,n){var
r=this._transformState;if(r.writecb=n,r.writechunk=e,r.writeencoding=t,!r.transforming){var
i=this._readableState;(r.needTransform||i.needReadable||i.length<i.highWaterMark)&&this._read(i.highWaterMark)
}},a.prototype._read=function(e){var
t=this._transformState;null!==t.writechunk&&t.writecb&&!t.transforming?(t.transforming=!0,this._transform(t.writ

```



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echunk,t.writeencoding,t.afterTransform)):t.needTransform=!0}},{"./_stream_duplex":44,"core-util-
is":6,inherits:38}],48:[function(e,t,n){(function(n){"use
strict";function r(){function i(e,t,n){this.chunk=e,this.encoding=t,this.callback=n,this.next=null}function
a(t,n){C=C||e("./_stream_duplex"),t=t||{}},this.objectMode=!t.objectMode,n instanceof
C&&(this.objectMode=this.objectMode||!t.writableObjectMode);var
r=t.highWaterMark,i=this.objectMode?16:16384;this.highWaterMark=r||0===r?r:i,this.highWaterMark=~this.high
WaterMark,this.needDrain=!1,this.ending=!1,this.ended=!1,this.finished=!1;var
a=t.decodeStrings===!1;this.decodeStrings=!a,this.defaultEncoding=t.defaultEncoding||"utf8",this.length=0,this.wri
ting=!1,this.corked=0,this.sync=!0,this.bufferProcessing=!1,this.onwrite=function(e){d(n,e)},this.writecb=null,this.
writelen=0,this.bufferedRequest=null,this.lastBufferedRequest=null,this.pendingcb=0,this.prefinished=!1,this.errorE
mitted=!1,this.bufferedRequestCount=0,this.corkedRequestsFree=new x(this)}function o(t){return
C=C||e("./_stream_duplex"),this instanceof o||this instanceof C?(this._writableState=new
a(t,this),this.writable=!0,t&&("function"===typeof
t.write&&(this._write=t.write),"function"===typeof t.writev&&(this._writev=t.writev)),void E.call(this)):new
o(t)}function s(e,t){var n=new Error("write after end");e.emit("error",n),A(t,n)}function l(e,t,n,r){var
i=!0,a=!1;return null===n?a=new TypeError("May not write null values to stream"):k.isBuffer(n)||"string"===typeof
n||void 0===n||t.objectMode||(a=new TypeError("Invalid non-string/buffer
chunk")),a&&(e.emit("error",a),A(r,a),i=!1),i}function u(e,t,n){return
e.objectMode||e.decodeStrings===!1||"string"!==typeof t||(t=T.from(t,n)),t}function
c(e,t,n,r,a){n=u(t,n,r),k.isBuffer(n)&&(r="buffer");var o=t.objectMode?1:n.length;t.length+=o;var
s=t.length<t.highWaterMark;if(s||(t.needDrain=!0),t.writing||t.corked){var
l=t.lastBufferedRequest;t.lastBufferedRequest=new
i(n,r,a),l?l.next=t.lastBufferedRequest:t.bufferedRequest=t.lastBufferedRequest,t.bufferedRequestCount+=1}else
p(e,t,!1,o,n,r,a);return s}function
p(e,t,n,r,i,a,o){t.writelen=r,t.writecb=o,t.writing=!0,t.sync=!0,n?e._writev(i,t.onwrite):e._write(i,a,t.onwrite),t.sync=!
1}function
h(e,t,n,r,i){--t.pendingcb,n?A(i,r):i(r),e._writableState.errorEmitted=!0,e.emit("error",r)}function
f(e){e.writing=!1,e.writecb=null,e.length-=e.writelen,e.writelen=0}function d(e,t){var
n=e._writableState,r=n.sync,i=n.writecb;if(f(n),t)h(e,n,r,t,i);else{var
a=v(n);a||n.corked||n.bufferProcessing||n.bufferedRequest||y(e,n),r?S(m,e,n,a,i):m(e,n,a,i)}}function
m(e,t,n,r){n||g(e,t),t.pendingcb--,r(),w(e,t)}function
g(e,t){0===t.length&&t.needDrain&&(t.needDrain=!1,e.emit("drain"))}function y(e,t){t.bufferProcessing=!0;var
n=t.bufferedRequest;if(e._writev&&n&&n.next){var r=t.bufferedRequestCount,i=new
Array(r),a=t.corkedRequestsFree;a.entry=n;for(var
o=0;n;i[o]=n,n=n.next,o+=1;p(e,t,!0,t.length,i,"",a.finish),t.pendingcb++,t.lastBufferedRequest=null,a.next?(t.corked
RequestsFree=a.next,a.next=null):t.corkedRequestsFree=new x(t))}else{for(;n;){var
s=n.chunk,l=n.encoding,u=n.callback,c=t.objectMode?1:s.length;if(p(e,t,!1,c,s,l,u),n=n.next,t.writing)break}null===
n&&(t.lastBufferedRequest=null)}t.bufferedRequestCount=0,t.bufferedRequest=n,t.bufferProcessing=!1}function
v(e){return e.ending&&0===e.length&&null===e.bufferedRequest&&!e.finished&&!e.writing}function
b(e,t){t.prefinished||(t.prefinished=!0,e.emit("prefinish"))}function w(e,t){var n=v(t);return
n&&(0===t.pendingcb?(b(e,t),t.finished=!0,e.emit("finish")):b(e,t)),n}function
_(e,t,n){t.ending=!0,w(e,t),n&&(t.finished?A(n):e.once("finish",n)),t.ended=!0,e.writable=!1}function x(e){var
t=this;this.next=null,this.entry=null,this.finish=function(n){var r=t.entry;for(t.entry=null;r;){var
i=r.callback;e.pendingcb--,i(n),r=r.next}e.corkedRequestsFree?e.corkedRequestsFree.next=t:e.corkedRequestsFree=t}}t.exports=o;var
A=e("process-nexttick-args"),S=!n.browser&&["v0.10","v0.9."].indexOf(n.version.slice(0,5))>-
1?setImmediate:A;o.WritableState=a;var j=e("core-util-is");j.inherits=e("inherits");var E,O={deprecate:e("util-
deprecate")};!function(){try{E=e("stream")}catch(t){}finally{E||(E=e("events")).EventEmitter}}();var

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k=e("buffer").Buffer,T=e("buffer-shims");j.inherits(o,E);var C;a.prototype.getBuffer=function(){for(var
e=this.bufferedRequest,t=[];e;)t.push(e),e=e.next;return
t},function(){try{Object.defineProperty(a.prototype,"buffer",{get:O.deprecate(function(){return
this.getBuffer()}),"_writableState.buffer is deprecated. Use _writableState.getBuffer instead."))}catch(e){}});var
C;o.prototype.pipe=function(){this.emit("error",new Error("Cannot pipe, not
readable"))},o.prototype.write=function(e,t,n){var i=this._writableState,a=!1;return"function"===typeof
t&&(n=t,t=null),k.isBuffer(e)?t="buffer":t||(t=i.defaultEncoding),"function"!==typeof
n&&(n=r),i.ended?s(this,n):l(this,i,e,n)&&(i.pendingcb++,a=c(this,i,e,t,n)),a},o.prototype.cork=function(){var
e=this._writableState;e.corked++,o.prototype.uncork=function(){var e=this._writableState;e.corked&&(e.corked--,
e.writing||e.corked||e.finished||e.bufferProcessing||!e.bufferedRequest||y(this,e))},o.prototype.setDefaultEncoding=f
unction(e){if("string"===typeof
e&&(e=e.toLowerCase()),!([ "hex","utf8","utf-8","ascii","binary","base64","ucs2","ucs-2","utf16le","utf-
16le","raw"].indexOf((e+"").toLowerCase())>-1))throw new TypeError("Unknown encoding: "+e);
return this._writableState.defaultEncoding=e,this},o.prototype._write=function(e,t,n){n(new Error("not
implemented"))},o.prototype._writev=null,o.prototype.end=function(e,t,n){var
r=this._writableState;"function"===typeof e?(n=e,e=null,t=null):"function"===typeof
t&&(n=t,t=null),null!==e&&void
0!===e&&this.write(e,t),r.corked&&(r.corked=1,this.uncork()),r.ending||r.finished||_(this,r,n)}).call(this,e("_process
")),{"./_stream_duplex":44,_process:42,buffer:5,"buffer-shims":4,"core-util-is":6,events:28,inherits:38,"process-
nexttick-args":41,"util-deprecate":57}],49:[function(e,t,n){"use strict";function
r(){this.head=null,this.tail=null,this.length=0}var i=(e("buffer").Buffer,e("buffer-
shims"));t.exports=r,r.prototype.push=function(e){var
t={data:e,next:null};this.length>0?this.tail.next=t:this.head=t,this.tail=t,++this.length},r.prototype.unshift=function(
e){var
t={data:e,next:this.head};0===this.length&&(this.tail=t),this.head=t,++this.length},r.prototype.shift=function(){if(0
!==this.length){var e=this.head.data;return 1===this.length?this.head=this.tail=null:this.head=this.head.next,--
this.length,e}},r.prototype.clear=function(){this.head=this.tail=null,this.length=0},r.prototype.join=function(e){if(0
===this.length)return"";for(var t=this.head,n=""+"t.data;t=t.next;n+=e+t.data;return
n},r.prototype.concat=function(e){if(0===this.length)return i.alloc(0);if(1===this.length)return
this.head.data;for(var t=i.allocUnsafe(e>>>0),n=this.head,r=0;n;n.data.copy(t,r),r+=n.data.length,n=n.next;return
t)},{"buffer:5,"buffer-
shims":4}],50:[function(e,t,n){t.exports=e("./lib/_stream_passthrough.js")},{"./lib/_stream_passthrough.js":45}],51:
[function(e,t,n){(function(r){var i=function(){try{return
e("stream")}catch(t){}}();n=t.exports=e("./lib/_stream_readable.js"),n.Stream=i||n,n.Readable=n,n.Writable=e("./lib
/_stream_writable.js"),n.Duplex=e("./lib/_stream_duplex.js"),n.Transform=e("./lib/_stream_transform.js"),n.PassThr
ough=e("./lib/_stream_passthrough.js"),!r.browser&&"disable"===r.env.READABLE_STREAM&&i&&(t.exports
=i)).call(this,e("_process"))},{"./lib/_stream_duplex.js":44,"./lib/_stream_passthrough.js":45,"./lib/_stream_readabl
e.js":46,"./lib/_stream_transform.js":47,"./lib/_stream_writable.js":48,_process:42}],52:[function(e,t,n){t.exports=e(
"./lib/_stream_transform.js")},{"./lib/_stream_transform.js":47}],53:[function(e,t,n){t.exports=e("./lib/_stream_writa
ble.js")},{"./lib/_stream_writable.js":48}],54:[function(e,t,n){t.exports=function(e){return e.replace(/[-
\\^$*+?.()|[\]{}]/g,"\\$&")}},{}],55:[function(e,t,n){function r(){i.call(this)}t.exports=r;var
i=e("events").EventEmitter,a=e("inherits");a(r,i),r.Readable=e("readable-
stream/readable.js"),r.Writable=e("readable-stream/writable.js"),r.Duplex=e("readable-
stream/duplex.js"),r.Transform=e("readable-stream/transform.js"),r.PassThrough=e("readable-
stream/passthrough.js"),r.Stream=r,r.prototype.pipe=function(e,t){function
n(t){e.writable&&!1===e.write(t)&&u.pause&&u.pause()}function
r(){u.readable&&u.resume&&u.resume()}function a(){c||(c=!0,e.end())}function o(){c||(c=!0,"function"===typeof
e.destroy&&e.destroy())}function s(e){if(!l,0===i.listenerCount(this,"error"))throw e}function

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l(){u.removeListener("data",n),e.removeListener("drain",r),u.removeListener("end",a),u.removeListener("close",o),
u.removeListener("error",s),e.removeListener("error",s),u.removeListener("end",l),u.removeListener("close",l),e.re
moveListener("close",l)}var
u=this;u.on("data",n),e.on("drain",r),e._isStdio||t&&t.end===1||((u.on("end",a),u.on("close",o));var c=!1;return
u.on("error",s),e.on("error",s),u.on("end",l),u.on("close",l),e.on("close",l),e.emit("pipe",u),e)}, {events:28,inherits:38
,"readable-stream/duplex.js":43,"readable-stream/passthrough.js":50,"readable-stream/readable.js":51,"readable-
stream/transform.js":52,"readable-stream/writable.js":53}],56:[function(e,t,n){function
r(e){if(e&&!l(e))throw new Error("Unknown encoding: "+e)}function i(e){return
e.toString(this.encoding)}function
a(e){this.charReceived=e.length%2,this.charLength=this.charReceived?2:0}function
o(e){this.charReceived=e.length%3,this.charLength=this.charReceived?3:0}var
s=e("buffer").Buffer,l=s.isEncoding||function(e){switch(e&&e.toLowerCase()){case"hex":case"utf8":case"utf-
8":case"ascii":case"binary":case"base64":case"ucs2":case"ucs-2":case"utf16le":case"utf-
16le":case"raw":return!0;default:return!1}},u=n.StringDecoder=function(e){switch(this.encoding=(e||"utf8").toLow
erCase().replace(/[-
_]/,""),r(e),this.encoding){case"utf8":this.surrogateSize=3;break;case"ucs2":case"utf16le":this.surrogateSize=2,this.
detectIncompleteChar=a;break;case"base64":this.surrogateSize=3,this.detectIncompleteChar=o;break;default:return
void(this.write=i)}this.charBuffer=new
s(6),this.charReceived=0,this.charLength=0};u.prototype.write=function(e){for(var t="";this.charLength;){var
n=e.length>=this.charLength-this.charReceived?this.charLength-
this.charReceived:e.length;if(e.copy(this.charBuffer,this.charReceived,0,n),this.charReceived+=n,this.charReceived
<this.charLength)return"";e=e.slice(n,e.length),t=this.charBuffer.slice(0,this.charLength).toString(this.encoding);var
r=t.charCodeAtAt(t.length-
1);if(!(r>=55296&&r<=56319)){if(this.charReceived=this.charLength=0,0===e.length)return
t;break}this.charLength+=this.surrogateSize,t=""}}this.detectIncompleteChar(e);var
i=e.length;this.charLength&&(e.copy(this.charBuffer,0,e.length-this.charReceived,i),i-
=this.charReceived),t+=e.toString(this.encoding,0,i);var i=t.length-
1,r=t.charCodeAtAt(i);if(r>=55296&&r<=56319){var a=this.surrogateSize;return
this.charLength+=a,this.charReceived+=a,this.charBuffer.copy(this.charBuffer,a,0,a),e.copy(this.charBuffer,0,0,a),t.
substring(0,i)}return
t},u.prototype.detectIncompleteChar=function(e){for(var t=e.length>=3?3:e.length;t>0;t--){var n=e[e.length-
t];if(1==t&&n>>5==6){this.charLength=2;break}if(t<=2&&n>>4==14){this.charLength=3;break}if(t<=3&&n>>3
==30){this.charLength=4;break}}this.charReceived=t},u.prototype.end=function(e){var
t="";if(e&&e.length&&(t=this.write(e)),this.charReceived){var
n=this.charReceived,r=this.charBuffer,i=this.encoding;t+=r.slice(0,n).toString(i)}return
t},{buffer:5}],57:[function(e,t,n){(function(e){function n(e,t){function n(o){if(!i){if(r("throwDeprecation"))throw
new Error(t);r("traceDeprecation"?console.trace(t):console.warn(t),i=!0)}return
e.apply(this,arguments)}if(r("noDeprecation"))return e;var i=!1;return n}function
r(t){try{if(!e.localStorage)return!1}catch(n){return!1}var r=e.localStorage[t];return
null!=r&&"true"===String(r).toLowerCase()}t.exports=n}).call(this,"undefined"!=typeof
global?global:"undefined"!=typeof self?self:"undefined"!=typeof
window?window:{})},{}],58:[function(e,t,n){function
r(){for(var e={},t=0;t<arguments.length;t++){var n=arguments[t];for(var r in n)i.call(n,r)&&(e[r]=n[r])}return
e}t.exports=r;var i=Object.prototype.hasOwnProperty,{}},{},[1])(1)),function(e){if("object"===typeof
exports&&"undefined"!=typeof module)module.exports=e;else if("function"===typeof
define&&define.amd)define([],e);else{var t;t="undefined"!=typeof window?window:"undefined"!=typeof
global?global:"undefined"!=typeof self?self:this,t.SwaggerClient=e()}}(function(){var t;return function
n(e,t,r){function i(o,s){if(!t[o]){if(!e[o]){var l="function"===typeof require&&require;if(!s&&l)return

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l(o,!0);if(a)return a(o,!0);var u=new Error("Cannot find module '"+o+"'");throw
u.code="MODULE_NOT_FOUND",u}var c=t[o]={exports:{}};e[o][0].call(c.exports,function(t){var
n=e[o][1][t];return i(n?t:n:t)},c,c.exports,n,e,t,r)}return t[o].exports}for(var a="function"===typeof
require&&require,o=0;o<r.length;o++)i(r[o]);return i}({1:[function(e,t,n){"use strict";var
r=e("./lib/auth"),i=e("./lib/helpers"),a=e("./lib/client"),o=function(e,t){return
i.log("This is deprecated, use 'new SwaggerClient' instead."),new
a(e,t)};Array.prototype.indexOf||(Array.prototype.indexOf=function(e,t){for(var
n=t||0,r=this.length;n<r;n++)if(this[n]===e)return n;return-
1}),String.prototype.trim||(String.prototype.trim=function(){return
this.replace(/^\s+|\s+$/g,"")}),String.prototype.endsWith||(String.prototype.endsWith=function(e){return
this.indexOf(e,this.length-e.length)!==-
1}),t.exports=a,a.ApiKeyAuthorization=r.ApiKeyAuthorization,a.PasswordAuthorization=r.PasswordAuthorization,
a.CookieAuthorization=r.CookieAuthorization,a.SwaggerApi=o,a.SwaggerClient=o,a.SchemaMarkup=e("./lib/sche
ma-markup")},{"/lib/auth":2,"/lib/client":3,"/lib/helpers":4,"/lib/schema-markup":7}],2:[function(e,t,n){"use
strict";var r=e("./helpers"),i=e("btoa"),a=e("cookiejar").CookieJar,o={each:e("lodash-
compat/collection/each"),includes:e("lodash-compat/collection/includes"),isObject:e("lodash-
compat/lang/isObject"),isArray:e("lodash-
compat/lang/isArray")},s=t.exports.SwaggerAuthorizations=function(e){this.authz=e||{};s.prototype.add=function(
e,t){if(o.isObject(e))for(var
n in e)this.authz[n]=e[n];else"string"===typeof e&&(this.authz[e]=t);return
t},s.prototype.remove=function(e){return delete this.authz[e]},s.prototype.apply=function(e,t){var
n=!0,r=!t,i=[],a=e.clientAuthorizations||this.authz;return o.each(t,function(e,t){"string"===typeof
t&&i.push(t),o.each(e,function(e,t){i.push(t)})),o.each(a,function(t,a){if(r||o.includes(i,a)){var
s=t.apply(e);n=n&&!!s}},n);var
l=t.exports.ApiKeyAuthorization=function(e,t,n){this.name=e,this.value=t,this.type=n};l.prototype.apply=function(
e){if("query"===this.type){var t;if(e.url.indexOf("?")>0){t=e.url.substring(e.url.indexOf("?")+1);var
n=t.split("&");if(n&&n.length>0)for(var r=0;r<n.length;r++){var
i=n[r].split("=");if(i&&i.length>0&&i[0]===this.name)return!1}}return
e.url.indexOf("?")>0?e.url=e.url+"&"+this.name+"="+this.value:e.url=e.url+"?" +this.name+"="+this.value,!0}if("h
eader"===this.type)return"undefined"===typeof
e.headers[this.name]&&(e.headers[this.name]=this.value),!0};var
u=t.exports.CookieAuthorization=function(e){this.cookie=e};u.prototype.apply=function(e){return
e.cookieJar=e.cookieJar||new a,e.cookieJar.setCookie(this.cookie,!0);var
c=t.exports.PasswordAuthorization=function(e,t){3===arguments.length&&(r.log("PasswordAuthorization: the
'name' argument has been removed, pass only username and
password"),e=arguments[1],t=arguments[2]),this.username=e,this.password=t};c.prototype.apply=function(e){retur
n"undefined"===typeof e.headers.Authorization&&(e.headers.Authorization="Basic
"+i(this.username+":")+this.password)),!0},{"/helpers":4,btoa:13,cookiejar:18,"lodash-
compat/collection/each":52,"lodash-compat/collection/includes":55,"lodash-compat/lang/isArray":140,"lodash-
compat/lang/isObject":144}],3:[function(e,t,n){"use strict";var r={bind:e("lodash-
compat/function/bind"),cloneDeep:e("lodash-compat/lang/cloneDeep"),find:e("lodash-
compat/collection/find"),forEach:e("lodash-compat/collection/forEach"),indexOf:e("lodash-
compat/array/indexOf"),isArray:e("lodash-compat/lang/isArray"),isObject:e("lodash-
compat/lang/isObject"),isFunction:e("lodash-compat/lang/isFunction"),isPlainObject:e("lodash-
compat/lang/isPlainObject"),isUndefined:e("lodash-
compat/lang/isUndefined")},i=e("./auth"),a=e("./helpers"),o=e("./types/model"),s=e("./types/operation"),l=e("./types
/operationGroup"),u=e("./resolver"),c=e("./http"),p=e("./spec-
converter"),h=e("q"),f=["apis","authorizationScheme","authorizations","basePath","build","buildFrom1_1Spec","bu

```

```

ildFrom1_2Spec","buildFromSpec","clientAuthorizations","convertInfo","debug","defaultErrorCallback","defaultSu
ccessCallback","enableCookies","fail","failure","finish","help","host","idFromOp","info","initialize","isBui
lid","modelPropertyMacro","models","modelsArray","options","parameterMacro","parseUri","progress","resourceC
ount","sampleModels","selfReflect","setConsolidatedModels","spec","supportedSubmitMethods","swaggerRequest
Headers","tagFromLabel","title","url","useJQuery","jqueryAjaxCache"],d=["apis","asCurl","description","externalD
ocs","help","label","name","operation","operations","operationsArray","path","tag"],m=["delete","get","head","opti
ons","patch","post","put"],g=t.exports=function(e,t){return
this.authorizations=null,this.authorizationScheme=null,this.basePath=null,this.debug=!1,this.enableCookies=!1,this.
info=null,this.isBuilt=!1,this.isValid=!1,this.modelsArray=[],this.resourceCount=0,this.url=null,this.useJQuery=!1,t
his.jqueryAjaxCache=!1,this.swaggerObject={},this.deferredClient=void 0,this.clientAuthorizations=new
i.SwaggerAuthorizations,"undefined"!==typeof
e?this.initialize(e,t):this};g.prototype.initialize=function(e,t){if(this.models={},this.sampleModels={},this.string==="typ
eof e?this.url=e:r.isObject(e)&&(t=e,this.url=t.url),this.url&&this.url.indexOf("http:")===-
1&&this.url.indexOf("https:")===-1&&"undefined"!==typeof
window&&window&&window.location&&(this.url=window.location.origin+this.url),t=t||{}},this.clientAuthorizatio
ns.add(t.authorizations),this.swaggerRequestHeaders=t.swaggerRequestHeaders||"application/json;charset=utf-
8,*/*",this.defaultSuccessCallback=t.defaultSuccessCallback||null,this.defaultErrorCallback=t.defaultErrorCallback||
null,this.modelPropertyMacro=t.modelPropertyMacro||null,this.connectionAgent=t.connectionAgent||null,this.param
eterMacro=t.parameterMacro||null,this.usePromise=t.usePromise||null,this.timeout=t.timeout||null,this.fetchSpecTim
eout="undefined"!==typeof
t.fetchSpecTimeout?t.fetchSpecTimeout:t.timeout||null,this.usePromise&&(this.deferredClient=h.defer()),"function"
===typeof
t.success&&(this.success=t.success),t.useJQuery&&(this.useJQuery=t.useJQuery),t.jqueryAjaxCache&&(this.jquer
yAjaxCache=t.jqueryAjaxCache),t.enableCookies&&(this.enableCookies=t.enableCookies),this.options=t||{},this.o
ptions.timeout=this.timeout,this.options.fetchSpecTimeout=this.fetchSpecTimeout,this.supportedSubmitMethods=t.
supportedSubmitMethods||[],this.failure=t.failure||function(e){throw
e},this.progress=t.progress||function(){}},this.spec=r.cloneDeep(t.spec),t.scheme&&(this.scheme=t.scheme),this.use
Promise||"function"===typeof t.success)return
this.ready=!0,this.build(),g.prototype.build=function(e){if(this.isBuilt)return this;var
t=this;this.spec?t.progress("fetching resource list; Please wait."):this.progress("fetching resource list: "+this.url+";
Please wait.");var
n={useJQuery:this.useJQuery,jqueryAjaxCache:this.jqueryAjaxCache,connectionAgent:this.connectionAgent,url:thi
s.url,method:"get",headers:{accept:this.swaggerRequestHeaders},on:{error:function(e){return"http"!==t.url.substrin
g(0,4)?t.fail("Please specify the protocol for
"+t.url):!e.errObj||"ECONNABORTED"!==e.errObj.code&&e.errObj.message.indexOf("timeout")===-
1?0===e.status?t.fail("Can't read from server. It may not have the appropriate access-control-origin
settings."):404===e.status?t.fail("Can't read swagger JSON
from "+t.url):t.fail(e.status+" : "+e.statusText+" "+t.url):t.fail("Request timed out after
"+t.fetchSpecTimeout+"ms")}},response:function(e){var n=e.obj;if(!n)return t.fail("failed to parse JSON/YAML
response");if(t.swaggerVersion=n.swaggerVersion,t.swaggerObject=n,n.swagger&&2===parseInt(n.swagger))t.swa
ggerVersion=n.swagger,(new u).resolve(n,t.url,t.buildFromSpec,t),t.isValid=!0}else{var r=new
p;t.oldSwaggerObject=t.swaggerObject,r.setDocumentationLocation(t.url),r.convert(n,t.clientAuthorizations,t.option
s,function(e){t.swaggerObject=e,(new
u).resolve(e,t.url,t.buildFromSpec,t),t.isValid=!0}})}},if(this.fetchSpecTimeout&&(n.timeout=this.fetchSpecTime
out),this.spec)t.swaggerObject=this.spec,setTimeout(function(){(new
u).resolve(t.spec,t.url,t.buildFromSpec,t),10}else{if(this.clientAuthorizations.apply(n),e)return n;(new
c).execute(n,this.options)}return
this.usePromise?t.deferredClient.promise:this},g.prototype.buildFromSpec=function(e){if(this.isBuilt)return

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this;this.apis={},this.apisArray=[],this.basePath=e.basePath||"",this.consumes=e.consumes,this.host=e.host||"",this.in
fo=e.info||{},this.produces=e.produces,this.schemes=e.schemes||[],this.securityDefinitions=r.cloneDeep(e.securityD
efinitions),this.security=e.security,this.title=e.title||"";var
t,n,i,u,c={},p=this;if(e.externalDocs&&(this.externalDocs=e.externalDocs),this.authSchemes=this.securityDefinitio
ns,this.securityDefinitions)for(t in this.securityDefinitions){var
h=this.securityDefinitions[t];h.vendorExtensions={};for(var g in h){if(a.extractExtensions(g,h),"scopes"===g){var
y=h[g];if("object"===typeof y){y.vendorExtensions={};for(var v in
y)a.extractExtensions(v,y)}}if(Array.isArray(e.tags))for(c={},n=0;n<e.tags.length;n++){var
b=r.cloneDeep(e.tags[n]);c[b.name]=b;for(u in b){if("externalDocs"===u&&"object"===typeof b[u])for(var w in
b[u])a.extractExtensions(w,b[u]);a.extractExtensions(u,b)}}if("string"===typeof
this.url){if(i=this.parseUri(this.url),"undefined"===typeof this.scheme&&"undefined"===typeof
this.schemes||0===this.schemes.length)"undefined"!==typeof
window?this.scheme=window.location.protocol.replace(":", "");this.scheme=i.scheme||"http";else
if("undefined"===typeof this.scheme)if("undefined"!==typeof window){var
_=window.location.protocol.replace(":", "");"https"===_&&this.schemes.indexOf(_)===-1?(a.log("Cannot call a
http server from https inside a browser!"),this.scheme="http");this.schemes.indexOf(_)==-
1?this.scheme=_:this.schemes.indexOf("https")!==-1?this.scheme="https":this.scheme="http"}else
this.scheme=this.schemes[0]||i.scheme;"undefined"!==typeof
this.host&&"!=="this.host||(this.host=i.host,i.port&&(this.host=this.host+":"+i.port)))else"undefined"===typeof
this.schemes||0===this.schemes.length?this.scheme="http":"undefined"===typeof
this.scheme&&(this.scheme=this.schemes[0]);this.definitions=e.definitions;for(t in this.definitions){var x=new
o(t,this.definitions[t],this.models,this.modelPropertyMacro);x&&(this.models[t]=x)}p.apis.help=r.bind(p.help,p),r.f
orEach(e.paths,function(e,t){r.isPlainObject(e)&&r.forEach(m,function(n){var
i=e[n];if(!r.isUndefined(i)){if(!r.isPlainObject(i))return void a.log("The '"+n+"' operation for '"+t+"' path is not an
Operation Object");var o=i.tags;!r.isUndefined(o)&&r.isArray(o)&&0!==o.length||(o=i.tags=["default"]);var
h=p.idFromOp(t,n,i),m=new
s(p,i.scheme,h,n,t,i.p.definitions,p.models,p.clientAuthorizations);m.vendorExtensions={};for(u in
i)a.extractExtensions(u,m,i[u]);if(m.externalDocs=i.externalDocs,m.externalDocs){m.externalDocs=r.cloneDeep(m.
externalDocs),m.externalDocs.vendorExtensions={};for(u in
m.externalDocs)a.extractExtensions(u,m.externalDocs)}r.forEach(o,function(e){var t=r.indexOf(f,e)>-
1?"_"+e:n=r.indexOf(d,e)>-1?"_"+e:i=p[t];if(t!==e&&a.log("The '"+e+"' tag conflicts with a SwaggerClient
function/property name. Use 'client."+t+"' or 'client.apis."+e+"' instead of 'client."+e+"."),n!=="e&&a.log("The
 '"+e+"' tag conflicts with a SwaggerClient operation function/property name. Use 'client.apis."+n+"'
instead of 'client.apis."+e+"."),r.indexOf(d,h)>-1&&(a.log("The '"+h+"' operationId conflicts with a SwaggerClient
operation function/property name. Use 'client.apis."+n+"_'+h+" instead of
'client.apis."+n+"_'+h+"."),h="_"+h,m.nickname=h),r.isUndefined(i)){i=p[t]=p.apis[n]={},i.operations={},i.label=n
,i.apis={};var
o=c[e];r.isUndefined(o)||(i.description=o.description,i.externalDocs=o.externalDocs,i.vendorExtensions=o.vendorEx
tensions),p[t].help=r.bind(p.help,i),p.apisArray.push(new
l(e,i.description,i.externalDocs,m))}h=p.makeUniqueOperationId(h,p.apis[n]),r.isFunction(i.help)||(i.help=r.bind(p.h
elp,i)),p.apis[n][h]=i[h]=r.bind(m.execute,m),p.apis[n][h].help=i[h].help=r.bind(m.help,m),p.apis[n][h].asCurl=i[h].
asCurl=r.bind(m.asCurl,m),i.apis[h]=i.operations[h]=m;var s=r.find(p.apisArray,function(t){return
t.tag===e});s&&s.operationsArray.push(m)}}));var A=[];return r.forEach(Object.keys(c),function(e){var t;for(t
in p.apisArray){var
n=p.apisArray[t];n&&e===n.name&&(A.push(n),p.apisArray[t]=null)}},r.forEach(p.apisArray,function(e){e&&A
.push(e)}),p.apisArray=A,r.forEach(e.definitions,function(e,t){e.id=t.toLowerCase(),e.name=t,p.modelsArray.push(
e)}),this.isBuilt=!0,this.usePromise?(this.isValid=!0,this.isBuilt=!0,this.deferredClient.resolve(this),this.deferredCli
ent.promise):(this.success&&this.success(),this)},g.prototype.makeUniqueOperationId=function(e,t){for(var

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n=0,i=e;;){var a=!1;if(r.forEach(t.operations,function(e){e.nickname===i&&(a=!0)}),!a)return
i;i=e+"_"+n,n++}return e},g.prototype.parseUri=function(e){var
t=/^(((([\^:\#\?]+):?(\:\/\/)((?:(\^:@\#\?)+)?:(\^:@\#\?)+)?@)?(([\^:\#\?]\[|\\[^\[]@#?)+\])(?:\{[0-
9]+\})?)?)?((\?|(\^:\#\?|\/+)*)(\^#\?*))?(?[\^#]+)?)(#.*)?/,n=t.exec(e);return{scheme:n[4]?n[4].replace(":",""):
void 0,host:n[11],port:n[12],path:n[15]}},g.prototype.help=function(e){var t="";return this instanceof
g?r.forEach(this.apis,function(e,n){r.isPlainObject(e)&&(t+="operations for the '"+n+"'
tag\n",r.forEach(e.operations,function(e,n){t+="
* '"+n+": "+e.summary+"\n"})):(this instanceof l||r.isPlainObject(this))&&(t+="operations for the '"+this.label+"
tag\n",r.forEach(this.apis,function(e,n){t+="
* '"+n+":
"+e.summary+"\n"})),e?t:(a.log(t),t)},g.prototype.tagFromLabel=function(e){return
e},g.prototype.idFromOp=function(e,t,n){n&&n.operationId||(n=n||{ },n.operationId=t+"_"+e);var
r=n.operationId.replace(/[\s!@#\$%^&*()_+=\[\]{};<.>|.\/?,\\"""-]/g,"_")||e.substring(1)+"_"+t;return
r=r.replace(/((_) {2,})/g,"_"),r=r.replace(/^(_)*/g,""),r=r.replace(/(\\_)*$/g,""),g.prototype.setHost=function(e){this.
host=e,this.apis&&r.forEach(this.apis,function(t){t.operations&&r.forEach(t.operations,function(t){t.host=e})),g.
prototype.setBasePath=function(e){this.basePath=e,this.apis&&r.forEach(this.apis,function(t){t.operations&&r.forE
ach(t.operations,function(t){t.basePath=e})),g.prototype.setSchemes=function(e){this.schemes=e,e&&e.length>0
&&this.apis&&r.forEach(this.apis,function(t){t.operations&&r.forEach(t.operations,function(t){t.scheme=e[0]}))}
,g.prototype.fail=function(e){return
this.usePromise?(this.deferredClient.reject(e),this.deferredClient.promise):void(this.failure?this.failure(e):this.failure
(e))},{"/auth":2,"/helpers":4,"/http":5,"/resolver":6,"/spec-
converter":8,"/types/model":9,"/types/operation":10,"/types/operationGroup":11,"lodash-
compat/array/indexOf":49,"lodash-compat/collection/find":53,"lodash-compat/collection/forEach":54,"lodash-
compat/function/bind":58,"lodash-compat/lang/cloneDeep":138,"lodash-compat/lang/isArray":140,"lodash-
compat/lang/isFunction":142,"lodash-compat/lang/isObject":144,"lodash-compat/lang/isPlainObject":145,"lodash-
compat/lang/isUndefined":148,q:157}],4:[function(e,t,n){(function(n){"use strict";var r={isPlainObject:e("lodash-
compat/lang/isPlainObject"),indexOf:e("lodash-compat/array/indexOf")};t.exports.__bind=function(e,t){return
function(){return e.apply(t,arguments)}};var
i=t.exports.log=function(){console&&"test"!==n.env.NODE_ENV&&console.log(Array.prototype.slice.call(argum
ents)[0])};t.exports.fail=function(e){i(e)},t.exports.optionHtml=function(e,t){return'<tr><td
class="optionName">'+e+'</td><td>'+t+'</td></tr>'};var a=t.exports.resolveSchema=function(e){return
r.isPlainObject(e.schema)&&(e=a(e.schema)),e};t.exports.simpleRef=function(e){return"undefined"!==typeof
e?null:0===e.indexOf("#/definitions/")?e.substring("#/definitions/".length):e},t.exports.extractExtensions=function(
e,t,n){e&&t&&"string"===typeof e&&0===e.indexOf("x-
")&&(t.vendorExtensions=t.vendorExtensions||{ },n?t.vendorExtensions[e]=n:t.vendorExtensions[e]=t[e])}).call(thi
s,e("_process"))},{_process:12,"lodash-compat/array/indexOf":49,"lodash-
compat/lang/isPlainObject":145}],5:[function(t,n,r){(function(r){"use strict";var
i=t("/helpers"),a=t("superagent"),o=t("js-yaml"),s={isObject:t("lodash-compat/lang/isObject"),keys:t("lodash-
compat/object/keys")},l=function(){this.type="jQueryHttpClient"},u=function(){this.type="SuperagentHttpClient"}
,c=n.exports=function(){c.prototype.execute=function(t,n){var
r;r=n&&n.client?n.client:new u(n),r.opts=n||{ };var i=!1;if("undefined"!==typeof window&&"undefined"!==typeof
window.jQuery&&(i=!0),"options"===t.method.toLowerCase()&&"SuperagentHttpClient"===r.type&&(e("forcing
jQuery as OPTIONS are not supported by
SuperAgent"),t.usejQuery=!0),this.isInternetExplorer()&&(t.usejQuery===!1||!i))throw new Error("Unsupported
configuration! JQuery is required but not
available");(t&&t.usejQuery===!0||this.isInternetExplorer()&&i)&&(r=new l(n));var
a=t.on.response,o=t.on.error,c=function(e){return
n&&n.requestInterceptor&&(e=n.requestInterceptor.apply(e)),e},p=function(e){return
n&&n.responseInterceptor&&(e=n.responseInterceptor.apply(e)),a(e)},h=function(e){n&&n.responseInterceptor&

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&(e=n.responseInterceptor.apply(e)),o(e));return
t.on.error=function(e){h(e)},t.on.response=function(e){p(e)},s.isObject(t)&&s.isObject(t.body)&&t.body.type&&"f
ormData"===t.body.type&&n.useJQuery&&(t.contentType=!1,t.processData=!1,delete
t.headers["Content-
Type"]),t=c(t)||t,t.beforeSend?t.beforeSend(function(e){r.execute(e||t)}):r.execute(t),t.deferred?t.deferred.promise:t),
c.prototype.isInternetExplorer=function(){var e=!1;if("undefined"!==typeof navigator&&navigator.userAgent){var
t=navigator.userAgent.toLowerCase();if(t.indexOf("msie")!==-1){var
n=parseInt(t.split("msie")[1]);n<=8&&(e=!0)}}return e},l.prototype.execute=function(e){var
t=this.jQuery||"undefined"!==typeof window&&window.jQuery,n=e.on,r=e;if("undefined"===typeof t||t===!1)throw
new Error("Unsupported configuration! JQuery is required but not available");return
e.type=e.method,e.cache=e.jqueryAjaxCache,e.data=e.body,delete e.jqueryAjaxCache,delete e.useJQuery,delete
e.body,e.complete=function(e){for(var t={},a=e.getAllResponseHeaders().split("\n"),s=0;s<a.length;s++){var
l=a[s].trim();if(0!==l.length){var u=l.indexOf(":");if(u!==-1){var
c=l.substring(0,u).trim(),p=l.substring(u+1).trim();t[c]=p}else t[l]=null}}var
h={url:r.url,method:r.method,status:e.status,statusText:e.statusText,data:e.responseText,headers:t};try{var
f=e.responseJSON||o.safeLoad(e.responseText);h.obj="string"===typeof f?f:f}catch(d){i.log("unable to parse
JSON/YAML
content")})if(h.obj=h.obj||null,e.status>=200&&e.status<300)n.response(h);else{if(!(0===e.status||e.status>=400&&
e.status<599))return n.response(h);n.error(h)},t.support.cors=!0,t.ajax(e)},u.prototype.execute=function(e){var
t=e.connectionAgent,n=e.method.toLowerCase(),l=e.timeout,"delete"===n&&(n="del");var
u=e.headers||{},c=a[n](e.url);t&&c.agent(t),l&&c.timeout(l),e.enableCookies&&c.withCredentials();var
p=e.headers.Accept;if(this.binaryRequest(p)&&c.on("request",function(){this.xhr&&(this.xhr.responseType="blob"
)}),e.body){if(s.isObject(e.body)){var h=e.headers["Content-Type"]||"";if(0===h.indexOf("multipart/form-
data"))if(delete u["Content-Type"],"[object FormData]"==={}.toString.apply(e.body))c.send(e.body);else{var
f,d,m;for(f in e.body)if(d=e.body[f],Array.isArray(d))for(m
in d)c.field(f,m);else c.field(f,d)}else s.isObject(e.body)&&(e.body=JSON.stringify(e.body),c.send(e.body))}else
c.send(e.body);var g;for(g in u)c.set(g,u[g]);"function"===typeof
c.buffer&&c.buffer(),c.end(function(t,n){n=n||{status:0,headers:{error:"no response from server"}};var
a,l={url:e.url,method:e.method,headers:n.headers};if(!t&&n.error&&(t=n.error),t&&e.on&&e.on.error){if(l.errObj
=t,l.status=n.status:500,l.statusText=n.text:t.message,n.headers&&n.headers["content-
type"]&&n.headers["content-
type"].indexOf("application/json")>=0)try{l.obj=JSON.parse(l.statusText)}catch(u){l.obj=null}a=e.on.error}else
if(n&&e.on&&e.on.response){var c;if(n.body&&s.keys(n.body).length>0)c=n.body;else
try{c=o.safeLoad(n.text),c="string"===typeof c?null:c}catch(u){i.log("cannot parse JSON/YAML
content")}"function"===typeof r&&r.isBuffer(c)?l.data=c:l.obj="object"===typeof
c?c:null,l.status=n.status,l.statusText=n.text,a=e.on.response}.xhr&&n.xhr.response?l.data=n.xhr.response:l.data||(l
.data=l.statusText),a&&a(l)}},u.prototype.binaryRequest=function(e){return!!e&&(/^image/i.test(e)||/^application/
pdf/.test(e))}.call(this,t("buffer").Buffer)},{"/.helpers":4,buffer:14,"js-yaml":19,"lodash-
compat/lang/isObject":144,"lodash-compat/object/keys":149,superagent:158}],6:[function(e,t,n){ "use
strict";function r(e){var t={},n=/[a-z]+\:\/\/i.exec(e);n&&(t.proto=n[0].slice(0,-
3),e=e.slice(t.proto.length+1)), "/"===e.slice(0,2)&&(t.domain=e.slice(2).split("/")[0],e=e.slice(2+t.domain.length))
;var r=e.split("#");return r[0].length&&(t.path=r[0]),r.length>1&&(t.fragment=r.slice(1).join("#")),t}function
i(e){var t=e.path;return void 0===t&&(t=""),void 0!==e.fragment&&(t+="#"+e.fragment),void
0!==e.domain&&( "/"===t.slice(0,1)&&(t=t.slice(1)),t="/" +e.domain+"/"+t,void
0!==e.proto&&(t=e.proto+"."+t)),t}function a(e,t){var n=r(t);if(void 0!==n.domain)return t;var a=r(e);if(void
0===n.path)a.fragment=n.fragment;else if( "/"===n.path.slice(0,1))a.path=n.path,a.fragment=n.fragment;else{var
o=void
0===a.path?[]:a.path.split("/"),s=n.path.split("/");for(o.length&&o.pop(); ".."===s[0]||"."===s[0];).."===s[0]&&o.p

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op(),s.shift();a.path=o.concat(s).join("/"),a.fragment=n.fragment}return i(a)}var o=e("./http"),s={isObject:e("lodash-
compat/lang/isObject"),cloneDeep:e("lodash-compat/lang/cloneDeep"),isArray:e("lodash-
compat/lang/isArray"),isString:e("lodash-
compat/lang/isString")},l=t.exports=function(){this.failedUrls=[],this.resolverCache={},this.pendingUrls={}};l.prototype.processAllOf=function(e,t,n,r,i,a){var o,s,l;n["x-resolved-from"]=["#/definitions/"+t];var
u=n.allOf;for(u.sort(function(e,t){return e.$ref&&t.$ref?0:e.$ref?-
1:1}),o=0;o<u.length;o++)l=u[o],s="/definitions/"+t+"/allOf",this.resolveInline(e,a,l,r,i,s)},l.prototype.resolve=function(e,t,n,r){this.spec=e;var i,a,l=t,u=n,c=r,p={};"function"===typeof t&&(l=null,u=t,c=n);var
h,f=l;this.scope=c||this,this.iteration=this.iteration||0,this.scope.options&&this.scope.options.requestInterceptor&&(
p.requestInterceptor=this.scope.options.requestInterceptor),this.scope.options&&this.scope.options.responseIntercep
tor&&(p.responseInterceptor=this.scope.options.responseInterceptor);var
d,m,g,y,v,b,w,_=0,x={},A={},S=[];e.definitions=e.definitions||{};for(d in e.definitions){var
j=e.definitions[d];if(j.$ref)this.resolveInline(l,e,j,S,A,j);else{for(y in
j.properties)g=j.properties[y],s.isArray(g.allOf)?this.processAllOf(l,d,g,S,A,e):this.resolveTo(l,g,S,"/definitions");j.a
llOf&&this.processAllOf(l,d,j,S,A,e)}e.parameters=e.parameters||{};for(d in
e.parameters){if(v=e.parameters[d],"body"===v["in"]&&v.schema)if(s.isArray(v.schema.allOf)){h="inline_model"
;var E=h;for(b=!1,w=0;!b){if("undefined"===typeof
e.definitions[E]){b=!0;break}E=h+"_"+w,w++}e.definitions[E]={allOf:v.schema.allOf},delete
v.schema.allOf,v.schema.$ref="#/definitions/"+E,this.processAllOf(l,E,e.definitions[E],S,A,e)}else
this.resolveTo(l,v.schema,S,i);v.$ref&&this.resolveInline(l,e,v,S,A,v.$ref)}for(d in e.paths){var
O,k,T;if(m=e.paths[d],"object"===typeof
m){for(O in m)if("$ref"===O)i="/paths"+d,this.resolveInline(l,e,m,S,A,i);else{k=m[O];var
C=m.parameters||[],I=k.parameters||[];for(a in
C)v=C[a],l.unshift(v),"parameters"!==O&&s.isObject(k)&&(k.parameters=k.parameters||I);for(a in
I){if(v=I[a],i="/paths"+d+"/"+O+"/parameters","body"===v["in"]&&v.schema)if(s.isArray(v.schema.allOf)){for(h=
"inline_model",d=h,b=!1,w=0;!b){if("undefined"===typeof
e.definitions[d]){b=!0;break}d=h+"_"+w,w++}e.definitions[d]={allOf:v.schema.allOf},delete
v.schema.allOf,v.schema.$ref="#/definitions/"+d,this.processAllOf(l,d,e.definitions[d],S,A,e)}else
this.resolveTo(l,v.schema,S,i);v.$ref&&this.resolveInline(l,e,v,S,A,v.$ref)}for(T in k.responses){var
D=k.responses[T];if(i="/paths"+d+"/"+O+"/responses/"+T,s.isObject(D)&&(D.$ref&&this.resolveInline(l,e,D,S,A,i
),D.schema)){var
L=D;if(s.isArray(L.schema.allOf)){for(h="inline_model",d=h,b=!1,w=0;!b){if("undefined"===typeof
e.definitions[d]){b=!0;break}d=h+"_"+w,w++}e.definitions[d]={allOf:L.schema.allOf},delete
L.schema.allOf,delete
L.schema.type,L.schema.$ref="#/definitions/"+d,this.processAllOf(l,d,e.definitions[d],S,A,e)}else"array"===L.sche
ma.type?L.schema.items&&L.schema.items.$ref&&this.resolveInline(l,e,L.schema.items,S,A,i):this.resolveTo(l,D.s
chema,S,i)}}m.parameters=[]}}var M,R=0,U=[],P=S;
for(a=0;a<P.length;a++){var q=P[a];if(l===q.root){if("ref"===q.resolveAs){var
B,N=((q.root||"")+"/"+q.key).split("/"),z=[],$="";if(q.key.indexOf("../")>=0){for(var
F=0;F<N.length;F++)".. "===N[F]?z=z.slice(0,z.length-
1):z.push(N[F]);for(B=0;B<z.length;B++)B>0&&($+="/"),$+=z[B];q.root=$,U.push(q)}else
if(M=q.key.split("#"),2===M.length){0===M[0].indexOf("http:")&&0===M[0].indexOf("https:")|(q.root=M[0]),i=
M[1].split("/");var V,H=e;for(B=0;B<i.length;B++){var Y=i[B];if("!"===Y){if(H=H[Y],"undefined"===typeof
H){V=null;break}V=H}}null===V&&U.push(q)}else
if("inline"===q.resolveAs){if(q.key&&q.key.indexOf("#")===-
1&&"/"!===q.key.charAt(0)){for(M=q.root.split("/"),i="",a=0;a<M.length-
1;a++)i+=M[a]+"/";i+=q.key,q.root=i,q.location=""U.push(q)}else

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U.push(q)}R=U.length;for(var
J={},W=0;W<U.length;W++){function(e,t,n,r,i){if(e.root&&e.root!==1)if(n.failedUrls.indexOf(e.root)===-1){var
a={useJQuery:!1,url:e.root,method:"get",headers:{accept:n.scope.swaggerRequestHeaders||"application/json"},on:{
error:function(i){_+=1,console.log("failed url: "+a.url),n.failedUrls.push(a.url),r&&delete
r[e.root],A[e.key]={root:e.root,location:e.location},_===R&&n.finish(t,f,S,x,A,u)},response:function(i){var
a=i.obj;r&&delete
r[e.root],n.resolverCache&&(n.resolverCache[e.root]=a),n.resolveItem(a,e.root,S,x,A,e),_+=1,_===R&&n.finish(t,f
,S,x,A,u)}};c&&c.fetchSpecTimeout&&(a.timeout=c.fetchSpecTimeout),c&&c.clientAuthorizations&&c.clientAu
thorizations.apply(a,function h(){setTimeout(function(){if(r[a.url])h();else{var
e=n.resolverCache[a.url];s.isObject(e)?a.on.response({obj:e}):(r[a.url]=!0,(new o).execute(a,p))},0)}()else
_+=1,A[e.key]={root:e.root,location:e.location},_===R&&n.finish(t,f,S,x,A,u);else
n.resolveItem(t,f,S,x,A,e),_+=1,_===R&&n.finish(t,l,S,x,A,u,!0)}(U[W],e,this,J,W);0===Object.keys(U).length&&
this.finish(e,f,S,x,A,u)},l.prototype.resolveItem=function(e,t,n,r,i,a){var
o=a.location,s=e,l=o.split("/");if(!o)for(var u=0;u<l.length;u++){var c=l[u];if(c.indexOf("~1")!==-
1&&(c=l[u].replace(/~/g,"").replace(/~1/g,""),!c.charAt(0)&&(c="/" + c)),"undefined"===typeof
s||null===s)break;if(!c&&u===l.length-1&&l.length>1){s=null;break}c.length>0&&(s=s[c])}var
p=a.key;l=a.key.split("/");var h=l[l.length-
1];h.indexOf("#")>=0&&(h=h.split("#")[1]),null===s&&"undefined"!==typeof
s?r[p]={name:h,obj:s,key:a.key,root:a.root}:if(p){root:a.root,location:a.location}},l.prototype.finish=function(e,t,n,
r,i,a,o){var s,l;for(s in n){var
u=n[s],c=u.key,p=r[c];if(p){if(e.definitions=e.definitions||{},"ref"===u.resolveAs){if(o!==!0)for(c in
p.obj)l=this.retainRoot(c,p.obj[c],u.root),p.obj[c]=l;e.definitions[p.name]=p.obj,u.obj.$ref="#/definitions/" + p.name}
else if("inline"===u.resolveAs){var
h=u.obj;h["x-resolved-from"]=u.key,delete h.$ref;for(c in
p.obj)l=p.obj[c],o!==!0&&(l=this.retainRoot(c,p.obj[c],u.root)),h[c]=l}}var
f=this.countUnresolvedRefs(e);0===f||this.iteration>5?(this.resolveAllOf(e.definitions),this.resolverCache=null,a.ca
ll(this.scope,e,i):(this.iteration+=1,this.resolve(e,t,a,this.scope)),l.prototype.countUnresolvedRefs=function(e){var
t,n=this.getRefs(e),r=[],i=[];for(t in
n)0===t.indexOf("#"?r.push(t.substring(1)):i.push(t);for(t=0;t<r.length;t++)for(var
a=r[t],o=a.split("/"),s=e,l=0;l<o.length;l++){var u=o[l];if(!u&&(s=s[u],"undefined"===typeof
s)){i.push(a);break}}return i.length},l.prototype.getRefs=function(e,t){t=t||e;var n={};for(var r in
t)if(t.hasOwnProperty(r)){var i=t[r];if("$ref"===r&&"string"===typeof i)n[i]=null;else if(s.isObject(i)){var
a=this.getRefs(i);for(var o in a)n[o]=null}}return n},l.prototype.retainRoot=function(e,t,n){if(s.isObject(t))for(var r
in t){var i=t[r];"$ref"===r&&"string"===typeof i?t[r]=a(n,i):s.isObject(i)&&this.retainRoot(r,i,n)}else
s.isString(t)&&"$ref"===e&&(t=a(n,t));return t},l.prototype.resolveInline=function(e,t,n,r,i,a){var
o,s,l,u,c=n.$ref,p=n.$ref,h=!1;if(e=e||"")p={if(0===p.indexOf("../")){for(s=p.split("../"),l=e.split("/"),p="",o=0;o<s.le
ngth;o++)""===s[o]?l=l.slice(0,l.length-1):p+=s[o];for(e="",o=0;o<l.length-
1;o++)o>0&&(e+="/" + l[o]);h=!0;if(p.indexOf("#")>=0)if(0===p.indexOf("/"))u=p.split("#"),s=e.split("/"),l=s[1
].split("/"),e=s[0]+="/" + l[0]+u[0],a=u[1];else{if(u=p.split("#"),!u[0]){if(l=e.split("/"),l=l.slice(0,l.length-
1),!h){e="";for(var
f=0;f<l.length;f++)f>0&&(e+="/" + l[f])e+="/" + p.split("#")[0]}a=u[1]}if(0===p.indexOf("http:")||0===p.indexO
f("https:"))p.indexOf("#")>=0?(e=p.split("#")[0],a=p.split("#")[1]):(e=p,a=""),r.push({obj:n,resolveAs:"inline",root:
e,key:c,location:a});else
if(0===p.indexOf("#"))a=p.split("#")[1],r.push({obj:n,resolveAs:"inline",root:e,key:c,location:a});else
if(0===p.indexOf("/")&&p.indexOf("#")===-1){a=p;var
d=e.match(/^https?:\\V([\\V?#]+)(?:[\\V?#])$/i);d&&(e=d[0]+p.substring(1),a=""),r.push({obj:n,resolveAs:"inline",ro
ot:e,key:c,location:a})}}else

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r.push({obj:n,resolveAs:"inline",root:e,key:c,location:a})}else"array"===n.type&&this.resolveTo(e,n.items,r,a)},l.p
rototype.resolveTo=function(e,t,n,r){var i,a,o=t.$ref,l=e;if("undefined"!==typeof
o&&null!==(o)){if(o.indexOf("#")>=0){var u=o.split("#");if(u[0]&&0===o.indexOf("/"))};else
if(!u[0]||0===u[0].indexOf("http:")&&0===u[0].indexOf("https:")){if(u[0]&&u[0].length>0){for(i=e.split("/"),l="",a
=0;a<i.length-1;a++)l+=i[a]+"/";l+=u[0]} }else l=u[0],o=u[1];r=u[1]}else
if(0===o.indexOf("http:")||0===o.indexOf("https:"))l=o,r="";else{for(i=e.split("/"),l="",a=0;a<i.length-
1;a++)l+=i[a]+"/";l+=o,r=""}}n.push({obj:t,resolveAs:"ref",root:l,key:o,location:r})}else if("array"===t.type){var
c=t.items;this.resolveTo(e,c,n,r)}else if(t&&(t.properties||t.additionalProperties)){var
p=this.uniqueName("inline_model");t.title&&(p=this.uniqueName(t.title)),delete
t.title,this.spec.definitions[p]=s.cloneDeep(t),t.$ref="#/definitions/"+p,delete t.type,delete
t.properties}},l.prototype.uniqueName=function(e){for(var t=e,n=0;;){if(!s.isObject(this.spec.definitions[t]))return
t;t=e+"_"+n,n++}},l.prototype.resolveAllOf=function(e,t,n){n=n||0,t=t||e;var r;for(var i in
t)if(t.hasOwnProperty(i)){var a=t[i];if(null===a)throw new TypeError("Swagger 2.0 does not support null types
("+t+"). See https://github.com/swagger-api/swagger-spec/issues/229.");if("object"===typeof
a&&this.resolveAllOf(e,a,n+1),a&&"undefined"!==typeof a.allOf){var o=a.allOf;if(s.isArray(o)){var
l=s.cloneDeep(a);delete l.allOf,l["x-composed"]=!0,"undefined"!==typeof a["x-resolved-from"]&&(l["x-resolved-
from"]=a["x-resolved-from"]);for(var u=0;u<o.length;u++){var c=o[u],p="self";"undefined"!==typeof c["x-resolved-
from"]&&(p=c["x-resolved-from"][0]);for(var h in c)if(l.hasOwnProperty(h))if("properties"===h){var f=c[h];for(r
in f){l.properties[r]=s.cloneDeep(f[r]);var d=f[r]["x-resolved-from"],"undefined"!==typeof
d&&"self"!==d||(d=p),l.properties[r]["x-resolved-from"]=d } else if("required"===h){for(var
m=l.required.concat(c[h]),g=0;g<m.length;++g)for(var y=g+1;y<m.length;++y)m[g]===m[y]&&m.splice(y--
,1);l.required=m} else"x-resolved-from"===h&&l["x-resolved-from"].push(p);else
if(l[h]=s.cloneDeep(c[h]),"properties"===h)for(r in l[h])l[h][r]["x-resolved-
from"]=p,t[i]=l}}}},{"./http":5,"lodash-compat/lang/cloneDeep":138,"lodash-compat/lang/isArray":140,"lodash-
compat/lang/isObject":144,"lodash-compat/lang/isString":146}},7:[function(e,t,n){"use strict";var
r=e("./helpers"),i={isPlainObject:e("lodash-compat/lang/isPlainObject"),isUndefined:e("lodash-
compat/lang/isUndefined"),isArray:e("lodash-compat/lang/isArray"),isObject:e("lodash-
compat/lang/isObject"),isEmpty:e("lodash-compat/lang/isEmpty"),map:e("lodash-
compat/collection/map"),indexOf:e("lodash-compat/array/indexOf"),cloneDeep:e("lodash-
compat/lang/cloneDeep"),keys:e("lodash-compat/object/keys"),forEach:e("lodash-
compat/collection/forEach")},a=t.exports.optionHtml=function(e,t){return"<tr><td
class='optionName'>'+e+'</td><td>"+t+"</td></tr>";t.exports.typeFromJsonSchema=function(e,t){var
n;return"integer"===e&&"int32"===t?n="integer":"integer"===e&&"int64"===t?n="long":"integer"===e&&"und
efined"===typeof t?n="long":"string"===e&&"date-time"===t?n="date-
time":"string"===e&&"date"===t?n="date":"number"===e&&"float"===t?n="float":"number"===e&&"double"=
===t?n="double":"number"===e&&"undefined"===typeof
t?n="double":"boolean"===e?n="boolean":"string"===e&&(n="string"),n};var
o=t.exports.getStringSignature=function(e,t){var n="";return"undefined"!==typeof
e.$ref?n+=r.simpleRef(e.$ref):"undefined"===typeof
e.type?n+="object":"array"===e.type?t+=o(e.items||e.$ref||{}):(n+="Array["+n+=o(e.items||e.$ref||{}),n+="]"):n+
="integer"===e.type&&"int32"===e.format?"integer":"integer"===e.type&&"int64"===e.format?"long":"integer"=
===e.type&&"undefined"===typeof e.format?"long":"string"===e.type&&"date-time"===e.format?"date-
time":"string"===e.type&&"date"===e.format?"date":"string"===e.type&&"undefined"===typeof
e.format?"string":"number"===e.type&&"float"===e.format?"float":"number"===e.type&&"double"===e.format?"
double":"number"===e.type&&"undefined"===typeof
e.format?"double":"boolean"===e.type?"boolean":e.$ref?r.simpleRef(e.$ref):e.type,n},s=t.exports.schemaToJSON=
function(e,t,n,a){e=r.resolveSchema(e),"function"!==typeof a&&(a=function(e){return(e||{})["default"]}),n=n||{};var
o,l,u=e.type||"object",c=e.format;return

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i.isUndefined(e.example)?i.isUndefined(e.items)&&i.isArray(e["enum"])&&(l=e["enum"][0]):l=e.example,i.isUndefined(l)&&(e.$ref?(o=t[r.simpleRef(e.$ref)],i.isUndefined(o))|(i.isUndefined(n[o.name])?(n[o.name]=o,l=s(o.definition,t,n,a),delete n[o.name]):l="array"===o.type?[l:{}]):i.isUndefined(e["default"])?"string"===u?l="date-time"===c?(new Date).toISOString():"date"===c?(new Date).toISOString().split("T")[0]:"string":"integer"===u?l=0:"number"===u?l=0:"boolean"===u?l=!0:"object"===u?(l={},i.forEach(e.properties,function(e,r){var o=i.cloneDeep(e);o["default"]=a(e),l[r]=s(o,t,n,a)})):"array"===u&&(l=[],i.isArray(e.items)?i.forEach(e.items,function(e){l.push(s(e,t,n,a))}):i.isPlainObject(e.items)?l.push(s(e.items,t,n,a)):i.isUndefined(e.items)?l.push({}):r.log("Array type's 'items' property is not an array or an object, cannot process")):l=e["default"]],l};t.exports.schemaToHTML=function(e,t,n,o){function s(e,t,a){var o,s;t;return e.$ref?(s=e.title|r.simpleRef(e.$ref),o=n[s]):i.isUndefined(t)&&(s=e.title|"Inline Model "+m,o={definition:e}),a!==!0&&(f[s]=i.isUndefined(o)?{:o.definition},s)function l(e){var t='<span class="propType">',n=e.type|"object";return e.$ref?t+=s(e,r.simpleRef(e.$ref)):"object"===n?t+=i.isUndefined(e.properties)?"object":s(e):"array"===n?(t+="Array["",i.isArray(e.items)?t+=i.map(e.items,s).join(","):i.isPlainObject(e.items)?t+=i.isUndefined(e.items.$ref)?i.isUndefined(e.items.type)|i.indexOf(["array","object"],e.items.type)!=-1?s(e.items):e.items.type:s(e.items,r.simpleRef(e.items.$ref)):(r.log("Array type's 'items' schema is not an array or an object, cannot process")),t+="object"),t+=""]):t+=e.type,t+="/span>"}function u(e,t){var n="",r=e.type|"object",o="array"===r;switch(o&&(r=i.isPlainObject(e.items)&&!i.isUndefined(e.items.type)?e.items.type:"object"),i.isUndefined(e["default"])|((n+=a("Default",e["default"])),r)){case"string":e.minLength&&(n+=a("Min. Length",e.minLength)),e.maxLength&&(n+=a("Max. Length",e.maxLength)),e.pattern&&(n+=a("Reg. Exp.",e.pattern));break;case"integer":case"number":e.minimum&&(n+=a("Min. Value",e.minimum)),e.exclusiveMinimum&&(n+=a("Exclusive Min.",true)),e.maximum&&(n+=a("Max. Value",e.maximum)),e.exclusiveMaximum&&(n+=a("Exclusive Max.",true)),e.multipleOf&&(n+=a("Multiple Of",e.multipleOf))}if(o&&(e.minItems&&(n+=a("Min. Items",e.minItems)),e.maxItems&&(n+=a("Max. Items",e.maxItems)),e.uniqueItems&&(n+=a("Unique Items",true)),e.collectionFormat&&(n+=a("Coll. Format",e.collectionFormat))),i.isUndefined(e.items)&&i.isArray(e["enum"])){var s;s="number"===r?"integer"===r?e["enum"].join(","):""+e["enum"].join(",")+"";n+=a("Enum",s)}return n.length>0&&(t='<span class="propWrap">'+t+'<table class="optionsWrapper"><tr><th colspan="2">'+r+'</th></tr>'+n+'</table></span>'),t}function c(e,t){var a=e.type|"object",c="array"===e.type,f=p+t+"+(c?"["":"{}")+h;if(t&&d.push(t),c)i.isArray(e.items)?f+=<div>"+i.map(e.items,function(e){var t=e.type|"object";return i.isUndefined(e.$ref)?i.indexOf(["array","object"],t)>-1?"object"===t&&i.isUndefined(e.properties)?"object":s(e):u(e,t):s(e,r.simpleRef(e.$ref))}).join(",</div><div>"):i.isPlainObject(e.items)?f+=i.isUndefined(e.items.$ref)?i.indexOf(["array","object"],e.items.type|"object">-1?(i.isUndefined(e.items.type)|"object"===e.items.type)&&i.isUndefined(e.items.properties)?<div>object</div>:"<div>"+s(e.items)+"</div>":"<div>"+u(e.items,e.items.type)+"</div>":"<div>"+s(e.items,r.simpleRef(e.items.$ref))+"</div>):(r.log("Array type's 'items' property is not an array or an object, cannot process")),f+=<div>object</div>");else if(e.$ref)f+=<div>"+s(e,t)+"</div>";else if("object"===a){if(i.isPlainObject(e.properties)){var m=i.map(e.properties,function(t,a){var s,c,p=i.indexOf(e.required,a)>=0,h=i.cloneDeep(t),f=p?"required":"","d='<span class="propName '+f+"'>"+a+'</span> (';return h["default"]=o(h),h=r.resolveSchema(h),c=t.description|h.description,i.isUndefined(h.$ref)|(s=n[r.simpleRef(h.$ref)],i.isUndefined(s)|i.indexOf([void 0,"array","object"],s.definition.type)!=-1|(h=r.resolveSchema(s.definition))),d+=l(h),p|(d+=', <span class="propOptKey">optional</span>'),t.readOnly&&(d+=', <span class="propReadOnly">read

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only</span>'),d+=')",i.isUndefined(c)||((d+=': <span class="propDesc">'+c+'</span>'),h["enum"]&&(d+= ' <span
class="propVals">['+h["enum"].join(", ")+""]</span>"),"<div"+(t.readOnly?'
class="readOnly":'+h["enum"].join(", ")+">"+u(h,d)).join(",</div>");m&&(f+=m+'</div>'))} else
f+= "<div>"+u(e,a)+'</div>";return
f+p+(c?"":'+h["enum"].join(", ")+'>'+h["enum"].join(", ")+'</div>";if(i.isObject(arguments[0])&&(e=void
0,t=arguments[0],n=arguments[1],o=arguments[2]),n=n||{}),t=r.resolveSchema(t,i,i.isEmpty(t))return
p+"Empty"+h;if("string"==typeof t.$ref&&(e=r.simpleRef(t.$ref),t=n[e],"undefined"==typeof t))return p+e+" is not
defined!"+h;"string"!=typeof e&&(e=t.title||"Inline Model"),t.definition&&(t=t.definition),"function"!=typeof
o&&(o=function(e){return(e||{}).default});for(var
f={},d=[],m=0,g=c(t,e);i.keys(f).length>0;i.forEach(f,function(e,t){var n=i.indexOf(d,t)>-1;delete
f[t],n||(d.push(t),g+= "<br />"+c(e,t));return g}},{"/helpers":4,"lodash-compat/array/indexOf":49,"lodash-
compat/collection/forEach":54,"lodash-compat/collection/map":56,"lodash-compat/lang/cloneDeep":138,"lodash-
compat/lang/isArray":140,"lodash-compat/lang/isEmpty":141,"lodash-compat/lang/isObject":144,"lodash-
compat/lang/isPlainObject":145,"lodash-compat/lang/isUndefined":148,"lodash-
compat/object/keys":149}),8:[function(e,t,n){ "use
strict";var r=e("/http"),i={isObject:e("lodash-
compat/lang/isObject")},a=t.exports=function(){this.errors=[],this.warnings=[],this.modelMap={}};a.prototype.set
DocumentationLocation=function(e){this.docLocation=e},a.prototype.convert=function(e,t,n,r){if(!e||!Array.isArray
(e.apis))return this.finish(r,null);this.clientAuthorizations=t;var
i={swagger:"2.0"};i.originalVersion=e.swaggerVersion,this.apiInfo(e,i),this.securityDefinitions(e,i),e.basePath&&t
his.setDocumentationLocation(e.basePath);var a,o=!1;for(a=0;a<e.apis.length;a++){ var
s=e.apis[a];Array.isArray(s.operations)&&(o=!0)}o?(this.declaration(e,i),this.finish(r,i)):this.resourceListing(e,i,n,r
),a.prototype.declaration=function(e,t){ var
n,r,a,o;if(e.apis){0===e.basePath.indexOf("http://")?(a=e.basePath.substring("http://".length),o=a.indexOf("/"),o>0?
(t.host=a.substring(0,o),t.basePath=a.substring(o)):t.host=a,t.basePath=""):0===e.basePath.indexOf("https://")?(a
=e.basePath.substring("https://".length),o=a.indexOf("/"),o>0?(t.host=a.substring(0,o),t.basePath=a.substring(o)):t
.host=a,t.basePath=""):t.basePath=e.basePath;var
s;if(e.authorizations&&(s=e.authorizations),e.consumes&&(t.consumes=e.consumes),e.produces&&(t.produces=e.p
roduces),i.isObject(e))for(n in e.models){ var
l=e.models[n],u=l.id||n;this.modelMap[u]=n}for(r=0;r<e.apis.length;r++){ var
c=e.apis[r],p=c.path,h=c.operations;this.operations(p,e.resourcePath,h,s,t)}var
f=e.models||{};this.models(f,t)},a.prototype.models=function(e,t){if(i.isObject(e)){ var
n;t.definitions=t.definitions||{};for(n in e){ var r,a=e[n],o=[],s={properties:{}};for(r in a.properties){ var
l=a.properties[r],u={};this.dataType(l,u),l.description&&(u.description=l.description),l["enum"]&&(u["enum"]=l["e
num"]), "boolean"==typeof l.required&&l.required===!0&&o.push(r),"string"==typeof
l.required&&"true"===l.required&&o.push(r),s.properties[r]=u}o.length>0?s.required=o:s.required=a.required,t.def
initions[n]=s}}},a.prototype.extractTag=function(e){ var
t=e||"default";return 0!==t.indexOf("http:")&&0!==t.indexOf("https:")||(t=t.split(["/"]),t=t[t.length-
1].substring(0),t.endsWith(".json")&&(t=t.substring(0,t.length-
".json".length)),t.replace("/","")),a.prototype.operations=function(e,t,n,r,i){if(Array.isArray(n)){ var
a,i.paths||(i.paths={});var o=i.paths[e]||{};s=this.extractTag(t);i.tags=i.tags||[];var
l=!1;for(a=0;a<i.tags.length;a++){ var
u=i.tags[a];u.name===s&&(l=!0)}for(l||i.tags.push({name:s}),a=0;a<n.length;a++){ var
c=n[a],p=(c.method||c.httpMethod).toLowerCase(),h={tags:[s]},f=c.authorizations;if(f&&0===Object.keys(f).lengt
h&&(f=r),"undefined"!=typeof f){ var d;for(var m in f){h.security=h.security||[];var g=f[m];if(g){ var y=[];for(var v
in g)y.push(g[v].scope);d={,d[m]=y,h.security.push(d)}else
d={,d[m]=[],h.security.push(d)} }c.consumes?h.consumes=c.consumes:i.consumes&&(h.consumes=i.consumes),c
.produces?h.produces=c.produces:i.produces&&(h.produces=i.produces),c.summary&&(h.summary=c.summary),c.n

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otes&&(h.description=c.notes),c.nickname&&(h.operationId=c.nickname),c.deprecated&&(h.deprecated=c.depreca
ted),this.authorizations(f,i),this.parameters(h,c.parameters,i),this.responseMessages(h,c,i),o[p]=h)i.paths[e]=o}},a.pr
ototype.responseMessages=function(e,t){if(i.isObject(t)){var
n={};this.dataType(t,n,!n.schema&&n.type&&(n={schema:n}),e.responses=e.responses||{};var
r=1;if(Array.isArray(t.responseMessages)){var a,o=t.responseMessages;for(a=0;a<o.length;a++){var
s=o[a],l={description:s.message};200===s.code&&(r=!0),s.responseModel&&(l.schema={$ref:"#/definitions/"+s.re
sponseModel}),e.responses[""+s.code]=l}}r?e.responses["default"]=n:e.responses[200]=n}},a.prototype.authorizati
ons=function(e){!i.isObject(e)},a.prototype.parameters=function(e,t){if(Array.isArray(t)){var
n;for(n=0;n<t.length;n++){var
r=t[n],i={};if(i.name=r.name,i.description=r.description,i.required=r.required,i["in"]=r.paramType,"body"===i["in"]
)&&(i.name="body"),"form"===i["in"]&&(i["in"]="formData"),r["enum"]&&(i["enum"]=r["enum"]),r.allowMultip
le===!0||"true"===r.allowMultiple){var
a={};if(this.dataType(r,a),i.type="array",i.items=a,r.allowableValues){var
o=r.allowableValues;"LIST"===o.valueType&&(i["enum"]=o.values)}else this.dataType(r,i);"undefined"!=typeof
r.defaultValue&&(i["default"]=r.defaultValue),e.parameters=e.parameters||[],e.parameters.push(i)}}},a.prototype.da
taType=function(e,t){if(i.isObject(e)){e.minimum&&(t.minimum=e.minimum),e.maximum&&(t.maximum=e.maxi
mum),e.format&&(t.format=e.format),"undefined"!=typeof e.defaultValue&&(t["default"]=e.defaultValue);var
n=this.toJsonSchema(e);n&&(t=t||{}),n.type&&(t.type=n.type),n.format&&(t.format=n.format),n.$ref&&(t.schema=
{$ref:n.$ref}),n.items&&(t.items=n.items))}},a.prototype.toJsonSchema=function(e){if(!e)return"object";var
t=e.type||e.dataType||e.responseClass||"",n=t.toLowerCase(),r=(e.format|| "").toLowerCase();if(0===n.indexOf("list["
)){var i=t.substring(5,t.length-
1),a=this.toJsonSchema({type:i});return{type:"array",items:a}}if("int"===n||"integer"===n&&"int32"===r)return{t
ype:"integer",format:"int32"};if("long"===n||"integer"===n&&"int64"===r)return{type:"integer",format:"int64"};if
("integer"===n)return{type:"integer",format:"int64"};if("float"===n||"number"===n&&"float"===r)return{type:"n
umber",format:"float"};if("double"===n||"number"===n&&"double"===r)return{type:"number",format:"double"};i
f("string"===n&&"date-time"===r||"date"===n)return{type:"string",format:"date-
time"};if("string"===n)return{type:"string"};if("file"===n)return{type:"file"};if("boolean"===n)return{type:"boole
an"};if("boolean"===n)return{type:"boolean"};if("array"===n||"list"===n){if(e.items){var
o=this.toJsonSchema(e.items);return{type:"array",items:o}}return{type:"array",items:{type:"object"}}}return
e.$ref?{$ref:this.modelMap[e.$ref]?"/definitions/"+this.modelMap[e.$ref]:e.$ref:"void"===n||""===n?{}:this.mo
delMap[e.type]?{$ref:"#/definitions/"+this.modelMap[e.type]}:{type:e.type}},a.prototype.resourceListing=function
(e,t,n,i){var
a,o=0,s=this,l=e.apis.length,u=t,c={};n&&n.requestInterceptor&&(c.requestInterceptor=n.requestInterceptor),n&&
n.responseInterceptor&&(c.responseInterceptor=n.responseInterceptor);var
p="application/json";for(n&&n.swaggerRequestHeaders&&(p=n.swaggerRequestHeaders),0===l&&this.finish(i,t),
a=0;a<l;a++){var
h=e.apis[a],f=h.path,d=this.getAbsolutePath(e.swaggerVersion,this.docLocation,f),h.description&&(t.tags=t.tags||[],
t.tags.push({name:this.extractTag(h.path),description:h.description||""}));var
m={url:d,headers:{accept:p},on:{},method:"get",timeout:n.timeout};m.on.response=function(e){o+=1;var
t=e.obj;t&&s.declaration(t,u),o===l&&s.finish(i,u)},m.on.error=function(e){console.error(e),o+=1,o===l&&s.finis
h(i,u)},this.clientAuthorizations&&"function"===typeof
this.clientAuthorizations.apply&&this.clientAuthorizations.apply(m),(new
r).execute(m,c)}},a.prototype.getAbsolutePath=function(e,t,n){if("1.0"===e&&t.endsWith(".json")){var
r=t.lastIndexOf("/");r>0&&(t=t.substring(0,r))}var i=t;return
0===n.indexOf("http:")||0===n.indexOf("https:")?i=n:(t.endsWith("/")&&(i=t.substring(0,t.length-
1)),i+=n),i=i.replace("{format}","json")},a.prototype.securityDefinitions=function(e,t){if(e.authorizations){var
n;for(n in e.authorizations){var
r=1,i={vendorExtensions:{}},a=e.authorizations[n];if("apiKey"===a.type)i.type="apiKey",i["in"]=a.passAs,i.name

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=a.keyname||n,r=!0;else if("basicAuth"===a.type)i.type="basicAuth",r=!0;else if("oauth2"===a.type){var
o,s=a.scopes||[],l={};for(o in s){var
u=s[o];l[u.scope]=u.description}if(i.type="oauth2",o>0&&(i.scopes=l),a.grantTypes){if(a.grantTypes.implicit){var
c=a.grantTypes.implicit;i.flow="implicit",i.authorizationUrl=c.loginEndpoint,r=!0}if(a.grantTypes.authorization_code&&!i.flow){var
p=a.grantTypes.authorization_code;i.flow="accessToken",i.authorizationUrl=p.tokenRequestEndpoint.url,i.tokenUrl
=p.tokenEndpoint.url,r=!0}}r&&(t.securityDefinitions=t.securityDefinitions||{},t.securityDefinitions[n]=i)}},a.prototype.apiInfo=function(e,t){if(e.info){var
n=e.info;t.info={},n.contact&&(t.info.contact={},t.info.contact.email=n.contact),n.description&&(t.info.description
=n.description),n.title&&(t.info.title=n.title),n.termsOfServiceUrl&&(t.info.termsOfService=n.termsOfServiceUrl),(
n.license||n.licenseUrl)&&(t.license={},n.license&&(t.license.name=n.license),n.licenseUrl&&(t.license.url=n.licenseUrl))}else
this.warnings.push("missing info section")},a.prototype.finish=function(e,t){e(t)},{"./http":5,"lodash-
compat/lang/isObject":144},9:[function(e,t,n){"use strict";var r=(e("../helpers").log,{isPlainObject:e("lodash-
compat/lang/isPlainObject"),isString:e("lodash-compat/lang/isString")}),i=e("../schema-markup.js"),a=e("js-
yaml"),o=t.exports=function(e,t,n,r){return
this.definition=t||{},this.isArray="array"===t.type,this.models=n||{},this.name=e||t.title||"Inline
Model",this.modelPropertyMacro=r||function(e){return
e["default"]},this};o.prototype.createJSONSample=o.prototype.getSampleValue=function(e){return
e=e||{},e[this.name]=this,this.examples&&r.isPlainObject(this.examples)&&this.examples["application/json"]?(this
.definition.example=this.examples["application/json"],r.isString(this.definition.example)&&(this.definition.example
=a.safeLoad(this.definition.example)):this.definition.example||(this.definition.example=this.examples),i.schemaToJ
SON(this.definition,this.models,e,this.modelPropertyMacro)},o.prototype.getMockSignature=function(){return
i.schemaToHTML(this.name,this.definition,this.models,this.modelPropertyMacro)},{"../helpers":4,"../schema-
markup.js":7,"js-yaml":19,"lodash-compat/lang/isPlainObject":145,"lodash-
compat/lang/isString":146},10:[function(e,t,n){"use strict";function r(e,t){if(i.isEmpty(t))return e[0];for(var
n=0,r=t.length;n<r;n++)if(e.indexOf(t[n])>-1)return t[n];return e[0]}var i={cloneDeep:e("lodash-
compat/lang/cloneDeep"),isUndefined:e("lodash-compat/lang/isUndefined"),isEmpty:e("lodash-
compat/lang/isEmpty"),isObject:e("lodash-
compat/lang/isObject")},a=e("../helpers"),o=e("../model"),s=e("../http"),l=e("q"),u=t.exports=function(e,t,n,r,i,s,l,u,c)
{var
p=[];e=e||{},s=s||{},e&&e.options&&(this.client=e.options.client||null,this.requestInterceptor=e.options.requestInter
ceptor||null,this.responseInterceptor=e.options.responseInterceptor||null),this.authorizations=s.security,this.basePath
=e.basePath||"/",this.clientAuthorizations=c,this.consumes=s.consumes||e.consumes||["application/json"],this.produc
es=s.produces||e.produces||["application/json"],this.deprecated=s.deprecated,this.description=s.description,this.host=
e.host,this.method=r||p.push("Operation "+n+" is missing
method."),this.models=u||{},this.nickname=n||p.push("Operations must have a
nickname."),this.operation=s,this.operations={},this.parameters=null!==(s.parameters||[])?s.parameters||[],this.parent=e,this.path
=i||p.push("Operation "+this.nickname+" is missing
path."),this.responses=s.responses||{},this.scheme=t||e.scheme||"http",this.schemes=s.schemes||e.schemes,this.securit
y=s.security||e.security,this.summary=s.summary||"",this.timeout=e.timeout,this.type=null,this.useJQuery=e.useJQu
ery,this.jqueryAjaxCache=e.jqueryAjaxCache,this.enableCookies=e.enableCookies;var
h;if(this.host||("undefined"!==(typeof
window?this.host=window.location.host:this.host="localhost")),this.parameterMacro=e.parameterMacro||function(e,t)
{return t["default"]},this.inlineModels=[],"/"!==(this.basePath&&"/"===this.basePath.slice(-
1))&&(this.basePath=this.basePath.slice(0,-1)),"string"===typeof
this.deprecated)switch(this.deprecated.toLowerCase()){case"true":case"yes":case"1":this.deprecated=!0;break;case"
false":case"no":case"0":case null:this.deprecated=!1;break;default:this.deprecated=Boolean(this.deprecated)}var

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f,d;if(l)for(h in l)d=new o(h,l[h],this.models,e.modelPropertyMacro),d&&(this.models[h]=d);else
l={};for(f=0;f<this.parameters.length;f++){var
m,g=this.parameters[f];g["default"]=this.parameterMacro(this,g),"array"===g.type&&(g.isList=!0,g.allowMultiple=
!0);var
y=this.getType(g);y&&"boolean"===y.toString().toLowerCase()&&(g.allowableValues={},g.isList=!0,g["enum"]=
[!0,!1]);for(h
in g)a.extractExtensions(h,g),"undefined"!=typeof g["x-example"]&&(m=g["x-example"],g["default"]=m),g["x-
examples"]&&(m=g["x-examples"]["default"],"undefined"!=typeof m&&(g["default"]=m));var
v=g["enum"]||g.items&&g.items["enum"];if("undefined"!=typeof v){var
b;for(g.allowableValues={},g.allowableValues.values=[],g.allowableValues.descriptiveValues=[],b=0;b<v.length;b
++){var
w=v[b],_=w===g["default"]||w+""===g["default"];g.allowableValues.values.push(w),g.allowableValues.descriptive
Values.push({value:w+"" ,isDefault:_})}}"array"===g.type&&(y=[y],"undefined"===typeof
g.allowableValues&&(delete g.isList,delete
g.allowMultiple)),g.modelSignature={type:y,definitions:this.models},g.signature=this.getModelSignature(y,this.mo
dels).toString(),g.sampleJSON=this.getModelSampleJSON(y,this.models),g.responseClassSignature=g.signature}va
r
x,A,S,j=this.responses;j[200]?((S=j[200],A="200");j[201]?((S=j[201],A="201");j[202]?((S=j[202],A="202");j[203]?((S
=j[203],A="203");j[204]?((S=j[204],A="204");j[205]?((S=j[205],A="205");j[206]?((S=j[206],A="206");j["default"]&
&(S=j["default"],A="default");for(x
in j)if(a.extractExtensions(x,j),"string"===typeof x&&x.indexOf("x-")===-1){var E=j[x];if("object"===typeof
E&&"object"===typeof E.headers){var O=E.headers;for(var k in O){var T=O[k];if("object"===typeof T)for(var C in
T)a.extractExtensions(C,T)}}if(S)for(x in S)a.extractExtensions(x,S);if(S&&S.schema){var
I,D=this.resolveModel(S.schema,l);delete
j[A],D?(this.successResponse={},I=this.successResponse[A]=D):S.schema.type&&"object"!=S.schema.type&&"a
rray"!=S.schema.type?(this.successResponse={},I=this.successResponse[A]=S.schema):(this.successResponse={},
I=this.successResponse[A]=new o((void
0),S.schema||{} ,this.models,e.modelPropertyMacro)),I&&(I.vendorExtensions=S.vendorExtensions,S.description&
&(I.description=S.description),S.examples&&(I.examples=S.examples),S.headers&&(I.headers=S.headers)),this.typ
e=S}return
p.length>0&&this.resource&&this.resource.api&&this.resource.api.fail&&this.resource.api.fail(p),this};u.prototype
.isDefaultArrayItemValue=function(e,t){return
t["default"]&&Array.isArray(t["default"])?t["default"].indexOf(e)===-
1:e===t["default"]},u.prototype.getType=function(e){var
t,n=e.type,r=e.format,i=!1;"integer"===n&&"int32"===r?t="integer":"integer"===n&&"int64"===r?t="long":"inte
ger"===n?t="integer":"string"===n?t="date-time"===r?t="date-
time":"date"===r?t="date":"string":"number"===n&&"float"===r?t="float":"number"===n&&"double"===r?t="dou
ble":"number"===n?t="double":"boolean"===n?t="boolean":"array"===n?(i=!0,e.items&&(t=this.getType(e.items)
)):"file"===n&&(t="file"),e.$ref&&(t=a.simpleRef(e.$ref));var o=e.schema;if(o){var s=o.$ref;return
s?(s=a.simpleRef(s),i?[s]:s):"object"===o.type?this.addInlineModel(o):this.getType(o)}return
i?[t]:t,u.prototype.addInlineModel=function(e){var t=this.inlineModels.length,n=this.resolveModel(e,{ });return
n?(this.inlineModels.push(n),"Inline Model "+t:null),u.prototype.getInlineModel=function(e){if(/^Inline
Model \d+$/ .test(e)){var t=parseInt(e.substr("Inline Model ".length).trim(),10),n=this.inlineModels[t];return
n}return null},u.prototype.resolveModel=function(e,t){if("undefined"!=typeof e.$ref){var
n=e.$ref;if(0===n.indexOf("#/definitions/")&&(n=n.substring("#/definitions/".length)),t[n])return new
o(n,t[n],this.models,this.parent.modelPropertyMacro)}else if(e&&"object"===typeof
e&&("object"===e.type||i.isUndefined(e.type)))return new o((void
0),e,this.models,this.parent.modelPropertyMacro);return null},u.prototype.help=function(e){for(var

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t=this.nickname+": "+this.summary+"\n",n=0;n<this.parameters.length;n++){var
r=this.parameters[n],i=r.signature;t+="\n  * "+r.name+" ("+"i+""): "+r.description}return"undefined"==typeof
e&&a.log(t,t),u.prototype.getModelSignature=function(e,t){var n,r;return e instanceof
Array&&(r=!0,e=e[0]),"undefined"==typeof
e?(e="undefined",n=!0):t[e]?(e=t[e],n=!1):this.getInlineModel(e)?(e=this.getInlineModel(e),n=!1):n=!0,n?"Array[
"+e+"]":e.toString():r?"Array["+e.getMockSignature()+"]":e.getMockSignature(),u.prototype.supportHeaderParam
s=function(){return!0},u.prototype.supportedSubmitMethods=function(){return
this.parent.supportedSubmitMethods},u.prototype.getHeaderParams=function(e){for(var
t=this.setContentTypes(e,{}),n={},r=0;r<this.parameters.length;r++){var
i=this.parameters[r];"header"===i["in"]&&(n[i.name.toLowerCase()]=i)}for(var a in e){var
o=n[a.toLowerCase()];if("undefined"!=typeof o){var
s=e[a];Array.isArray(s)&&(s=s.toString()),t[o.name]=s}}return t},u.prototype.urlify=function(e){for(var
t={},n=this.path.replace(/#.*\/,""),r="",i=0;i<this.parameters.length;i++){var
a=this.parameters[i];if("undefined"!=typeof e[a.name])if("path"===a["in"]){var o=new
RegExp("{"+"a.name+""},"gi"),s=e[a.name];s=Array.isArray(s)?this.encodePathCollection(a.collectionFormat,a.nam
e,s):this.encodePathParam(s),n=n.replace(o,s)}else if("query"===a["in"]&&"undefined"!=typeof
e[a.name])if(r+""===r&&n.indexOf("?")<0?"":"&","undefined"!=typeof
a.collectionFormat){var
l=e[a.name];r+=Array.isArray(l)?this.encodeQueryCollection(a.collectionFormat,a.name,l):this.encodeQueryKey(a.
name)+"="+this.encodeQueryParam(e[a.name])}else
r+=this.encodeQueryKey(a.name)+"="+this.encodeQueryParam(e[a.name]);else"formData"===a["in"]&&(t[a.name
]=e[a.name])}var u=this.scheme+"://"+this.host;
return"/"!=this.basePath&&(u+=this.basePath),u+n+r},u.prototype.getMissingParams=function(e){var
t,n=[];for(t=0;t<this.parameters.length;t++){var r=this.parameters[t];r.required===!0&&"undefined"==typeof
e[r.name]&&(n=r.name)}return n},u.prototype.getBody=function(e,t){for(var
n,r,i,a,o,s={},l=!1,u=0;u<this.parameters.length;u++){var r=this.parameters[u],"undefined"!=typeof
t[r.name]?"body"===r["in"]?i=t[r.name]:"formData"===r["in"]&&(s[r.name]={param:r,value:t[r.name]},n=!0):"bo
dy"===r["in"]&&(l=!0);if(l&&"undefined"==typeof i){var c=e["Content-
Type"];c&&0===c.indexOf("application/json")&&(i={})}var p=!1;if(e["Content-Type"]&&e["Content-
Type"].indexOf("multipart/form-data")>=0&&(p=!0),n&&!p){var
h="";for(a in s)r=s[a].param,o=s[a].value,"undefined"!=typeof
o&&(Array.isArray(o)?("!"==h&&(h+="&"),h+=this.encodeQueryCollection(r.collectionFormat,a,o)):("!"==h&&(
h+="&"),h+=encodeURIComponent(a)+"="+encodeURIComponent(o));i=h}else if(p){var f;if("function"==typeof
FormData){f=new FormData,f.type="formData";for(a in s)if(r=s[a].param,o=t[a],"undefined"!=typeof o)if("[object
File]"==={}.toString.apply(o))f.append(a,o);else if("file"===o.type&&o.value)f.append(a,o.value);else
if(Array.isArray(o))if("multi"===r.collectionFormat){f["delete"](a);for(var d in o)f.append(a,o[d])}else
f.append(a,this.encodeQueryCollection(r.collectionFormat,a,o).split("=").slice(1).join("="));else
f.append(a,o);i=f}else{f={};for(a in s)if(o=t[a],Array.isArray(o)){var
m,g=r.collectionFormat||"multi";if("ssv"===g)m=" ";else if("pipes"===g)m="|";else
if("tsv"===g)m="\t";else if("multi"===g){f[a]=o;break}m=","}var
y;o.forEach(function(e){y?y+=m:y="",y+=e}),f[a]=y}else
f[a]=o;i=f}e["Content-Type"]="multipart/form-data"}return
i},u.prototype.getModelSampleJSON=function(e,t){var n,r,a;if(t=t||{},n=e instanceof
Array,a=n?e[0]:e,t[a]?r=t[a].createJSONSample():this.getInlineModel(a)&&(r=this.getInlineModel(a).createJSONS
ample()),r){if(r=n?[r]:r,"string"==typeof r)return r;if(i.isObject(r)){var o=r;if(r instanceof
Array&&r.length>0&&(o=r[0]),o.nodeName&&"Node"==typeof o){var s=(new
XMLSerializer).serializeToString(o);return this.formatXml(s)}return JSON.stringify(r,null,2)}return
r}},u.prototype["do"]=function(e,t,n,r,i){return this.execute(e,t,n,r,i)},u.prototype.execute=function(e,t,n,r,o){var

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u,c,p,h,f=e||{ },d={ };i.isObject(t)&&(d=t,u=n,c=r),h="undefined"!==typeof
d.timeout?d.timeout:this.timeout,this.client&&(d.client=this.client),!d.requestInterceptor&&this.requestInterceptor
&&(d.requestInterceptor=this.requestInterceptor),!d.responseInterceptor&&this.responseInterceptor&&(d.responseI
nterceptor=this.responseInterceptor),"function"===typeof
t&&(u=t,c=n),this.parent.usePromise?p=l.defer():(u=u||this.parent.defaultSuccessCallback||a.log,c=c||this.parent.def
aultErrorCallback||a.log),"undefined"===typeof
d.useJQuery&&(d.useJQuery=this.useJQuery),"undefined"===typeof
d.jqueryAjaxCache&&(d.jqueryAjaxCache=this.jqueryAjaxCache),"undefined"===typeof
d.enableCookies&&(d.enableCookies=this.enableCookies);var m=this.getMissingParams(f);if(m.length>0){ var
g="missing required params: "+m;return a.fail(g),this.parent.usePromise?(p.reject(g),p.promise):(c(g,o),{ })}var
y,v=this.getHeaderParams(f),b=this.setContentTypes(f,d),w={ };for(y in v)w[y]=v[y];for(y in b)w[y]=b[y];var
_=this.getBody(b,f,d),x=this.urlify(f);if(x.indexOf(".{format}")>0&&w){ var
A=w.Accept||w.accept;A&&A.indexOf("json")>0?x=x.replace(".{format}",".json"):A&&A.indexOf("xml")>0&&(
x=x.replace(".{format}",".xml"))}var
S={ url:x,method:this.method.toUpperCase(),body:_,enableCookies:d.enableCookies,useJQuery:d.useJQuery,jquery
AjaxCache:d.jqueryAjaxCache,deferred:p,headers:w,clientAuthorizations:d.clientAuthorizations,on:{ response:funct
ion(e){ return
p?(p.resolve(e),p.promise):u(e,o)},error:function(e){ return p?(p.reject(e),p.promise):c(e,o)} } };return
h&&(S.timeout=h),this.clientAuthorizations.apply(S,this.operation.security),d.mock===!0?S:(new
s).execute(S,d)},u.prototype.setContentTypes=function(e,t){ var
n,i,o=this.parameters,s=e.parameterContentType||r(this.consumes,["application/json","application/yaml"]),l=t.respon
seContentType||r(this.produces,["application/json","application/yaml"]),u=[],c=[],p={ };for(i=0;i<o.length;i++){ var
h=o[i];if("formData"===h["in"])"file"===h.type?u.push(h):c.push(h);else if("header"===h["in"]&&t){ var
f=h.name,d=t[h.name];"undefined"!==typeof t[h.name]&&(p[f]=d)} else"body"===h["in"]&&"undefined"!==typeof
e[h.name]&&(n=e[h.name])}var
m=n||u.length||c.length;if("post"===this.method||"put"===this.method||"patch"===this.method||("delete"===this.met
hod||"get"===this.method)&&m){ if(t.requestContentType&&(s=t.requestContentType),c.length>0){ if(s===void
0,t.requestContentType)s=t.requestContentType;else if(u.length>0)s="multipart/form-data";else
if(this.consumes&&this.consumes.length>0)for(var g in this.consumes){ var
y=this.consumes[g];0!==y.indexOf("application/x-www-form-urlencoded")&&0!==y.indexOf("multipart/form-
data")||(s=y)}"undefined"===typeof s&&(s="application/x-www-form-urlencoded")} } else s=null;return
s&&this.consumes&&this.consumes.indexOf(s)===-1&&a.log("server doesn't consume "+s+", try
"+JSON.stringify(this.consumes)),this.matchesAccept(l)||a.log("server can't produce
"+l),s&&"!=="||"application/x-www-form-urlencoded"===s?p["Content-
Type"]=s:this.consumes&&this.consumes.length>0&&"application/x-www-form-
urlencoded"===this.consumes[0]&&(p["Content-
Type"]=this.consumes[0]),l&&(p.Accept=l),p,u.prototype.matchesAccept=function(e){ return!e||!this.produces||(thi
s.produces.indexOf(e)!==-1||this.produces.indexOf("*/")!==-1)},u.prototype.asCurl=function(e,t){ var
n={ mock:!0};if("object"===typeof t)for(var r in t)n[r]=t[r];var
a=this.execute(e,n);this.clientAuthorizations.apply(a,this.operation.security);var
o=[];if(o.push("-X "+this.method.toUpperCase()),"undefined"!==typeof a.headers){ var s;for(s in a.headers){ var
l=a.headers[s];"string"===typeof l&&(l=l.replace(/\g,"\\u0027")),o.push("--header '"+s+": "+l+"'") } } var
u=!1,c=!1,p=a.headers["Content-Type"];if(p&&0===p.indexOf("application/x-www-form-
urlencoded")?u=!0:p&&0===p.indexOf("multipart/form-data")&&(u=!0,c=!0),a.body){ var
h;if(i.isObject(a.body)){ if(c){ c=!0;for(var f=0;f<this.parameters.length;f++){ var
d=this.parameters[f];if("formData"===d["in"]){ h||(h="");var m;if(m="function"===typeof FormData&&a.body
instanceof FormData?a.body.getAll(d.name):a.body[d.name])if("file"===d.type)m.name&&(h+="-F
"+d.name+"=@"+m.name+" ");else if(Array.isArray(m))if("multi"===d.collectionFormat)for(var g in m)h+="-F

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"+this.encodeQueryKey(d.name)+"="+m[g]+" ";else h+="-F
"+this.encodeQueryCollection(d.collectionFormat,d.name,m)+" ";else h+="-F
"+this.encodeQueryKey(d.name)+"="+m+"
"} } }h||(h=JSON.stringify(a.body))}else h=a.body;h=h.replace(/\//g,"%27").replace(/\n/g,"\\n
"),u||(h=h.replace(/&/g,"%26")),c?o.push(h):o.push("-d "+h.replace(/@/g,"%40")+""))}return"curl "+o.join(" ")+"
"+a.url+"""},u.prototype.encodePathCollection=function(e,t,n){var
r,i="";a="";for(a="ssv"===e?"%20":"tsv"===e?"%09":"pipes"===e?"|":"",r=0;r<n.length;r++)0===r?i=this.encode
QueryParam(n[r]):i+=a+this.encodeQueryParam(n[r]);return
i},u.prototype.encodeQueryCollection=function(e,t,n){var
r,i="";if(e=e||"default","default"===e||"multi"===e)for(r=0;r<n.length;r++)r>0&&(i+="&"),i+=this.encodeQueryKe
y(t)+"="+this.encodeQueryParam(n[r]);else{var a="";if("csv"===e)a=",";else if("ssv"===e)a="%20";else
if("tsv"===e)a="%09";else if("pipes"===e)a="|";else
if("brackets"===e)for(r=0;r<n.length;r++)0!==r&&(i+="&"),i+=this.encodeQueryKey(t)+"["+this.encodeQueryP
aram(n[r]);if("!"===a)for(r=0;r<n.length;r++)0===r?i=this.encodeQueryKey(t)+"="+this.encodeQueryParam(n[r]):i+
=a+this.encodeQueryParam(n[r])}return
i},u.prototype.encodeQueryKey=function(e){return
encodeURIComponent(e).replace("%5B","[").replace("%5D","]").replace("%24","$"),u.prototype.encodeQueryPar
am=function(e){return encodeURIComponent(e)},u.prototype.encodePathParam=function(e){return
encodeURIComponent(e)},{"/helpers":4,"./http":5,"./model":9,"lodash-compat/lang/cloneDeep":138,"lodash-
compat/lang/isEmpty":141,"lodash-compat/lang/isObject":144,"lodash-
compat/lang/isUndefined":148,q:157}],11:[function(e,t,n){"use strict";var
r=t.exports=function(e,t,n,r){this.description=t,this.externalDocs=n,this.name=e,this.operation=r,this.operationsArra
y=[],this.path=e,this.tag=e};r.prototype.sort=function(){},{},12:[function(e,t,n){function r(){if(!s){s=!0;for(var
e,t=o.length;t){e=o,o=[];for(var n=-1;++n<t;)e[n]();t=o.length}s=!1}}function i(){var
a=t.exports={},o=[],s=!1;a.nextTick=function(e){o.push(e,s||setTimeout(r,0)),a.title="browser",a.browser=!0,a.env
={},a.argv=[],a.version="",a.versions={},a.on=i,a.addListener=i,a.once=i,a.off=i,a.removeListener=i,a.removeAllLi
steners=i,a.emit=i,a.binding=function(e){throw
new Error("process.binding is not supported")},a.cwd=function(){return"/"},a.chdir=function(e){throw new
Error("process.chdir is not supported")},a.umask=function(){return
0}},{}],13:[function(e,t,n){(function(e){!function(){"use strict";function n(t){var n;return n=t instanceof e?t:new
e(t.toString(),"binary"),n.toString("base64")}t.exports=n})();call(this,e("buffer").Buffer)},{buffer:14}],14:[functio
n(e,t,n){function r(){return i.TYPED_ARRAY_SUPPORT?2147483647:1073741823}function i(e){return this
instanceof i?(this.length=0,this.parent=void 0,"number"===typeof e?a(this,e):"string"===typeof
e?o(this,e,arguments.length>1?arguments[1]:"utf8"):s(this,e):arguments.length>1?new i(e,arguments[1]):new
i(e)}function a(e,t){if(e=d(e,t<0?0:m(t)),li.TYPED_ARRAY_SUPPORT)for(var n=0;n<t;n++)e[n]=0;return
e}function o(e,t,n){"string"===typeof n&&"!"===n||(n="utf8");var r=0|y(t,n);return
e=d(e,r),e.write(t,n),e}function s(e,t){if(i.isBuffer(t))return l(e,t);if(Q(t))return u(e,t);if(null===t)throw new
TypeError("must start with number, buffer, array or string");if("undefined"!==typeof ArrayBuffer){if(t.buffer
instanceof ArrayBuffer)return c(e,t);if(t instanceof ArrayBuffer)return p(e,t)}return t.length?h(e,t):f(e,t)}function
l(e,t){var n=0|m(t.length);return e=d(e,n),t.copy(e,0,0,n),e}function u(e,t){var n=0|m(t.length);e=d(e,n);for(var
r=0;r<n;r+=1)e[r]=255&t[r];return e}function c(e,t){var n=0|m(t.length);e=d(e,n);for(var
r=0;r<n;r+=1)e[r]=255&t[r];return e}function p(e,t){return
i.TYPED_ARRAY_SUPPORT?(t.byteLength,e=i._augment(new Uint8Array(t))):e=c(e,new
Uint8Array(t)),e}function h(e,t){var n=0|m(t.length);e=d(e,n);for(var r=0;r<n;r+=1)e[r]=255&t[r];return e}function
f(e,t){var n,r=0;"Buffer"===t.type&&Q(t.data)&&(n=t.data,r=0|m(n.length)),e=d(e,r);for(var
i=0;i<r;i+=1)e[i]=255&n[i];return e}function d(e,t){i.TYPED_ARRAY_SUPPORT?e=i._augment(new
Uint8Array(t)):e.length=t,e._isBuffer=!0;var

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n=0!=t&&t<=i.poolSize>>>1;return n&&(e.parent=G),e}function m(e){if(e>=r())throw new
RangeError("Attempt to allocate Buffer larger than maximum size: 0x"+r().toString(16)+" bytes");return
0|e}function g(e,t){if(!(this instanceof g))return new g(e,t);var n=new i(e,t);return delete n.parent,n}function
y(e,t){"string"!=typeof e&&(e=""+e);var n=e.length;if(0===n)return 0;for(var
r=1;;)switch(t){case"ascii":case"binary":case"raw":case"raws":return n;case"utf8":case"utf-8":return
$(e).length;case"ucs2":case"ucs-2":case"utf16le":case"utf-16le":return 2*n;case"hex":return
n>>>1;case"base64":return H(e).length;default:if(r)return $(e).length;t=("" +t).toLowerCase(),r=!0}}function
v(e,t,n){var r=!1;if(t=0|t,n=void
0===n||n===1/0?this.length:0|n,e||(e="utf8"),t<0&&(t=0),n>this.length&&(n=this.length),n<=t)return"";for(;;)switc
h(e){case"hex":return C(this,t,n);case"utf8":case"utf-8":return E(this,t,n);case"ascii":return
k(this,t,n);case"binary":return T(this,t,n);case"base64":return
j(this,t,n);case"ucs2":case"ucs-2":case"utf16le":case"utf-16le":return I(this,t,n);default:if(r)throw new
TypeError("Unknown encoding: " +e);e=(e+"").toLowerCase(),r=!0}}function b(e,t,n,r){n=Number(n)||0;var
i=e.length-n;r?(r=Number(r),r>i&&(r=i)):r=i;var a=t.length;if(a%2!==0)throw new Error("Invalid hex
string");r>a/2&&(r=a/2);for(var o=0;o<r;o++){var s=parseInt(t.substr(2*o,2),16);if(isNaN(s))throw new
Error("Invalid hex string");e[n+o]=s}return o}function w(e,t,n,r){return Y($(t,e.length-n),e,n,r)}function
_(e,t,n,r){return Y(F(t),e,n,r)}function x(e,t,n,r){return _(e,t,n,r)}function A(e,t,n,r){return Y(H(t),e,n,r)}function
S(e,t,n,r){return Y(V(t,e.length-n),e,n,r)}function j(e,t,n){return
0===t&&n===e.length?J.fromByteArray(e):J.fromByteArray(e.slice(t,n))}function
E(e,t,n){n=Math.min(e.length,n);for(var r=[],i=t;i<n;i++){var
a=e[i],o=null,s=a>239?4:a>223?3:a>191?2:1;if(i+s<=n){var l,u,c,p;switch(s){case 1:a<128&&(o=a);break;case
2:l=e[i+1],128===((192&l)&&(p=(31&a)<<6|63&l,p>127&&(o=p)));break;case
3:l=e[i+1],u=e[i+2],128===((192&l)&&128===((192&u)&&(p=(15&a)<<12|(63&l)<<6|63&u,p>2047&&(p<55296|
p>57343)&&(o=p)));break;case
4:l=e[i+1],u=e[i+2],c=e[i+3],128===((192&l)&&128===((192&u)&&128===((192&c)&&(p=(15&a)<<18|(63&l)<<
12|(63&u)<<6|63&c,p>65535&&p<1114112&&(o=p))))}null===o?(o=65533,s=1):o>65535&&(o-
=65536,r.push(o>>>10&1023|55296),o=56320|1023&o),r.push(o),i+=s}return O(r)}function O(e){var
t=e.length;if(t<=K)return String.fromCharCode.apply(String,e);for(var
n="",r=0;r<t;n+=String.fromCharCode.apply(String,e.slice(r,r+=K)));return n}function k(e,t,n){var
r="";n=Math.min(e.length,n);for(var i=t;i<n;i++)r+=String.fromCharCode(127&e[i]);return r}function T(e,t,n){var
r="";n=Math.min(e.length,n);for(var i=t;i<n;i++)r+=String.fromCharCode(e[i]);return r}function C(e,t,n){var
r=e.length;(!t||t<0)&&(t=0),(!n||n<0||n>r)&&(n=r);for(var i="",a=t;a<n;a++)i+=z(e[a]);return i}function
I(e,t,n){for(var r=e.slice(t,n),i="",a=0;a<r.length;a+=2)i+=String.fromCharCode(r[a]+256*r[a+1]);return
i}function D(e,t,n){if(e%1!==0|e<0)throw new RangeError("offset is not uint");if(e+t>n)throw new
RangeError("Trying to access beyond buffer length")}function L(e,t,n,r,a,o){if(!i.isBuffer(e))throw new
TypeError("buffer must be a Buffer instance");if(t>a||t<o)throw new RangeError("value is out of
bounds");if(n+r>e.length)throw new RangeError("index out of range")}function
M(e,t,n,r){t<0&&(t=65535+t+1);for(var i=0,a=Math.min(e.length-n,2);i<a;i++)e[n+i]=(t&255<<8*(r?i:1-
i))>>>8*(r?i:1-i)}function R(e,t,n,r){t<0&&(t=4294967295+t+1);for(var i=0,a=Math.min(e.length-
n,4);i<a;i++)e[n+i]=t>>>8*(r?i:3-i)&255}function U(e,t,n,r,i,a){if(t>i||t<a)throw new RangeError("value is out of
bounds");if(n+r>e.length)throw new RangeError("index out of range");if(n<0)throw new RangeError("index out of
range")}function P(e,t,n,r,i){return i||U(e,t,n,4,3.4028234663852886e38,-
3.4028234663852886e38),W.write(e,t,n,r,23,4),n+4}function q(e,t,n,r,i){return
i||U(e,t,n,8,1.7976931348623157e308,-1.7976931348623157e308),W.write(e,t,n,r,52,8),n+8}function
B(e){if(e=N(e).replace(Z,""),e.length<2)return"";for(;e.length%4!==0;)e+=" ";return e}function N(e){return
e.trim?e.trim():e.replace(/^\s+|\s+$/g,"")}function z(e){return e<16?"0"+e.toString(16):e.toString(16)}function
$(e,t){t=t||1/0;for(var
n,r=e.length,i=null,a=[],o=0;o<r;o++){if(n=e.charCodeAtAt(o),n>55295&&n<57344){if(!i){if(n>56319){(t-=3)>-

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1&&a.push(239,191,189);continue}if(o+1===r){(t=3)>-
1&&a.push(239,191,189);continue}i=n;continue}if(n<56320){(t=3)>-1&&a.push(239,191,189),i=n;continue}n=i-
55296<<10|n-56320|65536}else i&&(t=3)>-1&&a.push(239,191,189);if(i=null,n<128){if((t-
=1)<0)break;a.push(n)}else if(n<2048){if((t=2)<0)break;a.push(n>>6|192,63&n|128)}else if(n<65536){if((t-
=3)<0)break;a.push(n>>12|224,n>>6&63|128,63&n|128)}else{if(!(n<114112))throw new Error("Invalid code
point");if((t=4)<0)break;a.push(n>>18|240,n>>12&63|128,n>>6&63|128,63&n|128)}}return a}function
F(e){for(var t=[],n=0;n<e.length;n++)t.push(255&e.charCodeAtAt(n));return
t}function V(e,t){for(var n,r,i,a=[],o=0;o<e.length&&!(t-
=2)<0;o++)n=e.charCodeAtAt(o),r=n>>8,i=n%256,a.push(i),a.push(r);return a}function H(e){return
J.toByteArray(B(e))}function Y(e,t,n,r){for(var i=0;i<r&&!(i+n>=t.length||i>=e.length);i++)t[i+n]=e[i];return i}var
J=e("base64-js"),W=e("ieee754"),Q=e("is-
array");n.Buffer=i,n.SlowBuffer=g,n.INSPECT_MAX_BYTES=50,i.poolSize=8192;var
G={};i.TYPED_ARRAY_SUPPORT=function(){function e(){try{var t=new Uint8Array(1);return
t.foo=function(){return 42},t.constructor=e,42===t.foo()&&t.constructor===e&&"function"===typeof
t.subarray&&0===t.subarray(1,1).byteLength}catch(n){return!1}}(),i.isBuffer=function(e){return!(null==e||!e._isB
uffer)},i.compare=function(e,t){if(!i.isBuffer(e)||!i.isBuffer(t))throw new TypeError("Arguments must be
Buffers");if(e===t)return 0;for(var n=e.length,r=t.length,a=0,o=Math.min(n,r);a<o&&e[a]===t[a];)++a;return
a!==(o&&(n=e[a],r=t[a]),n<r?-
1:r<n?1:0)},i.isEncoding=function(e){switch(String(e).toLowerCase()){case"hex":case"utf8":case"utf-
8":case"ascii":case"binary":case"base64":case"raw":case"ucs2":case"ucs-2":case"utf16le":case"utf-
16le":return!0;default:return!1}},i.concat=function(e,t){if(!Q(e))throw
new TypeError("list argument must be an Array of Buffers.");if(0===e.length)return new i(0);var n;if(void
0===t)for(t=0,n=0;n<e.length;n++)t+=e[n].length;var r=new i(t),a=0;for(n=0;n<e.length;n++){var
o=e[n];o.copy(r,a),a+=o.length}return r},i.byteLength=y,i.prototype.length=void 0,i.prototype.parent=void
0,i.prototype.toString=function(){var e=0|this.length;return
0===e?"":0===arguments.length?E(this,0,e):v.apply(this,arguments)},i.prototype.equals=function(e){if(!i.isBuffer(
e))throw new TypeError("Argument must be a Buffer");return
this===e||0===i.compare(this,e)},i.prototype.inspect=function(){var e="",t=n.INSPECT_MAX_BYTES;return
this.length>0&&(e=this.toString("hex",0,t).match(/.{2}/g).join(" "),this.length>t&&(e+=" ... ")), "<Buffer
"+e+">"},i.prototype.compare=function(e){if(!i.isBuffer(e))throw
new TypeError("Argument must be a Buffer");return
this===e?0:i.compare(this,e)},i.prototype.indexOf=function(e,t){function n(e,t,n){for(var r=-
1,i=0;n+i<e.length;i++)if(e[n+i]===t[r===-1?0:i-r]){if(r===-1&&(r=i),i-r+1===t.length)return n+r}else r=-
1;return-1}if(t>2147483647?t=2147483647:t<-2147483648&&(t=-2147483648),t>>=0,0===this.length)return-
1;if(t>=this.length)return-1;if(t<0&&(t=Math.max(this.length+t,0)),"string"===typeof e)return 0===e.length?-
1:String.prototype.indexOf.call(this,e,t);if(i.isBuffer(e))return n(this,e,t);if("number"===typeof e)return
i.TYPED_ARRAY_SUPPORT&&"function"===Uint8Array.prototype.indexOf?Uint8Array.prototype.indexOf.call
(this,e,t):n(this,[e],t);throw new TypeError("val must be string, number or
Buffer")},i.prototype.get=function(e){return console.log(".get() is deprecated. Access using array indexes
instead."),this.readUInt8(e)},i.prototype.set=function(e,t){return console.log(".set() is deprecated. Access using
array indexes
instead."),this.writeUInt8(e,t)},i.prototype.write=function(e,t,n,r){if(void 0===t)r="utf8",n=this.length,t=0;else
if(void 0===n&&"string"===typeof t)r=t,n=this.length,t=0;else if(isFinite(t))t=0|t,isFinite(n)?(n=0|n,void
0===r&&(r="utf8")):(r=n,n=void 0);else{var i=r;r=t,t=0|n,n=i}var a=this.length-t;if((void
0===n||n>a)&&(n=a),e.length>0&&(n<0||t<0)||t>this.length)throw new RangeError("attempt to write outside buffer
bounds");r||(r="utf8");for(var o=!1;;switch(r){case"hex":return b(this,e,t,n);case"utf8":case"utf-8":return
w(this,e,t,n);case"ascii":return _(this,e,t,n);case"binary":return x(this,e,t,n);case"base64":return
A(this,e,t,n);case"ucs2":case"ucs-2":case"utf16le":case"utf-16le":return S(this,e,t,n);default:if(o)throw new

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```

TypeError("Unknown encoding:
"+r);r=(""+r).toLowerCase(),o=!0}},i.prototype.toJSON=function(){return{type:"Buffer",data:Array.prototype.slice
.call(this._arr||this,0)}};var K=4096;i.prototype.slice=function(e,t){var n=this.length;e=~e,t=void
0===t?n:~t,e<0?(e+=n,e<0&&(e=0)):e>n&&(e=n),t<0?(t+=n,t<0&&(t=0)):t>n&&(t=n),t<e&&(t=e);var
r;if(i.TYPED_ARRAY_SUPPORT)r=i._augment(this.subarray(e,t));else{var a=t-e;r=new i(a,(void 0));for(var
o=0;o<a;o++)r[o]=this[o+e]}return
r.length&&(r.parent=this.parent||this),r},i.prototype.readUIntLE=function(e,t,n){e=0|e,t=0|t,n||D(e,t,this.length);for(
var r=this[e],i=1,a=0;++a<t&&(i*=256));r+=this[e+a]*i;return
r},i.prototype.readUIntBE=function(e,t,n){e=0|e,t=0|t,n||D(e,t,this.length);for(var r=this[e+--
t],i=1;t>0&&(i*=256));r+=this[e+--t]*i;return r},i.prototype.readUInt8=function(e,t){return
t||D(e,1,this.length),this[e]},i.prototype.readUInt16LE=function(e,t){return
t||D(e,2,this.length),this[e]|this[e+1]<<8},i.prototype.readUInt16BE=function(e,t){return
t||D(e,2,this.length),this[e]<<8|this[e+1]},i.prototype.readUInt32LE=function(e,t){return
t||D(e,4,this.length),(this[e]|this[e+1]<<8|this[e+2]<<16]+16777216*this[e+3]),i.prototype.readUInt32BE=function(
e,t){return
t||D(e,4,this.length),16777216*this[e]+(this[e+1]<<16|this[e+2]<<8|this[e+3])},i.prototype.readIntLE=function(e,t,n
){e=0|e,t=0|t,n||D(e,t,this.length);for(var
r=this[e],i=1,a=0;++a<t&&(i*=256));r+=this[e+a]*i;return i*=128,r>=i&&(r-
=Math.pow(2,8*t)),r},i.prototype.readIntBE=function(e,t,n){e=0|e,t=0|t,n||D(e,t,this.length);for(var
r=t,i=1,a=this[e+--r];r>0&&(i*=256);)a+=this[e+--r]*i;return i*=128,a>=i&&(a-
=Math.pow(2,8*t)),a},i.prototype.readInt8=function(e,t){return t||D(e,1,this.length),128&this[e]?(255-this[e]+1)*-
1:this[e]},i.prototype.readInt16LE=function(e,t){t||D(e,2,this.length);var n=this[e]|this[e+1]<<8;return
32768&n?4294901760|n:n},i.prototype.readInt16BE=function(e,t){t||D(e,2,this.length);var
n=this[e+1]|this[e]<<8;return 32768&n?4294901760|n:n},i.prototype.readInt32LE=function(e,t){return
t||D(e,4,this.length),this[e]|this[e+1]<<8|this[e+2]<<16|this[e+3]<<24},i.prototype.readInt32BE=function(e,t){return
t||D(e,4,this.length),this[e]<<24|this[e+1]<<16|this[e+2]<<8|this[e+3]},i.prototype.readFloatLE=function(e,t){return
t||D(e,4,this.length),W.read(this,e,!0,23,4)},i.prototype.readFloatBE=function(e,t){return
t||D(e,4,this.length),W.read(this,e,!1,23,4)},i.prototype.readDoubleLE=function(e,t){return
t||D(e,8,this.length),W.read(this,e,!0,52,8)},i.prototype.readDoubleBE=function(e,t){return
t||D(e,8,this.length),W.read(this,e,!1,52,8)},i.prototype.writeUIntLE=function(e,t,n,r){e+=e,t=0|t,n=0|n,r||L(this,e,t,n,
Math.pow(2,8*n),0);var i=1,a=0;for(this[t]=255&e;++a<n&&(i*=256);)this[t+a]=e/i&255;return
t+n},i.prototype.writeUIntBE=function(e,t,n,r){e+=e,t=0|t,n=0|n,r||L(this,e,t,n,Math.pow(2,8*n),0);var i=n-
1,a=1;for(this[t+i]=255&e;--i>=0&&(a*=256);)this[t+i]=e/a&255;return
t+n},i.prototype.writeUInt8=function(e,t,n){return
e+=e,t=0|t,n||L(this,e,t,1,255,0),i.TYPED_ARRAY_SUPPORT||(e=Math.floor(e)),this[t]=e,t+1},i.prototype.writeUI
nt16LE=function(e,t,n){return
e+=e,t=0|t,n||L(this,e,t,2,65535,0),i.TYPED_ARRAY_SUPPORT?(this[t]=e,this[t+1]=e>>>8):M(this,e,t,!0),t+2},i.p
rototype.writeUInt16BE=function(e,t,n){return
e+=e,t=0|t,n||L(this,e,t,2,65535,0),i.TYPED_ARRAY_SUPPORT?(this[t]=e>>>8,this[t+1]=e):M(this,e,t,!1),t+2},i.p
rototype.writeUInt32LE=function(e,t,n){return
e+=e,t=0|t,n||L(this,e,t,4,4294967295,0),i.TYPED_ARRAY_SUPPORT?(this[t+3]=e>>>24,this[t+2]=e>>>16,this[t
+1]=e>>>8,this[t]=e):R(this,e,t,!0),t+4},i.prototype.writeUInt32BE=function(e,t,n){return
e+=e,t=0|t,n||L(this,e,t,4,4294967295,0),i.TYPED_ARRAY_SUPPORT?(this[t]=e>>>24,this[t+1]=e>>>16,this[t+2]
=e>>>8,this[t+3]=e):R(this,e,t,!1),t+4},i.prototype.writeIntLE=function(e,t,n,r){if(e+=e,t=0|t,!r){var
i=Math.pow(2,8*n-1);L(this,e,t,n,i-1,-i)}var
a=0,o=1,s=e<0?1:0;for(this[t]=255&e;++a<n&&(o*=256);)this[t+a]=(e/o>>0)-s&255;return
t+n},i.prototype.writeIntBE=function(e,t,n,r){if(e+=e,t=0|t,!r){var i=Math.pow(2,8*n-1);L(this,e,t,n,i-1,-i)}var a=n-
1,o=1,s=e<0?1:0;for(this[t+a]=255&e;--a>=0&&(o*=256);)this[t+a]=(e/o>>0)-s&255;return

```



```

l),o=l>0?e.length-4:e.length;var
p=0;for(r=0,i=0;r<o;r+=4,i+=3)s=t(e.charAt(r))<<18|t(e.charAt(r+1))<<12|t(e.charAt(r+2))<<6|t(e.charAt(r+3)),n((1
6711680&s)>>16),n((65280&s)>>8),n(255&s);return
2===l?(s=t(e.charAt(r))<<2|t(e.charAt(r+1))>>4,n(255&s)):1===l&&(s=t(e.charAt(r))<<10|t(e.charAt(r+1))<<4|t(e.
charAt(r+2))>>2,n(s>>8&255),n(255&s)),u}function i(e){function t(e){return r.charAt(e)}function n(e){return
t(e>>18&63)+t(e>>12&63)+t(e>>6&63)+t(63&e)}var i,a,o,s=e.length%3,l="";for(i=0,o=e.length-
s;i<o;i+=3)a=(e[i]<<16)+(e[i+1]<<8)+e[i+2],l+=n(a);switch(s){case 1:a=e[e.length-
1],l+=t(a>>2),l+=t(a<<4&63),l+="=";break;case 2:a=(e[e.length-2]<<8)+e[e.length-
1],l+=t(a>>10),l+=t(a>>4&63),l+=t(a<<2&63),l+="="}return
l}var a="undefined"!=typeof
Uint8Array?Uint8Array:Array,o="+".charCodeAt(0),s="/" charCodeAt(0),l="0" charCodeAt(0),u="a" charCodeAt(
0),c="A" charCodeAt(0),p="-
".charCodeAt(0),h="_" charCodeAt(0);e.toByteArray=n,e.fromByteArray=i)("undefined"==typeof
n?this.base64js={}:n)},{}},16:[function(e,t,n){n.read=function(e,t,n,r,i){var a,o,s=8*i-r-1,l=(1<<s)-1,u=l>>1,c=-
7,p=n?i-1:0,h=n?-1:1,f=e[t+p];for(p+=h,a=f&(1<<-c)-1,f>>=-c,c+=s;c>0;a=256*a+e[t+p],p+=h,c-
=8);for(o=a&(1<<-c)-1,a>>=-c,c+=r;c>0;o=256*o+e[t+p],p+=h,c-=8);if(0===a)a=1-u;else if(a===l)return
o?NaN:(f?-1:1)*(1/0);o+=Math.pow(2,r),a-=u}return(f?-1:1)*o*Math.pow(2,a-r)},n.write=function(e,t,n,r,i,a){var
o,s,l,u=8*a-i-1,c=(1<<u)-1,p=c>>1,h=23===i?Math.pow(2,-24)-Math.pow(2,-77):0,f=r?0:a-1,d=r?1:-
1,m=t<0||0===t&&1/t<0?1:0;for(t=Math.abs(t),isNaN(t)||t===1/0?(s=isNaN(t)?1:0,o=c):(o=Math.floor(Math.log(t)/
Math.LN2),t*(l=Math.pow(2,-o))<1&&(o--,l*=2),t+=o+p>=1?h/l:h*Math.pow(2,1-
p),t*l>=2&&(o++,l/=2),o+p>=c?(s=0,o=c):o+p>=1?(s=(t*1-1)*Math.pow(2,i),o+=p):(s=t*Math.pow(2,p-
1)*Math.pow(2,i),o=0));i>=8;e[n+f]=255&s,f+=d,s/=256,i-
=8);for(o=o<<i|s,u+=i;u>0;e[n+f]=255&o,f+=d,o/=256,u-=8);e[n+f-d]=128*m}},{}},17:[function(e,t,n){var
r=Array.isArray,i=Object.prototype.toString;t.exports=r||function(e){return!!e&&"[object
Array]"==i.call(e)},{}},18:[function(e,t,n){!function(){use strict};function e(t,n,r,i){return this instanceof
e?(this.domain=t||void 0,this.path=n||"/",this.secure=!!r,this.script=!!i,this):new e(t,n,r,i)}function t(e,n,r){return e
instanceof t?e:this instanceof
t?(this.name=null,this.value=null,this.expiration_date=1/0,this.path=String(r||"/"),this.explicit_path=!1,this.domain=
n||null,this.explicit_domain=!1,this.secure=!1,this.noscript=!1,e&&this.parse(e,n,r),this):new t(e,n,r)}function
r(){var e,n,i;return this instanceof r?(e=Object.create(null),this.setCookie=function(r,a,o){var s,l;if(r=new
t(r,a,o),s=r.expiration_date<=Date.now(),void
0!==e[r.name]){for(n=e[r.name],l=0;l<n.length;l+=1)if(i=n[l],i.collidesWith(r))return
s?(n.splice(l,1),0===n.length&&delete
e[r.name],!1):(n[l]=r,r);return!s&&(n.push(r),r)}return!s&&(e[r.name]=[r],e[r.name]),this.getCookie=function(t,r){
var i,a;if(n=e[t])for(a=0;a<n.length;a+=1)if(i=n[a],i.expiration_date<=Date.now())0===n.length&&delete
e[i.name];else if(i.matches(r))return i},this.getCookies=function(t){var n,r,i=[];for(n in
e)r=this.getCookie(n,t),r&&i.push(r);return i.toString=function(){return
i.join(";")},i.toString=function(){return i.map(function(e){return e.toString()}).join(";"),i},this):new
r}n.CookieAccessInfo=e,n.Cookie=t,t.prototype.toString=function(){var e=[this.name+"="+this.value];return
this.expiration_date!==1/0&&e.push("expires="+new
Date(this.expiration_date).toGMTString()),this.domain&&e.push("domain="+this.domain),this.path&&e.push("pat
h="+this.path),this.secure&&e.push("secure"),this.noscript&&e.push("httponly"),e.join(";
")},t.prototype.toString=function(){return
this.name+"="+this.value};var i=/[:](?=\s*[a-zA-Z0-9_-]+\s*[=])/g;t.prototype.parse=function(e,n,r){if(this
instanceof t){var
i,a=e.split(";").filter(function(e){return!!e}),o=a[0].match(/([^\s]+)=([\s\S]*)/),s=o[1],l=o[2];for(this.name=s,this.val
ue=l,i=1;i<a.length;i+=1)switch(o=a[i].match(/([^\s]+)=([\s\S]*)?/),s=o[1].trim().toLowerCase(),
l=o[2],s){case"httponly":this.noscript=!0;break;case"expires":this.expiration_date=l?Number(Date.parse(l)):1/0;brea

```



```

k;case"path":this.path=l?!l.trim():"";this.explicit_path=!0;break;case"domain":this.domain=l?!l.trim():"";this.explicit_
domain=!!this.domain;break;case"secure":this.secure=!0}return
this.explicit_path||(this.path=r||"/"),this.explicit_domain||(this.domain=n),this}return(new
t).parse(e,n,r)},t.prototype.matches=function(e){return!(this.noscript&&e.script||this.secure&&e.secure||!this.collid
esWith(e))},t.prototype.collidesWith=function(e){if(this.path&&!e.path||this.domain&&!e.domain)return!1;if(this.p
ath&&0!==e.path.indexOf(this.path))return!1;if(this.explicit_path&&0!==e.path.indexOf(this.path))return!1;var
t=e.domain&&e.domain.replace(/^[.]/,""),n=this.domain&&this.domain.replace(/^[.]/,"");if(n===t)return!0;if(n){if
(!this.explicit_domain)return!1;var r=t.indexOf(n);return r!==-1&&r===t.length-
n.length}return!0},n.CookieJar=r,r.prototype.setCookies=function(e,n,r){e=Array.isArray(e)?e:e.split(i);var
a,o,s=[];for(e=e.map(function(e){return new
t(e,n,r)}),a=0;a<e.length;a+=1)o=e[a],this.setCookie(o,n,r)&&s.push(o);return s}}(),{}},19:[function(e,t,n){
"use strict";var r=e("./lib/js-yaml.js");t.exports=r},{"/lib/js-yaml.js":20}],20:[function(e,t,n){
"use strict";function
r(e){return function(){throw new Error("Function "+e+" is deprecated and cannot be used.")}}var i=e("./js-
yaml/loader"),a=e("./js-yaml/dumper");t.exports.Type=e("./js-yaml/type"),t.exports.Schema=e("./js-
yaml/schema"),t.exports.FAILSAFE_SCHEMA=e("./js-yaml/schema/failsafe"),t.exports.JSON_SCHEMA=e("./js-
yaml/schema/json"),t.exports.CORE_SCHEMA=e("./js-
yaml/schema/core"),t.exports.DEFAULT_SAFE_SCHEMA=e("./js-
yaml/schema/default_safe"),t.exports.DEFAULT_FULL_SCHEMA=e("./js-
yaml/schema/default_full"),t.exports.load=i.load,t.exports.loadAll=i.loadAll,t.exports.safeLoad=i.safeLoad,t.exports
.safeLoadAll=i.safeLoadAll,t.exports.dump=a.dump,t.exports.safeDump=a.safeDump,t.exports.YAMLError=e(
"./js-yaml/exception"),t.exports.MINIMAL_SCHEMA=e("./js-
yaml/schema/failsafe"),t.exports.SAFE_SCHEMA=e("./js-
yaml/schema/default_safe"),t.exports.DEFAULT_SCHEMA=e("./js-
yaml/schema/default_full"),t.exports.scan=r("scan"),t.exports.parse=r("parse"),t.exports.compose=r("compose"),t.ex
ports.addConstructor=r("addConstructor")},{"/js-yaml/dumper":22,"./js-yaml/exception":23,"./js-
yaml/loader":24,"./js-yaml/schema":26,"./js-yaml/schema/core":27,"./js-yaml/schema/default_full":28,"./js-
yaml/schema/default_safe":29,"./js-yaml/schema/failsafe":30,"./js-yaml/schema/json":31,"./js-
yaml/type":32}],21:[function(e,t,n){
"use strict";function r(e){return"undefined"===typeof
e||null===e}function i(e){return"object"===typeof e&&null!==e}function a(e){return
Array.isArray(e)?e:r(e)?[]:[e]}function o(e,t){var
n,r,i,a;if(t)for(a=Object.keys(t),n=0,r=a.length;n<r;n+=1)i=a[n],e[i]=t[i];return e}function s(e,t){var
n,r="";for(n=0;n<t;n+=1)r+=e;return r}function l(e){return
0===e&&Number.NEGATIVE_INFINITY===1/e}t.exports.isNothing=r,t.exports.isObject=i,t.exports.toArray=a,t
.exports.repeat=s,t.exports.isNegativeZero=l,t.exports.extend=o},{},22:[function(e,t,n){
"use strict";function
r(e,t){var
n,r,i,a,o,s,l;if(null===t)return{};for(n={},r=Object.keys(t),i=0,a=r.length;i<a;i+=1)o=r[i],s=String(t[o]),"!!"===o.sli
ce(0,2)&&(o="tag:yaml.org,2002:"+o.slice(2)),l=e.compiledTypeMap[o],l&&R.call(l.styleAliases,s)&&(s=l.styleAl
iases[s]),n[o]=s;return n}function i(e){var t,n,r;if(t=e.toString(16).toUpperCase(),e<=255)n="x",r=2;else
if(e<=65535)n="u",r=4;else{if(!(e<=4294967295))throw new I("code point within a string may not be greater than
0xFFFFFFFF");n="U",r=8}return"\\ "+n+C.repeat("0",r-t.length)+t}function
a(e){this.schema=e.schema||D,this.indent=Math.max(1,e.indent||2),this.skipInvalid=e.skipInvalid||!1,this.flowLevel=
C.isNothing(e.flowLevel)?-
1:e.flowLevel,this.styleMap=r(this.schema,e.styles||null),this.sortKeys=e.sortKeys||!1,this.lineWidth=e.lineWidth||8
0,this.noRefs=e.noRefs||!1,this.noCompatMode=e.noCompatMode||!1,this.implicitTypes=this.schema.compiledImpl
icit,this.explicitTypes=this.schema.compiledExplicit,this.tag=null,this.result="",this.duplicates=[],this.usedDuplicate
s=null}function o(e,t){for(var n,r=C.repeat(" ",t),i=0,a=-1,o="",s=e.length;i<s;a=e.indexOf("\n",i),a===-
1?(n=e.slice(i,i+s):(n=e.slice(i,a+1),i=a+1),n.length&&"\n"!==n&&(o+=r),o+=n;return o)}function

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```

s(e,t){return"\n"+C.repeat(" ",e.indent*t)}function l(e,t){var
n,r,i;for(n=0,r=e.implicitTypes.length;n<r;n+=1)if(i=e.implicitTypes[n],i.resolve(t))return!0;return!1}function
u(e){return e===q||e===U}function c(e){return
32<=e&&e<=126||161<=e&&e<=55295&&8232!==(e&&8233)===e||57344<=e&&e<=65533&&65279!==(e||65536<
=e&&e<=1114111)}function
p(e){return c(e)&&65279!==(e&&e!==(Y&&e!==(X&&e!==(Z&&e!==(te&&e!==(re&&e!==(W&&e!==(z}function
h(e){return
c(e)&&65279!==(e&&!u(e)&&e!==(J&&e!==(G&&e!==(W&&e!==(Y&&e!==(X&&e!==(Z&&e!==(te&&e!==(re&&e!
==z&&e!==(F&&e!==(H&&e!==(B&&e!==(ne&&e!==(Q&&e!==(V&&e!==(N&&e!==(S&&e!==(K&&e!==(ee}functio
n f(e,t,n,r,i){var a,o,s=!1,l=!1,f=r!==-1,d=-1,m=h(e.charCodeAtAt(0))&&!u(e.charCodeAtAt(e.length-
1));if(t)for(a=0;a<e.length;a++){if(o=e.charCodeAtAt(a),!c(o))return
ce;m=m&m&p(o)}else{for(a=0;a<e.length;a++){if(o=e.charCodeAtAt(a),o===P)s=!0,f&&(l=!|a-d-1>r&&"
"!==(e[d+1],d=a);else if(!c(o))return ce;m=m&m&p(o)}l=|f&&a-d-1>r&&" "!==(e[d+1])return s||l?"
"===e[0]&&n>9?ce:l?ue:le:m&&!i(e)?oe:se}function d(e,t,n,r){e.dump=function(){function i(t){return
l(e,t)if(0===t.length)return"";if(!e.noCompatMode&&ae.indexOf(t)!=-1)return""+t+"";var
a=e.indent*Math.max(1,n),s=e.lineWidth===-1?-1:Math.max(Math.min(e.lineWidth,40),e.lineWidth-
a),u=r||e.flowLevel>-1&&n>=e.flowLevel;switch(f(t,u,e.indent,s,i)){case
oe:return t;case se:return""+t.replace(/"/g,"")+"";case le:return""+m(t,e.indent)+g(o(t,a));case
ue:return">" +m(t,e.indent)+g(o(y(t,s),a));case ce:return""+b(t,s)+"";default:throw new I("impossible error: invalid
scalar style")}}()function m(e,t){var n=" "===e[0]?String(t):"";r="n"===e[e.length-1],i=r&&("n"===e[e.length-
2])||("n"===e),a=i?"":r?"": "-";return n+a+"n"}function g(e){return"n"===e[e.length-1]?e.slice(0,-1):e}function
y(e,t){for(var n,r,i=/\n+)([^\n]*)/g,a=function(){var n=e.indexOf("n");return n=n!==-
1?n:e.length,i.lastIndex=n,v(e.slice(0,n),t)}(),o="n"===e[0]||" "===e[0];r=i.exec(e);){var s=r[1],l=r[2];n="
"===l[0],a+=s+(o||n||" "===l?"": "n")+v(l,t),o=n}return a}function v(e,t){if(" "===e||" "===e[0])return e;for(var
n,r,i=/\n+)([^\n]*)/g,a=0,o=0,s=0,l="";n=i.exec(e);s=n.index,s-a>t&&(r=o>a?o:s,l+="n"+e.slice(a,r),a=r+1),o=s;return
l+="n",l+=e.length-a>t&&o>a?e.slice(a,o)+"n"+e.slice(o+1):e.slice(a),l.slice(1)}function
b(e){for(var t,n,r=" ",a=0;a<e.length;a++)t=e.charCodeAtAt(a),n=ie[t],r+=!n&&c(t)?e[a]:n||i(t);return r}function
w(e,t,n){var r,i,a=" ",o=e.tag;for(r=0,i=n.length;r<i;r+=1)j(e,t,n[r],1,1)&&(0!==(r&&a+=
"),a+=e.dump);e.tag=o,e.dump="["+a+"]"}function _(e,t,n,r){var
i,a,o=" ",l=e.tag;for(i=0,a=n.length;i<a;i+=1)j(e,t+1,n[i],!0,!0)&&(r&&0===i||(o+=s(e,t)),o+= "-
"+e.dump);e.tag=l,e.dump=o||"[]"}function x(e,t,n){var
r,i,a,o,s,l=" ",u=e.tag,c=Object.keys(n);for(r=0,i=c.length;r<i;r+=1)s=" ",0!==(r&&(s+=
"),a=c[r],o=n[a],j(e,t,a,!1,!1)&&(e.dump.length>1024&&(s+="? "),s+=e.dump+";
"+j(e,t,o,!1,!1)&&(s+=e.dump,l+=s));e.tag=u,e.dump="{"+l+""}"}function A(e,t,n,r){var
i,a,o,l,u,c,p=" ",h=e.tag,f=Object.keys(n);if(e.sortKeys===!0)f.sort();else if("function"===typeof
e.sortKeys)f.sort(e.sortKeys);else if(e.sortKeys)throw new I("sortKeys must be a boolean or a
function");for(i=0,a=f.length;i<a;i+=1)c=" ",r&&0===i||(c+=s(e,t)),o=f[i],l=n[o],j(e,t+1,o,!0,!0)&&(u=null!==(e.ta
g&&"?"!==(e.tag||e.dump&&e.dump.length>1024,u&&(c+=e.dump&&P===e.dump.charCodeAtAt(0)?":":
"),c+=e.dump,u&&(c+=s(e,t)),j(e,t+1,l,!0,u)&&(c+=e.dump&&P===e.dump.charCodeAtAt(0)?":":
",c+=e.dump,p+=c));e.tag=h,e.dump=p||"{}"}function S(e,t,n){var
r,i,a,o,s,l;for(i=n?e.explicitTypes:e.implicitTypes,a=0,o=i.length;a<o;a+=1)if(s=i[a],(s instanceof|s.predicate)&&(!s
 instanceof|"object"===typeof t&&t instanceof
s instanceof)&&(!s.predicate||s.predicate(t)))if(e.tag=n?s.tag:"?",s.represent){if(l=e.styleMap[s.tag]||s.defaultStyle,
"[object Function]"===M.call(s.represent))r=s.represent(t,l);else if(!R.call(s.represent,l))throw new I("!"<"+s.tag+>
tag resolver accepts not "+l+" style");r=s.represent[l](t,l)}e.dump=r}return!0}return!1}function
j(e,t,n,r,i,a){e.tag=null,e.dump=n,S(e,n,!1)||S(e,n,!0);var
o=M.call(e.dump);r&&(r=e.flowLevel<0||e.flowLevel>t);var s,l,u="[object Object]"===o||"[object
Array]"===o;if(u&&(s=e.duplicates.indexOf(n),l=s!==-

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1),(null!==e.tag&&"?"!==e.tag|||2!==e.indent&&t>0)&&(i!=1),l&&e.usedDuplicats[s])e.dump="*ref_"+s;else{if
(u&&l&&!e.usedDuplicats[s]&&(e.usedDuplicats[s]!=0),"[object
Object]"===o)r&&0!==Object.keys(e.dump).length?(A(e,t,e.dump,i),l&&(e.dump="&ref_"+s+e.dump)):x(e,t,e.du
mp),l&&(e.dump="&ref_"+s+" "+e.dump));else if("[object
Array]"===o)r&&0!==e.dump.length?(_(e,t,e.dump,i),l&&(e.dump="&ref_"+s+e.dump)):w(e,t,e.dump),l&&(e.du
mp="&ref_"+s+" "+e.dump));else if("[object String]"===o){if(e.skipInvalid)return!1;throw new I("unacceptable
kind of an object to dump
"+o)}?"!==e.tag&&d(e,e.dump,t,a)}null!==e.tag&&"?"!==e.tag&&(e.dump="!<"+e.tag+">
"+e.dump)}return!0}function E(e,t){var
n,r,i=[],a=[];for(O(e,i,a),n=0,r=a.length;n<r;n+=1)t.duplicats.push(i[a[n]]);t.usedDuplicats=new Array(r)}function
O(e,t,n){var r,i,a;if(null!==e&&"object"===typeof e)if(i=t.indexOf(e),i!==-1)n.indexOf(i)===-1&&n.push(i);else
if(t.push(e),Array.isArray(e))for(i=0,a=e.length;i<a;i+=1)O(e[i],t,n);else
for(r=Object.keys(e),i=0,a=r.length;i<a;i+=1)O(e[r[i]],t,n)}function k(e,t){t=t||{};var
n=new a(t);return n.noRefs||E(e,n),j(n,0,e,!0,!0)?n.dump+"\n":""}function T(e,t){return
k(e,C.extend({schema:L},t))}var
C=e("./common"),I=e("./exception"),D=e("./schema/default_full"),L=e("./schema/default_safe"),M=Object.prototype
e.toString,R=Object.prototype.hasOwnProperty,U=9,P=10,q=32,B=33,N=34,z=35,$=37,F=38,V=39,H=42,Y=44,J=
45,W=58,Q=62,G=63,K=64,X=91,Z=93,ee=96,te=123,ne=124,re=125,ie={};ie[0]="\0",ie[7]="\a",ie[8]="\b",ie[9]
="\t",ie[10]="\n",ie[11]="\v",ie[12]="\f",ie[13]="\r",ie[27]="\e",ie[34]="\\",ie[92]="\\",ie[133]="\\N",ie[160]="
\\_",ie[8232]="\\L",ie[8233]="\\P";var
ae=["y","Y","yes","Yes","YES","on","On","ON","n","N","no","No","NO","off","Off","OFF"],oe=1,se=2,le=3,ue=4
,ce=5;t.exports.dump=k,t.exports.safeDump=T},{"/common":21,"/exception":23,"/schema/default_full":28,"/sche
ma/default_safe":29}],23:[function(e,t,n){"use strict";function
r(e,t){Error.call(this),Error.captureStackTrace?Error.captureStackTrace(this,this.constructor):this.stack=(new
Error).stack||"",this.name="YAMLEException",this.reason=e,this.mark=t,this.message=(this.reason||(unknown
reason)))+(this.mark?"
"+this.mark.toString():"")}r.prototype=Object.create(Error.prototype),r.prototype.constructor=r,r.prototype.toString
=function(e){var t=this.name+" ":return t+=this.reason||(unknown reason),!e&&this.mark&&(t+="
"+this.mark.toString()),t,t.exports=r},{},24:[function(e,t,n){"use strict";function r(e){return
10===e||13===e}function i(e){return 9===e||32===e}function a(e){return
9===e||32===e||10===e||13===e}function o(e){return 44===e||91===e||93===e||123===e||125===e}function
s(e){var t;return 48<=e&&e<=57?e-48:(t=32|e,97<=t&&t<=102?t-97+10:-1)}function l(e){return
120===e?2:117===e?4:85===e?8:0}function u(e){return 48<=e&&e<=57?e-48:-1}function c(e){return
48===e?"\0":97===e?"
":98===e?"\b":116===e?"\t":9===e?"\n":110===e?"\f":118===e?"\x0B":102===e?"\f":114===e?"\r":101===e?"
":32===e?"
":34===e?"\"":47===e?"'":92===e?"\\":78===e?"\"":95===e?"\"":76===e?"\u2028":80===e?"\u2029":""}function
p(e){return e<=65535?String.fromCharCode(e):String.fromCharCode((e-65536>>10)+55296,(e-
65536&1023)+56320)}function
h(e,t){this.input=e,this.filename=t.filename||null,this.schema=t.schema||V,this.onWarning=t.onWarning||null,this.leg
acy=t.legacy||!1,this.json=t.json||!1,this.listener=t.listener||null,this.implicitTypes=this.schema.compiledImplicit,this.
typeMap=this.schema.compiledTypeMap,this.length=e.length,this.position=0,this.line=0,this.lineStart=0,this.lineInd
ent=0,this.documents=[]}function f(e,t){return new z(t,new $(e.filename,e.input,e.position,e.line,e.position-
e.lineStart))}function d(e,t){throw f(e,t)}function m(e,t){e.onWarning&&e.onWarning.call(null,f(e,t))}function
g(e,t,n,r){var
i,a,o,s;if(t<n){if(s=e.input.slice(t,n),r)for(i=0,a=s.length;i<a;i+=1)o=s.charCodeAt(i),9===o||32<=o&&o<=1114111|
|d(e,"expected valid JSON character");else Z.test(s)&&d(e,"the stream contains non-printable
characters");e.result+=s}}function y(e,t,n,r){var i,a,o,s;for(N.isObject(n)||d(e,"cannot

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merge mappings; the provided source object is
unacceptable"),i=Object.keys(n),o=0,s=i.length;o<s;o+=1)a=i[o],H.call(t,a)||t[a]=n[a],r[a]=!0)}function
v(e,t,n,r,i,a){var
o,s;if(i=String(i),null===t&&(t={}),"tag:yaml.org,2002:merge"===r)if(Array.isArray(a))for(o=0,s=a.length;o<s;o+
=1)y(e,t,a[o],n);else y(e,t,a,n);else e.json||H.call(n,i)||H.call(t,i)||d(e,"duplicated mapping key"),t[i]=a,delete
n[i];return t}function b(e){var
t;t=e.input.charCodeAtAt(e.position),10===t?e.position++:13===t?(e.position++,10===e.input.charCodeAtAt(e.position
)&&e.position++):d(e,"a line break is expected"),e.line+=1,e.lineStart=e.position}function w(e,t,n){for(var
a=0,o=e.input.charCodeAtAt(e.position);0!==o;){for(;i(o);)o=e.input.charCodeAtAt(++e.position);if(t&&35===o)do
o=e.input.charCodeAtAt(++e.position);while(10!==o&&13===o&&0!==o);if(!r(o))break;for(b(e),o=e.input.charCodeAt
At(e.position),a++,e.lineIndent=0;32===o;)e.lineIndent++,o=e.input.charCodeAtAt(++e.position)}return n!==-
1&&0!==a&&e.lineIndent<n&&m(e,"deficient
indentation"),a}function _(e){var t,n=e.position;return
t=e.input.charCodeAtAt(n),!(45!==t&&46!==t||t!==e.input.charCodeAtAt(n+1)||t!==e.input.charCodeAtAt(n+2)||t===e
.input.charCodeAtAt(n),0!==t&&!a(t)))}function x(e,t){1===t?e.result+=" ":t>1&&(e.result+=N.repeat("\n",t-
1))}function A(e,t,n){var
s,l,u,c,p,h,f,d,m,y=e.kind,v=e.result;if(m=e.input.charCodeAtAt(e.position),a(m)||o(m)||35===m||38===m||42===m||33
===m||124===m||62===m||39===m||34===m||37===m||64===m||96===m)return!1;if((63===m||45===m)&&(l=e.i
nput.charCodeAtAt(e.position+1),a(l)||n&&o(l)))return!1;for(e.kind="scalar",e.result="",u=c=e.position,p=!1;0!==m;)
{if(58===m){if(l=e.input.charCodeAtAt(e.position+1),a(l)||n&&o(l))break}else
if(35===m){if(s=e.input.charCodeAtAt(e.position-
1),a(s))break}else{if(e.position===e.lineStart&&_(e)||n&&o(m))break;if(r(m)){if(h=e.line,f=e.lineStart,d=e.lineInd
ent,w(e,l,-
1),e.lineIndent>=t){p=!0,m=e.input.charCodeAtAt(e.position);continue}e.position=c,e.line=h,e.lineStart=f,e.lineInden
t=d;break}}p&&(g(e,u,c,!1),x(e,e.line-
h),u=c=e.position,p=!1),i(m)||c=e.position+1,m=e.input.charCodeAtAt(++e.position)}return
g(e,u,c,!1),!e.result||e.kind=y,e.result=v,!1)}function S(e,t){var
n,i,a;if(n=e.input.charCodeAtAt(e.position),39!==n)return!1;for(e.kind="scalar",e.result="",e.position++,i=a=e.positio
n;0!==(n=e.input.charCodeAtAt(e.position));)if(39===n){if(g(e,i,e.position,!0),n=e.input.charCodeAtAt(++e.position),3
9!==n)return!0;i=a=e.position,e.position++}else
r(n)?(g(e,i,a,!0),x(e,w(e,!1,t)),i=a=e.position):e.position===e.lineStart&&_(e)?d(e,"unexpected end of the document
within a single quoted scalar"):(e.position++,a=e.position);d(e,"unexpected end of the stream within a single quoted
scalar")}function j(e,t){var
n,i,a,o,u,c;if(c=e.input.charCodeAtAt(e.position),34!==c)return!1;for(e.kind="scalar",e.result="",e.position++,n=i=e.p
osition;0!==(c=e.input.charCodeAtAt(e.position));)if(34===c)return
g(e,n,e.position,!0),e.position++,!0;if(92===c){if(g(e,n,e.position,!0),c=e.input.charCodeAtAt(++e.position),r(c))w(e,!
1,t);else
if(c<256&&ie[c])e.result+=ae[c],e.position++;else if((u=l(c))>0){for(a=u,o=0;a>0;a--
)c=e.input.charCodeAtAt(++e.position),(u=s(c))>=0?o=(o<<4)+u:d(e,"expected hexadecimal
character");e.result+=p(o),e.position++}else d(e,"unknown escape sequence");n=i=e.position}else
r(c)?(g(e,n,i,!0),x(e,w(e,!1,t)),n=i=e.position):e.position===e.lineStart&&_(e)?d(e,"unexpected end of the document
within a double quoted scalar"):(e.position++,i=e.position)}d(e,"unexpected end of the stream within a double
quoted scalar")}function E(e,t){var
n,r,i,o,s,l,u,c,p,h,f,m=!0,g=e.tag,y=e.anchor,b={};if(f=e.input.charCodeAtAt(e.position),91===f)o=93,u=!1,r=[];else{i
f(123!==f)return!1;o=125,u=!0,r={}}for(null!==e.anchor&&(e.anchorMap[e.anchor]=r),f=e.input.charCodeAtAt(++e.
position);0!==f;){if(w(e,!0,t),f=e.input.charCodeAtAt(e.position),f===o)return
e.position++,e.tag=g,e.anchor=y,e.kind=u?"mapping":"sequence",e.result=r,!0;m||d(e,"missed comma between flow
collection

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entries"),p=c=h=null,s=l=!1,63===f&&(i=e.input.charCodeAtAt(e.position+1),a(i)&&(s=l=!0,e.position++,w(e,!0,t))),
n=e.line,L(e,t,Y,!1,!0),p=e.tag,c=e.result,w(e,!0,t),f=e.input.charCodeAtAt(e.position),!l&&e.line!==n||58===f||(s=!0,f
=e.input.charCodeAtAt(++e.position),w(e,!0,t),L(e,t,Y,!1,!0),h=e.result),u?v(e,r,b,p,c,h):s?r.push(v(e,null,b,p,c,h)):r.p
ush(c),w(e,!0,t),f=e.input.charCodeAtAt(e.position),44===f?(m=!0,f=e.input.charCodeAtAt(++e.position)):m=!1}d(e,"u
nexpected end of the stream within a flow collection"))}function O(e,t){var
n,a,o,s,l=G,c=!1,p=!1,h=t,f=0,m=!1;if(s=e.input.charCodeAtAt(e.position),124===s)a=!1;else{if(62===s)return!1;a=!0
}for(e.kind="scalar",e.result="";0!==s;if(s=e.input.charCodeAtAt(++e.position),43===s||45===s)G===l?l=43===s?X
:K:d(e,"repeat of a chomping mode identifier");else{if(!((o=u(s))>=0))break;0===o?d(e,"bad explicit indentation
width of a block scalar; it cannot be less than one"):p?d(e,"repeat of an indentation width identifier):(h=t+o-
1,p=!0)}if(i(s)){do
s=e.input.charCodeAtAt(++e.position);while(i(s));if(35===s)do
s=e.input.charCodeAtAt(++e.position);while(!r(s)&&0!==s)}for(;0!==s){for(b(e),e.lineIndent=0,s=e.input.charCodeAt
At(e.position);(!p||e.lineIndent<h)&&32===s)e.lineIndent++,s=e.input.charCodeAtAt(++e.position);if(!p&&e.lineInd
ent>h&&(h=e.lineIndent),r(s))f++;else{if(e.lineIndent<h){l===X?e.result+=N.repeat("\n",c?1+f:f):l===G&&c&&(
e.result+="\n");break}for(a?i(s):(m=!0,e.result+=N.repeat("\n",c?1+f:f)):m?(m=!1,e.result+=N.repeat("\n",f+1)):0=
===f?c&&(e.result+="
"):e.result+=N.repeat("\n",f):e.result+=N.repeat("\n",c?1+f:f),c=!0,p=!0,f=0,n=e.position;!r(s)&&0!==s;)s=e.input.c
harCodeAtAt(++e.position);g(e,n,e.position,!1)}return!0}function k(e,t){var
n,r,i,o=e.tag,s=e.anchor,l=[],u=!1;for(null!==e.anchor&&(e.anchorMap[e.anchor]=l),i=e.input.charCodeAtAt(e.positio
n);0!==i&&45===i&&(r=e.input.charCodeAtAt(e.position+1),a(r));if(u=!0,e.position++,w(e,!0,-
1)&&e.lineIndent<=t).push(null),i=e.input.charCodeAtAt(e.position);else
if(n=e.line,L(e,t,W,!1,!0),l.push(e.result),w(e,!0,-
1),i=e.input.charCodeAtAt(e.position),(e.line===n||e.lineIndent>t)&&0!==i)d(e,"bad
indentation of a sequence entry");else
if(e.lineIndent<t)break;return!!u&&(e.tag=o,e.anchor=s,e.kind="sequence",e.result=l,!0)}function T(e,t,n){var
r,o,s,l,u=e.tag,c=e.anchor,p={},h={},f=null,m=null,g=null,y=!1,b=!1;for(null!==e.anchor&&(e.anchorMap[e.ancho
r]=p),l=e.input.charCodeAtAt(e.position);0!==l){if(r=e.input.charCodeAtAt(e.position+1),s=e.line,63!==l&&58!==l||a(
r)){if(!L(e,n,J,!1,!0))break;if(e.line===s){for(l=e.input.charCodeAtAt(e.position);i(l);l=e.input.charCodeAtAt(++e.posit
ion);if(58===l)l=e.input.charCodeAtAt(++e.position),a(l)||d(e,"a whitespace character is expected after the key-value
separator within a block
mapping"),y&&(v(e,p,h,f,m,null),f=m=g=null),b=!0,y=!1,o=!0,f=e.tag,m=e.result;else{if(!b)return
e.tag=u,e.anchor=c,!0;d(e,"can not read an implicit mapping pair; a colon is missed")}}else{if(!b)return
e.tag=u,e.anchor=c,!0;d(e,"can not read a block mapping
entry; a multiline key may not be an implicit key")}}else
63===l?(y&&(v(e,p,h,f,m,null),f=m=g=null),b=!0,y=!0,o=!0):y?(y=!1,o=!0):d(e,"incomplete explicit mapping pair;
a key node is
missed"),e.position+=1,l=r;if((e.line===s||e.lineIndent>t)&&(L(e,t,Q,!0,o)&&(y?m=e.result:g=e.result),y||(v(e,p,h,f,
m,g),f=m=g=null),w(e,!0,-1),l=e.input.charCodeAtAt(e.position)),e.lineIndent>t&&0!==l)d(e,"bad indentation of a
mapping entry");else if(e.lineIndent<t)break}return
y&&v(e,p,h,f,m,null),b&&(e.tag=u,e.anchor=c,e.kind="mapping",e.result=p),b}function C(e){var
t,n,r,i,o=!1,s=!1;if(i=e.input.charCodeAtAt(e.position),33!==i)return!1;if(null!==e.tag&&d(e,"duplication of a tag
property"),i=e.input.charCodeAtAt(++e.position),60===i?(o=!0,i=e.input.charCodeAtAt(++e.position)):33===i?(s=!0,n=
"!",i=e.input.charCodeAtAt(++e.position)):n="!",t=e.position,o){do
i=e.input.charCodeAtAt(++e.position);while(0!==i&&62!==i);e.position<e.length?(r=e.input.slice(t,e.position),i=e.inp
ut.charCodeAtAt(++e.position)):d(e,"unexpected
end of the stream within a verbatim tag")}else{for(;0!==i&&!a(i);)33===i&&(s?d(e,"tag suffix cannot contain
exclamation marks):(n=e.input.slice(t-1,e.position+1),ne.test(n)||d(e,"named tag handle cannot contain such
characters"),s=!0,t=e.position+1)),i=e.input.charCodeAtAt(++e.position);r=e.input.slice(t,e.position),te.test(r)&&d(e,"t

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ag suffix cannot contain flow indicator characters"))return r&&!re.test(r)&&d(e,"tag name cannot contain such
characters:
"+r),o?e.tag=r:H.call(e.tagMap,n)?e.tag=e.tagMap[n]+r:"!"===n?e.tag="!"!r:"!"===n?e.tag="tag:yaml.org,2002:"+
r:d(e,'undeclared tag handle "'"+n+"')',!0}function I(e){var
t,n;if(n=e.input.charCodeAtAt(e.position),38!==(n))return!1;for(null!==(e.anchor&&d(e,"duplication of an anchor
property")),n=e.input.charCodeAtAt(++e.position),t=e.position;0!==(n&&!a(n)&&!o(n));n=e.input.charCodeAtAt(++e.po
sition);return e.position===t&&d(e,"name of an anchor node must contain at least one
character"),e.anchor=e.input.slice(t,e.position),!0}function D(e){var
t,n,r;if(r=e.input.charCodeAtAt(e.position),42!==(r))return!1;for(r=e.input.charCodeAtAt(++e.position),t=e.position;0!==(r
&&!a(r)&&!o(r));r=e.input.charCodeAtAt(++e.position);return e.position===t&&d(e,"name of an alias node must
contain at least one character"),n=e.input.slice(t,e.position),e.anchorMap.hasOwnProperty(n)||d(e,'unidentified alias
"'"+n+"')',e.result=e.anchorMap[n],w(e,!0,-1),!0}function L(e,t,n,r,i){var
a,o,s,l,u,c,p,h,f=1,m=!1,g=!1;if(null!==(e.listener&&e.listener("open",e),e.tag=null,e.anchor=null,e.kind=null,e.result
=null,a=o=s=Q===n||W===n,r&&w(e,!0,-
1)&&(m=!0,e.lineIndent>t?f=1:e.lineIndent===t?f=0:e.lineIndent<t&&(f=-1)),1===f)for(;C(e)||I(e);)w(e,!0,-
1)?(m=!0,s=a,e.lineIndent>t?f=1:e.lineIndent===t?f=0:e.lineIndent<t&&(f=-
1)):s=!1;if(s&&(s=m||i),!==(f&&Q!==(n||(p=Y===n||J===n?t:t+1,h=e.position-
e.lineStart,1===f?s&&(k(e,h)||T(e,h,p)))||E(e,p)?g=!0:(o&&O(e,p)||S(e,p)||j(e,p)?g=!0:D(e)?(g=!0,null===e.tag&&n
ull===e.anchor||d(e,"alias node should not have any
properties")):A(e,p,Y===n)&&(g=!0,null===e.tag&&(e.tag="?")),null!==(e.anchor&&(e.anchorMap[e.anchor]=e.re
sult)):0===f&&(g=s&&k(e,h))),null!==(e.tag&&"!"===e.tag)if("?"===e.tag){for(l=0,u=e.implicitTypes.length;l<u;l
+=1)if(c=e.implicitTypes[l],c.resolve(e.result)){e.result=c.construct(e.result),e.tag=c.tag,null!==(e.anchor&&(e.anch
orMap[e.anchor]=e.result));break}}else
H.call(e.typeMap,e.tag)?(c=e.typeMap[e.tag],null!==(e.result&&c.kind!==(e.kind&&d(e,"unacceptable node kind
for !<"+e.tag+"> tag; it should be "'"+c.kind+"", not
"+e.kind+"'),c.resolve(e.result)?(e.result=c.construct(e.result),null!==(e.anchor&&(e.anchorMap[e.anchor]=e.result)
):d(e,"cannot resolve a node with !<"+e.tag+"> explicit tag")):d(e,"unknown tag !<"+e.tag+">");return
null!==(e.listener&&e.listener("close",e),null!==(e.tag||null!==(e.anchor||g)}function M(e){var
t,n,o,s,l=e.position,u=!1;for(e.version=null,e.checkLineBreaks=e.legacy,e.tagMap={},e.anchorMap={},0!==(s=e.in
put.charCodeAtAt(e.position))&&(w(e,!0,-
1),s=e.input.charCodeAtAt(e.position),!(e.lineIndent>0||37!==(s));){for(u=!0,s=e.input.charCodeAtAt(++e.position),t=e.p
osition;0!==(s&&!a(s));s=e.input.charCodeAtAt(++e.position);for(n=e.input.slice(t,e.position),o=[],n.length<1&&d(e,"
directive
name must not be less than one character in
length");0!==(s);){for(i(s);s=e.input.charCodeAtAt(++e.position);if(35===s){do
s=e.input.charCodeAtAt(++e.position);while(0!==(s&&!r(s));break}if(r(s))break;for(t=e.position;0!==(s&&!a(s));s=e.in
put.charCodeAtAt(++e.position);o.push(e.input.slice(t,e.position)))0!==(s&&b(e),H.call(se,n)?se[n](e,n,o):m(e,'unkno
wn document directive "'"+n+"')')return w(e,!0,-
1),0===e.lineIndent&&45===e.input.charCodeAtAt(e.position)&&45===e.input.charCodeAtAt(e.position+1)&&45===
e.input.charCodeAtAt(e.position+2)?(e.position+=3,w(e,!0,-1)):u&&d(e,"directives end mark is
expected"),L(e,e.lineIndent-1,Q,!1,!0),w(e,!0,-
1),e.checkLineBreaks&&ee.test(e.input.slice(l,e.position))&&m(e,"non-ASCII line breaks are interpreted as
content"),e.documents.push(e.result),e.position===e.lineStart&&_(e)?void(46===e.input.charCodeAtAt(e.position)&
&(e.position+=3,w(e,!0,-1)):void(e.position<e.length-1&&d(e,"end
of the stream or a document separator is expected"))}function
R(e,t){e=String(e),t=t||{,0!==(e.length&&(10!==(e.charCodeAtAt(e.length-1)&&13!==(e.charCodeAtAt(e.length-
1)&&(e+="\n"),65279===e.charCodeAtAt(0)&&(e=e.slice(1)))};var n=new
h(e,t);for(n.input+="\0";32===n.input.charCodeAtAt(n.position);n.lineIndent+=1,n.position+=1;for(;n.position<n.len

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gth-1;M(n);return n.documents}function U(e,t,n){var r,i,a=R(e,n);for(r=0,i=a.length;r<i;r+=1)t(a[r])}function
P(e,t){var n=R(e,t);if(0!==(n.length)){if(1!==(n.length))return n[0];throw new z("expected a single document in the
stream, but found more")}}function q(e,t,n){U(e,t,N.extend({schema:F},n))}function B(e,t){return
P(e,N.extend({schema:F},t))}for(var
N=e("./common"),z=e("./exception"),$=e("./mark"),F=e("./schema/default_safe"),V=e("./schema/default_full"),H=
Object.prototype.hasOwnProperty,Y=1,J=2,W=3,Q=4,G=1,K=2,X=3,Z=/[x00-x08x0Bx0Cx0E-x1F\x7F-
\x84\x86-\x9F\uFFFE\uFFFF][\uD800-\uDBFF](?![\uDC00-\uDFFF])(?:[^\uD800-\uDBFF]|\^\uDC00-
\uDFFF)/,ee=/[x85\u2028\u2029]/,te=/[,\\]\{\}/,ne=/^(?:!!![a-z-]+!)$/i,re=/^(?:[^\^,\\]\{\}\}(?:%[0-9a-f]{2}[0-
9a-z-#;\|?:@&=+\$,._!~*\(\)\[\]])*$/i,ie=new
Array(256),ae=new Array(256),oe=0;oe<256;oe++)ie[oe]=c(oe)?1:0,ae[oe]=c(oe);var
se={YAML:function(e,t,n){var r,i,a;null!=e.version&&d(e,"duplication of %YAML
directive"),1!==(n.length&&d(e,"YAML directive accepts exactly one argument"),r=/^([0-9]+)\.([0-
9]+)$/.exec(n[0]),null===r&&d(e,"ill-formed argument of the YAML
directive"),i=parseInt(r[1],10),a=parseInt(r[2],10),1!==(i&&d(e,"unacceptable YAML version of the
document"),e.version=n[0],e.checkLineBreaks=a<2,1!==(a&&2!==(a&&m(e,"unsupported YAML version of the
document"))),TAG:function(e,t,n){var r,i;2!==(n.length&&d(e,"TAG directive accepts exactly two
arguments"),r=n[0],i=n[1],ne.test(r)||d(e,"ill-formed tag handle (first argument) of the TAG
directive"),H.call(e.tagMap,r)&&d(e,'there
is a previously declared suffix for "'+r+'"' tag handle'),re.test(i)||d(e,"ill-formed tag prefix (second argument) of the
TAG
directive"),e.tagMap[r]=i}};t.exports.loadAll=U,t.exports.load=P,t.exports.safeLoadAll=q,t.exports.safeLoad=B},{
"/common":21,"/exception":23,"/mark":25,"/schema/default_full":28,"/schema/default_safe":29}],25:[function(e,t,
n){t.use strict;function r(e,t,n,r,i){this.name=e,this.buffer=t,this.position=n,this.line=r,this.column=i}var
i=e("./common");r.prototype.getSnippet=function(e,t){var n,r,a,o,s;if(!this.buffer)return
null;for(e=e||4,t=t||75,n="",r=this.position;r>0&&"\0\r\n\u2028\u2029".indexOf(this.buffer.charAt(r-1))===-1;if(r-
=1,this.position-r>t/2-1){n=" ...
",r+=5;break}for(a="",o=this.position;o<this.buffer.length&&"\0\r\n\u2028\u2029".indexOf(this.buffer.charAt(o))=
===-1;if(o+=1,o-this.position>t/2-1){a=" ... ",o+=5;break}return s=this.buffer.slice(r,o),i.repeat("
",e)+n+s+a+"\n"+i.repeat(" ",e+this.position-r+n.length)+"^",r.prototype.toString=function(e){var
t,n="";return this.name&&(n+=in ""+this.name+""),n+="at line "+(this.line+1)+"",column
"+(this.column+1),e||(t=this.getSnippet(),t&&(n+=":\n"+t)),n},t.exports=r},{"/common":21}],26:[function(e,t,n){t.u
se strict;function r(e,t,n){var i=[];return
e.include.forEach(function(e){n=r(e,t,n)}),e[t].forEach(function(e){n.forEach(function(t,n){t.tag===e.tag&&i.push(
n)}),n.push(e)}),n.filter(function(e,t){return i.indexOf(t)===-1})}function i(o){function e(e){r[e.tag]=e}var
t,n,r={};for(t=0,n=arguments.length;t<n;t+=1)arguments[t].forEach(e);return r}function
a(e){this.include=e.include||[],this.implicit=e.implicit||[],this.explicit=e.explicit||[],this.implicit.forEach(function(e){i
f(e.loadKind&&"scalar"!==(e.loadKind))throw new s("There is a non-scalar type in the implicit list of a schema.
Implicit resolving of such types is not
supported."))},this.compiledImplicit=r(this,"implicit",[]),this.compiledExplicit=r(this,"explicit",[]),this.compiledTyp
eMap=i(this.compiledImplicit,this.compiledExplicit)}var
o=e("./common"),s=e("./exception"),l=e("./type");a.DEFAULT=null,a.create=function(o){var
e,t;switch(arguments.length){case 1:e=a.DEFAULT,t=arguments[0];break;case
2:e=arguments[0],t=arguments[1];break;default:throw new s("Wrong number of arguments for Schema.create
function")}if(e=o.toArray(e),t=o.toArray(t),!e.every(function(e){return e instanceof a}))throw new s("Specified list
of super schemas (or a single Schema object) contains a non-Schema object.");if(!t.every(function(e){return e
instanceof l}))throw new s("Specified list of YAML types (or a single Type object) contains a non-Type
object.");return new
a({include:e,explicit:t})},t.exports=a},{"/common":21,"/exception":23,"/type":32}],27:[function(e,t,n){t"use

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strict";var r=e("../schema");t.exports=new
r({include:[e("../json")]}),{"../schema":26,"../json":31}],28:[function(e,t,n){"use strict";var
r=e("../schema");t.exports=r.DEFAULT=new
r({include:[e("../default_safe")],explicit:[e("../type/js/undefined"),e("../type/js/regexp"),e("../type/js/function")]}),{"../
../schema":26,"../type/js/function":37,"../type/js/regexp":38,"../type/js/undefined":39,"../default_safe":29}],29:[functio
n(e,t,n){"use
strict";var r=e("../schema");t.exports=new
r({include:[e("../core")],implicit:[e("../type/timestamp"),e("../type/merge")],explicit:[e("../type/binary"),e("../type/om
ap"),e("../type/pairs"),e("../type/set")]}),{"../schema":26,"../type/binary":33,"../type/merge":41,"../type/omap":43,"..
../type/pairs":44,"../type/set":46,"../type/timestamp":48,"../core":27}],30:[function(e,t,n){"use strict";var
r=e("../schema");t.exports=new
r({explicit:[e("../type/str"),e("../type/seq"),e("../type/map")]}),{"../schema":26,"../type/map":40,"../type/seq":45,"../t
ype/str":47}],31:[function(e,t,n){"use strict";var r=e("../schema");t.exports=new
r({include:[e("../failsafe")],implicit:[e("../type/null"),e("../type/bool"),e("../type/int"),e("../type/float")]}),{"../schema
":26,"../type/bool":34,"../type/float":35,"../type/int":36,"../type/null":42,"../failsafe":30}],32:[function(e,t,n){"use
strict";function r(e){var t={};return
null!==e&&Object.keys(e).forEach(function(n){e[n].forEach(function(e){t[String(e)]=n})}),t}function
i(e,t){if(t=t||{},Object.keys(t).forEach(function(t){if(o.indexOf(t)===-1)throw new a("Unknown option '"+t+"' is met
in definition of '"+e+"' YAML
type.))},this.tag=e,this.kind=t.kind||null,this.resolve=t.resolve||function(){return!0},this.construct=t.construct||functi
on(e){return
e},this.instanceOf=t.instanceOf||null,this.predicate=t.predicate||null,this.represent=t.represent||null,this.defaultStyle=
t.defaultStyle||null,this.styleAliases=r(t.styleAliases||null),s.indexOf(this.kind)===-1)throw new a("Unknown kind
 '"+this.kind+"' is specified for '"+e+"' YAML type.))}var
a=e("../exception"),o=["kind","resolve","construct","instanceOf","predicate","represent","defaultStyle","styleAliases
"],s=["scalar","sequence","mapping"];t.exports=i},{"../exception":23}],33:[function(e,t,n){"use
strict";function r(e){if(null===e)return!1;var
t,n,r=0,i=e.length,a=p;for(n=0;n<i;n++)if(t=a.indexOf(e.charAt(n)),!(t>64)){if(t<0)return!1;r+=6}return
r%8===0}function i(e){var
t,n,r=e.replace(/[\r\n=]/g,""),i=r.length,a=p,o=0,l=[];for(t=0;t<i;t++)t%4===0&&t&&(l.push(o>>16&255),l.push(o>
>8&255),l.push(255&o)),o=o<<6|a.indexOf(r.charAt(t));
return
n=i%4*6,0===n?(l.push(o>>16&255),l.push(o>>8&255),l.push(255&o)):18===n?(l.push(o>>10&255),l.push(o>>
2&255)):12===n&&l.push(o>>4&255),s?new s(l):l}function a(e){var
t,n,r="",i=0,a=e.length,o=p;for(t=0;t<a;t++)t%3===0&&t&&(r+=o[i>>18&63],r+=o[i>>12&63],r+=o[i>>6&63],r+
=o[63&i]),i=(i<<8)+e[t];return
n=a%3,0===n?(r+=o[i>>18&63],r+=o[i>>12&63],r+=o[i>>6&63],r+=o[63&i]):2===n?(r+=o[i>>10&63],r+=o[i>>
4&63],r+=o[i<<2&63],r+=o[64]):1===n&&(r+=o[i>>2&63],r+=o[i<<4&63],r+=o[64],r+=o[64]),r}function
o(e){return s&&s.isBuffer(e)}var s;try{var l=e;s=l("buffer").Buffer}catch(u){}var
c=e("../type"),p="ABCDEFGHIJKLMNOPQRSTUVWXYZabcdefghijklmnopqrstuvwxyz0123456789+/-\n\r";t.ex
ports=new
c("tag:yaml.org,2002:binary",{kind:"scalar",resolve:r,construct:i,predicate:o,represent:a}),{"../type":32}],34:[funct
ion(e,t,n){"use strict";function r(e){if(null===e)return!1;var t=e.length;return
4===t&&("true"===e||"True"===e||"TRUE"===e)||5===t&&("false"===e||"False"===e||"FALSE"===e)}function
i(e){return"true"===e||"True"===e||"TRUE"===e}function a(e){return"[object
Boolean]"===Object.prototype.toString.call(e)}var o=e("../type");t.exports=new
o("tag:yaml.org,2002:bool",{kind:"scalar",resolve:r,construct:i,predicate:a,represent:{lowercase:function(e){return
e?"true":"false"},uppercase:function(e){return e?"TRUE":"FALSE"},camelcase:function(e){return

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e?"True":"False"}},defaultStyle:"lowercase"))},{"/type":32}],35:[function(e,t,n){"use strict";function r(e){return
null!==(e&&!u.test(e))function i(e){var t,n,r,i;return t=e.replace(/_/g,"").toLowerCase(),n="-"===t[0]?-1:1,i=[],"+-
".indexOf(t[0])>=0&&(t=t.slice(1)),".inf"===t?1===n?Number.POSITIVE_INFINITY:Number.NEGATIVE_INFI
NITY:".nan"===t?NaN:t.indexOf(":")>=0?(t.split(":").forEach(function(e){i.unshift(parseFloat(e,10))}),t=0,r=1,i.fo
rEach(function(e){t+=e*r,r*=60}),n*t):n*parseFloat(t,10)}function
a(e,t){var
n;if(isNaN(e))switch(t){case"lowercase":return".nan";case"uppercase":return".NaN";case"camelcase":return".NaN"
}else
if(Number.POSITIVE_INFINITY===e)switch(t){case"lowercase":return".inf";case"uppercase":return".INF";case"camelcase":return".Inf"}else if(Number.NEGATIVE_INFINITY===e)switch(t){case"lowercase":return"-
.inf";case"uppercase":return"-.INF";case"camelcase":return"-.Inf"}else if(s.isNegativeZero(e))return"-0.0";return
n=e.toString(10),c.test(n)?n.replace("e",".e"):n}function o(e){return"[object
Number]"===Object.prototype.toString.call(e)&&(e%1!==0||s.isNegativeZero(e))}var
s=e("/common"),l=e("/type"),u=new RegExp("^(?:[-+]?[0-9][0-9_]*\\.[0-9_]*(?:[eE][-+][0-9]+)?|\\.[0-
9_]+(?:[eE][-+][0-9]+)?|[-+]?[0-9][0-9_]*(?:[0-5]?[0-9]+\\.[0-9_]*|[-
+]?\\.(?:inf|Inf|INF)|\\.(?:nan|NaN|NAN))$"),c=/^[-+]?[0-9]+e;/t.exports=new
l("tag:yaml.org,2002:float",{kind:"scalar",resolve:r,construct:i,predicate:o,represent:a,defaultStyle:"lowercase"})),{
"/common":21,"/type":32}],36:[function(e,t,n){"use strict";function r(e){return
48<=e&&e<=57||65<=e&&e<=70||97<=e&&e<=102}function i(e){return 48<=e&&e<=55}function a(e){return
48<=e&&e<=57}function o(e){if(null===e)return!1;var t,n=e.length,o=0,s=!1;if(!n)return!1;if(t=e[o],"-
"!==t&&"+"!==(t=t[+o]),"0"===t){if(o+1===n)return!0;if(t=e[+o],"b"===t){for(o++;o<n;o++)if(t=e[o],"_"!=
=t){if("0"===t&&"1"===t)return!1;s=!0}return
s;if("x"===t){for(o++;o<n;o++)if(t=e[o],"_"!==(t=t[e.charCodeAt(o)]))return!1;s=!0}return
s}for(o++;o<n;o++)if(t=e[o],"_"!==(t=t[e.charCodeAt(o)]))return!1;s=!0}return
s}for(o++;o<n;o++)if(t=e[o],"_"!==(t=t[e.charCodeAt(o)]))return!1;s=!0}return!1;s&&("!"===t||/^(?:[0-
-5]?[0-9])+$/.test(e.slice(o)))}function s(e){var t,n,r=e,i=1,a=[];return r.indexOf("_")!==-
1&&(r=r.replace(/_/g,"")),t=r[0],"_"!==(t&&"+"!==(t=t["-"===t&&(i=-
1),r=r.slice(1),t=r[0]),"0"===r?0:"0"===t?"b"===r[1]?i*parseInt(r.slice(2),2):"x"===r[1]?i*parseInt(r,16):i*parseInt
(r,8):r.indexOf(":")!==-
1?(r.split(":").forEach(function(e){a.unshift(parseInt(e,10))}),r=0,n=1,a.forEach(function(e){r+=e*n,n*=60}),i*r):i*
parseInt(r,10)}function
l(e){return"[object Number]"===Object.prototype.toString.call(e)&&e%1===0&&!u.isNegativeZero(e)}var
u=e("/common"),c=e("/type");t.exports=new
c("tag:yaml.org,2002:int",{kind:"scalar",resolve:o,construct:s,predicate:l,represent:{binary:function(e){return"0b"+
e.toString(2)},octal:function(e){return"0o"+e.toString(8)},decimal:function(e){return
e.toString(10)},hexadecimal:function(e){return"0x"+e.toString(16).toUpperCase()}},defaultStyle:"decimal",styleAli
ases:{binary:[2,"bin"],octal:[8,"oct"],decimal:[10,"dec"],hexadecimal:[16,"hex"]}}),{"/common":21,"/type":32}],
37:[function(e,t,n){"use strict";function r(e){if(null===e)return!1;try{var
t="("+e+")",n=s.parse(t,{range:!0});return"Program"===n.type&&1===n.body.length&&"ExpressionStatement"===
n.body[0].type&&"FunctionExpression"===n.body[0].expression.type}catch(r){return!1}}function i(e){var
t,n="("+e+")",r=s.parse(n,{range:!0}),i=[];if("Program"!==r.type||1!==r.body.length||"ExpressionStatement"!==r.bo
dy[0].type||"FunctionExpression"!==r.body[0].expression.type)throw new Error("Failed to resolve function");return
r.body[0].expression.params.forEach(function(e){i.push(e.name)}),t=r.body[0].expression.body.range,new
Function(i,n.slice(t[0]+1,t[1]-1))}function a(e){return e.toString()}function o(e){return"[object
Function]"===Object.prototype.toString.call(e)}var s;try{var l=e;s=l("esprima")}catch(u){"undefined"!==typeof
window&&(s=window.esprima)}var c=e("/type");t.exports=new
c("tag:yaml.org,2002:js/function",{kind:"scalar",resolve:r,construct:i,predicate:o,represent:a})),{"/type":32}],38:
[function(e,t,n){"use strict";function r(e){if(null===e)return!1;if(0===e.length)return!1;var

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t=e,n=/\([gim]*)$/.exec(e),r="";if(!t[0]){if(n&&(r=n[1]),r.length>3)return!1;if(!t[0].length-r.length-1)}return!1}function i(e){var t=e,n=/\([gim]*)$/.exec(e),r="";return"/"===t[0]&&(n&&(r=n[1]),t=t.slice(1,t.length-r.length-1)),new RegExp(t,r)}function a(e){var t="/" + e.source + "/";return e.global&&(t+="g"),e.multiline&&(t+="m"),e.ignoreCase&&(t+="i"),t}function o(e){return"[object RegExp]"===Object.prototype.toString.call(e)}var s=e("../type");t.exports=new s("tag:yaml.org,2002:js/regexp",{kind:"scalar",resolve:r,construct:i,predicate:o,represent:a}),"../type":32}],39:[function(e,t,n){function r(){return!0}function i(o){function a(o){return""}function o(e){return"undefined"===typeof e}var s=e("../type");t.exports=new s("tag:yaml.org,2002:js/undefined",{kind:"scalar",resolve:r,construct:i,predicate:o,represent:a}),"../type":32}],40:[function(e,t,n){function r(e){var r=e("../type");t.exports=new r("tag:yaml.org,2002:map",{kind:"mapping",construct:function(e){return null!==e?e:{}}},{"../type":32}),41:[function(e,t,n){function r(e){return"<"===e||null===e}var i=e("../type");t.exports=new i("tag:yaml.org,2002:merge",{kind:"scalar",resolve:r}),"../type":32}],42:[function(e,t,n){function r(e){if(null===e)return!0;var t=e.length;return 1===t&&"~"===e||4===t&&("null"===e||"Null"===e||"NULL"===e)}function i(o){return null}function a(e){return null===e}var o=e("../type");t.exports=new o("tag:yaml.org,2002:null",{kind:"scalar",resolve:r,construct:i,predicate:a,represent:{canonical:function(){return""},lowercase:function(){return"null"},uppercase:function(){return"NULL"},camelcase:function(){return"Null"}},defaultStyle:"lowercase"}},{"../type":32}),43:[function(e,t,n){function r(e){if(null===e)return!0;var t,n,r,i,a,l=[],u=e;for(t=0,n=u.length;t<n;t+=1){if(r=u[t],a=!1,"[object Object]"!==s.call(r))return!1;for(i in r)if(o.call(r,i)){if(a)return!1;a=!0;if(!a)return!1;if(l.indexOf(i)===-1)return!1;l.push(i)}return!0}function i(e){return null!==e?e:[]}var a=e("../type"),o=Object.prototype.hasOwnProperty,s=Object.prototype.toString;t.exports=new a("tag:yaml.org,2002:omap",{kind:"sequence",resolve:r,construct:i}),"../type":32}],44:[function(e,t,n){function r(e){if(null===e)return!0;var t,n,r,i,a,s=e;for(a=new Array(s.length),t=0,n=s.length;t<n;t+=1){if(r=s[t],"[object Object]"!==o.call(r))return!1;if(i=Object.keys(r),1!==i.length)return!1;a[t]=[i[0],r[i[0]]]}return!0}function i(e){if(null===e)return[];var t,n,r,i,a,o=e;for(a=new Array(o.length),t=0,n=o.length;t<n;t+=1)r=o[t],i=Object.keys(r),a[t]=[i[0],r[i[0]]];return a}var a=e("../type"),o=Object.prototype.toString;t.exports=new a("tag:yaml.org,2002:pairs",{kind:"sequence",resolve:r,construct:i}),"../type":32}],45:[function(e,t,n){function r(e){var r=e("../type");t.exports=new r("tag:yaml.org,2002:seq",{kind:"sequence",construct:function(e){return null!==e?e:[]}}},"../type":32}),46:[function(e,t,n){function r(e){if(null===e)return!0;var t,n=e;for(t in n)if(o.call(n,t)&&null!=n[t])return!1;return!0}function i(e){return null!==e?e:{} } var a=e("../type"),o=Object.prototype.hasOwnProperty;t.exports=new a("tag:yaml.org,2002:set",{kind:"mapping",resolve:r,construct:i}),"../type":32}],47:[function(e,t,n){function r(e){var r=e("../type");t.exports=new r("tag:yaml.org,2002:str",{kind:"scalar",construct:function(e){return null!==e?e:""}}},"../type":32}),48:[function(e,t,n){function r(e){return null===e&&(null===s.exec(e)||null===l.exec(e))}function i(e){var t,n,r,i,a,o,u,c,p,h,f=0,d=null;if(t=s.exec(e),null===t&&(t=l.exec(e)),null===t)throw new Error("Date resolve error");if(n=+t[1],r=+t[2]-1,i=+t[3],!t[4])return new Date(Date.UTC(n,r,i));if(a=+t[4],o=+t[5],u=+t[6],t[7]){for(f=t[7].slice(0,3);f.length<3;)f+="0";f+=f}return t[9]&&(c=+t[10],p=+(t[11]||0),d=6e4*(60*c+p),"-")==t[9]&&(d=-d)),h=new Date(Date.UTC(n,r,i,a,o,u,f)),d&&h.setTime(h.getTime()-d),h}function a(e){return e.toISOString()}var o=e("../type"),s=new RegExp("^([0-9][0-9][0-9][0-9])-([0-9][0-9])-([0-9][0-9])$"),l=new RegExp("^([0-9][0-9][0-9][0-9])-([0-9][0-9]?)-([0-9][0-9]?)(?:[Tt][ \\t]+([0-9][0-9]?):([0-9][0-9]):([0-
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9)[0-9])(?:\\.([0-9]*))?(?:[\\t]*(Z|([+])([0-9][0-9]?)(?:\\.([0-9][0-9]?))?)?);$");t.exports=new
o("tag:yaml.org,2002:timestamp",{kind:"scalar",resolve:r,construct:i,instanceOf:Date,represent:a}},{"/type":32}],
49:[function(e,t,n){function r(e,t,n){var r=e.length;0;if(!r)return-1;if("number"===typeof n)n=n<0?o(r+n,0):n;else
if(n){var s=a(e,t);return s<r&&(t===t?t===e[s]:e[s]!==e[s])?s:-1}return i(e,t,n||0)}var
i=e("./internal/baseIndexOf"),a=e("./internal/binaryIndex"),o=Math.max;t.exports=r},{"/internal/baseIndexOf":78
,"./internal/binaryIndex":92}],50:[function(e,t,n){function r(e){var t=e.length;return t?t[t-1]:void
0}t.exports=r},{}],51:[function(e,t,n){function r(e){if(l(e)&&!s(e)&&!(e instanceof i)){if(e instanceof a)return
e;if(p.call(e,"__chain__")&&p.call(e,"__wrapped__"))return
u(e)}return new a(e)}var
i=e("./internal/LazyWrapper"),a=e("./internal/LodashWrapper"),o=e("./internal/baseLodash"),s=e("./lang/isArray"
),l=e("./internal/isObjectLike"),u=e("./internal/wrapperClone"),c=Object.prototype,p=c.hasOwnProperty;r.prototype
=o.prototype,t.exports=r},{"/internal/LazyWrapper":60,"./internal/LodashWrapper":61,"./internal/baseLodash":8
2,"./internal/isObjectLike":126,"./internal/wrapperClone":137,"./lang/isArray":140}],52:[function(e,t,n){t.exports=
e("./forEach")},{"/forEach":54}],53:[function(e,t,n){var
r=e("./internal/baseEach"),i=e("./internal/createFind"),a=i(r);t.exports=a},{"/internal/baseEach":71,"./internal/cre
ateFind":102}],54:[function(e,t,n){var
r=e("./internal/arrayEach"),i=e("./internal/baseEach"),a=e("./internal/createForEach"),o=a(r,i);t.exports=o},{"/int
ernal/arrayEach":63,"./internal/baseEach":71,"./internal/createForEach":103}],55:[function(e,t,n){function
r(e,t,n,r){
h=e?a(e):0;return l(h)|(e=c(e),h=e.length),n="number"!==typeof n||r&&s(t,n,r)?0:n<0?p(h+n,0):n||0,"string"===typeof
e||!o(e)&&u(e)?n<=h&&e.indexOf(t,n)>-1:!!h&&i(e,t,n)>-1}var
i=e("./internal/baseIndexOf"),a=e("./internal/getLength"),o=e("./lang/isArray"),s=e("./internal/isIterateeCall"),l=e(
"./internal/isLength"),u=e("./lang/isString"),c=e("./object/values"),p=Math.max;t.exports=r},{"/internal/baseInde
xOf":78,"./internal/getLength":112,"./internal/isIterateeCall":122,"./internal/isLength":125,"./lang/isArray":140,"..
/lang/isString":146,"./object/values":152}],56:[function(e,t,n){function r(e,t,n){var r=s(e)?i:o;return
t=a(t,n,3),r(e,t)}var
i=e("./internal/arrayMap"),a=e("./internal/baseCallback"),o=e("./internal/baseMap"),s=e("./lang/isArray");t.export
s=r},{"/internal/arrayMap":64,"./internal/baseCallback":67,"./internal/baseMap":83,"./lang/isArray":140}],57:[fu
nction(e,t,n){var r=e("./internal/getNative"),i=r(Date,"now"),a=i||function(){return(new
Date).getTime()}t.exports=a},{"/internal/getNative":114}],58:[function(e,t,n){var
r=e("./internal/createWrapper"),i=e("./internal/replaceHolders"),a=e("./restParam"),o=1,s=32,l=a(function(e,t,n){va
r a=o;if(n.length){var u=i(n,l.placeholder);a=s}return
r(e,a,t,n,u)});l.placeholder={},t.exports=l},{"/internal/createWrapper":106,"./internal/replaceHolders":132,"./restP
aram":59}],59:[function(e,t,n){function r(e,t){if("function"!==typeof e)throw new TypeError(i);return t=a(void
0===t?t.length-1:t||0,0,function(){for(var n=arguments,r=-1,i=a(n.length-
t,0),o=Array(i);++r<i;)o[r]=n[t+r];switch(t){case 0:return e.call(this,o);case 1:return e.call(this,n[0],o);case 2:return
e.call(this,n[0],n[1],o)}var s=Array(t+1);for(r=-1;++r<t;)s[r]=n[r];return s[t]=o,e.apply(this,s)} }var i="Expected a
function",a=Math.max;t.exports=r},{}],60:[function(e,t,n){function
r(e){this.__wrapped__=e,this.__actions__=[],this.__dir__=1,this.__filtered__=!1,this.__iteratees__=[],this.__takeCo
unt__=0,this.__views__=[]}var
i=e("./baseCreate"),a=e("./baseLodash"),o=Number.POSITIVE_INFINITY;r.prototype=i(a.prototype),r.prototype.c
onstructor=r,t.exports=r},{"/baseCreate":70,"./baseLodash":82}],61:[function(e,t,n){function
r(e,t,n){this.__wrapped__=e,this.__actions__=n||[],this.__chain__=!t}var
i=e("./baseCreate"),a=e("./baseLodash");r.prototype=i(a.prototype),r.prototype.constructor=r,t.exports=r},{"/baseCr
eate":70,"./baseLodash":82}],62:[function(e,t,n){function r(e,t){var n=-
1,r=e.length;for(t||(t=Array(r));++n<r;)t[n]=e[n];return t}t.exports=r},{}],63:[function(e,t,n){function r(e,t){for(var
n=-1,r=e.length;++n<r&&t(e[n],n,e)!==!1;);return e}t.exports=r},{}],64:[function(e,t,n){function r(e,t){for(var n=-
1,r=e.length,i=Array(r);++n<r;)i[n]=t(e[n],n,e);return i}t.exports=r},{}],65:[function(e,t,n){function r(e,t){for(var

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n=-1,r=e.length; ++n<r;if(t(e[n],n,e))return 0;return 1}t.exports=r},{},66:[function(e,t,n){function r(e,t){return
null==t?t:i(t,a(t),e)}var
i=e("./baseCopy"),a=e("../object/keys");t.exports=r},{ "../object/keys":149,"./baseCopy":69}],67:[function(e,t,n){fun
ction
r(e,t,n){var r=typeof e;return"function"==r?void 0===t?e:o(e,t,n):null==e?s:"object"==r?i(e):void
0===t?l(e):a(e,t)}var
i=e("./baseMatches"),a=e("./baseMatchesProperty"),o=e("./bindCallback"),s=e("../utility/identity"),l=e("../utility/pro
perty");t.exports=r},{ "../utility/identity":154,"../utility/property":156,"./baseMatches":84,"./baseMatchesProperty":8
5,"./bindCallback":94}],68:[function(e,t,n){function r(e,t,n,m,g,y,v){var w;if(n&&(w=g?n(e,m,g):n(e)),void
0!==(w))return w;if(!f(e))return e;var _=p(e);if(_){if(w=l(e),!t)return i(e,w)}else{var
A=B.call(e),S=A==b;if(A!=x&&A!=d&&(!S||g))return P[A]?u(e,A,t):g?e: {};if(h(e))return
g?e: {};if(w=c(S?{}:e),t)return o(w,e)}y||(y=[]),v||(v=[]);for(var j=y.length;j--);if(y[j]==e)return v[j];return
y.push(e),v.push(w),(_?a:s)(e,function(i,a){w[a]=r(i,t,n,a,e,y,v)}),w}var
i=e("./arrayCopy"),a=e("./arrayEach"),o=e("./baseAssign"),s=e("./baseForOwn"),l=e("./initCloneArray"),u=e("./init
CloneByTag"),c=e("./initCloneObject"),p=e("../lang/isArray"),h=e("./isHostObject"),f=e("../lang/isObject"),d="[obj
ect
Arguments]",m="[object Array]",g="[object Boolean]",y="[object Date]",v="[object Error]",b="[object
Function]",w="[object Map]",_="[object Number]",x="[object Object]",A="[object RegExp]",S="[object
Set]",j="[object String]",E="[object WeakMap]",O="[object ArrayBuffer]",k="[object Float32Array]",T="[object
Float64Array]",C="[object Int8Array]",I="[object Int16Array]",D="[object Int32Array]",L="[object
Uint8Array]",M="[object Uint8ClampedArray]",R="[object Uint16Array]",U="[object
Uint32Array]",P={};P[d]=P[m]=P[O]=P[g]=P[y]=P[k]=P[T]=P[C]=P[I]=P[D]=P[_]=P[x]=P[A]=P[j]=P[L]=P[M]=
P[R]=P[U]=!0,P[v]=P[b]=P[w]=P[S]=P[E]=!1;var
q=Object.prototype,B=q.toString;t.exports=r},{ "../lang/isArray":140,"../lang/isObject":144,"./arrayCopy":62,"./array
Each":63,"./baseAssign":66,"./baseForOwn":76,"./initCloneArray":116,"./initCloneByTag":117,"./initCloneObject":
118,"./isHostObject":120}],69:[function(e,t,n){function
r(e,t,n){n||(n={});for(var r=-1,i=t.length; ++r<i){var a=t[r];n[a]=e[a]}return
n}t.exports=r},{},70:[function(e,t,n){var r=e("../lang/isObject"),i=function(){function e(){}return
function(t){if(r(t)){e.prototype=t;var n=new e;e.prototype=void 0}return
n}}();t.exports=i},{ "../lang/isObject":144}],71:[function(e,t,n){var
r=e("./baseForOwn"),i=e("./createBaseEach"),a=i(r);t.exports=a},{ "../baseForOwn":76,"./createBaseEach":98}],72:[f
unction(e,t,n){function r(e,t,n,r){var i;return n(e,function(e,n,a){if(t(e,n,a))return
i=r?n:e,!1}),i}t.exports=r},{},73:[function(e,t,n){function r(e,t,n){for(var r=e.length,i=n?r:-1;n?i--
: ++i<r);if(t(e[i],i,e))return i;return-1}t.exports=r},{},74:[function(e,t,n){var
r=e("./createBaseFor"),i=r();t.exports=i},{ "../createBaseFor":99}],75:[function(e,t,n){function r(e,t){return
i(e,t,a)}var
i=e("./baseFor"),a=e("../object/keysIn");t.exports=r},{ "../object/keysIn":150,"./baseFor":74}],76:[function(e,t,n){fun
ction
r(e,t){return i(e,t,a)}var
i=e("./baseFor"),a=e("../object/keys");t.exports=r},{ "../object/keys":149,"./baseFor":74}],77:[function(e,t,n){functio
n r(e,t,n){if(null!=e){e=i(e),void 0!==(n&&n in e&&(t=[n]));for(var
r=0,a=t.length;null!=e&&r<a;j=e(i(e)[t[r++]]);return r&&r==a?e:void 0}}var
i=e("./toObject");t.exports=r},{ "../toObject":135}],78:[function(e,t,n){function r(e,t,n){if(t!==t)return i(e,n);for(var
r=n-1,a=e.length; ++r<a);if(e[r]==t)return r;return-1}var
i=e("./indexOfNaN");t.exports=r},{ "../indexOfNaN":115}],79:[function(e,t,n){function r(e,t,n,s,l,u){return
e===t||(null==e||null==t?!a(e)&&!o(t)?e!==e&&t!==t:i(e,t,r,n,s,l,u))}var
i=e("./baseIsEqualDeep"),a=e("../lang/isObject"),o=e("./isObjectLike");t.exports=r},{ "../lang/isObject":144,"./baseIs
EqualDeep":80,"./isObjectLike":126}],80:[function(e,t,n){function r(e,t,n,r,f,g,y){var

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v=s(e),b=s(t),w=p,_=p;v||(w=m.call(e),w==c?w=h:w!=h&&(v=u(e))),b||(_=m.call(t),_=c?_=h:_!=h&&(b=u(t)));va
r x=w==h&&!l(e),A=_==h&&!l(t),S=w==_;if(S&&!v&&!x)return
a(e,t,w);if(!f){var j=x&&d.call(e,"__wrapped__"),E=A&&d.call(t,"__wrapped__");if(j||E)return
n(j?e.value():e,E?t.value():t,r,f,g,y)}if(!S)return!1;g||(g=[]),y||(y=[]);for(var O=g.length;O-->0;if(g[O]==e)return
y[O]=t;g.push(e),y.push(t);var k=(v?i:o)(e,t,n,r,f,g,y);return g.pop(),y.pop(),k}var
i=e("./equalArrays"),a=e("./equalByTag"),o=e("./equalObjects"),s=e("./lang/isArray"),l=e("./isHostObject"),u=e("./lang/isTypedArray"),c="[object Arguments]",p="[object Array]",h="[object
Object]",f=Object.prototype,d=f.hasOwnProperty,m=f.toString;t.exports=r},{"/lang/isArray":140,"/lang/isTyped
Array":147,"/equalArrays":107,"/equalByTag":108,"/equalObjects":109,"/isHostObject":120}],81:[function(e,t,n)
{function r(e,t,n){var r=t.length,o=r,s=!n;if(null==e)return o;for(e=a(e);r-->0){var
l=t[r];if(s&&l[2]?l[1]==e[l[0]]:(l[0]in e))return!1}for(;++r<o;){l=t[r];var u=l[0],c=e[u],p=l[1];if(s&&l[2]){if(void
0===c&&(u in e))return!1}else{var h=n?n(c,p,u):void 0;if(!(void 0===h?i(p,c,n,!0):h))return!1}}return!0}var
i=e("./baseIsEqual"),a=e("./toObject");t.exports=r},{"/baseIsEqual":79,"/toObject":135}],82:[function(e,t,n){functi
on r(){t.exports=r},{t.exports=r},{t.exports=r}],83:[function(e,t,n){function r(e,t){var n=-1,r=a(e)?Array(e.length):[];return
i(e,function(e,i,a){r[++n]=t(e,i,a)}),r}var
i=e("./baseEach"),a=e("./isArrayLike");t.exports=r},{"/baseEach":71,"/isArrayLike":119}],84:[function(e,t,n){func
tion r(e){var t=a(e);if(1==t.length&&t[0][2]){var n=t[0][0],r=t[0][1];return function(e){return
null!=e&&(e=o(e),e[n]==r&&(void 0!=r?n in e))}}return function(e){return i(e,t)}}var
i=e("./baseIsMatch"),a=e("./getMatchData"),o=e("./toObject");t.exports=r},{"/baseIsMatch":81,"/getMatchData":1
13,"/toObject":135}],85:[function(e,t,n){function r(e,t){var n=s(e),r=l(e)&&u(t),f=e+"";return
e=h(e),function(s){if(null==s)return!1;var l=f;if(s=p(s),(n||r)&&(l in s)){if(s=1==e.length?s:i(s,o(e,0,-
1)),null==s)return!1;l=c(e),s=p(s)}return s[l]==t?void 0!=t?l in s:a(t,s[l],void 0,10)}var
i=e("./baseGet"),a=e("./baseIsEqual"),o=e("./baseSlice"),s=e("./lang/isArray"),l=e("./isKey"),u=e("./isStrictCompar
able"),c=e("./array/last"),p=e("./toObject"),h=e("./toPath");t.exports=r},{"/array/last":50,"/lang/isArray":140,"/b
aseGet":77,"/baseIsEqual":79,"/baseSlice":89,"/isKey":123,"/isStrictComparable":127,"/toObject":135,"/toPath"
:136}],86:[function(e,t,n){function r(e){return function(t){return null==t?void 0:i(t)[e]}var
i=e("./toObject");t.exports=r},{"/toObject":135}],87:[function(e,t,n){function r(e){var t=e+"";return
e=a(e),function(n){return i(n,e,t)}}var
i=e("./baseGet"),a=e("./toPath");t.exports=r},{"/baseGet":77,"/toPath":136}],88:[function(e,t,n){var
r=e("./utility/identity"),i=e("./metaMap"),a=i?function(e,t){return
i.set(e,t),e}:r;t.exports=a},{"/utility/identity":154,"/metaMap":129}],89:[function(e,t,n){function r(e,t,n){var r=-
1,i=e.length;t=null==t?0:t||0,t<0&&(t=-t>0?0:i+t),n=void 0===n||n>i?i:+n||0,n<0&&(n+=i),i=t>n?0:n-
t>>>0,t>>>0;for(var
a=Array(i);++r<i;a[r]=e[r+t];return a)t.exports=r},{t.exports=r}],90:[function(e,t,n){function r(e){return
null==e?"":e+""}t.exports=r},{t.exports=r}],91:[function(e,t,n){function r(e,t){for(var n=-
1,r=t.length,i=Array(r);++n<r;i[n]=e[t[n]];return i)t.exports=r},{t.exports=r}],92:[function(e,t,n){function r(e,t,n){var
r=0,o=e?e.length:r;if("number"==typeof t&&t===t&&o<=s){for(;r<o;){var
l=r+o>>>1,u=e[l];(n?u<=t:u<t)&&null!=u?r=l+1:o=l}return o}return i(e,t,a,n)}var
i=e("./binaryIndexBy"),a=e("./utility/identity"),o=4294967295,s=o>>>1;t.exports=r},{"/utility/identity":154,"/bin
aryIndexBy":93}],93:[function(e,t,n){function r(e,t,n,r){t=n(t);for(var
o=0,l=e?e.length:0,u=t!=t,c=null===t,p=void 0===t;o<l;){var h=i((o+1)/2),f=n(e[h]),d=void
0!=f,m=f===f;if(u)var g=m||r;else
g=c?m&&d&&(r||null!=f):p?m&&(r||d):null!=f&&(r?f<=t:f<t);g?o=h+1:l=h}return a(l,s)}var
i=Math.floor,a=Math.min,o=4294967295,s=o-1;t.exports=r},{t.exports=r}],94:[function(e,t,n){function
r(e,t,n){if("function"!=typeof e)return i;if(void 0===t)return e;switch(n){case
1:return function(n){return e.call(t,n)};case 3:return function(n,r,i){return e.call(t,n,r,i)};case 4:return
function(n,r,i,a){return e.call(t,n,r,i,a)};case 5:return function(n,r,i,a,o){return e.call(t,n,r,i,a,o)}return
function(){return e.apply(t,arguments)}}var

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i=e("../utility/identity");t.exports=r},{ "../utility/identity":154}],95:[function(e,t,n){(function(e){function n(e){var
t=new r(e.byteLength),n=new i(t);return n.set(new i(e)),t}var
r=e.ArrayBuffer,i=e.Uint8Array;t.exports=n}).call(this,"undefined"!=typeof global?global:"undefined"!=typeof
self?self:"undefined"!=typeof window?window:{})},{},96:[function(e,t,n){function r(e,t,n){for(var r=n.length,a=-
1,o=i(e.length-r,0),s=-1,l=t.length,u=Array(l+o);++s<l;)u[s]=t[s];for(++a<r;)u[n[a]]=e[a];for(o--
;)u[s++]=e[a++];return u}var i=Math.max;t.exports=r},{},97:[function(e,t,n){function r(e,t,n){for(var r=-
1,a=n.length,o=-1,s=i(e.length-a,0),l=-1,u=t.length,c=Array(s+u);++o<s;)c[o]=e[o];for(var
p=o;++l<u;)c[p+l]=t[l];for(++r<a;)c[p+n[r]]=e[o++];return
c}var i=Math.max;t.exports=r},{},98:[function(e,t,n){function r(e,t){return function(n,r){var
s=n?i(n):0;if(!a(s))return e(n,r);for(var l=t?s:-1,u=o(n);(t?l--:++l<s)&&r[u[l],l,u]!==1;);return n}}var
i=e("../getLength"),a=e("../isLength"),o=e("../toObject");t.exports=r},{ "../getLength":112,"/isLength":125,"/toObject"
:135}],99:[function(e,t,n){function r(e){return function(t,n,r){for(var a=i(t),o=r(t),s=o.length,l=e?s:-1;e!-
++l<s;){var u=o[l];if(n(a[u],u,a)===1)break}return t}}var
i=e("../toObject");t.exports=r},{ "../toObject":135}],100:[function(e,t,n){(function(n){function r(e,t){function r(){var
i=this&&this!==n&&this instanceof r?a:e;return i.apply(t,arguments)}var a=i(e);return r}var
i=e("../createCtorWrapper");t.exports=r}).call(this,"undefined"!=typeof global?global:"undefined"!=typeof
self?self:"undefined"!=typeof window?window:{})},{ "../createCtorWrapper":101}],101:[function(e,t,n){function
r(e){return function(){var t=arguments;switch(t.length){case
0:return new e;case 1:return new e(t[0]);case 2:return new e(t[0],t[1]);case 3:return new e(t[0],t[1],t[2]);case
4:return new e(t[0],t[1],t[2],t[3]);case 5:return new e(t[0],t[1],t[2],t[3],t[4]);case 6:return new
e(t[0],t[1],t[2],t[3],t[4],t[5]);case 7:return new e(t[0],t[1],t[2],t[3],t[4],t[5],t[6])}var
n=i(e.prototype),r=e.apply(n,t);return a(r)?r:n}}var
i=e("../baseCreate"),a=e("../lang/isObject");t.exports=r},{ "../lang/isObject":144,"/baseCreate":70}],102:[function(e,t
,n){function r(e,t){return function(n,r,l){if(r=i(r,l,3),s(n)){var u=o(n,r,t);return u>-1?n[u]:void 0}return a(n,r,e)}}var
i=e("../baseCallback"),a=e("../baseFind"),o=e("../baseFindIndex"),s=e("../lang/isArray");t.exports=r},{ "../lang/isArray
":140,"/baseCallback":67,"/baseFind":72,"/baseFindIndex":73}],103:[function(e,t,n){function r(e,t){return
function(n,r,o){return"function"===typeof r&&void 0===o&&a(n)?e(n,r):(t(n,i(r,o,3)))}}var
i=e("../bindCallback"),a=e("../lang/isArray");t.exports=r},{ "../lang/isArray":140,"/bindCallback":94}],104:[function
(e,t,n){(function(n){function
r(e,t,_x,A,S,j,E,O,k){function T(){for(var d=arguments.length,m=d,g=Array(d);m--
;)g[m]=arguments[m];if(x&&(g=a(g,x,A)),S&&(g=o(g,S,j)),L||R){var b=T.placeholder,P=c(g,b);if(d-
=P.length,d<k){var q=E?i(E):void 0,B=w(k-d,0),N=L?P:void 0,z=L?void 0:P,$=L?g:void 0,F=L?void
0:g;t|=L?y:v,t&=~(L?v:y),M||(t&=~(h|f));var V=[e,t,_,$,N,F,z,q,O,B],H=r.apply(void 0,V);return
l(e)&&p(H,V),H.placeholder=b,H}}var Y=I?_:this,J=D?Y[e]:e;return
E&&(g=u(g,E)),C&&O<g.length&&(g.length=O),this&&this!==n&&this instanceof
T&&(J=U||s(e)),J.apply(Y,g)}var C=t&b,I=t&h,D=t&f,L=t&m,M=t&d,R=t&g,U=D?void 0:s(e);return T}var
i=e("../arrayCopy"),a=e("../composeArgs"),o=e("../composeArgsRight"),s=e("../createCtorWrapper"),l=e("../isLaziable
"),u=e("../reorder"),c=e("../replaceHolders"),p=e("../setData"),h=1,f=2,d=4,m=8,g=16,y=32,v=64,b=128,w=Math.max
;t.exports=r}).call(this,"undefined"!=typeof global?global:"undefined"!=typeof self?self:"undefined"!=typeof
window?window:{})},{ "../arrayCopy":62,"/composeArgs":96,"/composeArgsRight":97,"/createCtorWrapper":101,
"/isLaziable":124,"/reorder":131,"/replaceHolders":132,"/setData":133}],105:[function(e,t,n){(function(n){functi
on
r(e,t,r,o){function s(){for(var t=-1,i=arguments.length,a=-1,c=o.length,p=Array(c+i);++a<c;)p[a]=o[a];for(i--
;)p[a++]=arguments[+t];var h=this&&this!==n&&this instanceof s?u:e;return h.apply(l?r:this,p)}var
l=t&a,u=i(e);return s}var i=e("../createCtorWrapper"),a=1;t.exports=r}).call(this,"undefined"!=typeof
global?global:"undefined"!=typeof self?self:"undefined"!=typeof
window?window:{})},{ "../createCtorWrapper":101}],106:[function(e,t,n){function r(e,t,n,r,y,v,b,w){var
_=t&h;if(!_&&"function"===typeof e)throw new TypeError(m);var x=r?r.length:0;if(x||(t&=~(f|d),r=y=void 0),x-

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=y?y.length:0,t&d){var A=r,S=y;r=y=void 0}var j=_?void
0:l(e),E=[e,t,n,r,y,A,S,v,b,w];if(j&&(u(E,j),t=E[1],w=E[9]),E[9]=null==w?_?0:e.length:g(w-x,0)||0,t==p)var
O=a(E[0],E[2]);else O=t!=f&&t!=(p|f)||E[4].length?o.apply(void
0,E):s.apply(void 0,E);var k=j?i:c;return k(O,E)}var
i=e("./baseSetData"),a=e("./createBindWrapper"),o=e("./createHybridWrapper"),s=e("./createPartialWrapper"),l=e("./
getData"),u=e("./mergeData"),c=e("./setData"),p=1,h=2,f=32,d=64,m="Expected a
function",g=Math.max;t.exports=r},{"./baseSetData":88,"./createBindWrapper":100,"./createHybridWrapper":104,"
./createPartialWrapper":105,"./getData":110,"./mergeData":128,"./setData":133}],107:[function(e,t,n){function
r(e,t,n,r,a,o,s){var l=-1,u=e.length,c=t.length;if(u!=c&&!(a&&c>u))return!1;for(++l<u;){var
p=e[l],h=t[l],f=r?r(a?h:p,a?h:l):void 0;if(void 0!==f){if(f)continue;return!1}if(a){if(!i(t,function(e){return
p===e||n(p,e,r,a,o,s)}))return!1}else if(p!=h&&!n(p,h,r,a,o,s))return!1}return!0}var
i=e("./arraySome");t.exports=r},{"./arraySome":65}],108:[function(e,t,n){function r(e,t,n){switch(n){case i:case
a:return e==+t;case o:return e.name==t.name&&e.message==t.message;case s:return e!=+e?t!=+t:e==+t;case
l:case u:return e==t+""}return!1}var i="[object Boolean]",a="[object Date]",o="[object Error]",s="[object
Number]",l="[object RegExp]",u="[object String]";t.exports=r},{}],109:[function(e,t,n){function r(e,t,n,r,a,s,l){var
u=i(e),c=u.length,p=i(t),h=p.length;if(c!=h&&!a)return!1;for(var f=c;f--;){var d=u[f];if(!(a?d in
t:o.call(t,d)))return!1}for(var m=a;f<c;){d=u[f];var g=e[d],y=t[d],v=r?r(a?y:g,a?g:y,d):void 0;if(!(void
0===v?n(g,y,r,a,s,l):v))return!1;m||(m="constructor"==d)?if(!m){var
b=e.constructor,w=t.constructor;if(b!=w&&"constructor" in e&&"constructor" in t&&!("function"==typeof b&&b
instanceof b&&"function"==typeof w&&w instanceof w))return!1}return!0}var
i=e("./object/keys"),a=Object.prototype,o=a.hasOwnProperty;t.exports=r},{"./object/keys":149}],110:[function(e,t
,n){var r=e("./metaMap"),i=e("./utility/noop"),a=r?function(e){return
r.get(e)}:i;t.exports=a},{"./utility/noop":155,"./metaMap":129}],111:[function(e,t,n){function r(e){for(var
t=e.name+="",n=i[t],r=n?n.length:0;r--;){var
a=n[r],o=a.func;if(null==o||o==e)return a.name}return t}var
i=e("./realNames");t.exports=r},{"./realNames":130}],112:[function(e,t,n){var
r=e("./baseProperty"),i=r("length");t.exports=i},{"./baseProperty":86}],113:[function(e,t,n){function r(e){for(var
t=a(e),n=t.length;n--;){t[n][2]=i(t[n][1]);return t}var
i=e("./isStrictComparable"),a=e("./object/pairs");t.exports=r},{"./object/pairs":151,"./isStrictComparable":127}],11
4:[function(e,t,n){function r(e,t){var n=null==e?void 0:e[t];return i(n)?n:void 0}var
i=e("./lang/isNative");t.exports=r},{"./lang/isNative":143}],115:[function(e,t,n){function r(e,t,n){for(var
r=e.length,i=t+(n?0:-1);n?i--:++i<r;){var a=e[i];if(a!==a)return i}return-
1}t.exports=r},{}],116:[function(e,t,n){function r(e){var t=e.length,n=new e.constructor(t);return
t&&"string"==typeof e[0]&&a.call(e,"index")&&(n.index=e.index,n.input=e.input),n}var
i=Object.prototype,a=i.hasOwnProperty;t.exports=r},{}],117:[function(e,t,n){(function(n){function r(e,t,n){var
r=e.constructor;switch(t){case c:return i(e);case a:case o:return new r(+e);case p:case h:case f:case d:case m:case
g:case y:case v:case b:r instanceof r&&(r=x[t]);var _=e.buffer;return new r(n?i(_):_,e.byteOffset,e.length);case
s:case u:return new r(e);case l:var A=new r(e.source,w.exec(e));A.lastIndex=e.lastIndex}return A}var
i=e("./bufferClone"),a="[object Boolean]",o="[object Date]",s="[object Number]",l="[object RegExp]",u="[object
String]",c="[object ArrayBuffer]",p="[object Float32Array]",h="[object Float64Array]",f="[object
Int8Array]",d="[object Int16Array]",m="[object Int32Array]",g="[object Uint8Array]",y="[object
Uint8ClampedArray]",v="[object Uint16Array]",b="[object
Uint32Array]",w=^w$/*,_=n.Uint8Array,x={};x[p]=n.Float32Array,x[h]=n.Float64Array,x[f]=n.Int8Array,x[d]=n.I
nt16Array,x[m]=n.Int32Array,x[g]=_,x[y]=n.Uint8ClampedArray,x[v]=n.Uint16Array,x[b]=n.Uint32Array,t.export
s=r}).call(this,"undefined"!=typeof global?global:"undefined"!=typeof self?self:"undefined"!=typeof
window?window:{})},{"./bufferClone":95}],118:[function(e,t,n){function r(e){var
t=e.constructor;return"function"==typeof t&&t instanceof t||(t=Object),new
t}t.exports=r},{}],119:[function(e,t,n){function r(e){return null!=e&&a(i(e))}var

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i=e("/getLength"),a=e("/isLength");t.exports=r},{"/getLength":112,"/isLength":125}],120:[function(e,t,n){var
r=function(){
try{Object({toString:0}+""))catch(e){return function(){return!1}}return function(e){return"function"!==typeof
e.toString&&"string"===typeof(e+""))}();t.exports=r},{},121:[function(e,t,n){function r(e,t){return
e="number"===typeof e||i.test(e)?+e:-1,t=null==t?a:t,e>-1&&e%1==0&&e<t}var
i=/^\\d+$/,a=9007199254740991;t.exports=r},{},122:[function(e,t,n){function r(e,t,n){if(!o(n))return!1;var r=typeof
t;if("number"==r?(i(n)&&a(t,n.length):"string"==r&&t in n){var s=n[t];return e===e?e===s:s!==s}return!1}var
i=e("/isArrayLike"),a=e("/isIndex"),o=e("/lang/isObject");t.exports=r},{"/lang/isObject":144,"/isArrayLike":11
9,"/isIndex":121}],123:[function(e,t,n){function
r(e,t){var n=typeof e;if("string"==n&&s.test(e)||"number"==n)return!0;if(i(e))return!1;var r=!o.test(e);return
r||null!=t&&e in a(t)}var
i=e("/lang/isArray"),a=e("/toObject"),o=/^\\.\\[(?:\\^\\[\\]*|\\(\\\"(?:\\?\\!\\1|^\\n\\|\\\\\\.)*?\\1\\)\\]|\\/s=\\/\\w*$/;t.exports=r},{"/la
ng/isArray":140,"/toObject":135}],124:[function(e,t,n){function r(e){var t=o(e),n=s[t];if("function"!==typeof n||(t in
i.prototype))return!1;if(e===n)return!0;var r=a(n);return!r&&e===r[0]}var
i=e("/LazyWrapper"),a=e("/getData"),o=e("/getFuncName"),s=e("/chain/lodash");t.exports=r},{"/chain/lodash":
51,"/LazyWrapper":60,"/getData":110,"/getFuncName":111}],125:[function(e,t,n){function
r(e){return"number"===typeof e&&e>-1&&e%1==0&&e<=i}var
i=9007199254740991;t.exports=r},{},126:[function(e,t,n){function r(e){return!!e&&"object"===typeof
e}t.exports=r},{},127:[function(e,t,n){function r(e){return e===e&&!i(e)}var
i=e("/lang/isObject");t.exports=r},{"/lang/isObject":144}],128:[function(e,t,n){function
r(e,t){var
n=e[1],r=t[1],m=n|r,g=m<p,y=r==p&&n==c||r==p&&n==h&&e[7].length<=t[8]||r==(p|h)&&n==c;if(!g&&!y)retur
n e;r&l&&(e[2]=t[2],m|=n&l?0:u);var v=t[3];if(v){var b=e[3];e[3]=b?a(b,v,t[4]):i(v),e[4]=b?s(e[3],f):i(t[4])}return
v=t[5],v&&(b=e[5],e[5]=b?o(b,v,t[6]):i(v),e[6]=b?s(e[5],f):i(t[6])),v=t[7],v&&(e[7]=i(v)),r&p&&(e[8]=null==e[8]?
t[8]:d(e[8],t[8])),null==e[9]&&(e[9]=t[9]),e[0]=t[0],e[1]=m,e}var
i=e("/arrayCopy"),a=e("/composeArgs"),o=e("/composeArgsRight"),s=e("/replaceHolders"),l=1,u=4,c=8,p=128,h
=256,f="__lodash_placeholder__",d=Math.min;t.exports=r},{"/arrayCopy":62,"/composeArgs":96,"/composeArgs
Right":97,"/replaceHolders":132}],129:[function(e,t,n){(function(n){var
r=e("/getNative"),i=r(n,"WeakMap"),a=i&&new i;t.exports=a}).call(this,"undefined"!==typeof
global?global:"undefined"!==typeof self?"undefined"!==typeof
window?window:{})},{"/getNative":114}],130:[function(e,t,n){var
r={};t.exports=r},{},131:[function(e,t,n){function
r(e,t){for(var n=e.length,r=o(t.length,n),s=i(e),r--;){var l=t[r];e[r]=a(l,n)?s[l]:void 0}return e}var
i=e("/arrayCopy"),a=e("/isIndex"),o=Math.min;t.exports=r},{"/arrayCopy":62,"/isIndex":121}],132:[function(e,t,
n){function r(e,t){for(var n=-1,r=e.length,a=-1,o=[];++n<r;)e[n]===t&&(e[n]=i,o[++a]=n);return o}var
i="__lodash_placeholder__";t.exports=r},{},133:[function(e,t,n){var
r=e("/baseSetData"),i=e("/date/now"),a=150,o=16,s=function(){var e=0,t=0;return function(n,s){var l=i(),u=o-(l-
t);if(t=l,u>0){if(++e>=a)return n}else e=0;return
r(n,s)}}();t.exports=s},{"/date/now":57,"/baseSetData":88}],134:[function(e,t,n){function r(e){for(var
t=u(e),n=t.length,r=n&&e.length,c=!!r&&s(r)&&(a(e)||i(e)||e)),h=-1,f=[];++h<n;){var
d=t[h];(c&&o(d,r)||p.call(e,d))&&f.push(d)}return f}var
i=e("/lang/isArguments"),a=e("/lang/isArray"),o=e("/isIndex"),s=e("/isLength"),l=e("/lang/isString"),u=e("/ob
ject/keysIn"),c=Object.prototype,p=c.hasOwnProperty;t.exports=r},{"/lang/isArguments":139,"/lang/isArray":14
0,"/lang/isString":146,"/object/keysIn":150,"/isIndex":121,"/isLength":125}],135:[function(e,t,n){function
r(e){if(o.unindexedChars&&a(e)){for(var t=-1,n=e.length,r=Object(e);++t<n;r[t]=e.charAt(t);return r}return
i(e)?e:Object(e)}var
i=e("/lang/isObject"),a=e("/lang/isString"),o=e("/support");t.exports=r},{"/lang/isObject":144,"/lang/isString":
146,"/support":153}],136:[function(e,t,n){function r(e){if(a(e))return e;var t=[];return

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i(e).replace(o,function(e,n,r,i){t.push(r?i.replace(s,"$1"):n||e)),t}var
i=e("./baseToString"),a=e("./lang/isArray"),o=/[^\[\]]+|[(?(-
?d+(?.\d+)?)(["'])(?:!(?!\2)[^\n\\]*(?|\2)\]/g,s=/^(\\)?/g;t.exports=r},{"/lang/isArray":140,"/baseToString":90
],137:[function(e,t,n){function r(e){return e instanceof i?e.clone():new
a(e.__wrapped__,e.__chain__,o(e.__actions__))}var
i=e("./LazyWrapper"),a=e("./LodashWrapper"),o=e("./arrayCopy");t.exports=r},{"/LazyWrapper":60,"/LodashWra
pper":61,"/arrayCopy":62}],138:[function(e,t,n){function
r(e,t,n){return"function"==typeof t?i(e,!0,a(t,n,3)):i(e,!0)}var
i=e("./internal/baseClone"),a=e("./internal/bindCallback");t.exports=r},{"/internal/baseClone":68,"/internal/bind
Callback":94}],139:[function(e,t,n){function r(e){return a(e)&&i(e)&&s.call(e,"callee")&&!l.call(e,"callee")}var
i=e("./internal/isArrayLike"),a=e("./internal/isObjectLike"),o=Object.prototype,s=o.hasOwnProperty,l=o.propertyI
sEnumerable;t.exports=r},{"/internal/isArrayLike":119,"/internal/isObjectLike":126}],140:[function(e,t,n){var
r=e("./internal/getNative"),i=e("./internal/isNaN"),a=e("./internal/isObjectLike"),o="[object
Array]",s=Object.prototype,l=s.toString,u=r(Array,"isArray"),c=u||function(e){return
a(e)&&i(e.length)&&l.call(e)==o};t.exports=c},{"/internal/getNative":114,"/internal/isNaN":125,"/internal/is
ObjectLike":126}],141:[function(e,t,n){function r(e){return
null==e||(o(e)&&(a(e)||u(e)||i(e)||l(e)&&s(e.splice))?!e.length:!c(e).length)}var
i=e("./isArguments"),a=e("./isArray"),o=e("./internal/isArrayLike"),s=e("./isFunction"),l=e("./internal/isObjectLike
"),u=e("./isString"),c=e("./object/keys");t.exports=r},{"/internal/isArrayLike":119,"/internal/isObjectLike":126,"
/object/keys":149,"/isArguments":139,"/isArray":140,"/isFunction":142,"/isString":146}],142:[function(e,t,n){fu
nction r(e){return i(e)&&s.call(e)==a}var i=e("./isObject"),a="[object
Function]",o=Object.prototype,s=o.toString;t.exports=r},{"/isObject":144}],143:[function(e,t,n){function
r(e){return null!=e&&(i(e)?p.test(u.call(e)):o(e)&&(a(e)?p:s).test(e))}var
i=e("./isFunction"),a=e("./internal/isHostObject"),o=e("./internal/isObjectLike"),s=/^([object
.+?Constructor\]$)/,l=Object.prototype,u=Function.prototype.toString,c=l.hasOwnProperty,p=RegExp("^(^"+u.call(c).r
eplace(/[\^\$.*+?(){}|]/g,"\\$&").replace(/hasOwnProperty|function/.source,"(?!\\)| for
.+?(?!\\)|/g,"$1.*?")+"$");t.exports=r},{"/internal/isHostObject":120,"/internal/isObjectLike":126,"/isFunction":
142}],144:[function(e,t,n){function
r(e){var t=typeof e;return!!e&&("object"==t||"function"==t)}t.exports=r},{},145:[function(e,t,n){function r(e){var
t;if(!s(e)||h.call(e)!=u||o(e)||a(e)||p.call(e,"constructor")&&(t=e.constructor,"function"==typeof t&&(t instanceof
t)))return!1;var n;return l.ownLast?(i(e,function(e,t,r){return n=p.call(r,t,!1}),n!=!1):(i(e,function(e,t){n=t}),void
0===n||p.call(e,n))}var
i=e("./internal/baseForIn"),a=e("./isArguments"),o=e("./internal/isHostObject"),s=e("./internal/isObjectLike"),l=e(
"./support"),u="[object
Object]",c=Object.prototype,p=c.hasOwnProperty,h=c.toString;t.exports=r},{"/internal/baseForIn":75,"/internal/i
sHostObject":120,"/internal/isObjectLike":126,"/support":153,"/isArguments":139}],146:[function(e,t,n){functio
n r(e){return"string"==typeof e||i(e)&&s.call(e)==a}var i=e("./internal/isObjectLike"),a="[object
String]",o=Object.prototype,s=o.toString;t.exports=r},{"/internal/isObjectLike":126}],147:[function(e,t,n){functio
n
r(e){return a(e)&&i(e.length)&&!!T[l.call(e)]}var
i=e("./internal/isNaN"),a=e("./internal/isObjectLike"),o="[object Arguments]",s="[object Array]",l="[object
Boolean]",u="[object Date]",c="[object Error]",p="[object Function]",h="[object Map]",f="[object
Number]",d="[object Object]",m="[object RegExp]",g="[object Set]",y="[object String]",v="[object
WeakMap]",b="[object ArrayBuffer]",w="[object Float32Array]",_="[object Float64Array]",x="[object
Int8Array]",A="[object Int16Array]",S="[object Int32Array]",j="[object Uint8Array]",E="[object
Uint8ClampedArray]",O="[object Uint16Array]",k="[object
Uint32Array]",T={};T[w]=T[_]=T[x]=T[A]=T[S]=T[j]=T[E]=T[O]=T[k]=!0,T[o]=T[s]=T[b]=T[l]=T[u]=T[c]=T[p]
=T[h]=T[f]=T[d]=T[m]=T[g]=T[y]=T[v]=!1;var

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C=Object.prototype,I=C.toString;t.exports=r},{../internal/isLength":125,../internal/isObjectLike":126}],148:[function(e,t,n){function r(e){return void 0===e?t.exports=r},{},149:[function(e,t,n){var
r=e("../internal/getNative"),i=e("../internal/isArrayLike"),a=e("../lang/isObject"),o=e("../internal/shimKeys"),s=e("../
support"),l=r(Object,"keys"),u=l?function(e){var
t=null==e?void 0:e.constructor;return"function"===typeof t&&t.prototype===e||("function"===typeof
e?s.enumPrototypes:i(e))?o(e):a(e)?l(e):[];o:t.exports=u},{../internal/getNative":114,../internal/isArrayLike":119,
../internal/shimKeys":134,../lang/isObject":144,../support":153}],150:[function(e,t,n){function
r(e){if(null==e)return[];c(e)|(e=Object(e));var t=e.length;t=t&&u(t)&&o(e)||a(e)||p(e)&&t||0;for(var
n=e.constructor,r=-1,i=s(n)&&n.prototype||S,f=i===e,d=Array(t),m=t>0,y=h.enumErrorProps&&(e===A||e
instanceof Error),v=h.enumPrototypes&&s(e);++r<t;)d[r]=r+"";for(var w in
e)v&&"prototype"===w||y&&("message"===w||"name"===w)||m&&l(w,t)||"constructor"===w&&(f||!E.call(e,w))||d.pus
h(w);if(h.nonEnumShadows&&e!==(S))var
T=e===j?_:e===A?g:O.call(e),C=k[T]||k[b];for(T=b&&(i=S),t=x.length;t--;) {w=x[t];var
I=C[w];f&&I||(?!E.call(e,w):e[w]===i[w])||d.push(w)}return
d}var
i=e("../internal/arrayEach"),a=e("../lang/isArguments"),o=e("../lang/isArray"),s=e("../lang/isFunction"),l=e("../intern
al/isIndex"),u=e("../internal/isLength"),c=e("../lang/isObject"),p=e("../lang/isString"),h=e("../support"),f="[object
Array]",d="[object Boolean]",m="[object Date]",g="[object Error]",y="[object Function]",v="[object
Number]",b="[object Object]",w="[object RegExp]",_="[object
String]",x=["constructor","hasOwnProperty","isPrototypeOf","propertyIsEnumerable","toLocaleString","toString","
valueOf"],A=Error.prototype,S=Object.prototype,j=String.prototype,E=S.hasOwnProperty,O=S.toString,k={};k[f]=
k[m]=k[v]={constructor:!0,toLocaleString:!0,toString:!0,valueOf:!0},k[d]=k[_]={constructor:!0,toString:!0,valueOf
:!0},k[g]=k[y]=k[w]={constructor:!0,toString:!0},k[b]={constructor:!0},i(x,function(e){for(var t in
k)if(E.call(k,t)){var
n=k[t];n[e]=E.call(n,e)}}),t.exports=r},{../internal/arrayEach":63,../internal/isIndex":121,../internal/isLength":12
5,../lang/isArguments":139,../lang/isArray":140,../lang/isFunction":142,../lang/isObject":144,../lang/isString":1
46,../support":153}],151:[function(e,t,n){function
r(e){e=a(e);for(var t=-1,n=i(e),r=n.length,o=Array(r);++t<r;){var s=n[t];o[t]=[s,e[s]]}return o}var
i=e("../keys"),a=e("../internal/toObject");t.exports=r},{../internal/toObject":135,../keys":149}],152:[function(e,t,n){f
unction r(e){return i(e,a(e))}var
i=e("../internal/baseValues"),a=e("../keys");t.exports=r},{../internal/baseValues":91,../keys":149}],153:[function(e,t
,n){var
r=Array.prototype,i=Error.prototype,a=Object.prototype,o=a.propertyIsEnumerable,s=r.splice,l={};!function(e){var
t=function(){this.x=e},n={0:e,length:e},r=[];t.prototype={valueOf:e,y:e};for(var a in new
t)r.push(a);l.enumErrorProps=o.call(i,"message")||o.call(i,"name"),l.enumPrototypes=o.call(t,"prototype"),l.nonEnu
mShadows=!/valueOf/.test(r),l.ownLast="x"!==(r[0],l.spliceObjects=(s.call(n,0,1),!n[0]),l.unindexedChars="x"[0]+Ob
ject("x")[0]!="xx")(1,0),t.exports=l},{},154:[function(e,t,n){function
r(e){return e}t.exports=r},{},155:[function(e,t,n){function r(){t.exports=r},{},156:[function(e,t,n){function
r(e){return o(e)?i(e):a(e)}var
i=e("../internal/baseProperty"),a=e("../internal/basePropertyDeep"),o=e("../internal/isKey");t.exports=r},{../internal/
baseProperty":86,../internal/basePropertyDeep":87,../internal/isKey":123}],157:[function(e,n,r){(function(e){!func
tion(e){"use strict";if("function"===typeof bootstrap)bootstrap("promise",e);else if("object"===typeof
r&&"object"===typeof n)n.exports=e;else if("function"===typeof t&&t.amd)t(e);else if("undefined"!==typeof
ses){if(!ses.ok())return;ses.makeQ=e}else if("undefined"===typeof window&&"undefined"===typeof self)throw new
Error("This environment was not anticipated by Q. Please file a bug.");var i="undefined"!==typeof
window?window:self,a=i.Q,i.Q=e(),i.Q.noConflict=function(){return i.Q=a,this}})(function(){"use strict";function
t(e){return function(){return Q.apply(e,arguments)}}function

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n(e){return e===Object(e)}function r(e){return"[object StopIteration]"===re(e)||e instanceof H}function
i(e,t){if($&&t.stack&&"object"===typeof e&&null!==e&&e.stack&&e.stack.indexOf(ie)===-1){for(var
n=[],r=t;r=r.source)r.stack&&n.unshift(r.stack);n.unshift(e.stack);var i=n.join("\n"+ie+"\n");e.stack=a(i)} }function
a(e){for(var t=e.split("\n"),n=[],r=0;r<t.length;++r){var i=t[r];l(i)||o(i)||i||n.push(i)}return n.join("\n")}function
o(e){return e.indexOf("(module.js:")!==-1||e.indexOf("(node.js:")!==-1}function s(e){var t=/at .+
\\((.+:\\d+):(?:\\d+))$/ .exec(e);if(t)return[t[1],Number(t[2])];var n=/at ([^
]+):(\\d+):(?:\\d+)$/ .exec(e);if(n)return[n[1],Number(n[2])];var r=/.*@.(.+:\\d+)$/ .exec(e);return
r?[r[1],Number(r[2])]:void 0}function l(e){var t=s(e);if(!t)return!1;var n=t[0],r=t[1];return
n===V&&r>=Y&&r<=ue}function u(){if($)try{throw new Error}catch(e){var
t=e.stack.split("\n"),n=t[0].indexOf("@")>0?t[1]:t[2],r=s(n);if(!r)return;return V=r[0],r[1]} }function c(e,t,n){return
function(){return"undefined"!==typeof console&&"function"===typeof console.warn&&console.warn(t+" is
deprecated, use "+n+" instead.",new Error("")).stack),e.apply(e,arguments)} }function p(e){return e instanceof
m?e:b(e)?k(e):O(e)}function h(){function
e(e){t=e,a.source=e,K(n,function(t,n){p.nextTick(function(){e.promiseDispatch.apply(e,n)}),void 0),n=void
0,r=void 0}var t,n=[],r=[],i=ee(h.prototype),a=ee(m.prototype);if(a.promiseDispatch=function(e,i,a){var
o=G(arguments);n?(n.push(o),"when"===i&&a[1]&&r.push(a[1])):p.nextTick(function(){t.promiseDispatch.apply(t
,o)}),a.valueOf=function(){if(n)return a;var e=y(t);return v(e)&&(t=e),e},a.inspect=function(){return
t?t.inspect():{state:"pending"}}},p.longStackSupport&&$)try{throw new
Error}catch(o){a.stack=o.stack.substring(o.stack.indexOf("\n")+1)}return
i.promise=a,i.resolve=function(n){t||e(p(n))},i.fulfill=function(n){t||e(O(n))},i.reject=function(n){t||e(E(n))},i.notify
=function(e){t||K(r,function(t,n){p.nextTick(function(){n(e)}),void
0)},i}function f(e){if("function"!==typeof e)throw new TypeError("resolver must be a function.");var
t=h();try{e(t.resolve,t.reject,t.notify)}catch(n){t.reject(n)}return t.promise}function d(e){return
f(function(t,n){for(var r=0,i=e.length;r<i;r++)p(e[r]).then(t,n))}}function m(e,t,n){void
0===t&&(t=function(e){return E(new Error("Promise does not support operation: "+e))),void
0===n&&(n=function(){return{state:"unknown"}});var r=ee(m.prototype);if(r.promiseDispatch=function(n,i,a){var
o;try{o=e[i]?e[i].apply(r,a):t.call(r,i,a)}catch(s){o=E(s)}n&&n(o)},r.inspect=n,n){var
i=n();"rejected"===i.state&&(r.exception=i.reason),r.valueOf=function(){var
e=n();return"pending"===e.state||"rejected"===e.state?r:e.value}}return r}function g(e,t,n,r){return
p(e).then(t,n,r)}function y(e){if(v(e)){var t=e.inspect();if("fulfilled"===t.state)return t.value}return e}function
v(e){return e instanceof m}function b(e){return n(e)&&"function"===typeof e.then}function w(e){return
v(e)&&"pending"===e.inspect().state}function
_(e){return!v(e)||"fulfilled"===e.inspect().state}function x(e){return v(e)&&"rejected"===e.inspect().state}function
A(){ae.length=0,oe.length=0,le||(le=!0)}function S(t,n){le&&("object"===typeof e&&"function"===typeof
e.emit&&p.nextTick.runAfter(function(){X(oe,t)!==
1&&(e.emit("unhandledRejection",n,t),se.push(t))),oe.push(t),n&&"undefined"!==typeof
n.stack?ae.push(n.stack):ae.push("(no stack) "+n))}function j(t){if(le){var n=X(oe,t);n!==-1&&("object"===typeof
e&&"function"===typeof e.emit&&p.nextTick.runAfter(function(){var r=X(se,t);r!==-
1&&(e.emit("rejectionHandled",ae[n],t),se.splice(r,1))}),oe.splice(n,1),ae.splice(n,1))}}function E(e){var
t=m({when:function(t){return t&&j(this),t?t(e):this}},function(){return
this},function(){return{state:"rejected",reason:e}});return S(t,e),t}function O(e){return m({when:function(){return
e},get:function(t){return e[t]},set:function(t,n){e[t]=n},"delete":function(t){delete e[t]},post:function(t,n){return
null===t||void
0===t?e.apply(void 0,n):e[t].apply(e,n)},apply:function(t,n){return e.apply(t,n)},keys:function(){return
ne(e)}},void 0,function(){return{state:"fulfilled",value:e}})}function k(e){var t=h();return
p.nextTick(function(){try{e.then(t.resolve,t.reject,t.notify)}catch(n){t.reject(n)}},t.promise)}function T(e){return
m({isDef:function(){}},function(t,n){return R(e,t,n)},function(){return p(e).inspect()})}function C(e,t,n){return
p(e).spread(t,n)}function I(e){return function(){function t(e,t){var o;if("undefined"===typeof

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StopIteration){try{o=n[e](t)}catch(s){return E(s)}return
o.done?p(o.value):g(o.value,i,a)}try{o=n[e](t)}catch(s){return r(s)?p(s.value):E(s)}return g(o,i,a)}var
n=e.apply(this,arguments),i=t.bind(t,"next"),a=t.bind(t,"throw");return i)}function
D(e){p.done(p.async(e))}function L(e){throw new H(e)}function M(e){return function(){return
C([this,U(arguments)],function(t,n){return e.apply(t,n)}}}function R(e,t,n){return p(e).dispatch(t,n)}function
U(e){return g(e,function(e){var
t=0,n=h();return K(e,function(r,i,a){var
o;v(i)&&"fulfilled"===o=i.inspect().state?e[a]=o.value(++t,g(i,function(r){e[a]=r,0===--
t&&n.resolve(e)),n.reject,function(e){n.notify({index:a,value:e})})),void
0),0===t&&n.resolve(e),n.promise}}function P(e){if(0===e.length)return p.resolve();var t=p.defer(),n=0;return
K(e,function(r,i,a){function o(e){t.resolve(e)}function s(){n--,0===n&&t.reject(new Error("Can't get fulfillment
value from any promise, all promises were rejected."))}function l(e){t.notify({index:a,value:e})}var
u=e[a];n++,g(u,o,s,l),void 0,t.promise}function q(e){return g(e,function(e){return
e=Z(e,p),g(U(Z(e,function(e){return g(e,J,J)})),function(){return e}})}function B(e){return
p(e).allSettled()}function N(e,t){return p(e).then(void 0,void 0,t)}function z(e,t){return p(e).nodeify(t)}var
$=!1;try{throw new Error}catch(F){$=!1,F.stack}var V,H,Y=u(),J=function(){},W=function(){function t(){for(var
e,t;r.next;r=r.next,e=r.task,r.task=void 0,t=r.domain,t&&(r.domain=void
0,t.enter()),n(e,t);for(;l.length;e=l.pop(),n(e);a=!1}function n(e,n){try{e()}catch(r){if(s)throw
n&&n.exit(),setTimeout(t,0),n&&n.enter(),r;setTimeout(function(){throw r},0)}n&&n.exit()}var r={task:void
0,next:null},i=r,a=!1,o=void
0,s=!1,l=[];if(W=function(t){i=i.next={task:t,domain:s&&e.domain,next:null},a||(a=!0,o())), "object"===typeof
e&&"[object process]"===e.toString()&&e.nextTick)s=!0,o=function(){e.nextTick(t)};else if("function"===typeof
setImmediate)o="undefined"!==typeof window?setImmediate.bind(window,t):function(){setImmediate(t)};else
if("undefined"!==typeof MessageChannel){var u=new
MessageChannel;u.port1.onmessage=function(){o=c,u.port1.onmessage=t,t()};var
c=function(){u.port2.postMessage(0)};o=function(){setTimeout(t,0,c())}else o=function(){setTimeout(t,0)};return
W.runAfter=function(e){l.push(e),a||(a=!0,o())},W(),Q=Function.call,G=t(Array.prototype.slice),K=t(Array.protot
ype.reduce||function(e,t){var n=0,r=this.length;if(1===arguments.length)for(;;){if(n
in this){t=this[n++];break}if(++n>=r)throw new TypeError}for(;n<r;n++)n in this&&(t=e(t,this[n],n));return
t}),X=t(Array.prototype.indexOf||function(e){for(var t=0;t<this.length;t++)if(this[t]===e)return t;return-
1}),Z=t(Array.prototype.map||function(e,t){var n=this,r=[];return K(n,function(i,a,o){r.push(e.call(t,a,o,n))},void
0),r}),ee=Object.create||function(e){function t(){}return t.prototype=e,new
t},te=t(Object.prototype.hasOwnProperty),ne=Object.keys||function(e){var t=[];for(var n in
e)te(e,n)&&t.push(n);return t},re=t(Object.prototype.toString);H="undefined"!==typeof
ReturnValue?ReturnValue:function(e){this.value=e};var ie="From previous
event:";p.resolve=p,p.nextTick=W,p.longStackSupport=!1,"object"===typeof
e&&e&&e.env&&e.env.Q_DEBUG&&(p.longStackSupport=!0),p.defer=h,h.prototype.makeNodeResolver=functio
n(){var e=this;return
function(t,n){t?e.reject(t):arguments.length>2?e.resolve(G(arguments,1)):e.resolve(n)},p.Promise=f,p.promise=f,f.r
ace=d,f.all=U,f.reject=E,f.resolve=p,p.passByCopy=function(e){return
e},m.prototype.passByCopy=function(){return this},p.join=function(e,t){return
p(e).join(t)},m.prototype.join=function(e){return p([this,e]).spread(function(e,t){if(e===t)return e;throw new
Error("Can't join: not the same: "+e+" "+t)}),p.race=d,m.prototype.race=function(){return
this.then(p.race)},p.makePromise=m,m.prototype.toString=function(){return"[object
Promise]"},m.prototype.then=function(e,t,n){function r(t){try{return"function"===typeof e?e(t):t}catch(n){return
E(n)}}function a(e){if("function"===typeof t){i(e,s);try{return t(e)}catch(n){return E(n)}}return E(e)}function
o(e){return"function"===typeof n?n(e):e}var s=this,l=h(),u=!1;return
p.nextTick(function(){s.promiseDispatch(function(e){u||(u=!0,l.resolve(r(e))), "when",[function(e){u||(u=!0,l.resolv

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e(a(e)))))),s.promiseDispatch(void 0,"when",[void 0,function(e){var
t,n=!1;try{t=o(e)} catch(r){if(n=!0,!p.onerror)throw
r;p.onerror(r)}n||l.notify(t)}]),l.promise},p.tap=function(e,t){return p(e).tap(t)},m.prototype.tap=function(e){return
e=p(e),this.then(function(t){return
e.fcall(t).thenResolve(t)})),p.when=g,m.prototype.thenResolve=function(e){return this.then(function(){return
e}}),p.thenResolve=function(e,t){return p(e).thenResolve(t)},m.prototype.thenReject=function(e){return
this.then(function(){throw e}}),p.thenReject=function(e,t){return
p(e).thenReject(t)},p.nearer=y,p.isPromise=v,p.isPromiseAlike=b,p.isPending=w,m.prototype.isPending=function()
{return"pending"===this.inspect().state},p.isFulfilled=_,m.prototype.isFulfilled=function(){return"fulfilled"===this
.inspect().state},p.isRejected=x,m.prototype.isRejected=function(){return"rejected"===this.inspect().state};var
ae=[],oe=[],se=[],le=!0;p.resetUnhandledRejections=A,p.getUnhandledReasons=function(){return
ae.slice()},p.stopUnhandledRejectionTracking=function(){A(),le=!1},A(),p.reject=E,p.fulfill=O,p.master=T,p.sprea
d=C,m.prototype.spread=function(e,t){return this.all().then(function(t){return e.apply(void
0,t)},t)},p.async=I,p.spawn=D,p["return"]=L,p.promised=M,p.dispatch=R,m.prototype.dispatch=function(e,t){var
n=this,r=h();return p.nextTick(function(){n.promiseDispatch(r.resolve,e,t)},r.promise},p.get=function(e,t){return
p(e).dispatch("get",[t])},m.prototype.get=function(e){return this.dispatch("get",[e])},p.set=function(e,t,n){return
p(e).dispatch("set",[t,n])},m.prototype.set=function(e,t){return
this.dispatch("set",[e,t])},p.del=p["delete"]=function(e,t){return
p(e).dispatch("delete",[t])},m.prototype.del=m.prototype["delete"]=function(e){return
this.dispatch("delete",[e])},p.mapply=p.post=function(e,t,n){return
p(e).dispatch("post",[t,n])},m.prototype.mapply=m.prototype.post=function(e,t){return
this.dispatch("post",[e,t])},p.send=p.mcall=p.invoke=function(e,t){return
p(e).dispatch("post",[t,G(arguments,2)])},m.prototype.send=m.prototype.mcall=m.prototype.invoke=function(e){ret
urn this.dispatch("post",[e,G(arguments,1)])},p.fapply=function(e,t){return p(e).dispatch("apply",[void
0,t])},m.prototype.fapply=function(e){return
this.dispatch("apply",[void 0,e])},p["try"]=p.fcall=function(e){return p(e).dispatch("apply",[void
0,G(arguments,1)])},m.prototype.fcall=function(){return this.dispatch("apply",[void
0,G(arguments)])},p.fbind=function(e){var t=p(e),n=G(arguments,1);return function(){return
t.dispatch("apply",[this,n.concat(G(arguments))])}},m.prototype.fbind=function(){var e=this,t=G(arguments);return
function(){return e.dispatch("apply",[this,t.concat(G(arguments))])}},p.keys=function(e){return
p(e).dispatch("keys",[])},m.prototype.keys=function(){return
this.dispatch("keys",[])},p.all=U,m.prototype.all=function(){return
U(this)},p.any=P,m.prototype.any=function(){return
P(this)},p.allResolved=c(q,"allResolved","allSettled"),m.prototype.allResolved=function(){return
q(this)},p.allSettled=B,m.prototype.allSettled=function(){return this.then(function(e){return
U(Z(e,function(e){function t(){return e.inspect()}return
e=p(e),e.then(t,t)}))}),p.fail=p["catch"]=function(e,t){return
p(e).then(void 0,t)},m.prototype.fail=m.prototype["catch"]=function(e){return this.then(void
0,e)},p.progress=N,m.prototype.progress=function(e){return this.then(void 0,void
0,e)},p.fin=p["finally"]=function(e,t){return
p(e)["finally"](t)},m.prototype.fin=m.prototype["finally"]=function(e){return e=p(e),this.then(function(t){return
e.fcall().then(function(){return t}}),function(t){return e.fcall().then(function(){throw
t}})}),p.done=function(e,t,n,r){return p(e).done(t,n,r)},m.prototype.done=function(t,n,r){var
a=function(e){p.nextTick(function(){if(i(e,o),!p.onerror)throw
e;p.onerror(e)}),o=t||n||r?this.then(t,n,r):this;"object"===typeof
e&&e&&e.domain&&(a=e.domain.bind(a)),o.then(void 0,a)},p.timeout=function(e,t,n){return
p(e).timeout(t,n)},m.prototype.timeout=function(e,t){var n=h(),r=setTimeout(function(){t&&"string"!==typeof
t||(t=new Error(t||"Timed out after "+e+" ms"),t.code="ETIMEDOUT"),n.reject(t)},e);return

```

```

this.then(function(e){clearTimeout(r),n.resolve(e)},function(e){clearTimeout(r),n.reject(e)},n.notify),n.promise},p.d
elay=function(e,t){return
void 0===t&&(t=e,e=void 0),p(e).delay(t)},m.prototype.delay=function(e){return this.then(function(t){var
n=h();return setTimeout(function(){n.resolve(t)},e),n.promise}}),p.nfapply=function(e,t){return
p(e).nfapply(t)},m.prototype.nfapply=function(e){var t=h(),n=G(e);return
n.push(t.makeNodeResolver()),this.fapply(n).fail(t.reject),t.promise},p.nfcall=function(e){var
t=G(arguments,1);return p(e).nfapply(t)},m.prototype.nfcall=function(e){var e=G(arguments),t=h();return
e.push(t.makeNodeResolver()),this.fapply(e).fail(t.reject),t.promise},p.nfbind=p.denodeify=function(e){var
t=G(arguments,1);return function(){var n=t.concat(G(arguments)),r=h();return
n.push(r.makeNodeResolver()),p(e).fapply(n).fail(r.reject),r.promise}},m.prototype.nfbind=m.prototype.denodeify=
function(){var e=G(arguments);return e.unshift(this),p.denodeify.apply(void 0,e)},p.nbind=function(e,t){var
n=G(arguments,2);return function(){function
r(){return e.apply(t,arguments)}var i=n.concat(G(arguments)),a=h();return
i.push(a.makeNodeResolver()),p(r).fapply(i).fail(a.reject),a.promise}},m.prototype.nbind=function(e){var
e=G(arguments,0);return e.unshift(this),p.nbind.apply(void 0,e)},p.nmapply=p.npost=function(e,t,n){return
p(e).npost(t,n)},m.prototype.nmapply=m.prototype.npost=function(e,t){var n=G(t||[]),r=h();return
n.push(r.makeNodeResolver()),this.dispatch("post",[e,n]).fail(r.reject),r.promise},p.nsend=p.nmcall=p.ninvoke=fun
ction(e,t){var n=G(arguments,2),r=h();return
n.push(r.makeNodeResolver()),p(e).dispatch("post",[t,n]).fail(r.reject),r.promise},m.prototype.nsend=m.prototype.n
mcall=m.prototype.ninvoke=function(e){var t=G(arguments,1),n=h();return
t.push(n.makeNodeResolver()),this.dispatch("post",[e,t]).fail(n.reject),n.promise},p.nodeify=z,m.prototype.nodeify=
function(e){return e?void
this.then(function(t){p.nextTick(function(){e(null,t)}),function(t){p.nextTick(function(){e(t)}):this},p.noConflict
=function(){throw
new Error("Q.noConflict only works when Q is used as a global")});var ue=u();return
p}}).call(this,e("_process"))},{_process:12}},158:[function(e,t,n){function r(){function i(e){if(!y(e))return e;var
t=[];for(var n in e)a(t,n,e[n]);return t.join("&")}function
a(e,t,n){if(null!=n)if(Array.isArray(n))n.forEach(function(n){a(e,t,n)});else if(y(n))for(var r in
n)a(e,t+"["+r+"]",n[r]);else e.push(encodeURIComponent(t)+"="+encodeURIComponent(n));else
null===n&&e.push(encodeURIComponent(t))}function o(e){for(var
t,n,r={},i=e.split("&"),a=0,o=i.length;a<o;++a)t=i[a],n=t.indexOf("="),n===
1?r[decodeURIComponent(t)]="":r[decodeURIComponent(t.slice(0,n))]=decodeURIComponent(t.slice(n+1));return
r}function s(e){var t,n,r,i,a=e.split(/\r?\n/),o={};a.pop();for(var
s=0,l=a.length;s<l;++s)n=a[s],t=n.indexOf(":"),r=n.slice(0,t).toLowerCase(),i=b(n.slice(t+1)),o[r]=i;return
o}function l(e){return/[V+]\json\b/.test(e)}function u(e){return e.split(/ *;/).shift()}function c(e){return e.split(/
 *;/).reduce(function(e,t){var n=t.split(/ *=/),r=n.shift(),i=n.shift();return r&&i&&(e[r]=i),e},{})}function
p(e,t){t=t||{};this.req=e,this.xhr=this.req.xhr,this.text="HEAD"!=this.req.method&&("=="===this.xhr.responseType||"t
ext"===this.xhr.responseType)||"undefined"===typeof
this.xhr.responseType?this.xhr.responseText:null,this.statusText=this.req.xhr.statusText,this._setStatusProperties(thi
s.xhr.status),this.header=this.headers=s(this.xhr.getAllResponseHeaders()),this.header["content-
type"]=this.xhr.getResponseHeader("content-
type"),this._setHeaderProperties(this.header),this.body="HEAD"!=this.req.method?this._parseBody(this.text?this.te
xt:this.xhr.response):null}function h(e,t){var
n=this;this._query=this._query||[],this.method=e,this.url=t,this.header={},this._header={},this.on("end",function(){v
ar e=null,t=null;try{t=new p(n)}catch(r){return e=new Error("Parser is unable to parse the
response"),e.parse=!0,e.original=r,e.rawResponse=n.xhr&&n.xhr.responseText?n.xhr.responseText:null,e.statusCod
e=n.xhr&&n.xhr.status?n.xhr.status:null,n.callback(e)}n.emit("response",t);var

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i;try{(t.status<200||t.status>=300)&&(i=new Error(t.statusText||"Unsuccessful HTTP
response"),i.original=e,i.response=t,i.status=t.status)}catch(r){i=r}i?n.callback(i,t):n.callback(null,t)}function
f(e,t){var n=v("DELETE",e);return t&&n.end(t),n}var d;"undefined"!==typeof
window?d=window:"undefined"!==typeof self?d=self:(console.warn("Using browser-only version of superagent in
non-browser environment"),d=this);var m=e("emitter"),g=e("./request-base"),y=e("./is-
object"),v=t.exports=e("./request").bind(null,h);v.getXHR=function(){if(!d.XMLHttpRequest||d.location&&"file:"
==d.location.protocol&&d.ActiveXObject))return new XMLHttpRequest;try{return new
ActiveXObject("Microsoft.XMLHTTP")}catch(e){}try{return new
ActiveXObject("Msxml2.XMLHTTP.6.0")}catch(e){}try{return new
ActiveXObject("Msxml2.XMLHTTP.3.0")}catch(e){}try{return new
ActiveXObject("Msxml2.XMLHTTP")}catch(e){}throw Error("Browser-only
verison of superagent could not find XHR");var b=""_.trim?function(e){return e.trim()}:function(e){return
e.replace(/(^|\s*|\s*$)/g,"")};v.serializeObject=i,v.parseString=o,v.types={html:"text/html",json:"application/json",x
ml:"application/xml",urlencoded:"application/x-www-form-urlencoded",form:"application/x-www-form-
urlencoded","form-data":"application/x-www-form-urlencoded"},v.serialize={"application/x-www-form-
urlencoded":i,"application/json":JSON.stringify},v.parse={"application/x-www-form-
urlencoded":o,"application/json":JSON.parse},p.prototype.get=function(e){return
this.header[e.toLowerCase()]},p.prototype._setHeaderProperties=function(e){var t=this.header["content-
type"]||"";this.type=u(t);var n=c(t);for(var r in n)this[r]=n[r]},p.prototype._parseBody=function(e){var
t=v.parse[this.type];return t&&l(this.type)&&(t=v.parse["application/json"]),t&&e&&(e.length||e instanceof
Object)?t(e):null},p.prototype._setStatusProperties=function(e){1223===e&&(e=204);var
t=e/100|0;this.status=this.statusCode=e,this.statusType=t,this.info=1==t,this.ok=2==t,this.clientError=4==t,this.serv
erError=5==t,this.error=(4==t||5==t)&&this.toError(),this.accepted=202==e,this.noContent=204==e,this.badReques
t=400==e,this.unauthorized=401==e,this.notAcceptable=406==e,this.notFound=404==e,this.forbidden=403==e},p.
prototype.toError=function(){var
e=this.req,t=e.method,n=e.url,r="cannot "+t+" "+n+" ("+"this.status+""),i=new Error(r);
return i.status=this.status,i.method=t,i.url=n,i},v.Response=p,m(h.prototype);for(var w in
g)h.prototype[w]=g[w];h.prototype.type=function(e){return this.set("Content-
Type",v.types[e]|e),this},h.prototype.responseType=function(e){return
this._responseType=e,this},h.prototype.accept=function(e){return
this.set("Accept",v.types[e]|e),this},h.prototype.auth=function(e,t,n){switch(n||(n={type:"basic"}),n.type){case"basi
c":var r=toa(e+": "+t);this.set("Authorization","Basic "+r);break;case"auto":this.username=e,this.password=t}return
this},h.prototype.query=function(e){return"string"!==typeof
e&&(e=i(e)),e&&this._query.push(e),this},h.prototype.attach=function(e,t,n){return
this._getFormData().append(e,t,n|t.name),this},h.prototype._getFormData=function(){return
this._formData||(this._formData=new d.FormData),this._formData},h.prototype.callback=function(e,t){var
n=this._callback;this.clearTimeout(),n(e,t)},h.prototype.crossDomainError=function(){var e=new Error("Request
has been terminated\nPossible causes: the network is offline, Origin is not allowed by Access-Control-Allow-Origin,
the page is being unloaded,
etc.");e.crossDomain=!0,e.status=this.status,e.method=this.method,e.url=this.url,this.callback(e)},h.prototype._time
outError=function(){var e=this._timeout,t=new Error("timeout of "+e+"ms
exceeded");t.timeout=e,this.callback(t)},h.prototype._appendQueryString=function(){var
e=this._query.join("&");e&&(this.url+=~this.url.indexOf("?")?"&"+e:""+"?"+e)},h.prototype.end=function(e){var
t=this,n=this.xhr=v.getXHR(),i=this._timeout,a=this._formData||this._data;this._callback=e||r,n.onreadystatechange
=function(){if(4==n.readyState){var
e;try{e=n.status}catch(r){e=0}if(0==e){if(t.timedout)return t._timeoutError();if(t._aborted)return;return
t.crossDomainError()}t.emit("end")}};var
o=function(e){e.total>0&&(e.percent=e.loaded/e.total*100),e.direction="download",t.emit("progress",e)};this.hasLi

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steners("progress")&&(n.onprogress=o);try{n.upload&&this.listeners("progress")&&(n.upload.onprogress=o)}
catch(s){if(i&&this._timer&&(this._timer=setTimeout(function(){t.timedout=!0,t.abort();}),this._appendQueryS
tring(),this.username&&this.password?n.open(this.method,this.url,!0,this.username,this.password):n.open(this.meth
od,this.url,!0),this._withCredentials&&(n.withCredentials=!0),"GET"!=this.method&&"HEAD"!=this.method&&"s
tring"!=typeof a&&this._isHost(a)){var u=this._header["content-
type"],c=this._serializer||v.serialize[u?u.split(";")[0]:""];!c&&l(u)&&(c=v.serialize["application/json"]),c&&(a=c(a)
)}for(var p in this.header)null!=this.header[p]&&n.setRequestHeader(p,this.header[p]);return
this._responseType&&(n.responseType=this._responseType),this.emit("request",this),n.send("undefined"!=typeof
a?a:null),this},v.Request=h,v.get=function(e,t,n){var r=v("GET",e);return"function"==typeof
t&&(n=t,t=null),t&&r.query(t),n&&r.end(n),r},v.head=function(e,t,n){var
r=v("HEAD",e);return"function"==typeof
t&&(n=t,t=null),t&&r.send(t),n&&r.end(n),r},v.options=function(e,t,n){var
r=v("OPTIONS",e);return"function"==typeof
t&&(n=t,t=null),t&&r.send(t),n&&r.end(n),r},v.del=f,v["delete"]=f,v.patch=function(e,t,n){var
r=v("PATCH",e);return"function"==typeof
t&&(n=t,t=null),t&&r.send(t),n&&r.end(n),r},v.post=function(e,t,n){var r=v("POST",e);return"function"==typeof
t&&(n=t,t=null),t&&r.send(t),n&&r.end(n),r},v.put=function(e,t,n){var r=v("PUT",e);return"function"==typeof
t&&(n=t,t=null),t&&r.send(t),n&&r.end(n),r}},{"./is-object":159,"./request":161,"./request-
base":160,emitter:162}],159:[function(e,t,n){function r(e){return
null!=e&&"object"==typeof e}.t.exports=r},{}],160:[function(e,t,n){var r=e("./is-
object");n.clearTimeout=function(){return
this._timeout=0,clearTimeout(this._timer),this},n.parse=function(e){return
this._parser=e,this},n.serialize=function(e){return this._serializer=e,this},n.timeout=function(e){return
this._timeout=e,this},n.then=function(e,t){if(!this._fulfilledPromise){var n=this;this._fulfilledPromise=new
Promise(function(e,t){n.end(function(n,r){n?t(n):e(r)}))}}return
this._fulfilledPromise.then(e,t)},n.use=function(e){return e(this),this},n.get=function(e){return
this._header[e.toLowerCase()],n.getHeader=n.get,n.set=function(e,t){if(r(e)){for(var n in e)this.set(n,e[n]);return
this}return this._header[e.toLowerCase()]=t,this.header[e]=t,this},n.unset=function(e){return delete
this._header[e.toLowerCase()],delete this.header[e],this},n.field=function(e,t){return
this._getFormData().append(e,t),this},n.abort=function(){return
this._aborted?this:(this._aborted=!0,this.xhr&&this.xhr.abort(),this.req&&this.req.abort(),this.clearTimeout(),this.e
mit("abort"),this)},n.withCredentials=function(){return
this._withCredentials=!0,this},n.redirects=function(e){return
this._maxRedirects=e,this},n.toJSON=function(){return {method:this.method,url:this.url,data:this._data,headers:this.
_header}},n._isHost=function(e){var t={}.toString.call(e);switch(t){case"[object File]":case"[object
Blob]":case"[object FormData]":return!0;default:return!1}},n.send=function(e){var t=r(e),n=this._header["content-
type"];if(t&&r(this._data))for(var i in e)this._data[i]=e[i];else"string"==typeof
e?(n||this.type("form"),n=this._header["content-type"],"application/x-www-form-
urlencoded"==n?this._data=this._data?this._data+"&"+e:e:this._data=(this._data||"")+e):this._data=e;return!t||this._i
sHost(e)?this:(n||this.type("json"),this)},{"./is-object":159}],161:[function(e,t,n){function
r(e,t,n){return"function"==typeof n?new e("GET",t).end(n):2==arguments.length?new e("GET",t):new
e(t,n)}.t.exports=r},{}],162:[function(e,t,n){function
r(e){if(e)return i(e)}function i(e){for(var t in r.prototype)e[t]=r.prototype[t];return e}"undefined"!=typeof
t&&(t.exports=r),r.prototype.on=r.prototype.addEventListener=function(e,t){return
this._callbacks=this._callbacks||{},(this._callbacks["$"+e]=this._callbacks["$"+e]||[]).push(t),this},r.prototype.once=
function(e,t){function n(){this.off(e,n),t.apply(this,arguments)}return
n.fn=t,this.on(e,n),this},r.prototype.off=r.prototype.removeListener=r.prototype.removeAllListeners=r.prototype.re
moveEventListener=function(e,t){if(this._callbacks=this._callbacks||{},0==arguments.length)return

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this._callbacks={},this;var n=this._callbacks["$"+e];if(!n)return this;if(1==arguments.length)return delete
this._callbacks["$"+e],this;for(var r,i=0;i<n.length;i++)if(r=n[i],r===t||r.fn===t){n.splice(i,1);break}return
this},r.prototype.emit=function(e){this._callbacks=this._callbacks||{};var
t= [].slice.call(arguments,1),n=this._callbacks["$"+e];if(n){n=n.slice(0);for(var
r=0,i=n.length;r<i;i++)n[r].apply(this,t)}return this},r.prototype.listeners=function(e){return
this._callbacks=this._callbacks||{},this._callbacks["$"+e]||[],r.prototype.hasListeners=function(e){return!!this.listen
ers(e).length}},{}},{},{[1]}(1)),window.SwaggerUi=Backbone.Router.extend({dom_id:"swagger_ui",options:null,
api:null,headerView:null,mainView:null,initialize:function(e){e=e||{},"model"!==e.defaultModelRendering&&(e.de
faultModelRendering="schema"),e.highlightSizeThreshold||(e.highlightSizeThreshold=1e5),e.dom_id&&(this.dom_
id=e.dom_id,delete
e.dom_id),e.supportedSubmitMethods||(e.supportedSubmitMethods=["get","put","post","delete","head","options","p
atch"]),"string"===typeof
e.oauth2RedirectUrl&&(window.oauth2RedirectUrl=e.oauth2RedirectUrl),$("#"+this.dom_id).length||$("#body").app
end("<div id='"+this.dom_id+"'></div>"),this.options=e,marked.setOptions({gfm:!0});var
t=this;this.options.success=function(){return t.render()},this.options.progress=function(e){return
t.showMessage(e)},this.options.failure=function(e){return
t.onLoadFailure(e)},this.headerView=new
SwaggerUi.Views.HeaderView({el:$("#header")}),this.headerView.on("update-swagger-ui",function(e){return
t.updateSwaggerUi(e)}),JSONEditor.defaults.iconlibs.swagger=JSONEditor.AbstractIconLib.extend({mapping:{col
lapse:"collapse",expand:"expand"},icon_prefix:"swagger-
"}),setOption:function(e,t){this.options[e]=t},getOption:function(e){return
this.options[e]},updateSwaggerUi:function(e){this.options.url=e.url,this.load()},load:function(){this.mainView&&t
his.mainView.clear(),this.authView&&this.authView.remove();var
e=this.options.url;e&&0!==e.indexOf("http")&&(e=this.buildUrl(window.location.href.toString(),e)),this.api&&(thi
s.options.authorizations=this.api.clientAuthorizations.authz),this.options.url=e,this.headerView.update(e),this.api=n
ew
SwaggerClient(this.options)},collapseAll:function(){Docs.collapseEndpointListForResource(""),listAll:function(){
Docs.collapseOperationsForResource("")},expandAll:function(){Docs.expandOperationsForResource("")},render:fu
nction(){var
e;switch(this.showMessage("Finished Loading Resource Information. Rendering Swagger
UI..."),this.mainView=new
SwaggerUi.Views.MainView({model:this.api,el:$("#"+this.dom_id),swaggerOptions:this.options,router:this}).rende
r(),_isEmpty(this.api.securityDefinitions)||e=_map(this.api.securityDefinitions,function(e,t){var n={};return
n[t]=e,n}),this.authView=new
SwaggerUi.Views.AuthButtonView({data:SwaggerUi.utils.parseSecurityDefinitions(e),router:this}),$("#auth_conta
iner").append(this.authView.render().el),this.showMessage(),this.options.docExpansion){case"full":this.expandAll(
);break;case"list":this.listAll()}this.renderGFM(),this.options.onComplete&&this.options.onComplete(this.api,this),
setTimeout(Docs.shebang.bind(this),100)},buildUrl:function(e,t){if(0===t.indexOf("/")){var n=e.split("/");return
e=n[0]+"/"+n[2],e+t}var r=e.length;return e.indexOf("?")>-1&&(r=Math.min(r,e.indexOf("?"))),e.indexOf("#")>-
1&&(r=Math.min(r,e.indexOf("#"))),e=e.substring(0,r),e.indexOf("/",e.length-1)!==
1?e+t:e+"/"+t},showMessage:function(e){void
0===e&&(e="");var t=$("#message-bar");t.removeClass("message-fail"),t.addClass("message-
success"),t.text(e),window.SwaggerTranslator&&window.SwaggerTranslator.translate(t),onLoadFailure:function(e
){void 0===e&&(e=""),$("#message-bar").removeClass("message-success"),$("#message-
bar").addClass("message-fail");var t=$("#message-bar").text(e);return
this.options.onFailure&&this.options.onFailure(e,t)},renderGFM:function(){$( ".markdown").each(function(){$(this
).html(marked($(this).html()))},$("#propDesc",".model-signature
.description").each(function(){$(this).html(marked($(this).html())).addClass("markdown")}})},window.SwaggerUi

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.Views={},window.SwaggerUi.Models={},window.SwaggerUi.Collections={},window.SwaggerUi.partials={},win
dow.SwaggerUi.utils={},function(){function e(e){"console"in window&&"function"===typeof
window.console.warn&&console.warn(e)}window.authorizations={add:function(){if(e("Using
window.authorizations is deprecated. Please use SwaggerUi.api.clientAuthorizations.add()."),"undefined"===typeof
window.swaggerUi)throw new TypeError("window.swaggerUi is not defined");window.swaggerUi instanceof
SwaggerUi&&window.swaggerUi.api.clientAuthorizations.add.apply(window.swaggerUi.api.clientAuthorizations,a
rguments)}},window.ApiKeyAuthorization=function(){e("window.ApiKeyAuthorization is deprecated. Please use
SwaggerClient.ApiKeyAuthorization."),SwaggerClient.ApiKeyAuthorization.apply(window,arguments)},window.P
asswordAuthorization=function(){e("window.PasswordAuthorization is deprecated. Please use
SwaggerClient.PasswordAuthorization."),SwaggerClient.PasswordAuthorization.apply(window,arguments)}},fun
ction(e,t){"function"===typeof define&&define.amd?define(["b"],function(n){return
e.SwaggerUi=t(n)}):"object"===typeof
exports?module.exports=t(require("b")):e.SwaggerUi=t(e.b)}(this,function(){return
SwaggerUi}),window.SwaggerUi.utils={parseSecurityDefinitions:function(e){var
t=Object.assign({},window.swaggerUi.api.authSchemes||window.swaggerUi.api.securityDefinitions),n=[],r=[],i=[],a
=window.SwaggerUi.utils;return Array.isArray(e)?e.forEach(function(e){var o={},s={};for(var l in
e)if(Array.isArray(e[l])){if(!t[l])continue;if(t[l]=t[l]||{},"oauth2"===t[l].type){s[l]=Object.assign({},t[l]),s[l].scopes
=Object.assign({},t[l].scopes);for(var u in s[l].scopes)e[l].indexOf(u)<0&&delete
s[l].scopes[u];s[l].scopes=a.parseOauth2Scopes(s[l].scopes),i=_merge(i,s[l].scopes)}else
o[l]=Object.assign({},t[l])}else"oauth2"===e[l].type?(s[l]=Object.assign({},e[l]),s[l].scopes=a.parseOauth2Scopes(
s[l].scopes),i=_merge(i,s[l].scopes)):o[l]=e[l];_isEmpty(o)||r.push(o),_isEmpty(s)||n.push(s)},{auths:r,oauth2:n,sc
opes:i}):null},parseOauth2Scopes:function(e){var t,n=Object.assign({},e),r=[];for(t in
n)r.push({scope:t,description:n[t]});return r},sanitize:function(e){return
e=e.replace(/<script\b[^\<]*(?:?!<\script>)<[^\<]*><\script>/gi,""),e=e.replace(/(on\w+="[^"]*"")*(on\w+='[^']*")*(
on\w+=\w*(\w*\w*))*/gi,"")},SwaggerUi.Models.ApiKeyAuthModel=Backbone.Model.extend({defaults:{"in":"","na
me":"","title":"","value":""},initialize:function(){this.on("change",this.validate)},validate:function(){var
e=!this.get("value");return
this.set("valid",e,e)}},SwaggerUi.Views.ApiKeyAuthView=Backbone.View.extend({events:{"change
.input_apiKey_entry":"apiKeyChange"},selectors:{apiKeyInput:".input_apiKey_entry"},template:Handlebars.templa
tes.apikey_auth,initialize:function(e){this.options=e||{}},this.router=this.options.router},render:function(){return
this.$el.html(this.template(this.model.toJSON()),this),apiKeyChange:function(e){var
t=$(e.target).val();t&&this.$(this.selectors.apikeyInput).removeClass("error"),this.model.set("value",t)},isValid:fun
ction(){return
this.model.validate()},highlightInvalid:function(){this.isValid()||this.$(this.selectors.apikeyInput).addClass("error")}
}),SwaggerUi.Views.AuthButtonView=Backbone.View.extend({events:{"click
.authorize__btn":"authorizeBtnClick"},tpls:{popup:Handlebars.templates.popup,authBtn:Handlebars.templates.auth
_button,authBtnOperation:Handlebars.templates.auth_button_operation},initialize:function(e){this.options=e||{}},thi
s.options.data=this.options.data||{}},this.isOperation=this.options.isOperation,this.model=this.model||{}},this.router=t
his.options.router,this.auths=this.options.data.oauth2.concat(this.options.data.auths)},render:function(){var
e=this.isOperation?"authBtnOperation":"authBtn";return
this.$authEl=this.renderAuths(this.auths),this.$el.html(this.tpls[e](this.model)),this},authorizeBtnClick:function(e){
var t;e.preventDefault(),t={title:"Available authorizations",content:this.$authEl},this.render(),this.popup=new
SwaggerUi.Views.PopupView({model:t}),this.popup.render(),renderAuths:function(e){var
t=$("<div>"),n=!1;return e.forEach(function(e){var r=new
SwaggerUi.Views.AuthView({data:e,router:this.router}),i=r.render().el;t.append(i),r.isLogout&&(n=!0)},this),this.
model.isLogout=n,t}},SwaggerUi.Collections.AuthsCollection=Backbone.Collection.extend({constructor:function(
){var

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e=Array.prototype.slice.call(arguments);e[0]=this.parse(e[0]),Backbone.Collection.apply(this,e)},add:function(e){v
ar t=Array.prototype.slice.call(arguments);Array.isArray(e)?t[0]=_.map(e,function(e){return
this.handleOne(e)},this):t[0]=this.handleOne(e),Backbone.Collection.prototype.add.apply(this,t)},handleOne:functio
n(e){var t=e;if(!(e instanceof Backbone.Model))switch(e.type){case"oauth2":t=new
SwaggerUi.Models.Oauth2Model(e);break;case"basic":t=new
SwaggerUi.Models.BasicAuthModel(e);break;case"apiKey":t=new
SwaggerUi.Models.ApiKeyAuthModel(e);break;default:t=new Backbone.Model(e)}return t},isValid:function(){var
e=!0;return this.models.forEach(function(t){t.validate()||(e=!1)}),e},isAuthorized:function(){return
this.length===this.where({isLogout:!0}).length},isPartiallyAuthorized:function(){return
this.where({isLogout:!0}).length>0},parse:function(e){var
t=Object.assign({},window.swaggerUi.api.clientAuthorizations.authz);return
_.map(e,function(e,n){var r=t[n]&&"basic"===e.type&&t[n].username&&t[n].password;return
_.extend(e,{title:n}),(t[n]||r)&&_.extend(e,{isLogout:!0,value:r?void 0:t[n].value,username:r?t[n].username:void
0,password:r?t[n].password:void
0,valid:!0}),e)}}),SwaggerUi.Views.AuthsCollectionView=Backbone.View.extend({initialize:function(e){this.opti
ons=e||{},this.options.data=this.options.data||{},this.router=this.options.router,this.collection=new
SwaggerUi.Collections.AuthsCollection(e.data),this.$innerEl=$("<div>"),this.authViews=[],render:function(){retu
rn
this.collection.each(function(e){this.renderOneAuth(e)},this),this.$el.html(this.$innerEl.html()?this.$innerEl:""),this
},renderOneAuth:function(e){var
t,n,r,i=e.get("type");"apiKey"===i?r="ApiKeyAuthView":"basic"===i&&0===this.$innerEl.find(".basic_auth_cont
ainer").length?r="BasicAuthView":"oauth2"===i&&(r="Oauth2View"),r&&(n=new
SwaggerUi.Views[r]({model:e,router:this.router}),t=n.render().el,this.authViews.push(n)),this.$innerEl.append(t)},h
ighlightInvalid:function(){this.authViews.forEach(function(e){e.highlightInvalid()},this)}),SwaggerUi.Views.Auth
View=Backbone.View.extend({events:{"click
.auth_submit__button":"authorizeClick","click
.auth_logout__button":"logoutClick"},tpls:{main:Handlebars.templates.auth_view},selectors:{innerEl:".auth_inner"
,authBtn:".auth_submit__button"},initialize:function(e){this.options=e||{},e.data=e.data||{},this.router=this.options.r
outer,this.authsCollectionView=new
SwaggerUi.Views.AuthsCollectionView({data:e.data}),this.$el.html(this.tpls.main({isLogout:this.authsCollectionView
.collection.isAuthorized(),isAuthorized:this.authsCollectionView.collection.isPartiallyAuthorized()})),this.$inne
rEl=this.$(this.selectors.innerEl),this.isLogout=this.authsCollectionView.collection.isPartiallyAuthorized(),render:f
unction(){return
this.$innerEl.html(this.authsCollectionView.render().el),this},authorizeClick:function(e){e.preventDefault(),e.stopP
ropagation(),this.authsCollectionView.collection.isValid()?this.authorize():this.authsCollectionView.highlightInvali
d(),authorize:function(){this.authsCollectionView.collection.forEach(function(e){var
t,n,r=e.get("type");"apiKey"===r?(t=new
SwaggerClient.ApiKeyAuthorization(e.get("name"),e.get("value"),e.get("in")),this.router.api.clientAuthorizations.ad
d(e.get("title"),t)):"basic"===r?(n=new
SwaggerClient.PasswordAuthorization(e.get("username"),e.get("password")),this.router.api.clientAuthorizations.ad
d(e.get("title"),n)):"oauth2"===r&&this.handleOauth2Login(e)},this),this.router.load(),logoutClick:function(e){e.p
reventDefault(),this.authsCollectionView.collection.forEach(function(e){window.swaggerUi.api.clientAuthorization
s.remove(e.get("title"))}),this.router.load(),handleOauth2Login:function(e){var
t,n,r,i=window.location,a=location.pathname.substring(0,location.pathname.lastIndexOf("/")),o=i.protocol+"/"/+i.ho
st+a+"/o2c.html",s=window.oAuthRedirectUrl||o,l=null,u=_.map(e.get("scopes"),function(e){return
e.scope});window.OAuthSchemeKey=e.get("title"),window.enabledScopes=u;var
c=e.get("flow");if("oauth2"!==e.get("type")||!c||"implicit"!==c&&"accessToken"===c){if("oauth2"===e.get("type")
&&c&&"application"===c)return n=e.attributes,window.swaggerUi.tokenName=n.tokenName||"access_token",void

```

```

this.clientCredentialsFlow(u,n.tokenUrl>window.OAuthSchemeKey);if(e.get("grantTypes")){var
p=e.get("grantTypes");for(var h in
p)p.hasOwnProperty(h)&&"implicit"===h?(n=p[h],r=n.loginEndpoint.url,l=n.loginEndpoint.url+"?response_type=t
oken",window.swaggerUi.tokenName=n.tokenName):p.hasOwnProperty(h)&&"accessCode"===h&&(n=p[h],r=n.t
okenRequestEndpoint.url,l=n.tokenRequestEndpoint.url+"?response_type=code",window.swaggerUi.tokenName=n.
tokenName)}}else
n=e.attributes,l=n.authorizationUrl+"?response_type="+("implicit"===c?"token":"code"),window.swaggerUi.token
Name=n.tokenName||"access_token",window.swaggerUi.tokenUrl="accessCode"===c?n.tokenUrl:null,t=window.O
AuthSchemeKey;redirect_uri=s,l+="&redirect_uri="+encodeURIComponent(s),l+="&realm="+encodeURIComponent(
realm),l+="&client_id="+encodeURIComponent(clientId),l+="&scope="+encodeURIComponent(u.join(scopeS
eparator)),l+="&state="+encodeURIComponent(t);for(var
f in
additionalQueryStringParams)l+="&"+f+"="+encodeURIComponent(additionalQueryStringParams[f]);window.ope
n(l)},clientCredentialsFlow:function(e,t,n){var r={client_id:clientId,client_secret:clientSecret,scope:e.join("
"),grant_type:"client_credentials"};$ajax({url:t,type:"POST",data:r,success:function(e){onOAuthComplete(e,n)},er
ror:function(){onOAuthComplete("")}})),SwaggerUi.Models.BasicAuthModel=Backbone.Model.extend({default
s:{username:"",password:"",title:"basic"},initialize:function(){this.on("change",this.validate)},validate:function(){v
ar e=!this.get("password")&&!this.get("username");return
this.set("valid",e),e}},SwaggerUi.Views.BasicAuthView=Backbone.View.extend({initialize:function(e){this.optio
ns=e||{},this.router=this.options.router},events:{"change
.auth_input":"inputChange"},selectors:{usernameInput:".basic_auth__username",passwordInput:".basic_auth__pass
word"},cls:{error:"error"},template:Handlebars.templates.basic_auth,render:function(){return
$(this.el).html(this.template(this.model.toJSON()))},inputChange:function(e){var
t=$(e.target),n=t.val(),r=t.prop("name");n&&t.removeClass(this.cls.error),this.model.set(r,n)},isValid:function(){ret
urn
this.model.validate()},highlightInvalid:function(){this.model.get("username")||this.$(this.selectors.usernameInput).a
ddClass(this.cls.error)}}),SwaggerUi.Views.ContentTypeView=Backbone.View.extend({initialize:function(){},rend
er:function(){return
this.model.contentTypeId="ct"+Math.random(),$(this.el).html(Handlebars.templates.content_type(this.model)),this}
}),SwaggerUi.Views.HeaderView=Backbone.View.extend({events:{"click #show-pet-store-
icon":"showPetStore","click #explore":"showCustom","submit #api_selector":"showCustom","keyup
#input_baseUrl":"showCustomOnKeyup","keyup
#input_apiKey":"showCustomOnKeyup"},initialize:function(){},showPetStore:function(){this.trigger("update-
swagger-
ui",{url:"http://petstore.swagger.io/v2/swagger.json"}),showCustomOnKeyup:function(e){13===e.keyCode&&thi
s.showCustom()},showCustom:function(e){e&&e.preventDefault(),this.trigger("update-swagger-
ui",{url:$("#input_baseUrl").val()})},update:function(e,t,n){void
0===n&&(n=!1),$("#input_baseUrl").val(e),n&&this.trigger("update-swagger-
ui",{url:e})}},SwaggerUi.Views.MainView=Backbone.View.extend({apisorter:{alpha:function(e,t){return
e.name.localeCompare(t.name)}},operationsSorters:{alpha:function(e,t){return
e.path.localeCompare(t.path)},method:function(e,t){return
e.method.localeCompare(t.method)}},initialize:function(e){var
t,n,r,i;if(e=e||{},this.router=e.router,e.swaggerOptions.apisorter&&(t=e.swaggerOptions.apisorter,n=_.isFunction(
t)?t:this.apisorter[t],_.isFunction(n)&&this.model.apisArray.sort(n)),e.swaggerOptions.operationsSorter&&(t=e.sw
aggerOptions.operationsSorter,n=_.isFunction(t)?t:this.operationsSorters[t],_.isFunction(n)))for(r
in this.model.apisArray)this.model.apisArray[r].operationsArray.sort(n);this.model.auths=[];for(r in
this.model.securityDefinitions)i=this.model.securityDefinitions[r],this.model.auths.push({name:r,type:i.type,value:i
});"validatorUrl"in

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e.swaggerOptions?this.model.validatorUrl=e.swaggerOptions.validatorUrl:this.model.url.indexOf("localhost")>0||this.model.url.indexOf("127.0.0.1")>0?this.model.validatorUrl=null:this.model.validatorUrl="//online.swagger.io/validator";var a;for(a in this.model.definitions)this.model.definitions[a].type||(this.model.definitions[a].type="object"),render:function(){$(this.el).html(Handlebars.templates.main(this.model)),this.info=this.$(".info")[0],this.info&&this.info.addEventListener("click",this.onLinkClick,!0),this.model.securityDefinitions=this.model.securityDefinitions||{};for(var e={},t=0,n=0;n<this.model.apisArray.length;n++){for(var r=this.model.apisArray[n],i=r.name;"undefined"!==typeof e[i];i=i+"_" +t,t+=1;r.id=sanitizeHtml(i),e[i]=r,this.addResource(r,this.model.auths))return $( ".propWrap").hover(function(){$( ".optionsWrapper",$(this)).show()},function(){$( ".optionsWrapper",$(this)).hide()}),this},addResource:function(e,t){e.id=e.id.replace(/s/g,"_"),e.definitions=this.model.definitions;var n=new SwaggerUi.Views.ResourceView({model:e,router:this.router,tagName:"li",id:"resource_" +e.id,className:"resource",auths:t,swaggerOptions:this.options.swaggerOptions});$("#resources",this.el).append(n.render().el),clear:function(){$(this.el).html("")},onLinkClick:function(e){var t=e.target;"A"===t.tagName&&t.href&&!t.target&&(e.preventDefault(),window.open(t.href,"_blank"))}},SwaggerUi.Models.Oauth2Model=Backbone.Model.extend({defaults:{scopes:{}},initialize:function(){this.on("change",this.validate)},setScopes:function(e,t){var n=_ .extend({},this.attributes),r=_ .findIndex(n.scopes,function(t){return t.scope===e});n.scopes[r].checked=t,this.set(n),this.validate(),validate:function(){var e=!1,t=this.get("scopes"),n=_ .findIndex(t,function(e){return e.checked===!0});return t.length>0&&n>=0&&(e=!0),0===t.length&&(e=!0),this.set("valid",e),e}},SwaggerUi.Views.Oauth2View=Backbone.View.extend({events:{"change .oauth-scope":"scopeChange"},template:Handlebars.templates.oauth2,render:function(){return this.$el.html(this.template(this.model.toJSON()))},scopeChange:function(e){var t=$(e.target).prop("checked"),n=$(e.target).data("scope");this.model.setScopes(n,t)},SwaggerUi.Views.OperationView=Backbone.View.extend({invocationUrl:null,events:{"submit .sandbox":"submitOperation","click .submit":"submitOperation","click .response_hider":"hideResponse","click .toggleOperation":"toggleOperationContent","mouseenter .api-ic":"mouseenter","dblclick .curl":"selectText","change [name=responseContentType]":"showSnippet"},initialize:function(e){return e=e||{}},this.router=e.router,this.auths=e.auths,this.parentId=this.model.parentId,this.nickname=this.model.nickname,this.model.encodedParentId=encodeURIComponent(this.parentId),e.swaggerOptions&&(this.model.defaultRendering=e.swaggerOptions.defaultModelRendering,e.swaggerOptions.showRequestHeaders&&(this.model.showRequestHeaders=!0)),this},selectText:function(e){var t,n,r=document,i=e.target.firstChild;r.body.createTextRange?(t=document.body.createTextRange(),t.moveToElementText(i),t.select());window.getSelection&&(n=window.getSelection(),t=document.createRange(),t.selectNodeContents(i),n.removeAllRanges(),n.addRange(t)),mouseenter:function(e){var t=$(this.el).find(".content"),n=e.pageX,r=e.pageY,i=$(window).scrollLeft(),a=$(window).scrollTop(),o=i+(window).width(),s=a+(window).height(),l=t.width(),u=t.height();n+1>o&&(n=o-1),n<i&&(n=i),r+u>s&&(r=s-u),r<a&&(r=a);var c={};c.top=r,c.left=n,t.css(c)},render:function(){var e,t,n,r,i,a,o,s,l,u,c,p,h,f,d,m,g,y,v,b,w,x,A,S,j,E,O,k,T,C,I,D,L,M,R,U,P,q,B,N,z;if(a=jQuery.inArray(this.model.method,this.model.supportedSubmitMethods())>=0,a||(this.model.isReadOnly=!0),this.model.description=this.model.description||this.model.notes,this.model.oauth=null,m=this.model.authorizations||this.model.security)if(Array.isArray(m))for(l=0,u=m.length;l<u;l++){n=m[l];for(s in n)for(e in this.auths)if(t=this.auths[e],s===t.name&&"oauth2"===t.type){this.model.oauth={},this.model.oauth.scopes=[],A=t.value.scopes;for(o in A)P=A[o],D=n[s].indexOf(o),D>=0&&(y={scope:o,description:P},this.model.oauth.scopes.push(y))}else for(o in m)if(P=m[o],"oauth2"===o)for(null===this.model.oauth&&(this.model.oauth={}),void 0===this.model.oauth.scopes&&(this.model.oauth.scopes=[]),d=0,c=P.length;d<c;d++)y=P[d],this.model.oauth.scopes.push(y);if("undefined"!==typeof

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this.model.responses){this.model.responseMessages=[],S=this.model.responses;for(r in
S)q=S[r],C=null,I=this.model.responses[r].schema,I&&I.$ref&&(C=I.$ref,C.indexOf("#/definitions/")!==-
1&&(C=C.replace(/^\.*#\//definitions\/, ""))),this.model.responseMessages.push({code:r,message:q.description,resp
onseModel:C,headers:q.headers,schema:I});if("undefined"===typeof
this.model.responseMessages&&(this.model.responseMessages=[]),L=null,B=this.model.produces,N=this.contains(
B,"xml"),z=!N||this.contains(B,"json"),this.model.successResponse){R=this.model.successResponse;for(s in
R)q=R[s],this.model.successCode=s,"object"===typeof q&&"function"===typeof
q.createJSONSample?(this.model.successDescription=q.description,this.model.headers=this.parseResponseHeaders(
q.headers),L={sampleJSON:!!z&&JSON.stringify(SwaggerUi.partials.signature.createJSONSample(q),void
0,2),isParam:!!1,sampleXML:!!N&&SwaggerUi.partials.signature.createXMLSample(q.name,q.definition,q.models),
signature:SwaggerUi.partials.signature.getModelSignature(q.name,q.definition,q.models,q.modelPropertyMacro)}):
L={signature:SwaggerUi.partials.signature.getPrimitiveSignature(q)} }else
this.model.responseClassSignature&&"string"!==this.model.responseClassSignature&&(L={sampleJSON:this.mod
el.responseSampleJSON,isParam:!!1,signature:this.model.responseClassSignature});for($(this.el).html(Handlebars.te
mplates.operation(this.model)),L?(L.defaultRendering=this.model.defaultRendering,T=new
SwaggerUi.Views.SignatureView({model:L,router:this.router,tagName:"div"}),$(" ".model-
signature",$(this.el)).append(T.render().el):(this.model.responseClassSignature="string",$(" ".model-
signature",$(this.el)).html(this.model.type)),i={isParam:!!1},i.consumes=this.model.consumes,i.produces=this.model
.produces,j=this.model.parameters,g=0,p=j.length;g<p;g++)b=j[g],U=b.type||b.dataType||"", "undefined"===typeof
U&&(C=b.schema,C&&C.$ref&&(x=C.$ref,U=0===x.indexOf("#/definitions/")?x.substring("#/definitions/".length
):x)),U&&"file"===U.toLowerCase()&&(i.consumes||(i.consumes="multipart/form-data")),b.type=U;for(k=new
SwaggerUi.Views.ResponseContentTypeView({model:i,router:this.router}),$(" ".response-content-
type",$(this.el)).append(k.render().el),E=this.model.parameters,v=0,h=E.length;v<h;v++)b=E[v],this.addParameter(
b,i.consumes);for(O=this.model.responseMessages,w=0,f=O.length;w<f;w++)M=O[w],M.isXML=N,M.isJSON=z,_
.isUndefined(M.headers)|| (M.headers=this.parseHeadersType(M.headers)),this.addStatusCode(M);if(Array.isArray(t
his.model.security)){var
F=SwaggerUi.utils.parseSecurityDefinitions(this.model.security);F.isLogout=!_.isEmpty(window.swaggerUi.api.cli
entAuthorizations.authz),this.authView=new
SwaggerUi.Views.AuthButtonView({data:F,router:this.router,isOperation:!0,model:{scopes:F.scopes}}),this.$(".aut
horize-wrapper").append(this.authView.render().el)}return
this.showSnippet(),this},parseHeadersType:function(e){var t={string:{"date-time":"dateTime",date:"date"}};return
_.forEach(e,function(e){var
n;e=e||{} ,n=t[e.type]&&t[e.type][e.format],_.isUndefined(n)|| (e.type=n)),e,contains:function(e,t){return
e.filter(function(e){if(e.indexOf(t)>-1)return!0}).length},parseResponseHeaders:function(e){var t="";
",n=_.clone(e);return _.forEach(n,function(e){var n=[];_.forEach(e,function(e,t){var
r=["type","description"];r.indexOf(t.toLowerCase())===-1&&n.push(t+"":
"+e)}),n.join(t,e.other=n)),n},addParameter:function(e,t){e.consumes=t,e.defaultRendering=this.model.defaultRen
dering,e.schema&&($.extend(!0,e.schema,this.model.definitions[e.type]),e.schema.definitions=this.model.definition
s,e.schema.type||(e.schema.type="object"),e.schema.title||(e.schema.title=" "));var n=new
SwaggerUi.Views.ParameterView({model:e,tagName:"tr",readOnly:this.model.isReadOnly,swaggerOptions:this.opt
ions.swaggerOptions});$(" ".operation-
params",$(this.el)).append(n.render().el)},addStatusCode:function(e){e.defaultRendering=this.model.defaultRenderi
ng;var t=new SwaggerUi.Views.StatusCodeView({model:e,tagName:"tr",router:this.router});$(" ".operation-
status",$(this.el)).append(t.render().el)},submitOperation:function(e){var
t,n,r,i,a;if(null!==e&&e.preventDefault(),n=$(".sandbox",$(this.el)),t=!0,n.find("input.required").each(function(){$(
this).removeClass("error"),""===jQuery.trim($(this).val())&&$(this).addClass("error"),$(this).wigggle({callback:fu
nction(e){return

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function(){$(e).focus()}{(this)}),t=!1)}),n.find("textarea.required:visible").each(function(){$(this).removeClass("error"),""===jQuery.trim($(this).val())&&$(this).addClass("error"),$(this).wiggle({callback:function(e){return function(){return $(e).focus()}{(this)}),t=!1)}),n.find("select.required").each(function(){$(this).removeClass("error"),this.selectedIndex===-1&&$(this).addClass("error"),$(this).wiggle({callback:function(e){return function(){$(e).focus()}{(this)}),t=!1)}),t){if(i=this.getInputMap(n),r=this.isFileUpload(n),a={parent:this},this.options.swaggerOptions)for(var o in this.options.swaggerOptions)a[o]=this.options.swaggerOptions[o];var s;for(s=0;s<this.model.parameters.length;s++){var l=this.model.parameters[s];if(l.jsonEditor&&l.jsonEditor.isEnabled()){var u=l.jsonEditor.getValue();i[l.name]=JSON.stringify(u)}return a.responseContentType=$(("div select[name=responseContentType]",$(this.el)).val(),a.requestContentType=$(("div select[name=parameterContentType]",$(this.el)).val(),$(" .response_throbber",$(this.el)).show(),r?$(" .request_url",$(this.el)).html("<pre></pre>"),$(" .request_url pre",$(this.el)).text(this.invocationUrl),a.useJQuery=!0,i.parameterContentType="multipart/form-data",this.map=i,this.model.execute(i,a,this.showCompleteStatus,this.showErrorStatus,this)):(this.map=i,this.model.execute(i,a,this.showCompleteStatus,this.showErrorStatus,this))},getInputMap:function(e){var t,n,r,i,a,o,s,l,u,c,p,h;for(t={},n=e.find("input"),r=0,i=n.length;r<i;r++)a=n[r],null!==a.value&&jQuery.trim(a.value).length>0&&(t[a.name]=a.value),"file"===a.type&&(t[a.name]=a.files[0]);for(o=e.find("textarea"),s=0,l=o.length;s<l;s++)a=o[s],u=this.getTextAreaValue(a),null!==u&&jQuery.trim(u).length>0&&(t[a.name]=u);for(c=e.find("select"),p=0,h=c.length;p<h;p++)a=c[p],u=this.getSelectedValue(a),null!==u&&jQuery.trim(u).length>0&&(t[a.name]=u);return t},isFileUpload:function(e){var t,n,r,i,a=!1;for(t=e.find("input"),n=0,r=t.length;n<r;n++)i=t[n],"file"===i.type&&(a=!0);return a},success:function(e,t){t.showCompleteStatus(e)},wrap:function(e){var t,n,r,i,a,o,s;for(r={},n=e.getAllResponseHeaders().split("\r"),a=0,o=n.length;a<o;a++)i=n[a],t=i.match(/^(.:[^:]*?):(.*)$/),t||(t=[],t.shift(),void 0!==t[0]&&void 0!==t[1]&&(r[t[0].trim()]=t[1].trim()));return s={},s.content={},s.content.data=e.responseText,s.headers=r,s.request={},s.request.url=this.invocationUrl,s.status=e.status,s},getSelectedValue:function(e){if(e.multiple){for(var t=[],n=0,r=e.options.length;n<r;n++){var i=e.options[n];i.selected&&t.push(i.value)}return t.length>0?t:null}return e.value},hideResponse:function(e){e&&e.preventDefault(),$(" .response",$(this.el)).slideUp(),$(" .response_hider",$(this.el)).fadeOut(),showResponse:function(e){var t=JSON.stringify(e,null,"\t").replace(/\n/g,"<br>");$(" .response_body",$(this.el)).html(_escape(t)),showErrorStatus:function(e,t){t.showStatus(e)},showCompleteStatus:function(e,t){t.showStatus(e)},formatXml:function(e){var t,n,r,i,a,o,s,l,u,c,p,h,f;for(p=/(<|>)(\/*)/g,f=/[ ]*(.*)[ ]+\n/g,t=/(<.+>)(.+\n)/g,e=e.replace(/\r\n/g,"").replace(p,"$1\n$2$3").replace(f,"$1\n").replace(t,"$1\n$2"),c=0,r="",l=e.split("\n"),i=0,o="other",h={"single->single":0,"single->closing":-1,"single->opening":0,"single->other":0,"closing->single":0,"closing->closing":-1,"closing->opening":0,"closing->other":0,"opening->single":1,"opening->closing":0,"opening->opening":1,"opening->other":1,"other->single":0,"other->closing":-1,"other->opening":0,"other->other":0},n=function(e){var t,n,a,s,l,u,c;u={single:Boolean(e.match(/<.+>/)),closing:Boolean(e.match(/<\/.+>/)),opening:Boolean(e.match(/<^[!?:.*>/))},l=function(){var e;e=[];for(a in u)c=u[a],c&&e.push(a);return e}(),l=void 0===l?"other":l,t=o+">"+"l,o=l,s="",i+=h[t],s=function(){var e,t,r;for(r=[],n=e=0,t=i;0<=t?e<t:e>t;n=0<=t?++e:--e)r.push(" ");return r}.join(""),"opening->closing"===t?r=r.substr(0,r.length-1)+e+"\n":r+=s+e+"\n",a=0,s=l.length;a<s;a++)u=l[a],n(u);return r},showStatus:function(e){var t,n;void 0===e.content?(n=e.data,t=e.url):(n=e.content.data,t=e.request.url);var r=e.headers,"string"===typeof n&&(n=jQuery.trim(n));var i=null;r&&(i=r["Content-Type"]||r["content-type"],i&&(i=i.split(";")[0].trim()),$(" .response_body",$(this.el)).removeClass("json"),$(" .response_body",$(this.el)).removeClass("xml");var a,o,s=function(e){var

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t=document.createElement("audio");return(!t.canPlayType||!t.canPlayType(e).replace(/no/, ""));if(n)if(r["Content-
Disposition"]&&/attachment/.test(r["Content-Disposition"]))||r["content-disposition"]&&/attachment/.test(r["content-
disposition"])]||r["Content-Description"]&&/File Transfer/.test(r["Content-Description"])]||r["content-
description"]&&/File Transfer/.test(r["content-description"])]if("Blob"in window){var
l,u=i||"text/html",c=document.createElement("a");if("[object
Blob]"==={}.toString.apply(n))l=window.URL.createObjectURL(n);else{var
p=[];p.push(n),l=window.URL.createObjectURL(new Blob(p,{type:u}))}var
h=e.url.substr(e.url.lastIndexOf("/")+1),f=[u,h,l].join(":"),d=r["content-disposition"]||r["Content-
Disposition"];if("undefined"!==typeof d){var
m=/filename=([^;]*);?/.exec(d);null!==m&&m.length>1&&(f=m[1])}c.setAttribute("href",l),c.setAttribute("downlo
ad",f),c.innerHTML="Download "+h,a=$("<div/>").append(c)}else a=$("<pre class='json' />").append("Download
headers detected but your browser does not support downloading binary via XHR (Blob).");else
if("application/json"===i||/^+json$/ .test(i)){var g=null;try{g=JSON.stringify(JSON.parse(n,null,"
"))}catch(y){g="can't parse JSON. Raw result:\n\n"+n}o=$("<code />").text(g),a=$("<pre class='json'
/>").append(o)}else if("application/xml"===i||/^+xml$/ .test(i))o=$("<code />").text(this.formatXml(n)),a=$("<pre
class='xml' />").append(o);else if("text/html"===i)o=$("<code />").html(_ .escape(n)),a=$("<pre class='xml'
/>").append(o);else if(/text\/plain/ .test(i))o=$("<code />").text(n),a=$("<pre class='plain' />").append(o);else
if(/^image\/\./ .test(i)){var
v=window.URL||window.webkitURL,b=v.createObjectURL(n);a=$("<img>").attr("src",b)}else/^audio\/\./ .test(i)&&s
(i)?a=$("<audio
controls>").append($("<source>").attr("src",t).attr("type",i)):r.location||r.Location?window.location=e.url:(o=$("<co
de />").text(n),a=$("<pre class='json' />").append(o));else o=$("<code />").text("no content"),a=$("<pre class='json'
/>").append(o);var w=a;$(".request_url",$(this.el)).html("<pre></pre>"),$(".request_url
pre",$(this.el)).text(t),$(".response_code",$(this.el)).html("<pre>"+e.status+"</pre>"),$(".response_body",$(this.el))
.html(w),$(".response_headers",$(this.el)).html("<pre>"+_ .escape(JSON.stringify(e.headers,null,"
")) .replace(/\n/g,"<br>")+"</pre>"),$(".response",$(this.el)).slideDown(),$(".response_hider",$(this.el)).show(),$(".r
esponse_throbber",$(this.el)).hide();var
x=this.model.asCurl(this.map,{responseContentType:i});x=x.replace("!","&#33;"),$("div.curl",$(this.el)).html("<pr
e>"+_ .escape(x)+"</pre>");var A=this.options.swaggerOptions;if(A.showRequestHeaders){var
S=$(".sandbox",$(this.el)),j=this.getInputMap(S),E=this.model.getHeaderParams(j);delete E["Content-
Type"],$(".request_headers",$(this.el)).html("<pre>"+_ .escape(JSON.stringify(E,null,"
")) .replace(/\n/g,"<br>")+"</pre>")}var O=$(".response_body",$(this.el))[0];return
A.highlightSizeThreshold&&"undefined"!==typeof
e.data&&e.data.length>A.highlightSizeThreshold?O:hljs.highlightBlock(O)},toggleOperationContent:function(e){v
ar
t=$("#"+Docs.escapeResourceName(this.parentId+"_"+this.nickname+"_content"));t.is(":visible")?($ .bbq.pushState
("#",2),e.preventDefault(),Docs.collapseOperation(t)):Docs.expandOperation(t)},getTextAreaValue:function(e){var
t,n,r,i;if(null===e.value||0===jQuery.trim(e.value).length)return
null;if(t=this.getParamByName(e.name),t&&t.type&&"array"===t.type.toLowerCase()){for(n=e.value.split("\n"),r=
[],i=0;i<n.length;i++)null!==n[i]&&jQuery.trim(n[i]).length>0&&r.push(n[i]);return r.length>0?r:null}return
e.value},showSnippet:function(){var
e,t=this.$("[name=responseContentType]"),n=this.$(".operation-status .snippet_xml, .response-class
.snippet_xml"),r=this.$(".operation-status .snippet_json, .response-class
.snippet_json");t.length&&(e=t.val(),e.indexOf("xml")>-
1?(n.show(),r.hide()):r.show(),n.hide())},getParamByName:function(e){var
t;if(this.model.parameters)for(t=0;t<this.model.parameters.length;t++)if(this.model.parameters[t].name===e)return
this.model.parameters[t];return
null}},SwaggerUi.Views.ParameterContentTypeView=Backbone.View.extend({initialize:function(){},render:funct

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ion(){return
this.model.parameterContentTypeId="pct"+Math.random(),$(this.el).html(Handlebars.templates.parameter_content
_type(this.model)),this}},SwaggerUi.Views.ParameterView=Backbone.View.extend({events:{'change
[name=parameterContentType]':'toggleParameterSnippet'},initialize:function(){Handlebars.registerHelper("isArra
y",function(e,t){var
n=e.type&&e.type.toLowerCase();return"array"===n||e.allowMultiple?t.fn(this):t.inverse(this)}}),render:function(){
var
e,t,n=this.model.type||this.model.dataType,r=this.model.modelSignature.type,i=this.model.modelSignature.definitio
ns,a=this.model.schema||{ },o=this.model.consumes||[];if("undefined"===typeof n&&a.$ref){var
s=a.$ref;n=0===s.indexOf("#/definitions/")?s.substring("#/definitions/".length):s}this.model.type=n,this.model.para
mType=this.model["in"]||this.model.paramType,this.model.isBody="body"===this.model.paramType||"body"===th
is.model["in"],this.model.isFile=n&&"file"===n.toLowerCase(),"undefined"===typeof
this.model["default"]&&(this.model["default"]=this.model.defaultValue),this.model.hasDefault="undefined"!type
of
this.model["default"],this.model.valueId="m"+this.model.name+Math.random(),this.model.allowableValues&&(thi
s.model.isList=!0);var
l=this.contains(o,"xml"),u=!l||this.contains(o,"json");e=SwaggerUi.partials.signature.createParameterJSONSample(r
,i);var c=this.template();$(this.el).html(c(this.model));var
p={sampleJSON:!!u&&e,sampleXML:!(l||u)&&SwaggerUi.partials.signature.createXMLSample("",a,i,!0),isPara
m:!0,signature:SwaggerUi.partials.signature.getParameterModelSignature(r,i),defaultRendering:this.model.defaultR
endering};e?(t=new
SwaggerUi.Views.SignatureView({model:p,tagName:"div"}),$(".model-
signature",$(this.el)).append(t.render().el):$(".model-signature",$(this.el)).html(this.model.signature);var
h=!1;if(this.options.swaggerOptions.jsonEditor&&this.model.isBody&&this.model.schema){var
f=$(this.el);this.model.jsonEditor=new
JSONEditor($(".editor_holder",f)[0],{schema:this.model.schema,startval:this.model["default"],ajax:!0,disable_prop
erties:!0,disable_edit_json:!0,iconlib:"swagger"}),p.jsonEditor=this.model.jsonEditor,$(".body-
textarea",f).hide(),$(".editor_holder",f).show(),$(".parameter-content-
type",f).change(function(e){"application/xml"===e.target.value?($(".body-
textarea",f).show(),$(".editor_holder",f).hide(),this.model.jsonEditor.disable()):($(".body-
textarea",f).hide(),$(".editor_holder",f).show(),this.model.jsonEditor.enable())}}this.model.isBody&&(h=!0);var
d={isParam:h};if(d.consumes=this.model.consumes,h){var m=new
SwaggerUi.Views.ParameterContentTypeView({model:d});$(".parameter-content-
type",$(this.el)).append(m.render().el),this.toggleParameterSnippet()}else{var g=new
SwaggerUi.Views.ResponseContentTypeView({model:d});$(".response-content-
type",$(this.el)).append(g.render().el),this.toggleResponseSnippet()}return this},contains:function(e,t){return
e.filter(function(e){if(e.indexOf(t)>-1)return!0}).length},toggleParameterSnippet:function(){var
e=this.$("[name=parameterContentType]").val();this.toggleSnippet(e)},toggleResponseSnippet:function(){var
e=this.$("[name=responseContentType]");e.length&&this.toggleSnippet(e.val())},toggleSnippet:function(e){e=e||"",
e.indexOf("xml")>-
1?(this.$(".snippet_xml").show(),this.$(".snippet_json").hide()):(this.$(".snippet_json").show(),this.$(".snippet_xml"
).hide())},template:function(){return
this.model.isList?Handlebars.templates.param_list:this.options.readOnly?this.model.required?Handlebars.templates.
param_readonly_required:Handlebars.templates.param_readonly:this.model.required?Handlebars.templates.param_r
equired:Handlebars.templates.param}},SwaggerUi.partials.signature=function(){function
e(e){var
t,i=e.name,a=e.definition,o=e.config,s=e.models,l=e.config.isParam,u=[],c=a.properties,p=a.additionalProperties,h=
a.xml,f=b(h);return f&&u.push(f),c||p?(c=c||{ },t=_.map(c,function(e,t){var n,i;return

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```



```

function(e,t){var n,r,i;if(t=t||{},n=e instanceof
Array,i=n?e[0]:e,t[i]?r=d(t[i]):c(i)&&(r=d(c(i))),r){if(r=n?[r]:r,"string"===typeof r)return r;if(!_isObject(r)){var
a=r;if(r instanceof Array&&r.length>0&&(a=r[0]),a.nodeName&&"Node"===typeof a){var o=(new
XMLSerializer).serializeToString(a);return p(o)}return JSON.stringify(r,null,2)}return r}},y=function(e,t,r){var
i,a;return r=r||[],a=r.map(function(e){return
"+e.name+"+"'+e.value+'"'").join(''),e?(i=["<","e,a,">","t,"</","e,">"],i.join('')):n("Node name is not
provided")),v=function(e,t){var n=e||"";return
t=t||{,t.name&&(n=t.name),t.prefix&&(n=t.prefix+" ":"+n),n},b=function(e){var t="",n="xmlns";return
e=e||{,e.namespace?(t=e.namespace,e.prefix&&(n+=" ":"+e.prefix),{name:n,value:t}):t},w=function(e){var
t,i=e.name,a=e.config,o=e.definition,s=e.models,l=o.items,u=o.xml||{,c=b(u),p=[];return
l?(t=r(i,l,s,a),c&&p.push(c),u.wrapped&&(t=y(i,t,p)),t:n()),x=function(e){var
t,n;switch(e=e||{,n=e.items||{,t=e.type||""}){case"object":return"Object is not a
primitive";case"array":return"Array["+n.format||n.type+"]";default:return
e.format||t}},A=function(e){var t,r=e.name,i=e.definition,a={string:{date:new
Date(1).toISOString().split("T")[0],"date-time":new
Date(1).toISOString(),"default":"string"},integer:{"default":1},number:{"default":1.1},"boolean":{"default":!0}},o=
i.type,s=i.format,l=i.xml||{,u=b(l),c=[];return
_.keys(a).indexOf(o)<0?n):(t=_isArray(i["enum"])?i["enum"][0]:i.example||a[o][s]||a[o][["default"],l.attribute?{nam
e:r,value:t}:{u&&c.push(u),y(r,t,c)}));return{getModelSignature:h,createJSONSample:d,getParameterModelSignatu
re:m,createParameterJSONSample:g,createSchemaXML:r,createXMLSample:s,getPrimitiveSignature:x}}(),Swagger
rUi.Views.PopupView=Backbone.View.extend({events:{'click .api-popup-
cancel':"cancelClick"},template:Handlebars.templates.popup,className:"api-popup-
dialog",selectors:{content:".api-popup-content",main:"#swagger-ui-
container"},initialize:function(){this.$el.html(this.template(this.model));},render:function(){return
this.$(this.selectors.content).append(this.model.content),$(this.selectors.main).first().append(this.el),this.showPopup
(),this},showPopup:function(){this.$el.show()},cancelClick:function(){this.remove()}}),SwaggerUi.Views.Resourc
eView=Backbone.View.extend({initialize:function(e){e=e||{,this.router=e.router,this.auths=e.auths,""===this.mod
el.description&&(this.model.description=null),this.model.description&&(this.model.summary=this.model.descriptio
n),this.number=0},render:function(){var
e={,$(this.el).html(Handlebars.templates.resource(this.model));for(var
t=0;t<this.model.operationsArray.length;t++){for(var
n=this.model.operationsArray[t],r=0,i=n.nickname;"undefined"!==typeof
e[i];i=i+"_"+r,r+=1,e[i]=n,n.nickname=i,n.parentId=this.model.id,n.definitions=this.model.definitions,this.addOper
ation(n))return
$($(".toggleEndpointList",this.el).click(this.callDocs.bind(this,"toggleEndpointListForResource")),$(".collapseResour
ce",this.el).click(this.callDocs.bind(this,"collapseOperationsForResource")),$(".expandResource",this.el).click(this.c
allDocs.bind(this,"expandOperationsForResource")),this},addOperation:function(e){e.number=this.number;var
t=new
SwaggerUi.Views.OperationView({model:e,router:this.router,tagName:"li",className:"endpoint",swaggerOptions:t
his.options.swaggerOptions,auths:this.auths});$(".endpoints",$(this.el)).append(t.render().el),this.number++,callDo
cs:function(e,t){t.preventDefault(),Docs[e](t.currentTarget.getAttribute("data-
id"))}}),SwaggerUi.Views.ResponseContentTypeView=Backbone.View.extend({initialize:function(){},render:funct
ion(){return
this.model.responseContentTypeId="rct"+Math.random(),$(this.el).html(Handlebars.templates.response_content_ty
pe(this.model)),this}},SwaggerUi.Views.SignatureView=Backbone.View.extend({events:{'click a.description-
link':"switchToDescription","click a.snippet-link':"switchToSnippet"},"mousedown
.snippet_json':"jsonSnippetMouseDown"},"mousedown
.snippet_xml':"xmlSnippetMouseDown"},initialize:function(){},render:function(){return

```

```

$(this.el).html(Handlebars.templates.signature(this.model)), "model" === this.model.defaultRendering ? this.switchTo
Description(): this.switchToSnippet(), this }, switchToDescription: function(e) { e && e.preventDefault(), $(".snippet", $(t
his.el)).hide(), $(".description", $(this.el)).show(), $(".description-link", $(this.el)).addClass("selected"), $(".snippet-
link", $(this.el)).removeClass("selected") }, switchToSnippet: function(e) { e && e.preventDefault(), $(".snippet", $(this.e
l)).show(), $(".description", $(this.el)).hide(), $(".snippet-link", $(this.el)).addClass("selected"), $(".description-
link", $(this.el)).removeClass("selected") }, snippetToTextArea: function(e) { var
t = $(".textarea", $(this.el.parentNode.parentNode.parentNode)); "" !== $.trim(t.val()) && t.prop("placeholder") !== t.val() |
(t.val(e), this.model.jsonEditor && this.model.jsonEditor.isEnabled()) && this.model.jsonEditor.setValue(JSON.parse(
this.model.sampleJSON))) }, jsonSnippetMouseDown: function(e) { this.model.isParam && (e && e.preventDefault(), thi
s.snippetToTextArea(this.model.sampleJSON)) }, xmlSnippetMouseDown: function(e) { this.model.isParam && (e && e
.preventDefault(), this.snippetToTextArea(this.model.sampleXML)) } }, SwaggerUi.Views.StatusCodeView = Backbone
View.extend({ initialize: function(e) { this.options = e || {} }, this.router = this.options.router }, render: function() { var
e, t, n = this.router.api.models[this.model.responseModel]; return
$(this.el).html(Handlebars.templates.status_code(this.model)), e = this.router.api.models.hasOwnProperty(this.model.r
esponseModel) ? { sampleJSON: JSON.stringify(SwaggerUi.partials.signature.createJSONSample(n), void
0, 2), sampleXML: !!this.model.isXML && SwaggerUi.partials.signature.createXMLSample("", this.model.schema, this
.router.api.models), isParam: !1, signature: SwaggerUi.partials.signature.getModelSignature(this.model.responseModel
, n, this.router.api.models), defaultRendering: this.model.defaultRendering } : { signature: SwaggerUi.partials.signature.g
etPrimitiveSignature(this.model.schema) }, t = new
SwaggerUi.Views.SignatureView({ model: e, tagName: "div" }), $(".model-
signature", this.$el).append(t.render().el, this) } } ).call(this);

```

Found

in path(s):

\* /wiremock-standalone-2-5-1-sources-1-jar/assets/swagger-ui/swagger-ui.min.js

No license file was found, but licenses were detected in source scan.

/\*\*

\* marked - a markdown parser

\* Copyright (c) 2011-2014, Christopher Jeffrey. (MIT Licensed)

\* <https://github.com/chjj/marked>

\*/

Found in path(s):

\* /wiremock-standalone-2-5-1-sources-1-jar/assets/swagger-ui/lib/marked.js

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handlebars v4.0.5

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\* /wiremock-standalone-2-5-1-sources-1-jar/assets/swagger-ui/lib/handlebars-4.0.5.js

## 1.229 httpcomponents-core 4.4.3

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%% winjs version 4.4.0 (<https://github.com/winjs/winjs>)

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1. Seti UI - A subtle dark colored UI theme for Atom. (<https://github.com/jesseweed/seti-ui>)

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## 1.237 pyjwt 1.5.3

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jar/com/azure/core/serializer/json/jackson/JacksonJsonSerializerBuilder.java

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jar/com/azure/core/serializer/json/jackson/JacksonJsonSerializerProvider.java

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Most GNU software, including some libraries, is covered by the ordinary GNU General Public License. This license, the GNU Lesser General Public License, applies to certain designated libraries, and is quite different from the ordinary General Public License. We use this license for certain libraries in order to permit linking those libraries into non-free programs.

When a program is linked with a library, whether statically or using a shared library, the combination of the two is legally speaking a combined work, a derivative of the original library. The ordinary General Public License therefore permits such linking only if the entire combination fits its criteria of freedom. The Lesser General Public License permits more lax criteria for linking other code with the library.

We call this license the "Lesser" General Public License because it does Less to protect the user's freedom than the ordinary General Public License. It also provides other free software developers Less of an advantage over competing non-free programs. These disadvantages are the reason we use the ordinary General Public License for many libraries. However, the Lesser license provides advantages in certain special circumstances.

For example, on rare occasions, there may be a special need to encourage the widest possible use of a certain library, so that it becomes a de-facto standard. To achieve this, non-free programs must be allowed to use the library. A more frequent case is that a free library does the same job as widely used non-free libraries. In this case, there is little to gain by limiting the free library to free software only, so we use the Lesser General Public License.

In other cases, permission to use a particular library in non-free programs enables a greater number of people to use a large body of free software. For example, permission to use the GNU C Library in non-free programs enables many more people to use the whole GNU

operating system, as well as its variant, the GNU/Linux operating system.

Although the Lesser General Public License is Less protective of the users' freedom, it does ensure that the user of a program that is linked with the Library has the freedom and the wherewithal to run that program using a modified version of the Library.

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"Source code" for a work means the preferred form of the work for making modifications to it. For a library, complete source code means all the source code for all modules it contains, plus any associated interface definition files, plus the scripts used to control compilation and installation of the library.

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- d) If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful.

(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library, and can

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Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Library.

In addition, mere aggregation of another work not based on the Library with the Library (or with a work based on the Library) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

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4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not

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5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a "work that uses the library". The executable is therefore covered by this License. Section 6 states terms for distribution of such executables.

When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.  
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6. As an exception to the Sections above, you may also combine or link a "work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer's own use and reverse engineering for debugging such modifications.

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a)

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## 1.247 libiconv 1.14\_11

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Most GNU software, including some libraries, is covered by the ordinary GNU General Public License, which was designed for utility programs. This license, the GNU Library General Public License, applies to certain designated libraries. This license is quite different from the ordinary one; be sure to read it in full, and don't assume that anything in it is the same as in the ordinary license.

The reason we have a separate public license for some libraries is that they blur the distinction we usually make between modifying or adding to a program and simply using it. Linking a program with a library, without changing the library, is in some sense simply using the library, and is analogous to running a utility program or application program. However, in a textual and legal sense, the linked executable is a combined work, a derivative of the original library, and the ordinary General Public License treats it as such.

Because of this blurred distinction, using the ordinary General Public License for libraries did not effectively promote software sharing, because most developers did not use the libraries. We concluded that weaker conditions might promote sharing better.

However, unrestricted linking of non-free programs would deprive the users of those programs of all benefit from the free status of the libraries themselves. This Library General Public License is intended to permit developers of non-free programs to use free libraries, while preserving your freedom as a user of such programs to change the free libraries that are incorporated in them. (We have not seen how to achieve this as regards changes in header files, but we have achieved it as regards changes in the actual functions of the Library.) The hope is that this will lead to faster development of free libraries.

The precise terms and conditions for copying, distribution and modification follow. Pay close attention to the difference between a "work based on the library" and a "work that uses the library". The former contains code derived from the library, while the latter only works together with the library.

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d) If a facility in the modified Library refers to a function or a table of data to be supplied by an application program that uses the facility, other than as an argument passed when the facility is invoked, then you must make a good faith effort to ensure that, in the event an application does not supply such function or table, the facility still operates, and performs whatever part of its purpose remains meaningful.

(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must

be optional: if the application does not supply it, the square root function must still compute square roots.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library, and can be reasonably considered independent and separate works in themselves, then this License, and its terms, do not apply to those sections when you distribute them as separate works. But when you distribute the same sections as part of a whole which is a work based

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In addition,

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This option is useful when you wish to copy part of the code of the

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4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or



linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a "work that uses the library". The executable is therefore covered by this License. Section 6 states terms for distribution of such executables.

When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

6. As an exception to the Sections above, you may also compile or link a "work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer's own use and reverse engineering for debugging such modifications.

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```
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*/
```

Found in path(s):

\* /jackson-mapper-asl-1-0-1-sources-1-jar/org/codehaus/jackson/map/MappingJsonFactory.java

# 1.250 tomcat-jdbc 8.5.32

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## 1.255 tomcat-tribes 8.5.32

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## 1.256 tcp-wrappers 7.6.24

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*
  /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/modeler/modules/ModelerSource.java
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```

/tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/fileupload/ParameterParser.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/AbstractEndpoint.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/SocketProperties.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/parser/HttpParser.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/modeler/modules/MbeansDescriptorsIntrospectionSource.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/openssl/OpenSSLX509Certificate.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/fileupload/util/package-info.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/fileupload/util/Closeable.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/parser/Cookie.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/openssl/OpenSSLSessionContext.java  
 \*  
 /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/openssl/OpenSSLKeyManager.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/parser/Authorization.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/fileupload/FileUploadBase.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/fileupload/UploadContext.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/fileupload/util/LimitedInputStream.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/fileupload/FileItemHeaders.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/modeler/BaseAttributeFilter.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/openssl/OpenSSLEngine.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/openssl/OpenSSLContext.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/fileupload/disk/DiskFileItemFactory.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/log/UserDataHelper.java  
 \*  
 /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/fileupload/util/mime/MimeUtility.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/fileupload/FileItemIterator.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/fileupload/util/Streams.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/RequestUtil.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/fileupload/FileItemFactory.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/ApplicationBufferHandler.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/modeler/BaseModelMBean.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/NioChannel.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/Nio2Channel.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/fileupload/package-info.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/modeler/BaseNotificationBroadcaster.java  
 \*  
 /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/fileupload/servlet/package-info.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/fileupload/IOUtils.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/openssl/OpenSSLProtocols.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/fileupload/RequestContext.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/modeler/NotificationInfo.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/fileupload/FileItem.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/modeler/RegistryMBean.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/fileupload/util/mime/ParseException.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/fileupload/servlet/ServletFileUpload.java  
 \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/modeler/OperationInfo.java  
 \*

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/tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/fileupload/MultipartStream.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/fileupload/util/FileItemHeadersImpl.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/openssl/OpenSSLImplementation.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/modeler/Registry.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/SecureNioChannel.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/parser/Host.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/fileupload/ByteArrayOutputStream.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/fileupload/ThresholdingOutputStream.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/modeler/FeatureInfo.java
* /tomcat-coyote-8-5-32-sources-1-
jar/org/apache/tomcat/util/modeler/modules/MbeansDescriptorsDigesterSource.java
*
/tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/fileupload/DeferredFileOutputStream.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/fileupload/disk/package-info.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/fileupload/FileUploadException.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/fileupload/FileItemStream.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/parser/SkipResult.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/modeler/ManagedBean.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/fileupload/InvalidFileNameException.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/fileupload/util/mime/package-info.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/fileupload/FileUtils.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/fileupload/FileUpload.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/openssl/OpenSSLSessionStats.java
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```

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*/
/**
* Return the initialization parameters for the TrustManager.
* Currently, only the default <code>PKIX</code>
is supported.
*
* @param crlf The path to the CRL file.
* @param trustStore The configured TrustStore.

```

```

* @param revocationEnabled Should the JSSE provider perform revocation
* checks? Ignored if {@code crlf} is non-null.
* Configuration of revocation checks are expected
* to be via proprietary JSSE provider methods.
* @return The parameters including the CRLs and TrustStore.
* @throws Exception An error occurred
*/

```

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\* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/jsse/JSSEUtil.java

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* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/bcel/classfile/ConstantLong.java
*
/tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/bcel/classfile/EnumElementValue.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/bcel/classfile/JavaClass.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/bcel/classfile/ClassElementValue.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/bcel/classfile/ClassFormatException.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/bcel/classfile/Annotations.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/bcel/classfile/AnnotationElementValue.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/bcel/classfile/ConstantInteger.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/bcel/classfile/ElementValuePair.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/bcel/classfile/Constant.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/bcel/classfile/ConstantDouble.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/bcel/classfile/AnnotationEntry.java
*
/tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/bcel/classfile/SimpleElementValue.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/bcel/classfile/ConstantClass.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/bcel/classfile/ClassParser.java

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\* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/bcel/classfile/ConstantFloat.java  
\* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/bcel/classfile/ArrayElementValue.java  
\* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/bcel/classfile/ConstantPool.java  
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\* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/modeler/mbeans-descriptors.dtd  
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\* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http2/Flags.java  
\* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/Http11Protocol.java  
\*  
/tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/AsyncStateMachine.java  
\* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/SendfileKeepAliveState.java

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* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/AprEndpoint.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/SSLUtil.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/ajp/Constants.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http2/HPackHuffman.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/jsse/JSSEKeyManager.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/ajp/AjpNio2Protocol.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/SendfileDataBase.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/Http11NioProtocol.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http2/Http2Exception.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/Request.java
*
/tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/RequestGroupInfo.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/HttpMessages.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/openssl/OpenSSLConfCmd.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/openssl/ciphers/Cipher.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/AbstractHttp11JsseProtocol.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/OutputFilter.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/filters/VoidInputFilter.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http2/HeaderSink.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/log/SystemLogHandler.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/AprSSLSupport.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/upgrade/UpgradeServletInputStream.java
*
/tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/SSLSessionManager.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/SSLHostConfigCertificate.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/ajp/AbstractAjpProtocol.java
* /tomcat-coyote-8-5-32-sources-1-
jar/org/apache/tomcat/util/net/openssl/ciphers/OpenSSLCipherConfigurationParser.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/filters/BufferedInputFilter.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/filters/VoidOutputFilter.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/bcel/classfile/ElementValue.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/openssl/ciphers/EncryptionLevel.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http2/AbstractStream.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/AbstractHttp11Protocol.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/CookieProcessor.java
*
/tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/openssl/OpenSSLConf.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/SocketBufferHandler.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/SocketWrapperBase.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/Response.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/jsse/JSSESSLContext.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/ServerCookies.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http2/HpackEncoder.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/SSLImplementation.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/openssl/ciphers/Protocol.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/upgrade/UpgradeProcessorInternal.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/HttpOutputBuffer.java
*

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/tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/upgrade/UpgradeProcessorExternal.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/UpgradeProtocol.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/upgrade/InternalHttpUpgradeHandler.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/Http11Nio2Protocol.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/ajp/AjpProtocol.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/ServerCookie.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/jsse/JSSEImplementation.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http2/ConnectionSettingsLocal.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/openssl/ciphers/MessageDigest.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/DispatchType.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http2/Http2Error.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/AbstractProcessorLight.java
*
/tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/InputBuffer.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/ContainerThreadMarker.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/AsyncContextCallback.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/MimeHeaders.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/filters/SavedRequestInputFilter.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http2/Http2Protocol.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/Constants.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/ajp/AjpAprProtocol.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/TLSClientHelloExtractor.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/upgrade/UpgradeServletOutputStream.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http2/StreamStateMachine.java
*
/tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http2/ConnectionException.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http2/HpackException.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http2/ByteUtil.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/AbstractProtocol.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/AbstractProcessor.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/filters/IdentityInputFilter.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http2/Setting.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/openssl/ciphers/Encryption.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/jsse/PEMFile.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/ajp/AjpNioProtocol.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/Constants.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http2/Stream.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/jsse/JSSESupport.java
*
/tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/SSLContext.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/CompressionConfig.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/ActionCode.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/ErrorState.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/Constants.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/bcel/classfile/ConstantUtf8.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/modeler/Util.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/InputFilter.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http2/Http2Parser.java

```

- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/filters/ChunkedInputFilter.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/SendfileState.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/filters/GzipOutputFilter.java
- \*
- /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/parser/AcceptLanguage.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http2/StreamException.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/Nio2Endpoint.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/SSLHostConfig.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http2/HpackDecoder.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http2/FrameType.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http2/Constants.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/log/CaptureLog.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/filters/IdentityOutputFilter.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/Http11AprProtocol.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/SSLSupport.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/HeadersTooLargeException.java
- \*
- /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/Adapter.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/parser/MediaTypeCache.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/NioEndpoint.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/ajp/AjpProcessor.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/openssl/ciphers/KeyExchange.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http2/StreamRunnable.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/filters/ChunkedOutputFilter.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/Rfc6265CookieProcessor.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/openssl/ciphers/Authentication.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/LegacyCookieProcessor.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/upgrade/UpgradeProcessorBase.java
- \*
- /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/Processor.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/ProtocolHandler.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/FastHttpDateFormat.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http2/Http2OutputBuffer.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/Http11InputBuffer.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/SocketProcessorBase.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/RequestInfo.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/SSLUtilBase.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/ActionHook.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http2/ConnectionSettingsRemote.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/AbstractJsseEndpoint.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/Parameters.java
- \*
- /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/UpgradeToken.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http2/Hpack.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/ajp/AjpMessage.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/CookieProcessorBase.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/CloseNowException.java
- \* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http2/ConnectionSettingsBase.java

```
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/Http11Processor.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http2/StreamProcessor.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/bcel/classfile/Utility.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/SocketEvent.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/Http11OutputBuffer.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/ProtocolException.java
*
/tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http2/Http2UpgradeHandler.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/parser/MediaType.java
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/OutputBuffer.java
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```
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/parser/LocalStrings.properties
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/filters/LocalStrings.properties
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/openssl/ciphers/LocalStrings.properties
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/res/LocalStrings.properties
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/upgrade/LocalStrings.properties
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http2/LocalStrings.properties
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/http/LocalStrings.properties
*
/tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/ajp/LocalStrings.properties
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/openssl/LocalStrings.properties
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/LocalStrings.properties
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/LocalStrings.properties
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/net/jsse/LocalStrings.properties
* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/coyote/http11/LocalStrings.properties
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- \*
- \*/

Found in path(s):

\* /tomcat-coyote-8-5-32-sources-1-jar/org/apache/tomcat/util/bcel/Const.java

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## 1.263 tomcat-jasper 8.5.32

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# 1.266 tomcat-jni 8.5.32

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```

*
/tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/tagext/TagData.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/el/ELParseException.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/JspException.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/tagext/TagLibraryValidator.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/JspContext.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/tagext/DynamicAttributes.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/tagext/TryCatchFinally.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/tagext/IterationTag.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/tagext/FunctionInfo.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/tagext/Tag.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/tagext/TagFileInfo.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/HttpJspPage.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/tagext/TagExtraInfo.java
*
/tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/tagext/TagInfo.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/tagext/SimpleTagSupport.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/tagext/JspFragment.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/el/FunctionMapper.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/el/ImplicitObjectELResolver.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/JspFactory.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/JspPage.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/tagext/TagSupport.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/tagext/JspTag.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/tagext/PageData.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/el/Expression.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/PageContext.java
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* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/el/ELException.java

```

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* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/JspWriter.java
*
/tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/tagext/BodyTag.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/ErrorMessage.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/SkipPageException.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/JspApplicationContext.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/JspTagException.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/tagext/TagLibraryInfo.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/el/ExpressionEvaluator.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/tagext/TagAttributeInfo.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/tagext/BodyTagSupport.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/el/ScopedAttributeELResolver.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/tagext/ValidationMessage.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/el/VariableResolver.java
*
/tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/tagext/TagAdapter.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/tagext/VariableInfo.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/tagext/TagVariableInfo.java
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/tagext/BodyContent.java

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* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/resources/jspxml.dtd
* /tomcat-jsp-api-8-5-32-sources-1-jar/javax/servlet/jsp/resources/jspxml.xsd

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* /tomcat-jaspic-api-8-5-32-sources-1-jar/javax/security/auth/message/AuthStatus.java
* /tomcat-jaspic-api-8-5-32-sources-1-jar/javax/security/auth/message/config/AuthConfigProvider.java
*
* /tomcat-jaspic-api-8-5-32-sources-1-jar/javax/security/auth/message/config/AuthConfig.java
* /tomcat-jaspic-api-8-5-32-sources-1-jar/javax/security/auth/message/module/ServerAuthModule.java
* /tomcat-jaspic-api-8-5-32-sources-1-jar/javax/security/auth/message/config/ServerAuthConfig.java
* /tomcat-jaspic-api-8-5-32-sources-1-jar/javax/security/auth/message/ServerAuth.java
* /tomcat-jaspic-api-8-5-32-sources-1-jar/javax/security/auth/message/config/RegistrationListener.java
* /tomcat-jaspic-api-8-5-32-sources-1-jar/javax/security/auth/message/config/ClientAuthContext.java
* /tomcat-jaspic-api-8-5-32-sources-1-jar/javax/security/auth/message/config/ServerAuthContext.java

```

```

* /tomcat-jaspic-api-8-5-32-sources-1-jar/javax/security/auth/message/callback/CallerPrincipalCallback.java
* /tomcat-jaspic-api-8-5-32-sources-1-jar/javax/security/auth/message/MessagePolicy.java
* /tomcat-jaspic-api-8-5-32-sources-1-jar/javax/security/auth/message/config/AuthConfigFactory.java
*
/tomcat-jaspic-api-8-5-32-sources-1-jar/javax/security/auth/message/AuthException.java
* /tomcat-jaspic-api-8-5-32-sources-1-jar/javax/security/auth/message/callback/GroupPrincipalCallback.java
* /tomcat-jaspic-api-8-5-32-sources-1-jar/javax/security/auth/message/config/ClientAuthConfig.java
* /tomcat-jaspic-api-8-5-32-sources-1-jar/javax/security/auth/message/callback/SecretKeyCallback.java
* /tomcat-jaspic-api-8-5-32-sources-1-jar/javax/security/auth/message/callback/PasswordValidationCallback.java
* /tomcat-jaspic-api-8-5-32-sources-1-jar/javax/security/auth/message/ClientAuth.java
* /tomcat-jaspic-api-8-5-32-sources-1-jar/javax/security/auth/message/module/ClientAuthModule.java
* /tomcat-jaspic-api-8-5-32-sources-1-jar/javax/security/auth/message/MessageInfo.java
* /tomcat-jaspic-api-8-5-32-sources-1-jar/javax/security/auth/message/callback/TrustStoreCallback.java
* /tomcat-jaspic-api-8-5-32-sources-1-jar/javax/security/auth/message/callback/CertStoreCallback.java
*
/tomcat-jaspic-api-8-5-32-sources-1-jar/javax/security/auth/message/callback/PrivateKeyCallback.java

```

# 1.270 tomcat-i18n-ja 8.5.32

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## 1.273 tomcat-util-scan 8.5.32

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# 1.274 tomcat-i18n-fr 8.5.32

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## 1.279 ply 3.11

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# PLY (Python Lex-Yacc)

Version 3.11

[![Build Status](https://travis-ci.org/dabeaz/ply.svg?branch=master)](https://travis-ci.org/dabeaz/ply)

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Introduction

=====

PLY is a 100% Python implementation of the common parsing tools lex and yacc. Here are a few highlights:

- PLY is very closely modeled after traditional lex/yacc.  
If you know how to use these tools in C, you will find PLY to be similar.
- PLY provides *very* extensive error reporting and diagnostic information to assist in parser construction. The original implementation was developed for instructional purposes. As a result, the system tries to identify the most common types of errors made by novice users.

- PLY provides full support for empty productions, error recovery, precedence specifiers, and moderately ambiguous grammars.
- Parsing is based on LR-parsing which is fast, memory efficient, better suited to large grammars, and which has a number of nice properties when dealing with syntax errors and other parsing problems. Currently, PLY builds its parsing tables using the LALR(1) algorithm used in yacc.
- PLY uses Python introspection features to build lexers and parsers. This greatly simplifies the task of parser construction since it reduces the number of files and eliminates the need to run a separate lex/yacc tool before running your program.
- PLY can be used to build parsers for "real" programming languages. Although it is not ultra-fast due to its Python implementation, PLY can be used to parse grammars consisting of several hundred rules (as might be found for a language like C). The lexer and LR parser are also reasonably efficient when parsing typically sized programs. People have used PLY to build parsers for C, C++, ADA, and other real programming languages.

#### How to Use

=====

PLY consists of two files : lex.py and yacc.py. These are contained within the 'ply' directory which may also be used as a Python package. To use PLY, simply copy the 'ply' directory to your project and import lex and yacc from the associated 'ply' package. For example:

```
import ply.lex as lex
import ply.yacc as yacc
```

Alternatively, you can copy just the files lex.py and yacc.py individually and use them as modules. For example:

```
import lex
import yacc
```

The file setup.py can be used to install ply using distutils.

The file doc/ply.html contains complete documentation on how to use the system.

The example directory contains several different examples including a PLY specification for ANSI C as given in K&R 2nd Ed.

A simple example is found at the end of this document

## Requirements

=====

PLY requires the use of Python 2.6 or greater. However, you should use the latest Python release if possible. It should work on just about any platform. PLY has been tested with both CPython and Jython. It also seems to work with IronPython.

## Resources

=====

More information about PLY can be obtained on the PLY webpage at:

<http://www.dabeaz.com/ply>

For a detailed overview of parsing theory, consult the excellent book "Compilers : Principles, Techniques, and Tools" by Aho, Sethi, and Ullman. The topics found in "Lex & Yacc" by Levine, Mason, and Brown may also be useful.

The GitHub page for PLY can be found at:

<https://github.com/dabeaz/ply>

An old and relatively inactive discussion group for PLY is found at:

<http://groups.google.com/group/ply-hack>

## Acknowledgments

=====

A special thanks is in order for all of the students in CS326 who suffered through about 25 different versions of these tools :-).

The CHANGES file acknowledges those who have contributed patches.

Elias Ioup did the first implementation of LALR(1) parsing in PLY-1.x. Andrew Waters and Markus Schoepflin were instrumental in reporting bugs and testing a revised LALR(1) implementation for PLY-2.0.

## Special Note for PLY-3.0

=====

PLY-3.0 the first PLY release to support Python 3. However, backwards compatibility with Python 2.6 is still preserved. PLY provides dual Python 2/3 compatibility by restricting its implementation to a common subset of basic language features. You should not convert PLY using 2to3--it is not necessary and may in fact break the implementation.

## Example

=====

Here is a simple example showing a PLY implementation  
of a calculator  
with variables.

```
# -----
# calc.py
#
# A simple calculator with variables.
# -----

tokens = (
    'NAME','NUMBER',
    'PLUS','MINUS','TIMES','DIVIDE','EQUALS',
    'LPAREN','RPAREN',
)

# Tokens

t_PLUS = r\+'
t_MINUS = r\+'-
t_TIMES = r\+'*'
t_DIVIDE = r\+'/'
t_EQUALS = r\+='
t_LPAREN = r\+'('
t_RPAREN = r\+')'
t_NAME = r'[a-zA-Z_][a-zA-Z0-9_]*'

def t_NUMBER(t):
    r\d+'
    t.value = int(t.value)
    return t

# Ignored characters
t_ignore = " \t"

def t_newline(t):
    r\n+'
    t.lexer.lineno += t.value.count("\n")

def t_error(t):
    print("Illegal character '%s'" % t.value[0])
    t.lexer.skip(1)

# Build the lexer
import ply.lex as lex
```

```

lex.lex()

# Precedence
rules for the arithmetic operators
precedence = (
    ('left','PLUS','MINUS'),
    ('left','TIMES','DIVIDE'),
    ('right','UMINUS'),
)

# dictionary of names (for storing variables)
names = { }

def p_statement_assign(p):
    'statement : NAME EQUALS expression'
    names[p[1]] = p[3]

def p_statement_expr(p):
    'statement : expression'
    print(p[1])

def p_expression_binop(p):
    '''expression : expression PLUS expression
                  | expression MINUS expression
                  | expression TIMES expression
                  | expression DIVIDE expression'''
    if p[2] == '+': p[0] = p[1] + p[3]
    elif p[2] == '-': p[0] = p[1] - p[3]
    elif p[2] == '*': p[0] = p[1] * p[3]
    elif p[2] == '/': p[0] = p[1] / p[3]

def p_expression_uminus(p):
    'expression : MINUS expression %prec UMINUS'
    p[0] = -p[2]

def p_expression_group(p):
    'expression : LPAREN
expression RPAREN'
    p[0] = p[2]

def p_expression_number(p):
    'expression : NUMBER'
    p[0] = p[1]

def p_expression_name(p):
    'expression : NAME'
    try:
        p[0] = names[p[1]]

```



```

except LookupError:
    print("Undefined name '%s'" % p[1])
    p[0] = 0

def p_error(p):
    print("Syntax error at '%s'" % p.value)

import ply.yacc as yacc
yacc.yacc()

while True:
    try:
        s = raw_input('calc > ') # use input() on Python 3
    except EOFError:
        break
    yacc.parse(s)

```

## Bug Reports and Patches

=====

My goal with PLY is to simply have a decent lex/yacc implementation for Python. As a general rule, I don't spend huge amounts of time working on it unless I receive very specific bug reports and/or patches to fix problems. I also try to incorporate submitted feature requests and enhancements into each new version. Please visit the PLY github page

at <https://github.com/dabeaz/ply> to submit issues and pull requests. To contact me about bugs and/or new features, please send email to [dave@dabeaz.com](mailto:dave@dabeaz.com).

-- Dave

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ca-bundle.crt -- Bundle of CA Root Certificates

Certificate data from Mozilla as of: Thu Nov 3 19:04:19 2011#

This is a bundle of X.509 certificates of public Certificate Authorities (CA). These were automatically extracted from Mozilla's root certificates file (certdata.txt). This file can be found in the mozilla source tree:

<http://mxr.mozilla.org/mozilla/source/security/nss/lib/ckfw/builtins/certdata.txt?raw=1#>

It contains the certificates in PEM format and therefore can be directly used with curl / libcurl / php\_curl, or with an Apache+mod\_ssl webserver for SSL client authentication. Just configure this file as the SSLCACertificateFile.#

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# 1.287 pystemmer 1.3.0

## 1.287.1 Available under license :

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=====

There are two files in the "sampledata/" subdirectory, used for benchmarking. The first of these, "englishvoc.txt", is the english vocabulary list from snowball, and is covered by the same license as snowball itself (ie, the BSD license, see above).

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# 1.288 typing 3.6.4

## 1.288.1 Available under license :

### A. HISTORY OF THE SOFTWARE

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Python was created in the early 1990s by Guido van Rossum at Stichting Mathematisch Centrum (CWI, see <http://www.cwi.nl>) in the Netherlands as a successor of a language called ABC. Guido remains Python's principal author, although it includes many contributions from others.

In 1995, Guido continued his work on Python at the Corporation for National Research Initiatives (CNRI, see <http://www.cnri.reston.va.us>) in Reston, Virginia where he released several versions of the software.

In May 2000, Guido and the Python core development team moved to BeOpen.com to form the BeOpen PythonLabs team. In October of the same year, the PythonLabs team moved to Digital Creations (now Zope Corporation, see <http://www.zope.com>). In 2001, the Python Software Foundation (PSF, see <http://www.python.org/psf/>) was formed, a non-profit organization created specifically to own Python-related Intellectual Property. Zope Corporation is a sponsoring member of the PSF.

All Python releases are Open Source (see <http://www.opensource.org> for the Open Source Definition). Historically, most, but not all, Python releases have also been GPL-compatible; the table below summarizes the various releases.

| Release        | Derived from | Year      | Owner      | GPL-compatible? (1) |
|----------------|--------------|-----------|------------|---------------------|
| 0.9.0 thru 1.2 |              | 1991-1995 | CWI        | yes                 |
| 1.3 thru 1.5.2 | 1.2          | 1995-1999 | CNRI       | yes                 |
| 1.6            | 1.5.2        | 2000      | CNRI       | no                  |
| 2.0            | 1.6          | 2000      | BeOpen.com | no                  |
| 1.6.1          | 1.6          | 2001      | CNRI       | yes (2)             |
| 2.1            | 2.0+1.6.1    | 2001      | PSF        | no                  |
| 2.0.1          | 2.0+1.6.1    | 2001      | PSF        | yes                 |
| 2.1.1          | 2.1+2.0.1    | 2001      | PSF        | yes                 |
| 2.1.2          | 2.1.1        | 2002      | PSF        | yes                 |
| 2.1.3          | 2.1.2        | 2002      | PSF        | yes                 |
| 2.2 and above  |              |           |            |                     |

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## 1.299 json-smart 2.2.1

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```

* /json-smart-2-2-1-sources-6-jar/net/minidev/json/parser/JSONParserByteArray.java
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* /json-smart-2-2-1-sources-6-jar/net/minidev/json/parser/JSONParserBase.java
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* /json-smart-2-2-1-sources-6-jar/net/minidev/json/JSONUtil.java
* /json-smart-2-2-1-sources-6-jar/net/minidev/json/JSONAware.java
* /json-smart-2-2-1-sources-6-jar/net/minidev/json/JStylerObj.java
* /json-smart-2-2-1-sources-6-jar/net/minidev/json/JSONAwareEx.java
* /json-smart-2-2-1-sources-6-jar/net/minidev/json/writer/BeansMapper.java
* /json-smart-2-2-1-sources-6-jar/net/minidev/json/JSONStyle.java
* /json-smart-2-2-1-sources-6-jar/net/minidev/json/JSONObject.java
* /json-smart-2-2-1-sources-6-jar/net/minidev/json/JSONValue.java
* /json-smart-2-2-1-sources-6-jar/net/minidev/json/writer/FakeMapper.java
* /json-smart-2-2-1-sources-6-jar/net/minidev/json/writer/JsonReader.java
* /json-smart-2-2-1-sources-6-jar/net/minidev/json/JSONArray.java
* /json-smart-2-2-1-sources-6-jar/net/minidev/json/parser/JSONParserReader.java
*
* /json-smart-2-2-1-sources-6-jar/net/minidev/json/writer/DefaultMapperOrdered.java
* /json-smart-2-2-1-sources-6-jar/net/minidev/json/parser/JSONParserInputStream.java
* /json-smart-2-2-1-sources-6-jar/net/minidev/json/writer/CollectionMapper.java
* /json-smart-2-2-1-sources-6-jar/net/minidev/json/JSONStreamAwareEx.java
* /json-smart-2-2-1-sources-6-jar/net/minidev/json/parser/JSONParser.java
* /json-smart-2-2-1-sources-6-jar/net/minidev/json/parser/ParseException.java
* /json-smart-2-2-1-sources-6-jar/net/minidev/json/parser/JSONParserStream.java
* /json-smart-2-2-1-sources-6-jar/net/minidev/json/writer/JsonReaderI.java
* /json-smart-2-2-1-sources-6-jar/net/minidev/json/writer/CompressorMapper.java
* /json-smart-2-2-1-sources-6-jar/net/minidev/json/parser/JSONParserString.java
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- \* /json-smart-2-2-1-sources-6-jar/net/minidev/json/writer/DefaultMapper.java

# 1.300 tevent 0.10.2

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## 1.303 nginx 1.12.1

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\* QUnit - A JavaScript Unit Testing Framework

\*

\* <http://docs.jquery.com/QUnit>

\*

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\* jsDump

\* Copyright (c) 2008 Ariel Flesler - aflesler(at)gmail(dot)com | <http://flesler.blogspot.com>

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\* Date: 5/15/2008

\* @projectDescription Advanced and extensible data dumping for Javascript.

\* @version 1.0.0

\* @author Ariel Flesler

\* @link {<http://flesler.blogspot.com/2008/05/jsdump-pretty-dump-of-any-javascript.html>}

\*/

/\*

\* Javascript Diff Algorithm

\* By John Resig (<http://ejohn.org/>)

\* Modified by Chu Alan "sprite"

\*

\* Released under the MIT license.

\*

\* More Info:

\* <http://ejohn.org/projects/javascript-diff-algorithm/>

\*

\* Usage: QUnit.diff(expected, actual)

\*

\* QUnit.diff("the quick brown

fox jumped over", "the quick fox jumps over") == "the quick <del>brown </del> fox <del>jumped </del><ins>jumps </ins> over"

\*/

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\* /coverage-3-6-tar-gz/coverage-3.6/test/qunit/qunit.js

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\* jQuery Templates Plugin 1.0.0pre

\* <http://github.com/jquery/jquery-tmpl>

\* Requires jQuery 1.4.2



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# 1.305 libdwarf 20161124

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/\*

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\*/

/\* dsc\_type: if 0, then dsc\_low is a single discriminant value  
and dsc\_high is zero..  
If 1, then dsc\_low, dsc\_high are a discriminant range

All the messy complexity here is so we can have both  
a set of values read as uleb and as sleb.  
We make our own copy of the block for the same reason.  
\*/

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libdwarf.h  
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17 March 2014: Updated to  
remove reference to dwarf.v2.mm.

## 1.306 openjdk-jre 1.8.0u131

## 1.306.1 Available under license :

## zlib v1.2.11

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<pre>

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jloup@gzip.org      madler@alumni.caltech.edu

</pre>

## Little Color Management System (LCMS) v2.9

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<pre>

Little Color Management System

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- doc/example/pcsc\_demo.c
- the files in src/spy/
- the files in UnitaryTests/

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###

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| Gallium code   | src/gallium/       | MIT            |
| Ext headers    | GL/glxt.h          | Khronos        |
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Mesa 3-D  
graphics library

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include/GL/glxt.h  
include/GL/wglxt.h :

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## jopt-simple v5.0.4

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Written by: Philip Hazel

Email local part: ph10

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```

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/**
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 \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom3/as/ASObject.java  
 \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom3/as/CharacterDataEditAS.java  
 \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom3/as/DOMImplementationAS.java  
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 /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom3/as/ASModel.java  
 \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom3/as/DocumentAS.java  
 \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom3/as/ASAttributeDeclaration.java  
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 \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom3/as/ASContentModel.java  
 \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom3/as/DOMASWriter.java  
 \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom3/as/DocumentEditAS.java  
 \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom3/as/ASObjectList.java  
 \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom3/as/DOMASBuilder.java  
 \*  
 /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom3/as/DOMASException.java  
 \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom3/as/NodeEditAS.java  
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* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/traversers/XSDocumentInfo.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/traversers/XSDElementTraverser.java
*
/xercesimpl-2-12-0-sources-jar/org/apache/xerces/xni/parser/XMLErrorHandler.java
* /xercesimpl-2-12-0-sources-jar/org/apache/html/dom/HTMLFrameElementImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/util/XMLEntityDescriptionImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/util/ShadowedSymbolTable.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/util/ObjectListImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/wml/dom/WMLImgElementImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/wml/WMLOptgroupElement.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xni/parser/XMLInputSource.java
* /xercesimpl-2-12-0-sources-jar/org/apache/wml/WMLImgElement.java
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* /xercesimpl-2-12-0-sources-jar/org/apache/wml/dom/WMLTimerElementImpl.java
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* /xercesimpl-2-12-0-sources-jar/org/apache/wml/dom/WMLWmlElementImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dv/xs/AnySimpleDV.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xs/StringList.java
* /xercesimpl-2-12-0-sources-jar/org/apache/wml/WMLTimerElement.java
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* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/opti/DefaultXMLDocumentHandler.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/DeferredElementImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/wml/WMLAnchorElement.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xml/serialize/HTMLSerializer.java
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* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/opti/SchemaParsingConfig.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dtd/XML11NSDTDValidator.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xpointer/XPointerMessageFormatter.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xs/XSException.java
* /xercesimpl-2-12-0-sources-jar/org/apache/wml/dom/WMLMetaElementImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/html/dom/HTMLQuoteElementImpl.java
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* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xinclude/XIncludeTextReader.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/DOMInputImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/html/dom/ObjectFactory.java
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* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/jaxp/TeeXMLDocumentFilterImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/html/dom/HTMLTableSectionElementImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dtd/models/CMStateSet.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dv/xs/Base64BinaryDV.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/jaxp/validation/DraconianErrorHandler.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/jaxp/JAXPValidatorComponent.java
* /xercesimpl-2-12-0-sources-jar/org/apache/html/dom/HTMLTitleElementImpl.java
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* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/XSAttributeGroupDecl.java
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* /xercesimpl-2-12-0-sources-jar/org/apache/html/dom/HTMLLabelElementImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/html/dom/HTMLFieldSetElementImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/wml/dom/WMLCardElementImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/util/ShortListImpl.java
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* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/CDATASectionImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/jaxp/validation/XSGrammarPoolContainer.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/models/CMBuilder.java
* /xercesimpl-2-12-0-sources-jar/org/apache/wml/WMLMetaElement.java
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* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xs/datatypes/ByteList.java
* /xercesimpl-2-12-0-sources-jar/org/apache/html/dom/HTMLBodyElementImpl.java
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* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/jaxp/validation/SoftReferenceGrammarPool.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/jaxp/validation/AbstractXMLSchema.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/AttrNSImpl.java

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- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/jaxp/datatype/DurationImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/wml/dom/WMLTdElementImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/XMLEntityDescription.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xni/parser/XMLDTDScanner.java
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- /xercesimpl-2-12-0-sources-jar/org/apache/xerces/util/SecurityManager.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xs/XSModel.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/util/XMLErrorCode.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/jaxp/validation/DOMResultAugmentor.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/identity/FieldActivator.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/ParentNode.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/util/XIntPool.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/html/dom/HTMLTableCellElementImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/SchemaSymbols.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/ObjectFactory.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/io/UTF16Reader.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/TextImpl.java
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- \* /xercesimpl-2-12-0-sources-jar/org/apache/html/dom/HTMLImageElementImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dv/xs/DecimalDV.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/XSModelImpl.java
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- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dv/dtd/ListDatatypeValidator.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/jaxp/validation/StAXEventResultBuilder.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/DeferredAttrNSImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dtd/DTDGrammar.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/DeferredEntityReferenceImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xs/datatypes/ObjectList.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/identity/XPathMatcher.java
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- /xercesimpl-2-12-0-sources-jar/org/apache/wml/WMLHeadElement.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/PSVErrorList.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dv/dtd/XML11NMTOKENDatatypeValidator.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/stax/events/StartDocumentImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xml/serialize/XMLSerializer.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/identity/KeyRef.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/XSDDescription.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xni/XMLAttributes.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/wml/dom/WMLHeadElementImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/DeferredEntityImpl.java
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- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/io/Latin1Reader.java
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- /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/LCount.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dtd/XMLDTDProcessor.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dv/xs/BooleanDV.java

- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xni/parser/XMLEntityResolver.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/DOMMessageFormatter.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/SchemaGrammar.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xni/grammars/XMLGrammarDescription.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/util/XSInputSource.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dv/ValidatedInfo.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/ChildNode.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/util/XSNamedMapImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/Constants.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/events/MouseEventImpl.java
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- /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dtd/XMLDTDValidatorFilter.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/XMLDocumentScannerImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/jaxp/validation/Util.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xinclude/XInclude11TextReader.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/jaxp/DefaultValidationErrorHandler.java
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- \* /xercesimpl-2-12-0-sources-jar/org/apache/wml/dom/WMLPostfieldElementImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/traversers/StAXSchemaParser.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/DeferredNotationImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/CoreDocumentImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/XMLNSDocumentScannerImpl.java
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- /xercesimpl-2-12-0-sources-jar/org/apache/xerces/jaxp/validation/ReadOnlyGrammarPool.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/DOMErrorImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/util/XMLAttributesImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/traversers/XSDAttributeTraverser.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/parsers/XMLDocumentParser.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/traversers/XSDComplexTypeTraverser.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/util/DatatypeMessageFormatter.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/wml/WMLIElement.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/wml/dom/WMLNoopElementImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xml/serialize/SecuritySupport.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dv/DatatypeException.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dv/dtd/ENTITYDatatypeValidator.java
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- \* /xercesimpl-2-12-0-sources-jar/org/apache/wml/dom/WMLTableElementImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/stax/events/ElementImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/traversers/SchemaContentHandler.java
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- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dtd/BalancedDTDGrammar.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xpointer/ShortHandPointer.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xni/parser/XMLParserConfiguration.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/parsers/BasicParserConfiguration.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/html/dom/HTMLPreElementImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/parsers/SecurityConfiguration.java

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* /xercesimpl-2-12-0-sources-jar/org/apache/xml/serialize/HTMLdtd.java
* /xercesimpl-2-12-0-sources-jar/org/apache/wml/WMLDOMImplementation.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/util/AugmentationsImpl.java
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* /xercesimpl-2-12-0-sources-jar/org/apache/html/dom/HTMLDListElementImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dv/xs/DayTimeDurationDV.java
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* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/util/XSNamedMap4Types.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xs/datatypes/XSDateTime.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/opti/DefaultText.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dtd/models/CMLLeaf.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xs/XSTerm.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xni/parser/XMLComponent.java
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/xercesimpl-2-12-0-sources-jar/org/apache/wml/dom/WMLSmallElementImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/jaxp/DocumentBuilderImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dv/DatatypeValidator.java
* /xercesimpl-2-12-0-sources-jar/org/apache/html/dom/HTMLTextAreaElementImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xs/AttributePSVI.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xpath/regex/Token.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/DeferredNode.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xml/serialize/XML11Serializer.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/traversers/XSDAttributeGroupTraverser.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dv/xs/HexBinaryDV.java
* /xercesimpl-2-12-0-sources-jar/org/apache/wml/WMLGoElement.java
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* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/XSLoaderImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/XML11NamespaceBinder.java
* /xercesimpl-2-12-0-sources-jar/org/apache/html/dom/SecuritySupport.java
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- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/util/XMLResourceIdentifierImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/wml/dom/WMLElementImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xpath/XPath.java
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- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xni/XMLDocumentFragmentHandler.java
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- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/parsers/XPointerParserConfiguration.java
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- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/io/UTF8Reader.java
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- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/EntityReferenceImpl.java
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* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/identity/IdentityConstraint.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xs/datatypes/XSDouble.java
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* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/CommentImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/DeferredProcessingInstructionImpl.java
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* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/traversers/XSAnnotationInfo.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/XML11DTDScannerImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/opti/NodeImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/parsers/XMLGrammarCachingConfiguration.java
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* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xni/QName.java
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* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xni/grammars/XMLGrammarPool.java
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* /xercesimpl-2-12-0-sources-jar/org/apache/html/dom/HTMLScriptElementImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/util/XMLStringBuffer.java
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* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/traversers/XSDGroupTraverser.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dv/xs/FullDVFactory.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xinclude/ObjectFactory.java
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* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/parsers/DOMParserImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/wml/WMLTrElement.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dtd/models/CMUniOp.java
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* /xercesimpl-2-12-0-sources-jar/org/apache/wml/dom/WMLSelectElementImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/traversers/XSDSimpleTypeTraverser.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/XML11EntityScanner.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dv/xs/StringDV.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dv/xs/IDREFDV.java
* /xercesimpl-2-12-0-sources-jar/org/apache/html/dom/HTMLButtonElementImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/identity/Field.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/DocumentImpl.java
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/xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/opti/TextImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/wml/WMLOneventElement.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dv/util/ByteListImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/parsers/XIncludeParserConfiguration.java
* /xercesimpl-2-12-0-sources-jar/org/apache/wml/dom/WMLStrongElementImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/parsers/CachingParserPool.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/util/ParserConfigurationSettings.java
* /xercesimpl-2-12-0-sources-jar/org/apache/wml/WMLDocument.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/jaxp/validation/EmptyXMLSchema.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xs/XSObjectList.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/opti/DefaultNode.java
* /xercesimpl-2-12-0-sources-jar/org/apache/html/dom/HTMLMapElementImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/XML11NSDocumentScannerImpl.java
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* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xni/XMLDTDContentModelHandler.java
* /xercesimpl-2-12-0-sources-jar/org/apache/wml/WMLEmElement.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/PSVIDocumentImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dtd/DTDGrammarBucket.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/ElementPSVImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xpath/regex/REUtil.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xni/parser/XMLParseException.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xpath/regex/Op.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xni/parser/XMLDTDContentModelSource.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/parsers/XML11DTDConfiguration.java
* /xercesimpl-2-12-0-sources-jar/org/apache/wml/dom/WMLTemplateElementImpl.java
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/xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/SecuritySupport.java
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- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dv/dtd/NMTOKENDatatypeValidator.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/html/dom/HTMLParagraphElementImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xml/serialize/OutputFormat.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dv/dtd/NOTATIONDatatypeValidator.java
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- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/DOMImplementationSourceImpl.java
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- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/CharacterDataImpl.java
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- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/XMLSchemaLoader.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/XMLScanner.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/util/XMLGrammarPoolImpl.java
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- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/models/CMNodeFactory.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/html/dom/HTMLFontElementImpl.java
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- \* /xercesimpl-2-12-0-sources-jar/org/apache/html/dom/HTMLAppletElementImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dv/xs/IDDV.java
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- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/traversers/XSAbstractParticleTraverser.java
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- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/jaxp/datatype/XMLGregorianCalendarImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/util/XInt.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xs/XSConstants.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xml/serialize/Serializer.java
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* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/util/IntStack.java
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- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dv/dtd/XML11DTDDVFactoryImpl.java
- \*
- /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xpath/regex/ParseException.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xni/parser/XMLDTDFilter.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dtd/XMLDTDValidator.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/traversers/XSDNotationTraverser.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xni/grammars/XMLSchemaDescription.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/jaxp/validation/DOMResultBuilder.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/wml/dom/WMLAnchorElementImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/html/dom/HTMLModElementImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/wml/dom/WMLDocumentImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/DeferredElementNSImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/html/dom/HTMLTableCaptionElementImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/XMLEntityHandler.java
- \*
- /xercesimpl-2-12-0-sources-jar/org/apache/xerces/parsers/StandardParserConfiguration.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/models/XSAllCM.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/opti/AttrImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/wml/dom/WMLFieldsetElementImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/wml/dom/WMLDoElementImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xpath/regex/RangeToken.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/parsers/DOMASBuilderImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/html/dom/NameNodeListImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/wml/dom/WMLDOMImplementationImpl.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/io/UCSReader.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/parsers/XIncludeAwareParserConfiguration.java
- \* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/RevalidationHandler.java
- \*

```

/xercesimpl-2-12-0-sources-jar/org/apache/xerces/xs/XSValue.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/NodeImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dv/dtd/XML11IDREFDatatypeValidator.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/xni/parser/XMLConfigurationException.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/util/AttributesProxy.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/jaxp/validation/ValidatorImpl.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/parsers/XMLGrammarParser.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/dtd/XMLSimpleType.java
* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/impl/xs/SchemaNamespaceSupport.java
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*/
/**
* DOM Level 3 LS CR - Experimental.
* Create a new LSParser. The newly constructed parser may
*
then be configured by means of its DOMConfiguration
* object, and used to parse documents by means of its parse
* method.
* @param mode The mode argument is either
* MODE_SYNCHRONOUS or MODE_ASYNCHRONOUS, if
* mode is MODE_SYNCHRONOUS then the
* LSParser that is created will operate in synchronous
* mode, if it's MODE_ASYNCHRONOUS then the
* LSParser that is created will operate in asynchronous
* mode.
* @param schemaType An absolute URI representing the type of the schema
* language used during the load of a Document using the
* newly created LSParser. Note that no lexical checking
* is done on the absolute URI. In order to create a
* LSParser for any kind of schema types (i.e. the
* LSParser will be free to use any schema

```

found), use the value

- \* `<code>null</code>.`
- \* `<p><b>Note:</b>` For W3C XML Schema [`<a href='http://www.w3.org/TR/2001/REC-xmlschema-1-20010502/'>XML Schema Part 1</a>`]
- \* , applications must use the value
- \* `<code>"http://www.w3.org/2001/XMLSchema"</code>`. For XML DTD [`<a href='http://www.w3.org/TR/2000/REC-xml-20001006'>XML 1.0</a>`],
- \* applications must use the value
- \* `<code>"http://www.w3.org/TR/REC-xml"</code>`. Other Schema languages
- \* are outside the scope of the W3C and therefore should recommend an
- \* absolute URI in order to use this method.
- \* `@return` The newly created `<code>LSParser</code>` object. This
- \* `<code>LSParser</code>` is either synchronous or asynchronous
- \* depending on the value of the `<code>mode</code>` argument.
- \* `<p><b>Note:</b>` By default, the newly created `<code>LSParser</code>`
- \* does not contain a `<code>DOMErrorHandler</code>`, i.e. the value of
- \* the "`<a href='http://www.w3.org/TR/2003/WD-DOM-Level-3-Core-20030609/core.html#parameter-error-handler'>`
- \* `error-handler</a>`" configuration parameter is `<code>null</code>`. However, implementations
- \* may provide a default error handler at creation time. In that case,
- \* the initial value of the `<code>"error-handler"</code>` configuration
- \* parameter on the new created `<code>LSParser</code>` contains a
- \* reference to the default error handler.
- \* `@exception` DOMException
- \* NOT\_SUPPORTED\_ERR: Raised if the requested mode or schema type is
- \* not supported.
- \*/

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\* /xercesimpl-2-12-0-sources-jar/org/apache/xerces/dom/CoreDOMImplementationImpl.java  
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## 1.313 jackson-annotations 2.11.1

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 */
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Found in path(s):

\* /stateless4j-2-5-0-sources-jar/com/github/oxo42/stateless4j/delegates/FuncBoolean.java

\* /stateless4j-2-5-0-sources-jar/com/github/oxo42/stateless4j/OutVar.java

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It was originally written by Tatu Saloranta (tatu.saloranta@iki.fi), and has been in development since 2007.  
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- \* /jopt-simple-4-9-sources-jar/joptsimple/UnrecognizedOptionException.java
- \* /jopt-simple-4-9-sources-jar/joptsimple/util/DateConverter.java
- \* /jopt-simple-4-9-sources-jar/joptsimple/internal/Objects.java
- \* /jopt-simple-4-9-sources-jar/joptsimple/AlternativeLongOptionSpec.java
- \* /jopt-simple-4-9-sources-jar/joptsimple/OptionDescriptor.java
- \* /jopt-simple-4-9-sources-jar/joptsimple/OptionException.java
- \* /jopt-simple-4-9-sources-jar/joptsimple/IllegalOptionSpecificationException.java
- \* /jopt-simple-4-9-sources-jar/joptsimple/MultipleArgumentsForOptionException.java
- \* /jopt-simple-4-9-sources-jar/joptsimple/NonOptionArgumentSpec.java
- \* /jopt-simple-4-9-sources-jar/joptsimple/OptionSpec.java
- \*



```

/jopt-simple-4-9-sources-jar/joptsimple/MissingRequiredOptionsException.java
* /jopt-simple-4-9-sources-jar/joptsimple/BuiltinHelpFormatter.java
* /jopt-simple-4-9-sources-jar/joptsimple/internal/AbbreviationMap.java
* /jopt-simple-4-9-sources-jar/joptsimple/internal/Rows.java
* /jopt-simple-4-9-sources-jar/joptsimple/util/InetAddressConverter.java
* /jopt-simple-4-9-sources-jar/joptsimple/internal/Strings.java
* /jopt-simple-4-9-sources-jar/joptsimple/internal/Classes.java
* /jopt-simple-4-9-sources-jar/joptsimple/internal/Messages.java
* /jopt-simple-4-9-sources-jar/joptsimple/util/KeyValuePair.java
* /jopt-simple-4-9-sources-jar/joptsimple/NoArgumentOptionSpec.java
* /jopt-simple-4-9-sources-jar/joptsimple/util/RegexMatcher.java
* /jopt-simple-4-9-sources-jar/joptsimple/OptionSpecTokenizer.java
* /jopt-simple-4-9-sources-jar/joptsimple/ValueConverter.java
* /jopt-simple-4-9-sources-jar/joptsimple/AbstractOptionSpec.java
* /jopt-simple-4-9-sources-jar/joptsimple/internal/ReflectionException.java
*
/jopt-simple-4-9-sources-jar/joptsimple/ArgumentList.java
* /jopt-simple-4-9-sources-jar/joptsimple/internal/Columns.java
* /jopt-simple-4-9-sources-jar/joptsimple/internal/Row.java
* /jopt-simple-4-9-sources-jar/joptsimple/ParserRules.java
* /jopt-simple-4-9-sources-jar/joptsimple/RequiredArgumentOptionSpec.java
* /jopt-simple-4-9-sources-jar/joptsimple/UnconfiguredOptionException.java
* /jopt-simple-4-9-sources-jar/joptsimple/ValueConversionException.java
* /jopt-simple-4-9-sources-jar/joptsimple/internal/ConstructorInvokingValueConverter.java
* /jopt-simple-4-9-sources-jar/joptsimple/OptionalArgumentOptionSpec.java
* /jopt-simple-4-9-sources-jar/joptsimple/internal/Reflection.java
* /jopt-simple-4-9-sources-jar/joptsimple/OptionParserState.java
* /jopt-simple-4-9-sources-jar/joptsimple/OptionSpecBuilder.java
* /jopt-simple-4-9-sources-jar/joptsimple/HelpFormatter.java
* /jopt-simple-4-9-sources-jar/joptsimple/OptionMissingRequiredArgumentException.java
*
/jopt-simple-4-9-sources-jar/joptsimple/OptionArgumentConversionException.java
* /jopt-simple-4-9-sources-jar/joptsimple/internal/MethodInvokingValueConverter.java
* /jopt-simple-4-9-sources-jar/joptsimple/ArgumentAcceptingOptionSpec.java

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--- end ---

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////

[#mpl]

# MPL Support, <boost/mp11/mpl.hpp>

:toc:

:toc-title:

:idprefix:

The header `<boost/mp11/mpl.hpp>`, when included, defines the necessary support infrastructure for `mp_list` and `std::tuple` to be valid link:../../../../libs/mpl[MPL] sequences.

NOTE: `mpl.hpp` is not included by `<boost/mp11.hpp>`.

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This is an attempt to acknowledge early contributions to the garbage collector. Later contributions should instead be mentioned in

README.changes.

## HISTORY -

Early versions of this collector were developed as a part of research projects supported in part by the National Science Foundation and the Defense Advance Research Projects Agency.

The garbage collector originated as part of the run-time system for the Russell programming language implementation. The first version of the garbage collector was written primarily by Al Demers. It was then refined and mostly rewritten, primarily by Hans-J. Boehm, at Cornell U., the University of Washington, Rice University (where it was first used for C and assembly code), Xerox PARC, SGI, and HP Labs. However, significant contributions have also been made by many others.

Some other contributors:

More recent contributors are mentioned in the modification history in README.changes. My apologies for any omissions.

The SPARC specific code was originally contributed by Mark Weiser.

The Encore Multimax modifications were supplied by Kevin Kenny (kenny@m.cs.uiuc.edu). The adaptation to the IBM PC/RT is largely due to Vernon Lee, on machines made available to Rice by IBM.

Much of the HP specific code and a number of good suggestions for improving the generic code are due to Walter Underwood.

Robert Brazile (brazile@diamond.bbn.com) originally supplied the ULTRIX code. Al Dosser (dosser@src.dec.com) and Regis Cridlig (Regis.Cridlig@cl.cam.ac.uk) subsequently provided updates and information on variation between ULTRIX systems. Parag Patel (parag@netcom.com) supplied the A/UX code.

Jesper Peterson(jep@mtiame.mtia.oz.au), Michel Schinz, and Martin Tauchmann (martintauchmann@bigfoot.com) supplied the Amiga port. Thomas Funke (thf@zelator.in-berlin.de(?)) and

Brian D.Carlstrom (bdc@clark.lcs.mit.edu) supplied the NeXT ports.

Douglas Steel (doug@wg.icl.co.uk) provided ICL DRS6000 code.

Bill Janssen (janssen@parc.xerox.com) supplied the SunOS dynamic loader

specific code. Manuel Serrano (serrano@cornas.inria.fr) supplied linux and Sony News specific code. Al Dosser provided Alpha/OSF/1 code. He and Dave Detlefs(detlefs@src.dec.com) also provided several generic bug fixes.

Alistair G. Crooks(agc@uts.amdahl.com) supplied the NetBSD and 386BSD ports.

Jeffrey Hsu (hsu@soda.berkeley.edu) provided the FreeBSD port.

Brent Benson (brent@jade.ssd.csd.harris.com) ported the collector to a Motorola 88K processor running CX/UX (Harris NightHawk).

Ari Huttunen (Ari.Huttunen@hut.fi) generalized the OS/2 port to nonIBM development environments (a nontrivial task).

Patrick Beard (beard@cs.ucdavis.edu) provided the initial MacOS port. David Chase, then at Olivetti Research, suggested several improvements. Scott Schwartz (schwartz@groucho.cse.psu.edu) supplied some of the code to save and print call stacks for leak detection on a SPARC. Jesse Hull and John Ellis supplied the C++ interface code. Zhong Shao performed much of the experimentation that led to the current typed allocation facility. (His dynamic type inference code hasn't made it into the released version of the collector, yet.)

## 1.322 elfutils 0.170-1

### 1.322.1 Available under license :

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Version 3, 29 June 2007

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Also thanks to all the people who reported  
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## 1.326 readline 7.0.3-1

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## 1.327 golang 1.15.10

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## 1.328 jackson-annotations 2.6.1

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* /jetty-webapp-9-2-13-v20150730-sources-jar/org/eclipse/jetty/webapp/WebInfConfiguration.java
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* /jetty-webapp-9-2-13-v20150730-sources-jar/org/eclipse/jetty/webapp/WebDescriptor.java
*
/jetty-webapp-9-2-13-v20150730-sources-jar/org/eclipse/jetty/webapp/IterativeDescriptorProcessor.java
* /jetty-webapp-9-2-13-v20150730-sources-jar/org/eclipse/jetty/webapp/Descriptor.java
```

- \* /jetty-webapp-9-2-13-v20150730-sources-jar/org/eclipse/jetty/webapp/WebXmlConfiguration.java
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- \* /jetty-webapp-9-2-13-v20150730-sources-jar/org/eclipse/jetty/webapp/JarScanner.java
- \* /jetty-webapp-9-2-13-v20150730-sources-jar/org/eclipse/jetty/webapp/Origin.java
- \* /jetty-webapp-9-2-13-v20150730-sources-jar/org/eclipse/jetty/webapp/StandardDescriptorProcessor.java
- \* /jetty-webapp-9-2-13-v20150730-sources-jar/org/eclipse/jetty/webapp/CloneConfiguration.java
- \* /jetty-webapp-9-2-13-v20150730-sources-jar/org/eclipse/jetty/webapp/FragmentDescriptor.java
- \* /jetty-webapp-9-2-13-v20150730-sources-jar/org/eclipse/jetty/webapp/Ordering.java
- \* /jetty-webapp-9-2-13-v20150730-sources-jar/org/eclipse/jetty/webapp/DefaultsDescriptor.java
- \*
- /jetty-webapp-9-2-13-v20150730-sources-jar/org/eclipse/jetty/webapp/WebAppClassLoader.java
- \* /jetty-webapp-9-2-13-v20150730-sources-jar/org/eclipse/jetty/webapp/MetaInfConfiguration.java
- \* /jetty-webapp-9-2-13-v20150730-sources-jar/org/eclipse/jetty/webapp/AbstractConfiguration.java
- \* /jetty-webapp-9-2-13-v20150730-sources-jar/org/eclipse/jetty/webapp/WebAppContext.java
- \* /jetty-webapp-9-2-13-v20150730-sources-jar/org/eclipse/jetty/webapp/ClasspathPattern.java
- \* /jetty-webapp-9-2-13-v20150730-sources-jar/org/eclipse/jetty/webapp/FragmentConfiguration.java
- \* /jetty-webapp-9-2-13-v20150730-sources-jar/org/eclipse/jetty/webapp/package-info.java
- \* /jetty-webapp-9-2-13-v20150730-sources-jar/org/eclipse/jetty/webapp/DiscoveredAnnotation.java
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* /jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/RoleInfo.java
* /jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/package-info.java
* /jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/authentication/LoginCallback.java
* /jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/UserAuthentication.java
* /jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/HashLoginService.java
*
/jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/authentication/FormAuthenticator.java
* /jetty-security-9-2-13-v20150730-sources-
jar/org/eclipse/jetty/security/authentication/ClientCertAuthenticator.java
* /jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/authentication/SessionAuthentication.java
* /jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/MappedLoginService.java
* /jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/DefaultUserIdentity.java
* /jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/authentication/SpnegoAuthenticator.java
* /jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/authentication/BasicAuthenticator.java
* /jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/authentication/package-info.java
* /jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/Authenticator.java
*
/jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/DefaultIdentityService.java
* /jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/authentication/LoginAuthenticator.java
* /jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/PropertyUserStore.java
* /jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/CrossContextPseudoSession.java
* /jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/JDBCLoginService.java
* /jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/SpnegoUserPrincipal.java
* /jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/SpnegoUserIdentity.java
* /jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/LoginService.java
* /jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/SecurityHandler.java
* /jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/ConstraintMapping.java
*
/jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/authentication/LoginCallbackImpl.java
* /jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/authentication/DigestAuthenticator.java
* /jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/SpnegoLoginService.java
* /jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/RunAsToken.java
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```

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* /jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/AbstractUserAuthentication.java
* /jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/ConstraintAware.java
* /jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/authentication/DeferredAuthentication.java
* /jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/RoleRunAsToken.java
* /jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/DefaultAuthenticatorFactory.java
*
/jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/HashCrossContextPseudoSession.java
* /jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/ServerAuthException.java
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```

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//Equivalent to //<user-data-constraint><transport-guarantee>CONFIDENTIAL</transport-guarantee></user-data-
constraint>
```

Found in path(s):

```
* /jetty-security-9-2-13-v20150730-sources-jar/org/eclipse/jetty/security/ConstraintSecurityHandler.java
```

## 1.331 jetty-util 9.2.13.v20150730

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/**
 * @param c Data constrain indicator: 0=DC+NONE, 1=DC_INTEGRAL &
 *          2=DC_CONFIDENTIAL
 */
/**
 * @return Data constrain indicator: 0=DC+NONE, 1=DC_INTEGRAL &
 *          2=DC_CONFIDENTIAL
 */
```

Found in path(s):

```
* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/security/Constraint.java
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 */
```

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```

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```
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```

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/**
 * Utf8 Appendable abstract base class
```



\*  
 \* This abstract class wraps a standard {@link java.lang.Appendable} and provides methods to append UTF-8 encoded bytes, that are converted into characters.  
 \*  
 \* This class is stateful and up to 4 calls to {@link #append(byte)} may be needed before state a character is appended to the string buffer.  
 \*  
 \* The UTF-8 decoding is done by this class and no additional buffers or Readers are used. The UTF-8 code was inspired by  
 \* <http://bjoern.hoehrmann.de/utf-8/decoder/dfa/>  
 \*  
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\* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/Utf8Appendable.java

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/\*

\* @(#)UnixCrypt.java 0.9 96/11/25

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```

Found in path(s):

```
* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/statistic/CounterStatistic.java
* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/HostMap.java
* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/thread/ShutdownThread.java
* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/Scanner.java
* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/ArrayTrie.java
* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/resource/URLResource.java
* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/IPAddressMap.java
*
/jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/resource/EmptyResource.java
* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/BlockingCallback.java
* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/log/Log.java
* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/ConcurrentArrayQueue.java
* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/UrlEncoded.java
* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/component/Container.java
* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/BufferUtil.java
* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/security/Credential.java
* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/log/Logger.java
* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/component/package-info.java
* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/MemoryUtils.java
*
/jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/LazyList.java
* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/MultiPartInputStreamParser.java
* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/IteratingNestedCallback.java
* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/resource/JarFileResource.java
* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/Loader.java
* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/CompletableCallback.java
* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/component/ContainerLifecycle.java
* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/component/Dumpable.java
* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/component/AbstractLifecycle.java
* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/resource/BadResource.java
* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/resource/Resource.java
*
/jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/resource/ResourceFactory.java
* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/thread/TimerScheduler.java
* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/FuturePromise.java
```

- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/preventers/DOMLeakPreventer.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/thread/ThreadPool.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/statistic/package-info.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/log/package-info.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/log/JavaUtilLog.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/security/CertificateValidator.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/ClassLoadingObjectInputStream.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/resource/package-info.java
- \*
- /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/LeakDetector.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/preventers/AppContextLeakPreventer.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/log/AbstractLogger.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/RolloverFileOutputStream.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/log/StdErrLog.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/preventers/AbstractLeakPreventer.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/Utf8StringBuilder.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/resource/JarResource.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/ArrayTernaryTrie.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/ssl/AliasedX509KeyManager.java
- \*
- /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/preventers/DriverManagerLeakPreventer.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/MultiPartOutputStream.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/Trie.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/log/Slf4jLog.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/AttributesMap.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/ssl/AliasedX509ExtendedKeyManager.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/thread/Scheduler.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/security/Password.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/Attributes.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/security/package-info.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/log/JettyAwareLogger.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/ssl/package-info.java
- \*
- /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/FutureCallback.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/ArrayQueue.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/IO.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/thread/NonBlockingThread.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/SharedBlockingCallback.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/ReadLineInputStream.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/IntrospectionUtil.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/BlockingArrayQueue.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/log/LoggerLog.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/annotation/ManagedOperation.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/TreeTrie.java
- \*
- /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/component/FileDestroyable.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/annotation/Name.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/TypeUtil.java

- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/MultiMap.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/Atomics.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/MultiPartWriter.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/component/FileNoticeLifecycleListener.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/ByteArrayISO8859Writer.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/DateCache.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/QuotedStringTokenizer.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/Fields.java
- \*
- /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/ArrayUtil.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/ssl/SslContextFactory.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/preventers/SecurityProviderLeakPreventer.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/PatternMatcher.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/IteratingCallback.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/annotation/ManagedAttribute.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/URIUtil.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/resource/FileResource.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/Utf8LineParser.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/preventers/AWTLeakPreventer.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/CountingCallback.java
- \*
- /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/log/StacklessLogging.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/thread/package-info.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/component/Lifecycle.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/Jetty.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/Utf8StringBuffer.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/annotation/package-info.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/resource/PathResource.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/security/CertificateUtils.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/Uptime.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/component/Graceful.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/ByteArrayOutputStream2.java
- \*
- /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/thread/ExecutorThreadPool.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/Promise.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/preventers/GCThreadLeakPreventer.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/preventers/LoginConfigurationLeakPreventer.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/AbstractTrie.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/statistic/SampleStatistic.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/component/Destroyable.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/ConcurrentHashSet.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/annotation/ManagedObject.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/SocketAddressResolver.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/thread/ScheduledExecutorScheduler.java
- \*
- /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/HttpCookieStore.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/resource/ResourceCollection.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/StringUtil.java

- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/preventers/LDAPLeakPreventer.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/thread/Sweeper.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/MultiException.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/package-info.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/thread/QueuedThreadPool.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/preventers/package-info.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/preventers/Java2DLeakPreventer.java
- \* /jetty-util-9-2-13-v20150730-sources-jar/org/eclipse/jetty/util/B64Code.java

## 1.332 jetty-servlets 9.2.13.v20150730

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- \* /jetty-servlets-9-2-13-v20150730-sources-jar/about.html

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Found in path(s):

- \* /jetty-servlets-9-2-13-v20150730-sources-jar/org/eclipse/jetty/servlets/gzip/GzipFactory.java
- \* /jetty-servlets-9-2-13-v20150730-sources-jar/org/eclipse/jetty/servlets/AsyncGzipFilter.java
- \* /jetty-servlets-9-2-13-v20150730-sources-jar/org/eclipse/jetty/servlets/gzip/package-info.java
- \* /jetty-servlets-9-2-13-v20150730-sources-jar/org/eclipse/jetty/servlets/ConcatServlet.java
- \* /jetty-servlets-9-2-13-v20150730-sources-jar/org/eclipse/jetty/servlets/gzip/CompressedResponseWrapper.java
- \* /jetty-servlets-9-2-13-v20150730-sources-jar/org/eclipse/jetty/servlets/gzip/GzipHandler.java
- \*
- /jetty-servlets-9-2-13-v20150730-sources-jar/org/eclipse/jetty/servlets/WelcomeFilter.java
- \* /jetty-servlets-9-2-13-v20150730-sources-jar/org/eclipse/jetty/servlets/GzipFilter.java
- \* /jetty-servlets-9-2-13-v20150730-sources-jar/org/eclipse/jetty/servlets/EventSourceServlet.java
- \* /jetty-servlets-9-2-13-v20150730-sources-jar/org/eclipse/jetty/servlets/gzip/AbstractCompressedStream.java

```

* /jetty-servlets-9-2-13-v20150730-sources-jar/org/eclipse/jetty/servlets/PutFilter.java
* /jetty-servlets-9-2-13-v20150730-sources-jar/org/eclipse/jetty/servlets/EventSource.java
* /jetty-servlets-9-2-13-v20150730-sources-jar/org/eclipse/jetty/servlets/MultiPartFilter.java
* /jetty-servlets-9-2-13-v20150730-sources-jar/org/eclipse/jetty/servlets/DataRateLimitedServlet.java
* /jetty-servlets-9-2-13-v20150730-sources-jar/org/eclipse/jetty/servlets/gzip/GzipOutputStream.java
* /jetty-servlets-9-2-13-v20150730-sources-jar/org/eclipse/jetty/servlets/CloseableDoSFilter.java
*
/jetty-servlets-9-2-13-v20150730-sources-jar/org/eclipse/jetty/servlets/CrossOriginFilter.java
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* /jetty-servlets-9-2-13-v20150730-sources-jar/org/eclipse/jetty/servlets/gzip/GzipHttpOutput.java
* /jetty-servlets-9-2-13-v20150730-sources-jar/org/eclipse/jetty/servlets/package-info.java
* /jetty-servlets-9-2-13-v20150730-sources-jar/org/eclipse/jetty/servlets/DoSFilter.java
* /jetty-servlets-9-2-13-v20150730-sources-jar/org/eclipse/jetty/servlets/CGI.java
* /jetty-servlets-9-2-13-v20150730-sources-jar/org/eclipse/jetty/servlets/gzip/DeflatedOutputStream.java
* /jetty-servlets-9-2-13-v20150730-sources-jar/org/eclipse/jetty/servlets/IncludableGzipFilter.java

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## 1.333 openjdk-jre 1.7.0u161

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- doc/example/pcsc\_demo.c

- the files in src/spy/



- the files in UnitaryTests/

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*/
```

```
/******
```

```
*
```

```
* This file is based on code from bdf.c,v 1.22 2000/03/16 20:08:50
```

```
*
```

```
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```

```
*
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|                | GL/glxt.h          | Khronos        |
|                | GL/wglxt.h         | Khronos        |
|                | KHR/khrplatform.h  | Khronos        |

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include/GL/gl.h :

Mesa 3-D  
graphics library

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\*\*\*\*\*

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```
include/GL/glex.h
include/GL/glxext.h
include/GL/wglxext.h :
```

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```
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```

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@version 3.0 (December 2000)

Optimised ANSI C code for the Rijndael cipher (now AES)

@author Vincent Rijmen <vincent.rijmen@esat.kuleuven.ac.be>

@author Antoon Bosselaers <antoon.bosselaers@esat.kuleuven.ac.be>

@author Paulo Barreto <paulo.barreto@terra.com.br>

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Thanks to: Dan Hoey for his excellent Initial and Inverse permutation code; Jim Gillogly & Phil Karn for the DES key schedule code; Dennis Ferguson, Eric Young and Dana How for comparing notes; and Ray Lau, for humouring me on.

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-----  
fpconst: A Python module for handling IEEE 754 floating point special  
values  
-----

Author: Gregory R. Warnes <Gregory.R.Warnes@Pfizer.com>

Date: 2005-02-24

Version: 0.7.2

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This module provides 'fpconst' a reference implementation of Python  
Enhancement Protocol (PEP) 754, "IEEE 754 Floating Point Special  
Values". See the file pep-0754.txt or  
<http://www.python.org/peps/pep-0754.html> for the text of PEP 754.

### INSTALLATION

This is a standard Python source package. Consequently, simply unpack  
the source distribution, change into the directory, and run

\$ Python setup.py install

### DOCUMENTATION

See the text of PEP  
754 at <http://www.python.org/peps/pep-0754.html>  
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Name: fpconst

Version: 0.7.2

Summary: Utilities for handling IEEE 754 floating point special values

Home-page: <http://www.analytics.washington.edu/statcomp/projects/rzope/fpconst/>

Author: Gregory Warnes

Author-email: [Gregory.R.Warnes@Pfizer.com](mailto:Gregory.R.Warnes@Pfizer.com)

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Description: Utilities for handling IEEE 754 floating point special values

This python module implements constants and functions for working with  
IEEE754 double-precision special values. It provides constants for  
Not-a-Number (NaN), Positive Infinity (PosInf), and Negative Infinity  
(NegInf), as well as functions to test for these values.

The code is implemented in pure python by taking advantage of the  
'struct' standard module. Care has been taken to generate proper  
results on both big-endian and little-endian machines. Some efficiency  
could be gained by translating  
the core routines into C.

See <http://babbage.cs.qc.edu/courses/cs341/IEEE-754references.html>  
for reference material on the IEEE 754 floating point standard.

Further information on this package is available at  
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Author: Gregory R. Warnes <[Gregory.R.Warnes@Pfizer.com](mailto:Gregory.R.Warnes@Pfizer.com)>

Date: 2005-02-24

Version: 0.7.2

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Platform: UNKNOWN

Found in path(s):

\* /fpconst-zip/fpconst/PKG-INFO

No license file was found, but licenses were detected in source scan.

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Author: Gregory R. Warnes <Gregory.R.Warnes@Pfizer.com>

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Version: 0.7.2

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\*\*\*\*\*

from distutils.core import setup

url="http://www.analytics.washington.edu/statcomp/projects/rzope/fpconst/"

```

import
fpconst

setup(name="fpconst",
      version=fpconst.__version__,
      description="Utilities for handling IEEE 754 floating point special values",
      author="Gregory Warnes",
      author_email="Gregory.R.Warnes@Pfizer.com",
      url = url,
      long_description=fpconst.__doc__,
      py_modules=['fpconst']
)

```

Found in path(s):

\* /fpconst-zip/fpconst/setup.py

## 1.340 pyrex 0.9.5.1a

### 1.340.1 Available under license :

The icons are mostly derived work from other icons. As such they are licensed accordingly to the original license:

Crystal: LGPL

Unless stated in this file, icons are work of enthought, and are released under a 3 clause BSD-like license.

Files and original authors:

```

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scene.ico | Crystal
NUMPY{'descr': [('date', '|O8'), ('open', '<f8'), ('high', '<f8'), ('low', '<f8'), ('close', '<f8'), ('volume', '<i8'), ('adj_close', '<f8')], 'fortran_order': False, 'shape': (1047,), }
cnumpy.core.multiarray
_reconstruct
qcnumpy.core.records
recarray
qKUbRq(KMcumpy
dtype
qcnumpy.core.records
record
qKKRq(KU|N(UdateqUopenqUhighq Ulowq
UcloseqUvolumeqU adj_closeq
tq}q(hhUi8KKRq(KU<NNNJKtbK(qh
hUf8KKRq(KU<NNNJKtbK0qh hKqh
hKqhhUO8KKRq(KU|NNNJK?tbKqhhK qhhKquK8KKtb]q((cdatetime
date

```

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=qG@[EQG@Y G@  
=pJbG@  
=ptq(hURq  
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=p  
=G@[G@YQG@ZJt,FG@Ztq%(hURq&G@Z<G@ZG@Z\*=p  
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J/6G@Z=p  
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=qJ('G@Y  
=qtq+(hURq,G@Y33333G@Yp  
=G@Y=p  
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=qJpY'G@Y  
=qtq3(hU Rq4G@Y@  
=qG@YG@X  
=pG@YeQJl,G@YeQtq5(hU Rq6G@Y^(G@YRG@Y  
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=pG@^8QG@]s33333G@]  
=qJ5G@]  
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=ptq](hU  
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Rq~G@gU\"(G@hLzGG@g333333G@h)JPG@h) tq(hU  
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=pJ|!G@h[  
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RqG@eUp  
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tr(hURrG@x@zGG@x}RG@x(\G@x2QJ=G@x2Qtr(hURrG@xp\))G@y@G@x\G@y"zGJmG@y"zGtr(hURrG@  
yGzG@y`G@x@G@x3333J\5ZG@x3333tr(hURrG@y,(\G@yG@y  
=pG@yM\JQG@yM\tr(hURrG@y]G@yG@y4G@yCQJ/6G@yCQtr(hURrG@y[(G@yG@y(\G@y%QJ>G@y  
%Qtr(hURrG@y@(\G@ygzHG@yzGG@ya\J\$8G@ya\tr(hURrG@y  
=pG@z#3333G@y]QG@z)JeG@z)tr(hURrG@yG@z5GzG@yGzG@z5GzJP}\_G@z5Gztr(hURrG@z@  
=qG@z|QG@z73333G@zs3333J  
G@zs3333tr(hURrG@zXQG@z]G@y=p  
G@zW\JLG@zW\tr(hURrG@zvzGG@zzGG@z\_zHG@zs  
=pJB8G@zs  
=ptr(hURrG@zG@z=p  
G@yzGG@zG3333J,1\G@zG3333tr(hU  
RrG@zw  
=pG@zzHG@zzGG@z#3333JCG@z#3333tr(hURrG@z(\G@zG@yzGG@z)Jd[G@z)tr(hURrG@zap  
=G@zk  
=pG@zzHG@zJJG@ztr(hU  
RrG@yG@z%p  
=G@ymGzG@yGzJiG@yGztr(hURrG@yGzG@y  
=pG@x\G@y8Jd<sG@y8tr(hURrG@yJzGG@yG@y;QG@y~p  
JXG@y~p  
tr(hURrG@yG@yQG@x  
=pG@y0JBG@y0tr(hURrG@x\G@y=p  
G@x\G@xJdG@xtr(hURrG@yDzGG@yG  
=pG@x\G@x1RJLSG@x1Rtr(hURrG@x"=p  
G@x]G@w  
=pG@xa\Jh\G@xa\tr(hURrG@xQG@x=p  
G@w\G@xnfJJfTb{G@xnfJJftr(hURrG@xQG@xt)G@wG@xU\JLWG@xU\tr(hURrG@xC3333G@x~(G  
@wG@xJhTG@xtr(hURrG@x5RG@x7  
=pG@w3333G@wffffJVG@wfffftr(hURrG@wG@xX\))G@wzHG@xARJO>G@xARtr(hURrG@x@G@xRQ  
G@w\G@x)JdFG@x)tr(hURrG@x\G@xQG@wx\G@wx\J\SG@wx\tr(hURrG@wyG@wQG@v3333G@vz  
HJMIg@vzHtr(hURrG@vzHG@w\G@v\G@wv=p  
J`G@wv=p  
tr(hURrG@w\G@wG{G@w<G@w]J  
MG@w]tr(hURrG@w8G@wzHG@w2ffffG@w3333J9<G@w3333tr(hURrG@wQG@xG@wp  
=G@wJ`WG@wtr(hU RrG@wG@x  
G{G@w\G@w  
=pJAG@w  
=ptr(hU  
RrG@w^zGG@wQG@wG\G@wc3333JAG@wc3333tr(hURrG@wffffG@wtzGG@wG@wJx9G@wtr(hURr  
G@w8G@wrzGG@w

QG@wG{JIKG@wG{tr(hURrG@wa\G@wQG@wIG@wQJ4fG@wQtr(hURrG@wzHG@xG33333G@wRG@x;  
QJPYG@x;Qtr (hURr  
G@x&=p  
G@x`G@wQG@xJMG@xtr(hURrG@x\$)G@x1p  
=G@wG@w\JKG@w\tr  
(hURrG@wG@wG@wsQG@wJd=G@wtr(hURrG@wzHG@w\G@wmp  
=G@w  
=qJ?G@w  
=qtr(hURrG@w=p  
G@wQG@wJ\G@wVG{J7G@wVG{tr(hURrG@wg  
=pG@wfffffG@wD\G@w[zHJ#5G@w[zHtr(hURrG@wQGzG@wuQG@wHG@wT(J%G@wT\tr(hURrG@wy\  
(G@w33333G@wpG@w33333J?G@w33333tr(hURrG@wzGG@wQG@w33333G@w33333J  
DG@w33333tr(hURrG@w\G@x  
fffffG@w\G@wJp=G@wtr(hURrG@w  
=pG@wfffffG@w33333G@wzGJ\*-G@wzGtr(hU Rr  
G@w  
=pG@wzGG@w  
=pG@wJ(G@wtr!(hU Rr"G@wRG@xfffffG@w  
=pG@x\J<+>G@x\tr#(hU Rr\$G@wG@w  
=pG@w\G@w=p  
JD8G@w=p  
tr%(hU Rr&G@w=p  
G@wG@wfffffG@w  
=pJ:G@w  
=ptr'(hU Rr(G@wQG@w  
=qG@wQG@wJ/G@wtr)(hU Rr\*G@w\G@x  
=pG@wQG@xp  
=J0EG@xp  
=tr+(hU Rr,G@xG@xzHG@xzGG@x~fffffJ  
SG@x~ffffftr-(hU  
Rr.G@xfffffG@yl\G@xG@yiQJ  
G@yiQtr(hU Rr0G@yDG@ydzGG@yG{G@y?zHJTQG@y?zHtr1(hU Rr2G@y wzHG@yG@yk  
=pG@yzGJwG@yzGtr3(hU Rr4G@yG@z+  
=pG@yQG@y  
=pJpIG@y  
=ptr5(hU Rr6G@y\G@y  
=pG@x  
=pG@y<)JG@y<)tr7(hU Rr8G@yqG@yv=p  
G@xRG@xJG@xtr9(hU Rr:G@yG@y33333G@x\G@ymJ&G@ymtr;(hU  
Rr<G@yOzHG@yw33333G@y\G@y<zGJFG@y<zGtr=(hU  
Rr>G@yYGzG@y33333G@y(G@y?zHJTWG@y?zHtr?(hU  
Rr@G@yXG@yzG{G@yQG@ymRJPG@ymRtrA(hU RrBG@ydG@yQG@y%RG@y.QJYG@y.QtrC(hU  
RrDG@yAGzG@yozHG@y  
=qG@y9GzJMG@y9GztrE(hU RrFG@yRzGG@yYRG@y\G@yfffffJ42G@yffffftrG(hU  
RrHG@yfffffG@y`G@yG@y  
=pJ<7G@y  
=ptrI(hU  
RrJG@y

=qG@yg\ (G@x  
=pG@y@  
=qJ|bSG@y@  
=qtrK(hU  
RrLG@yOQG@yQG@y0G@y33333JeG@y33333trM(hU  
RrNG@y33333G@z#  
=pG@y\ (G@y\ )JhXXG@y\ )trO(hU  
RrPG@yQG@z^\ (G@yG@zHJ4oG@zHtrQ(hU  
RrRG@zG@z33333G@zvQG@zJDsG@ztrS(hU  
  
RrTG@z\ )G@{ }G@zf=p  
G@zfffffJ\G@zffffftrU(hU  
RrVG@zQG@z\ (G@z|(\G@zJHUG@ztrW(hU  
RrXG@z\ )G@zG{ }G@zG@z  
=pJIG@z  
=ptrY(hU  
  
RrZG@z\ (G@zG@z\ )G@zJdF7G@ztr[(hU  
Rr\G@z33333G@z33333G@zUp  
=G@z\JAG@z\tr](hU  
Rr^G@zDG@z|G@z33333G@zJ=p  
JxOG@zJ=p  
tr\_(hU  
Rr`G@zo  
=pG@zG@zG@z4\ )J[G@z4\ )tra(hU  
RrbG@zCzHG@zG@z9QG@z\ )JG@z\ )trc(hU  
RrdG@|  
=pG@|G@|Yp  
=G@|QJG@|Qtre(hU  
RrfG@|zGG@~J=p  
G@|RG@~zG.JyG@~zGtrg(hU  
RrhG@}zGG@}\ (G@}v\ (G@}\ )J\$G@}\ )tri(hU  
RrjG@}  
=pG@~G@}\ (G@~iJ0G@~itrk(hU  
RrlG@~zG{ }G@~\ (G@~C33333G@~QJKkG@~Qtrm(hU  
RrnG@~>fffffG@~S  
=pG@}  
=pG@}33333JdG@}33333tro(hU  
RrpG@}QG@~\ (G@}\ `(\G@}QJ%dG@}Qtrq(hU  
RrrG@}\ )G@~"\ (G@}p  
=G@}=p  
JX\_G@}=p  
trs(hURrtG@}\ (G@}zGG@}\ (G@}8J|RG@}8tru(hURrvG@}8G@}zHG@}&zGG@}^\ (JOG@}^\ (trw(hURrxG@  
}zHG@}G@}\ )G@}|JJG@}|try(hURrzG@}QG@}\ (G@}GzG@}33333J\*LG@}33333tr{(hURr|G@}33333G@}  
QG@}|QG@}QJLJG@}Qtr{(hURr~G@}eG@~  
=pG@}IG@}JHyG@}tr(hU RrG@}G@}  
=pG@}\ }(\G@}zGJ`sJG@}zGtr(hU  
RrG@}zGG@}QG@}d

=qG@}J\*G@}tr(hU  
RrG@}ffffG@~QG@}=p  
G@~zGJ@BG@~zGtr(hURrG@~33333G@~33333G@~G@~Jh8nG@~tr(hURrG@~G{G@=G@~G{G@~G{JG  
@~G{tr(hURrG@~G@G{G@~})G@~ffffJMG@~fffftr(hURrG@~G@:(G@~G@,  
=qJXTG@,  
=qtr(hURrG@&ffffG@&ffffG@~ffffG@~J1NG@~tr(hURrG@  
=qG@G@~GzG@ffffJG@fffftr(hURrG@QG@G@zGG@(\JDG@(\tr(hURrG@G@G@G@JpG@tr(hURrG@U  
RG@~zGG@~LG@~LJoG@~Ltr(hURrG@~zGG@~(G@}zGG@~J`vG@~tr(hURrG@~  
=pG@~  
=pG@~\$G@~JffffJ\$J`G@~Jfffftr(hURrG@~C  
=pG@~ffffG@~G@~L\)JUG@~L\)tr(hURrG@~\_zHG@~=p  
G@}G@~JUG@~tr(hURrG@~0G@~vG{G@}G@~MJ<JG@~Mtr(hURrG@~vffffG@~  
=pG@~N=p  
G@~pJX>G@~ptr(hURrG@~o(G@~ffffG@~HQG@~(JCG@~(\tr(hURrG@~zHG@~G@~&QG@~\*=p  
J+GG@~\*=p  
tr(hURrG@~  
=pG@~G@~G@~A\<G@~A\tr(hURrG@~NQG@~ffffG@~<G@~>G{J1G@~>G{tr(hURrG@~=G@~e(G@  
~zGG@~zGJ?G@~zGtr(hU  
RrG@~K  
=pG@~XG@}QG@}  
=pJT#GG@}  
=ptr(hURrG@~G@~<G@}(\G@~!RJdvHG@~!Rtr(hURrG@~\*=p  
G@~A\G@}p  
=G@~J4OG@~tr(hURrG@~(\G@~+  
=pG@|QG@|JRzG@|tr(hURrG@|QG@}T\)G@|G@}JzGJxdG@}JzGtr(hURrG@}`G@}xG@|GzG@|ffffJBG@|f  
fffftr(hURrG@}G{G@}G@|Ep  
=G@|33333JTjG@|33333tr(hURrG@|G@|=p  
G@|KzHG@|yGzJL<G@|yGztr(hURrG@|QG@|QG@|ip  
=G@|zGJG@|zGtr(hURrG@|G@}AGzG@|G@}@zGJL@G@}@zGtr(hURrG@}1RG@}IGzG@|G@|)J/G@|)tr(  
hURrG@|G@}QG@|(\G@|zHJ'G@|zHtr(hURrG@}  
G@}\G@|\G@}9p  
=JuG@}9p  
=tr(hURrG@}PG@~?33333G@}EG@~4(\JZxG@~4(\tr(hURrG@~(G@~xG@}\G@~s  
=pJ\$hg@~s  
=ptr(hURrG@~{  
=pG@~RG@~#33333G@~9GzJHG@~9Gztr(hU RrG@~W33333G@~G@~33333G@~XJRG@~Xtr(hU  
RrG@~FG{G@~G@~  
=qG@~(Jt(G@~(\tr(hURrG@33333G@~G@G{G@;QJmG@;Qtr(hURrG@\_  
=pG@G@~G@~JdCDG@tr(hURrG@G@G@tG@zGJ~sG@zGtr(hURrG@v=p  
G@QG@~zGG@zGJ\8fG@zGtr(hURrG@~QG@zHG@~vG{G@~}GzJZG@~}Gztr(hURrG@~zHG@~(\G@~k  
=pG@~JlKG@~tr(hURrG@~G@~ffffG@}G@~  
p  
=JvRG@~  
p  
=tr(hURrG@~  
=qG@~LG@}  
=qG@}J0GG@}tr(hURrG@~G33333G@8  
=qG@~4

=qG@1Q\$u\G@1Qtr(hURrG@PG@G@~Z\G@~p  
 =J,aG@~p  
 =tr(hURrG@~G{G@fffffG@~pzGG@~p  
 =JSG@~p  
 =tr(hURrG@  
 G@,G@~G@~QJHG@~Qtr(hURrG@~G@ G@~QG@~QJ?G@~Qtr(hURrG@  
 =pG@G@~(\G@XJ@G@Xtr(hURrG@G@(\G@~zGG@~JG@~tr(hURrG@~)(G@~PG@})G@~J\_G@~tr(hUR  
 rG@}G@}G@}#  
 =pG@}2\JmG@}2\tr(hURrG@}AG@}G@}4(\G@}wzHJ4QG@}wzHtr(hURrG@}QG@}G@}LzGG@}`(\J>G  
 @}`(\tr(hURrG@}@G@}G@}fffffG@}pzGJ4>G@}pzGtr(hU RrG@}zfffffG@}G{G@|G@|=p  
 J"JG@|=p  
 tr(hURrG@|G{G@|=p  
 G@|pQG@|  
 =qJWG@|  
 =qtr(hU  
 RrG@|fffffG@|zGG@|(\G@|J=G@|tr(hURrG@|G@}RzGG@|QG@}G{JVG@}G{tr(hURrG@}  
 G@}"zGG@|QG@|QJ=G@|Qtr(hURrG@|G@}bfffffG@|\)G@}\_  
 =pJ@^G@}\_  
 =ptr(hURrG@}GQG@}G@}\(G@}J>G@}tr(hURrG@})p  
 =G@}G{G@};  
 =pG@}\(JVG@}\(tr (hURr  
 G@}  
 =pG@~C  
 =pG@}=p  
 G@}JWG@}tr(hURrG@}G@}33333G@}<G@}iRjh>;G@}iRtr  
 (hURrG@}GzG@}G@|G@}G{JI<G@}G{tr(hURrG@|pG@|G@{QG@|QJ G@|Qtr(hURrG@|&\(G@|ZQG@{  
 =qG@|33333J,zG@|33333tr(hURrG@{QG@|FQG@{G@|zHJG@|zHtr(hURrG@{\(G@|33333G@{jG{G@{jG{J  
 0udG@{jG{tr(hURrG@{PQG@{G@{PG@{33333J'G@{33333tr(hURrG@{QG@|G@|zGG@|JrG@|tr(hURrG@  
 |  
 =pG@|=p  
 G@|d  
 =qG@|z=p  
 JcG@|z=p  
 tr(hURrG@|QG@}G@|aG@|kQJpQG@|kQtr(hU Rr  
 G@|G@|fffffG@|!G@|O\J\$KG@|O\tr!(hURr"G@|IQG@|tG@|1\G@|IJ4G@|ltr#(hU  
 Rr\$G@|!\(G@|>G{G@{GzG@{zGJTOaG@{zGtr%(hURr&G@{zHG@|  
 \G@{pG@|JTzG@|tr'(hURr(G@{\(G@|QG@{  
 =pG@{  
 =pJ/<G@{  
 =ptr)(hURr\*G@{fffffG@{33333G@{~p  
 G@{JYVG@{tr+(hURr,G@{G@|G@{zGG@{zHJOOG@{zHtr-(hURr.G@{  
 =qG@{G@{G@{zGJ<54G@{zGtr/(hURr0G@{G@|QG@{\(G@|JyXG@|tr1(hURr2G@|y\G@|QG@|HzGG@|  
 =qJ<VG@|  
 =qtr3(hURr4G@|33333G@|=p  
 G@|GzG@|GzJ>G@|Gztr5(hURr6G@|G@}G@|yRG@}JGG@}tr7(hURr8G@|G@}zHG@|p  
 =G@|RJ9G@|Rtr9(hURr:G@|RG@}  
 =pG@|fffffG@|zGJFG@|zGtr;(hURr<G@}G@} G@|pG@|QJ<G@|Qtr=(hURr>G@|G@|fffffG@|=p  
 G@|\(J3G@|\tr?(hURr@G@|\G@|zGG@|ARG@|zGJ4G@|zGtrA(hURrBG@}G@}G@}G@}J5cG@}trC(hURr

DG@}=p  
G@}G@}YGzG@}pQJ9G@}pQtrE(hURrFG@}tG@}p  
=G@}YRG@}x(\Jp)G@}x(trG(hU RrHG@}zHG@}G@}p  
=G@}C\JT.G@}C\trI(hU  
RrJG@}1p  
=G@}l  
=qG@}\(G@}(Ju-G@}(trK(hURrLG@} \)G@}VffffG@|\(G@}zGJ\*:G@}zGtrM(hURrNG@}G@}@G@|  
=pG@}6=p  
JQ)G@}6=p  
trO(hU  
RrPG@}G33333G@}LQG@|\(G@}\$  
=qJ0\*G@}\$  
=qtrQ(hURrRG@}G\G@}  
=pG@}BffffG@}QJ{MG@}QtrS(hURrTG@}G@}=p  
G@}yG@}Jt0G@}trU(hURrVG@}t\G@}ffffG@}XzGG@}(JdVG@}\trW(hURrXG@}G@~33333G@}Yp  
=G@}zffffJ@G@}zfffftrY(hURrZG@~QG@~G@~  
QG@~'zHJG@~zHtr[(hURr\G@~G@~PG@}\(G@}GzJhVG@}Gztr[(hURr^G@}\(G@}zHG@}G@}zGJl`8G@  
}zGtr\_(hURr`G@~G@~RG@}\(G@}  
=pJP<G@}  
=ptr(hURrbG@}G@~G33333G@}\(G@~G@}J>G@~G@{trc(hURrdG@~QG@~&ffffG@}GzG@}\(J,G@}\tre(h  
URrfG@}ffffG@~G@}vzGG@}vzGJp7G@}vzGtrg(hURrhG@}  
=pG@})G@}QG@}PJ7G@}Ptri(hURrjG@}JffffG@}qGzG@}zHG@}zGJ.G@}zGtrk(hURrlG@}#QG@}QG  
@}  
=qG@}zHJ6G@}zHtrm(hURrnG@}aRG@}p  
=G@}zGG@}qRJE<G@}qRtro(hURrpG@}=p  
G@}QG@}'QG@}4QJD.G@}4Qtrq(hURrG@}'zGG@}BQG@}zHG@},\JT,G@},\trs(hU  
RrtG@}"ffffG@}{zHG@|zGG@}TJZ;G@}Ttru(hU  
RrvG@}0  
=qG@}W  
=pG@|QG@|QJ?8G@|Qtrw(hURrxG@|GzG@}0G@|G@}+  
=pJd,G@}+  
=ptry(hURrzG@}zHG@}8\G@|G@|zGJ;G@|zGtr{(hURr|G@|\(G@|  
=qG@|\(G@|J>G@|tr}(hURr~G@|G@}=p  
G@|QG@}\(JXdG@}\tr(hURrG@}\(G@}QG@}l)G@}o\JxGG@}o\tr(hURrG@}zGG@}33333G@}\G@}eQJ  
e8G@}eQtr(hURrG@}XzGG@}33333G@}+QG@}iJG@}itr(hURrG@}G@}\(G@}G@}\(J:G@}\tr(hURrG@~  
QG@~6\G@}G@}QJh6MG@}Qtr(hURrG@}ffffG@}33333G@}xG@}GzJ  
?G@}Gztr(hURrG@}33333G@~O33333G@}QG@~8QJQG@~8Qtr(hURrG@~PG@~G@~@G@~q\JOG@~q\  
tr(hURrG@~HG@-p  
=G@~0G@)JnG@)tr(hURrG@H)G@zGG@)G@|\(J,G@|\tr(hURrG@PG@QG@G{G@FffffJ:IG@Ffffftr(hUR  
rG@|\(G@|\G@p  
=G@QJHZIG@Qtr(hURrG@G@8G@|\(G@6QJhG@6Qtr(hURrG@&G@F=p  
G@zGG@2JlWxG@2tr(hURrG@>G@tG@zGG@zGJd5G@zGtr(hURrG@!G@=QG@|\(G@RJJaG@Rtr(hURrG  
@|\G@2G@G@p  
=JFG@p  
=tr(hURrG@|\(G@QG@rQG@QJ,aG@Qtr(hU  
RrG@p  
=G@  
=qG@+

=pG@  
=pJTkG@  
=ptr(hURrG@zGG@zGG@[33333G@mp  
=JFG@mp  
=tr(hURrG@  
=pG@G@SzHG@=p  
J5^G@=p  
tr(hURrG@G{G@ G@  
=pG@J<IG@tr(hURrG@zGG@\*G@  
=qG@zGJtBG@zGtr(hURrG@'zHG@6G@\\)G@QJ2BG@Qtr(hURrG@zHG@QG@zGG@G{JdICG@G{tr(hURr  
G@#(G@gRG@ G@g  
=pJtmG@g  
=ptr(hURrG@  
=pG@RG@[  
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J>G@n=p  
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=pG@

=pJIG@  
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 J-G@=p  
 trC(hU  
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=p  
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=J{G@  
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G@}\\hG@}p  
=G@}5\\(G@}=p  
JdG@}=p  
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=pG@}  
ffffG@}rG{JG@}rG{tr  
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```

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\J7AG@ \try(hURrzG@ffffG@g
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```

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=pG@~(G@G@ffffJd6G@fffftr(hURrG@p  
=G@G@~(\G@\$J2G@\$tr(hURrG@~G{G@\$zGG@~jzGG@~Jd|.G@~tr(hURrG@~QG@  
=pG@~)QG@~PJ<G@~Ptr(hURrG@~.QG@~ffffG@}QG@~hzGJ5G@~hzGtr(hURrG@~G@~zGG@~zHG@~  
p  
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#G@~p  
=tr(hURrG@~a\(\G@G@~G@~0\(\JG@~0\(\tr(hURrG@~7\(\G@~7\(\G@}ip  
=G@}\(Jz2G@}\(\tr(hURrG@}zHG@}GzG@}  
p  
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=pG@}33333G@}eGzG@}zGJ:.G@}zGtr(hURr  
G@}\G@}p\(\G@|GzG@|  
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(hU RrG@}KzHG@}  
=qG@|GzG@}\(JAG@}\(\tr(hU RrG@|G@|  
=pG@|ffffG@|\$(\JtIG@|\$(\tr(hU RrG@{  
=pG@|G\(\G@{GzG@{J0EG@{tr(hU RrG@|@QG@|O  
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=pG@y  
=pJCG@y  
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PDB2PQR

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P6

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 hKqhhUO8KKRq(KU|NNNJJk?tbKqhhK qhhKquK8KKtb]q((cdatetime  
 date  
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=p



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RrDG@DG@DG@C  
=qG@DJIG@"u\trE(hU  
RrFG@D G@D G@CG@C  
=qJq.G@"fffffftrG(hU  
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=qG@B  
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=tr(hU  
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=p  
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=p  
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=p

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Rr G@A@G@AG@A G@AJ088G@ =p  
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Rr G@AG@AG@A`G@AJPwGG@ =p  
=tr (hURr G@AG@AG@Ap  
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(hURr G@AG@AG@A@G@Ap  
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=qJ-eG@ Qtr (hURr G@AG@B G@A`G@AJZG@ =p  
=tr! (hURr" G@A@G@Ap  
=qG@@  
=qG@A@J?G@  
tr# (hURr\$ G@A@G@AG@A G@AJ`AG@ =p  
=tr% (hURr& G@A`G@B  
=qG@A@G@BJPnUG@ 33333tr' (hURr( G@BG@BG@BG@B  
=qJ@G@!W  
=ptr) (hU  
Rr\* G@BG@CG@B`G@BJJG@!(\tr+ (hURr, G@BG@CG@BG@BJ0%PG@!Qtr- (hURr. G@C G@CG@B  
=qG@C@JpG@!(\tr/ (hU  
Rr0 G@C`G@CG@C G@C@JcG@!(\tr1 (hURr2 G@CG@CG@C G@C`JECG@!G{tr3 (hURr4  
G@C@G@CG@CG@CJLG@"33333tr5 (hURr6 G@CG@D@G@CG@D  
=qJ2G@"Qtr7 (hURr8 G@DG@D  
=qG@CG@Dp  
=qJ+G@"\tr9 (hURr: G@D`G@DG@D G@D`J`.bG@"fffftr; (hURr< G@D@G@Dp  
=qG@CG@D  
=qJ?G@"Qtr= (hURr> G@DG@D G@CG@D  
=qJ<G@"Qtr? (hURr@ G@DG@D@G@CG@DJ?G@"\trA (hURrB G@DG@D G@C  
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=qtr} (hURr~ G@H@G@HG@GG@G  
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=qtr (hURr G@D`G@D`G@C`G@CJ,G@"=p  
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=qG@I`JG@=(=p  
trc(hURrdG@H`G@IG@HG@HJRG@'  
=qtreg(hU RrfG@FG@F  
=qG@FG@F J>G@%fffffftrg(hU  
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=qtrs(hURrtG@D  
=qG@E  
=qG@CG@DJG@#Rtru(hURrvG@D@G@D@G@CG@C  
=qJ.G@#()\trw(hURrxG@Dp  
=qG@EG@CG@D  
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Rr~G@D0  
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G@C G@C`G@BG@C@JwhG@\"Qtr(hURrG@C G@CG@BG@BJTG@\"B\\(tr(hURrG@BG@B  
=qG@B G@B@J{G@!)\tr(hURrG@B@G@BG@B G@B@JKG@!)\tr(hU  
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=qG@B G@CJ^G@"aGztr(hU  
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@tr(hURrG@:G@:G@9G@:@JwG@ffffftr(hURrG@:G@;G@9G@:J`EsG@  
=ptr(hURrG@:G@;G@:G@:@J  
G@ffffftr(hURrG@:G@;G@:G@:QJ`oSG@tr(hURrG@:G@;G@:@G@:JYIG@  
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G@  
=ptr(hURrG@<@G@=@G@<G@<JuG@\\tr(hURrG@=G@=@G@<G@=JP^`G@  
=p  
tr(hURrG@=@G@>G@=G@>@J`G@=p  
=tr(hURrG@>G@>G@=G@=J0lrG@Qtr(hURrG@=@G@>@G@=@G@=@JDG@GzHtr(hU  
RrG@=@G@>@G@=G@=JXG@\\tr(hU  
RrG@=G@=G@<@G@<JfSG@\\tr(hURrG@<G@<G@;G@;JIG@tr(hURrG@:G@;G@:G@:JG@  
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@\\tr(hURrG@=G@=G@<@G@<JgG@zGtr(hURrG@<G@<G@;G@;J0SG@Qtr(hURrG@:G@<G@;G@<J6G  
@333333tr(hURrG@<G@<G@;G@<^QJ@1G@\\tr(hURrG@<@G@<G@;G@<JR7G@333333tr(hURrG@<G@  
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@:G@:G@9QG@:JQG@=p  
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=p  
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=p  
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3G@  
=p  
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Rr G@<G@<@G@;@G@;JKG@\\(tr!(hU

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Rr&G@>@G@>G@=QG@>J wG@\\)tr'(hU

Rr(G@=G@>G@=G@=JuyG@Qtr)(hU

Rr\*G@>G@@ G@=G@?JyG@

=ptr+(hU

Rr,G@?G@@ G@?G@?J PG@Qtr-(hU

Rr.G@?G@?G@>G@>JJG@Gztr/(hURr0G@>G@?G@>@G@?J9G@tr1(hURr2G@?@G@@G@?G@@`J

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Rr>G@>@G@>G@>G@>J

3\*G@Gztr?(hURr@G@>G@@G@>G@?^QJMG@zG{trA(hURrBG@?G@@G@>G@?JaNG@

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CG@tro(hURrpG@=G@=G@=G@=^QJ 'EG@

=ptrq(hURrrG@=G@=G@=QG@=J

OOG@\\(trs(hURrtG@=G@=G@<@G@<JHgG@tru(hURrvG@<G@<G@;@G@;J

G@trw(hURrxG@;@G@<G@;G@<J)cG@GzHtry(hURrzG@;@G@;@G@:G@;@J{G@\\(tr{(hURr|G@;G@<G

@;@G@<JnWG@tr}(hURr~G@<G@=G@<G@=QJWG@fffffftr(hURrG@=@G@=@G@<G@<J:G@tr(hURrG

@<G@>@G@<G@=JG@tr(hURrG@=G@>@G@=@G@=@JPWG@Qtr(hURrG@=G@>G@=G@=QJbG@Qtr

(hURrG@>@G@?G@>G@?JG@Qtr(hURrG@?G@@

=qG@?G@@JMG@

u\\(tr(hURrG@@G@AG@@@G@@`J G@Qtr(hURrG@@G@@G@?@G@@

=qJ G@ \\)tr(hU

RrG@@G@@

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G@@  
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B\tr(hURrG@@G@@G@@ G@@@`JtG@

Qtr(hURrG@@@G@@G@?G@@@J\G@tr(hURrG@@@G@@G@?G@@Jp'rG@ B\tr(hURrG@@  
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G@@G@@G@@`G@@  
=qJ0\*G@ W  
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(hURrG@@G@@G@@@G@@JW:G@ aGztr(hURrG@@  
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3G@(\tr)(hURr\*G@>G@?@G@>G@?J0(CG@QRtr+(hURr,G@?G@?@G@=G@>@JpHG@tr-  
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=qJ:G@  
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tr;(hU  
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RrbG@;QG@;^QG@;^QG@:JMG@  
=p  
trc(hU  
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=p

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=p  
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RrG@<G@>@G@<G@=  
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=tr (hU

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=qG@4JH9G@\$tr(hURr G@5QG@6p  
=qG@5\G@6O\J  
BG@&Ltr  
(hURr G@7G@7G@5  
=qG@6@JhG@&=p

=tr (hURr G@6p  
 =qG@6QG@4QG@5p  
 =qJG@%p  
 =qtr (hURr  
 G@5G@5\G@4\G@5O\JG@%Ltr (hURr G@5^QG@5p  
 =qG@3\G@4\J0%G@\$\'(tr  
 (hU Rr G@3QG@4G@3\G@40  
 =qJG@\$33333tr (hU  
 Rr G@3\G@3QG@3\G@3\JG@#\tr (hU  
 Rr G@2G@4G@2@G@3^QJVG@#aGztr (hURr G@3  
 =qG@4G@3\G@4@JG@\$=p  
 =tr (hURr G@4zHG@40  
 =qG@3@G@3QJG@#Gztr (hURr G@3G@3\G@2QG@3JG@#tr (hURr G@30  
 =qG@3@G@2@G@2JFG@"tr (hURr G@2  
 =pG@3G@2@G@2  
 =qJ`G@"  
 =qtr (hURr G@30  
 =qG@3G@2G@2\JG@"tr (hURr G@2\G@3QG@2^QG@2J  
 G@"tr! (hURr" G@2\G@3G@2\G@3O\JWG@#Ltr# (hURr\$ G@3QG@3  
 =qG@2G@2  
 =qJ`  
 G@"33333tr% (hURr& G@2  
 =qG@3G@1  
 =qG@2zHJG@"  
 =p  
 tr' (hURr( G@2  
 =pG@2O\G@1@G@1\JXG@!\tr (hURr\* G@0  
 =qG@1G@0QG@0JXQG@ tr+ (hURr, G@1G@1G@0\G@1\JRG@!\tr- (hURr. G@10  
 =qG@10  
 =qG@0p  
 =qG@0  
 =qJ8G@ 33333tr/ (hURr0 G@0  
 =qG@1p  
 =qG@0^QG@1JNG@!tr1 (hURr2 G@-B\G@.G@.G@.QJ0G@  
 =ptr3 (hURr4 G@.GzG@-\G@.G@.QJG@  
 =ptr5 (hURr6 G@-QG@.QG@.GzG@.QJHG@Qtr7 (hURr8 G@.aGzG@.\G@-\G@.aGzJUG@\tr9 (hURr:  
 G@.G@0G@.G@.\JG@\tr; (hU  
 Rr< G@/QG@/QG@-\G@.J  
 G@tr= (hURr> G@.\G@.G@.GzG@.GzJG@Gztr? (hURr@ G@-QG@-aGzG@.G@.QJ5G@QtrA (hURrB G@-  
 QG@-B\G@+GzG@.JHG@zG{trC (hURrD G@.\G@.G@.G@.JG@trE (hURrF G@+\G@-  
 B\G@+B\G@.\Jh+4G@\trG (hURrH G@.G@.G@+\G@.QJG@QtrI (hURrJ G@.B\G@.G@.B\G@.J|G@trK  
 (hURrL G@-\G@.G@.G@-aGzJx/vG@\trM (hURrN G@.zGG@-QG@.aGzG@-QJfG@  
 =ptrO (hURrP G@.\G@-GzG@.QG@-QJ0yG@  
 =ptrQ (hURrR G@-aGzG@.G@-G@-\JWG@\trS (hURrT G@-\G@.G@-QG@-\JG@\trU (hURrV G@-G@0  
 =qG@.GzG@0^QJhGG@ aGztrW (hURrX G@2#  
 =pG@2G@0\G@1\JG@!\trY (hURrZ G@0  
 =qG@1^QG@0\G@0^QJG@ aGztr[ (hURr\ G@0  
 =qG@0G{G@/GzG@0\JpG@ \tr] (hU Rr^ G@0\G@1

=pG@0\G@10  
=qJ  
AG@!33333tr\_ (hU  
Rr` G@0  
=qG@1G@0\G@0\J<G@ \tra (hURrb G@0@G@2G@0@G@2JG@"trc (hURrd G@1QG@2G@1\G@10  
=qJhG@!33333tre (hURrf G@1p  
=qG@2@G@1G@1QJ`G@!Qtrg (hURrh G@1\G@1\G@0G@0\J`VG@ tri (hURrj G@1\G@2G@1QG@2  
=qJG@"33333trk (hURrl G@3p  
=qG@3\G@2  
=qG@3JhgG@#trm (hURrn G@3\G@3QG@2p  
=qG@3@J0G@#=#p  
=tro (hURrp G@3O\G@4  
=qG@3\G@4J hG@\$trq (hURrr G@4QG@4  
=qG@3\G@4JHG@\$trs (hURrt  
G@4\G@4\G@3G@3  
=qJ  
G@#  
=qtru (hURrv G@3G@3\G@3\G@3\J%G@#\trw (hURrx G@3\G@5G@3\G@5  
=qJYG@%33333try (hURrz G@5\G@6G@4QG@5JkyG@%\tr{ (hURr| G@5G@6G@5p  
=qG@5QJXG@%Qtr} (hURr~ G@4  
=qG@5G@4G@5QJG@%Qtr (hURr G@5QG@5  
=qG@4G@4QJG@\$Qtr (hURr G@4G@4\G@3G@40  
=qJ@G@\$33333tr (hURr G@4\G@5c  
=pG@4G@5QJ4G@%Qtr (hURr G@4\G@4QG@3\G@4J0G@\$\tr (hURr G@4\G@5\G@40  
=qG@4JhIG@\$\tr (hU Rr G@4G@4\G@2  
=qG@3QJAG@#Qtr (hURr G@3\G@4G@2\G@3  
=qJxG@#33333tr (hU  
Rr G@3  
=qG@4p  
=qG@3G@3QJH@G@#Qtr (hURr G@30  
=qG@3QG@2G@3JuG@#tr (hURr G@3  
=qG@4\G@3  
=qG@4\JG@\$\tr (hURr G@3G@3G@2G@3JG@#tr (hURr G@30  
=qG@3p  
=qG@20  
=qG@2O\JG@"Ltr (hURr G@2@G@3  
=qG@2@G@2QJG@"Gztr (hURr G@3\G@3^QG@2G@2\J vG@"tr (hURr  
G@2QG@2QG@2@G@2\JxFG@"tr (hURr G@3\G@3  
=qG@2\G@3J pG@#tr (hURr G@3GzHG@3p  
=qG@2  
=qG@3^QJG@#aGztr (hURr G@3^QG@3p  
=qG@2QG@2@J G@"=p  
=tr (hURr G@1\G@2G@10  
=qG@2JG@"\tr (hURr G@2O\G@4p  
=qG@2@G@3@J`IG@#=#p  
=tr (hURr G@3^QG@4G@3@G@4^QJG@\$aGztr (hURr G@4QG@6\G@4  
=qG@5JXG@%tr (hURr G@5O\G@5QG@4G@5@JG@%=p  
=tr

(hURr G@4  
=qG@5QG@4p  
=qG@4\JoG@\$tr (hU Rr G@4QG@4  
=qG@4G@4@JG@\$=p  
=tr (hURr G@3  
=qG@3QG@2QG@2QJ!G@"Qtr (hU  
Rr G@2QG@3\G@20  
=qG@3\JXG@#\tr (hURr G@2G@4G@2p  
=qG@4p  
=qJeG@\$p  
=qtr (hURr G@4QG@5^QG@3  
=qG@3  
=qJ} G@#33333tr (hURr G@3G@4O\G@2QG@3QJrG@#Qtr (hURr G@3G@4QG@3G@4\Jp"G@\$\\tr (hURr  
G@4QG@4  
=qG@3  
=qG@3  
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G@5QG@7s33333G@5G@6zHJ NG@&=p  
tr (hURr G@6G@6QG@5W  
=pG@6RjX,G@&\\tr (hURr G@6  
=pG@6\G@5fffffG@5  
=pJ(G@%tr (hURr G@5\G@5fffffG@4!GzG@4=p  
=J(G@\$=p  
=tr (hURr G@3\G@4@G@2G@3J@uG@#tr (hURr G@4G@6G@4G@4QJXwG@\$Gztr (hURr G@4G@5  
=p  
G@3fffffG@4  
=pJ  
G@\$tr (hU Rr G@4  
=qG@5W  
=pG@4\G@4=p  
JFG@\$=p  
tr (hU  
Rr G@4fffffG@633333G@4zHG@6  
=p  
J?G@&  
=p  
tr (hURr G@6G{G@7G@5GzHG@5J`G@%tr (hURr G@5kQG@7QG@5&fffffG@6kQJG@&kQtr (hURr G@6  
=pG@6fffffG@4\G@5p  
=qJhoG@%p  
=qtr (hURr  
G@5333333G@55\G@3G@4fffffJhguG@\$ffffftr (hURr G@5RG@8zGG@5zGG@6=p  
JXWG@&tr (hURr G@9G@9G@7G@9QJG@)Qtr (hURr G@8zGG@9GzG@8G@9  
=p  
JyG@)  
=p



tr (hURr G@8W  
=pG@9G@8G@8@J'G@ (=p  
=tr (hURr G@8TzGG@8G@7\ (G@8zHJG@(  
=p  
tr (hURr G@85\ (G@8\ (G@7RG@8QJBG@ (Qtr (hURr G@9+QG@:G@8zGG@8  
=qJG@ (33333tr (hURr G@9333333G@:J=p  
G@8G@:333333J8G@\*333333tr (hURr G@:33333G@;QG@8QG@9}p  
=J  
G@)zG{tr (hURr G@9h\ )G@:G@9333333G@9zGJxG@)  
=qtr (hURr G@:W  
=pG@:33333G@9\ (G@:  
=pJG@\*tr (hURr G@9QG@:@G@8G{G@8\ (JSG@\ (tr (hURr G@8=p  
=G@9G@7\ (G@9J` )G@)\ (tr (hURr!G@9QG@9\ (G@8  
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G@'G{tr! (hU  
Rr!G@85\ (G@8G@633333G@7JzG@'tr! (hURr!G@7\ (G@7}p  
=G@6\ (G@6JnG@&\ (tr ! (hURr  
!G@6  
=pG@7zGG@6G@7J=p  
JG@'Ltr! (hURr!G@7^QG@9G@7  
=p  
G@7.zGJ0+G@'.zGtr  
! (hURr!G@7B\ (G@8G@6G@8JG@ (tr! (hURr!G@8:G{G@8TzGG@7@G@7JG@'=p  
tr! (hURr!G@7\ (G@7  
=pG@7QG@7zHJV G@'=p  
tr! (hURr!G@7GzG@7\ )G@7G@7\ (JH9G@\ (tr! (hURr!G@8G@8!GzG@7fffffG@7JxG@'tr! (hURr!G@7G@7G  
@6\ (G@7:G{J'G@'8Qtr! (hURr!G@7J=p  
G@7LG@6QG@7333333JG@'333333tr! (hURr!G@7333333G@7J=p  
G@6G@6\ (JVG@&\ (tr! (hURr!G@6QRG@6G@4\ (G@5xQJ (1G@%u\ (tr! (hURr  
!G@4\ (G@4\ (G@3LG@3zHJ`yG@#zHtr!! (hURr"!G@3G@4=p  
=G@3}p  
=G@333333J[G@#\ (tr#! (hURr\$!G@4!GzG@5  
=pG@3G{G@4  
=pJG@\$Gztr%!(hURr&!G@5zGG@5\ (G@4u\ (G@4\ )JxG@\$)tr! (hURr!G@4G@5G@4YG@4  
=qJG@\$  
=qtr! (hURr\*!G@4zGG@4zGG@4TzGG@4G{J(yG@\$Qtr+! (hURr,!G@4\ (G@533333G@4s33333G@5\ )J5G@  
%)tr-! (hURr.!G@5fffffG@5fffffG@4\ (G@5QRJ8G@%QRtr! (hURr0!G@5G@5RG@333333G@4  
=p  
J7G@\$  
=p  
tr1! (hURr2!G@3QG@4  
=qG@3\ (G@4O\ (JG@\$Ltr3! (hU  
Rr4!G@5kQG@5G{G@4\ (G@4xQJG@\$u\ (tr5! (hURr6!G@4  
=p  
G@4s33333G@3QG@3GzJ  
G@#Gztr7! (hURr8!G@4G@4G@3YG@4p  
=qJ8G@\$p

=qtr9!(hURr:!G@4h)G@4G@4G@4TzGJG@\$QRtr;!(hURr<!G@4G@5fffffG@4\G@40  
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=JG@'G{trE!(hURrF!G@7W  
=pG@7QG@7\G@7JxG@'\trG!(hURrH!G@7zGG@8G@6G@7W  
=pJG@'W  
=ptrI!(hURrJ!G@7G@7\G@6  
=qG@7=p  
J@G@'=p  
trK!(hURrL!G@7\G@9G@7333333G@7@JG@'=p  
=trM!(hURrN!G@7  
=pG@8:G{G@7#  
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=ptrQ!(hURrR!G@7G@7QG@7\G@70  
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=pG@5#  
=pJgG@%#  
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JgG@&=p  
tr[!(hURr\!G@7LG@8\G@7LG@8\JP  
OG@(\tr)!hU  
Rr^!G@8!GzG@9\G@7  
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aG@)trc!(hURrd!G@5zHG@6zHG@4kQG@4=p  
JpkG@\$tre!(hURrf!G@5:G{G@5kQG@3G@3\JHG@#\trg!(hURrh!G@333333G@4\G@3}p  
=G@3G{JpGG@#G{tri!(hURrj!G@4  
=pG@4G@3\G@3=p  
JG@#=p  
trk!(hURrl!G@3c  
=pG@3QG@2G{G@3  
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=qtru!(hURrv!G@3EQG@3kQG@2\G@2=p  
JHG@"trw!(hURrx!G@3\G@3zHG@233333G@3\JG@#\try!(hURrz!G@3fffffG@3QG@3B\G@3RJ`G@#Rtr  
{!(hURr!G@3  
=pG@3fffffG@3G@3J@deG@#tr}!(hURr~!G@3  
=p  
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G@"ffffftr!(hU Rr!G@2\G@3&fffffG@2QG@3JZmG@#  
=p

tr!(hU  
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=p  
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=qJG@"p  
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=ptr!(hURr!G@2G@2s33333G@1p  
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tr!(hU Rr!G@2G@3zGG@2.zGG@2@JG@="=p  
=tr!(hU Rr!G@2=p  
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Rr!G@1G@1G@0QG@1^QJNG@!aGztr!(hU Rr!G@0G@1RG@/u\G@0p  
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u\tr!(hU Rr!G@0#  
=pG@08QG@.33333G@/zGJG@zGtr!(hU Rr!G@/QG@/zHG@-\G@.LJ  
G@GzHtr!(hU Rr!G@.G@/G@.ffffG@/QJxG@  
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=p  
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Rr!G@.\G@/\G@-\G@.JG@Qtr!(hU  
Rr!G@-ffffG@.QG@-\G@-\J:tG@\tr!(hU  
Rr!G@.33333G@0@G@-G{G@/\J(G@\tr!(hU  
Rr!G@.G@0&ffffG@-G{G@0#  
=pJG@ #  
=ptr!(hU  
Rr!G@/#  
=pG@0YG@/G@0333333JWqG@ 333333tr!(hU  
Rr!G@0G@0333333G@/B\G@0J ^G@ tr!(hU

Rr!G@0G@0G@/fffffG@0RJ(G@ Rtr!(hU  
Rr!G@0QG@1p  
=G@0G@1p  
=JG@!p  
=tr!(hU  
Rr!G@1O\G@2zGG@0\G@2\JXG@"Qtr!(hU  
Rr!G@133333G@2aGzG@133333G@1p  
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Rr!G@2  
=pG@2333333G@1QG@2\JHnG@"Qtr!(hU  
Rr!G@2W  
=pG@2h\G@0\G@0p  
=J(G@ G{tr!(hU  
Rr!G@1J=p  
G@2:G{G@1J=p  
G@2J`MG@"tr!(hU  
Rr!G@1  
=qG@2fffffG@1GzG@2LJZG@"Ltr!(hU  
Rr!G@25\G@3RG@2  
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Rr!G@3QG@3kQG@1QG@2#  
=pJHuG@"#  
=ptr!(hU  
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=pG@1G@233333JG@"\tr!(hU  
Rr!G@2p  
=qG@3@G@2\G@30  
=qJG@#333333tr!(hU  
Rr!G@2\G@3@G@2QG@2QJG@"zGtr!(hU  
Rr!G@2RG@2QG@1G@1GzJWG@!Qtr!(hU  
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@3EQG@3J=p  
G@2fffffG@2QJ}G@"\tr "(hURr  
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tr  
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=pJ  
G@#  
=ptr"(hURr"G@3  
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tr%"(hU  
Rr&"G@6J=p  
G@6p  
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=G@7  
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=ptrO"(hU  
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=p  
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=p  
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=JNG@)p  
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@9)p  
=G@9)p  
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=pG@8zGG@8:G{G@8zHJG@ (=p  
tr"(hURr"G@8=p  
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=pG@8@J;G@ (=p  
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#(hURr#G@7QG@8p  
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=p  
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=qG@4zGG@5ffffJMG@%fffftr#(hU  
Rr#G@5zG{G@5  
=pG@5W  
=pG@5zG{J8DG@%zG{tr#(hURr  
#G@5  
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=qG@4  
=pJ G@\$tr##(hU  
Rr\$#G@4QG@4G@3aGzG@3=p  
JG@# =p  
tr%#(hURr&#G@3=p  
=G@4\G@2\G@4JXG@\$tr'#(hURr(#G@4=p  
=G@4GzG@3G@4=p  
JG@\$=p  
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G@/\G@0J0G@ =p  
tr7#(hURr8#G@0=p  
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trA#(hURrB#G@1\G@2G@1\G@2p  
=JXG@"p  
=trC#(hURrD#G@2QG@2\G@1zGG@2\JsG@"QtrE#(hU RrF#G@2  
=pG@2J=p  
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trG#(hU



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=pG@-\ (G@-QJG@QtrW#(hURrX#G@-G@.aGzG@-8QG@-  
=pJG@  
=ptrY#(hURrZ#G@-G@.B\ (G@,GzG@,  
=qJHG@ \ (tr[ # (hURr\ #G@,\ )G@.p  
=qG@,G@.fffffJpG@ffffftr]#(hURr^#G@-\ (G@-fffffG@,QG@,QJ8:G@Qtr\_#(hURr`#G@,QG@-\ (G@+G@,zGJ0qG@zGtra#(hURrb#G@,\ (G@.333333G@,p  
=G@.  
=p  
J`G@  
=p  
trc#(hURrd#G@-33333G@/QG@-QG@.\ (J  
\_G@Gztre#(hURrf#G@.G@.  
=pG@-G@.QJPQG@Qtrg#(hURrh#G@.8QG@.  
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=p  
trq#(hURrr#G@-=p  
G@.\ (G@-=p  
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=p  
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Rrx#G@-G@.kQG@-G@-.zGJ8G@333333try#(hURrz#G@-W  
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=pJ{G@ \ (tr{ # (hURr\ #G@.G@/G@.QG@/8QJG@333333tr}#(hURr~#G@.fffffG@0G@.\ (G@/QJG@  
=ptr#(hURr#G@/\ (G@0@G@/p  
=qG@/\ (JvG@ \ (tr#(hURr#G@/  
=qG@0  
=pG@/\ (G@/RJeG@tr#(hURr#G@0\ (G@0=p  
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=qtr#(hURr#G@/fffffG@/fffffG@.QRG@/\ (JXgG@  
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Rr#G@,fffffG@-\ (G@,W  
=pG@,\ (J=G@ \ (tr#(hU Rr#G@,p  
=qG@,QG@,G@,\ (JA{G@ \ (tr#(hU Rr#G@-QG@-LG@,u\ (G@,\ (JbG@ \ (tr#(hU Rr#G@,\ (G@-\ (G@,LG@,p  
=J<VG@Qtr#(hU  
Rr#G@,RG@,G{G@,=p  
=G@,\ )J G@  
=ptr#(hU Rr#G@,zGG@-333333G@,LG@,zGJHnG@ \ (tr#(hU Rr#G@,fffffG@-QG@,=p

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=G@-J5G@tr#(hU Rr#G@-#  
=pG@.\G@-#  
=pG@-J`=G@tr#(hU Rr#G@-aGzG@..zGG@-  
=p  
G@.  
=p  
JpG@  
=p  
tr#(hU Rr#G@-G@-G@,\G@-())J@;pG@()\tr#(hU Rr#G@-=p  
=G@-GzG@-  
=p  
G@-p  
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33333G@,\G@-p  
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=qtr#(hU Rr#G@,G@-#  
=pG@,GzHG@-JG@tr#(hU  
Rr#G@-.zGG@-333333G@,G@-QJG@  
=p  
tr#(hU  
Rr#G@,\G@-B\G@,333333G@,W  
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Rr#G@,QG@,G@+G{G@,\JgG@  
=p  
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Rr#G@+  
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Rr#G@+B\G@,p  
=qG@+(\G@,8QJ>G@333333tr#(hU  
Rr#G@,G@-\G@,333333G@-QJ(G@  
=p  
tr#(hU  
Rr#G@-G@-\G@,GzG@-=p  
JiG@(\tr#(hU  
Rr#G@.p  
=qG@.G@-\G@.QRJpG@QRtr#(hU  
Rr#G@-QG@.B\G@+G@-QJhG@Qtr#(hU  
Rr#G@,kQG@,\G@+(\G@,8QJG@333333tr#(hU

Rr#G@,G@,33333G@+(\G@,zGJPG@zGtr#(hU  
Rr#G@,QG@-B\(\G@,G@-QJG@Qtr#(hU  
Rr#G@,  
=qG@-\(\G@,QG@-ffffffJvG@fffffftr#(hU  
Rr#G@-B\(\G@-\(\G@-G@-\(\JqG@)\tr#(hU  
Rr#G@.  
=p  
G@.kQG@-G@-aGzJ:\_G@)\tr#(hU  
Rr#G@-aGzG@.fffffG@-zGG@.  
=pJG@  
=ptr#(hU  
Rr#G@/G@/fffffG@.G@/8QJxZG@33333tr#(hU  
Rr#G@/#  
=pG@/\(\G@-QG@.GzJ=G@Gztr#(hU  
Rr#G@.G{G@0^QG@.\(\G@/\(JG@)\tr#(hU  
Rr#G@/G{G@0p  
=qG@/  
=pG@0RJ7G@  
\tr#(hURr#G@/GzG@0G@/zHG@0)\JrgG@ \tr#(hURr#G@0G@1aGzG@0YG@0  
=pJYG@ Gztr#(hURr#G@0G@0\(\G@0YG@0ffffffJrG@  
fffffftr#(hURr#G@1zGG@1QRG@033333G@18QJHuG@!8Qtr#(hURr#G@0  
=qG@1G@/QG@0J4G@ tr#(hURr#G@0\(\G@0333333G@/  
=p  
G@/zGJgG@zGtr#(hURr#G@/zG{G@/zHG@.=p  
=G@.QRJh]SG@QRtr#(hURr#G@.  
=pG@0  
=p  
G@.\(\G@/GzHJyG@GzHtr#(hU  
Rr#G@/G@0RG@.\(\G@/.zGJI~G@33333tr#(hURr#G@/G@0h\)\G@/\(\G@0LJP:MG@  
Ltr#(hURr#G@0:G{G@0=p  
=G@/QG@/fffffJ(WG@Gztr#(hURr\$G@00  
=qG@0333333G@/  
=p  
G@/LJ(YG@GzHtr\$(hURr\$G@/G@/G@.QG@.=p  
JrG@)\tr\$(hURr\$G@.G@/fffffG@.G@/\(JqG@  
=p  
tr\$(hURr\$G@/G@0p  
=qG@/G@0YJG@ \tr\$(hURr\$G@0  
=pG@0LG@/G@0\(\JH,|G@ Qtr \$(hURr  
\$G@0zHG@0#  
=pG@/kQG@/  
=qJlG@)\tr\$(hURr\$G@/33333G@/G@.=p  
G@.RJG@tr  
\$(hURr\$G@/333333G@/QG@.fffffG@/p  
=qJJG@p  
=qtr\$(hURr\$G@/zGG@/\(\G@.RG@/J(\*NG@tr\$(hURr\$G@/G@0G@.QG@.\(\J  
LG@)\tr\$(hURr\$G@.fffffG@.zGG@.333333G@.QRJ-|G@QRtr\$(hURr\$G@.\(\G@.aGzG@-G@-  
=qJG@)\tr\$(hURr\$G@.\(\G@.\)\G@-\(\G@-B\(\J@G@GzHtr\$(hURr\$G@-LG@.aGzG@-

=p  
G@-ffffJG@Gztr\$(hU Rr\$G@-GzG@-ffffG@-W  
=pG@-JG@Qtr\$(hU  
Rr\$G@-G@.ffffG@-u\ (G@.\ (J-G@\ (tr\$(hURr  
\$G@.G@.G{G@.\)G@.G{J%G@\ (tr!\$(hURr"\$G@/QG@/G@.QG@.aGzJ`bQG@\ (tr#\$(hU  
Rr\$G@.GzHG@.LG@-LG@-zGJHYG@\ (tr%\$(hURr&\$G@-QG@.33333G@-8QG@-  
33333JG@Qtr\$(hURr(\$G@-33333G@.aGzG@-QRG@.\)JHWyG@\ (tr)\$(hURr\*\$G@-G@-QG@-G@-#  
=pJ8  
RG@Qtr+\$(hURr,\$G@-\ (G@-  
=pG@,33333G@,ffffffJbG@fffffftr-\$(hURr.\$G@,zGG@-  
QG@+\ (G@,GzHJXYG@GzHtr/\$(hURr0\$G@,QRG@-G@,=p  
=G@,G{JDG@\ (tr1\$(hURr2\$G@,GzG@,  
=qG@,G@,QJHpG@Qtr3\$(hURr4\$G@,  
=pG@-QG@,\ (G@,J0.G@tr5\$(hURr6\$G@,QG@,\ (G@,QG@,QJ+G@Qtr7\$(hURr8\$G@,\)G@,LG@+zGG@,#  
=pJ}TG@Qtr9\$(hURr:\$G@,G@,QG@+ffffG@,\)J cmG@  
=ptr;\$ (hURr<\$G@,QG@-  
=pG@,33333G@-JbG@tr=\$(hURr>\$G@-G@-\ (G@-.zGG@-J[PG@tr?\$(hURr@\$G@.\ (G@.\ (G@-\ (G@-  
JG@trA\$(hURrB\$G@-zGG@.G@,  
=qG@-33333J(G@QtrC\$(hURrD\$G@-\)G@-kQG@,GzG@-J%}G@QtrE\$(hU RrF\$G@-=p  
=G@-  
=pG@-G@-\ (JMuG@\ (trG\$(hU  
RrH\$G@-\)G@-  
=pG@,G{G@-p  
=qJ l\_G@p  
=qtrI\$(hU  
RrJ\$G@-G@-G@,QG@-B\ (JaG@GzHtrK\$(hURrL\$G@-aGzG@-  
=pG@,G{G@-8QJeG@33333trM\$(hURrN\$G@-.zGG@-ffffffG@,QG@,\ (J?G@GztrO\$(hURrP\$G@,kQG@-  
QG@,kQG@-=p  
=JP0G@=p  
=trQ\$(hURrR\$G@-QG@-QG@,\)G@,33333J\_G@33333trS\$(hURrT\$G@,kQG@,RG@,G@,  
=p  
J`G@  
=p  
trU\$(hURrV\$G@+\ (G@,LG@+G@+\ (J>uG@\ (trW\$(hURrX\$G@,G@,QG@+ffffG@,W  
=pJc|G@\ (trY\$(hURrZ\$G@,zG{G@,zG{G@+QG@+JwG@tr[ \$(hURr\ \$G@+\ (G@-  
G@+LG@,B\ (JLG@GzHtr]\$(hURr^\$G@,zG{G@-aGzG@,QRG@-\)J(G@)\ (tr\_\$(hURr`\$G@-  
G@.33333G@,G@-\ (JJG@Gztra\$(hURrb\$G@-\ (G@.#  
=pG@,zGG@,  
=pJHG@  
=ptrc\$(hURrd\$G@,aGzG@-G@,G@,QJG@Qtre\$(hURrf\$G@,RG@-RG@,33333G@-  
QRJKG@QRtrg\$(hURrh\$G@,ffffG@-LG@,QG@-33333JG@33333tri\$(hURrj\$G@-kQG@-  
\ (G@,GzG@,ffffJ0xG@Gztrk\$(hURrl\$G@,QG@-.zGG@,p  
=qG@,\ (JaG@Gztrm\$(hURrn\$G@-G@-33333G@,#  
=pG@,LJG@GzHtro\$(hU  
Rrp\$G@,QG@-#  
=pG@,QG@,33333J}[G@Qtrq\$(hURrr\$G@-G@-B\ (G@,ffffffG@,33333JHYG@Qtrs\$(hURrt\$G@,=p  
G@-33333G@,=p  
G@,zHJ|G@tru\$(hU

Rrv\$G@,RG@-GzHG@,zG{G@-zGJqG@zGtrw\$(hURrx\$G@-8QG@-p  
=qG@,33333G@-W  
=pJ0G@\\(try\$(hURrz\$G@-G@.G@-p  
=qG@.=p  
JG@\\(tr{\$(hURr|\$G@.#  
=pG@.LG@-\\(G@-33333JG@Qtr}\$(hURr~\$G@-33333G@-QG@-kQG@-=p  
J8CzG@\\(tr\$(hURr\$G@-  
=pG@.QG@-LG@.JUG@tr\$(hURr\$G@-QG@.\\(G@+G@-zG{J:bG@zG{tr\$(hURr\$G@-\\(G@.\\)G@-\\)G@.  
=p  
J0fG@  
=p  
tr\$(hURr\$G@-G{G@.  
=p  
G@,\\(G@-JNvG@tr\$(hURr\$G@-#  
=pG@.G@-QG@-QJTG@Qtr\$(hURr\$G@-QG@..zGG@-=p  
G@.QJQjG@  
=p  
tr\$(hURr\$G@.QG@.QRG@-G@-LJ  
oG@GzHtr\$(hURr\$G@-zG{G@-QG@,GzG@-QJDG@Qtr\$(hURr\$G@-8QG@-G@-  
=p  
G@-=p  
=Jp EG@=p  
=tr\$(hURr\$G@-\\)G@-333333G@,G@-QJ@k6G@Qtr\$(hURr\$G@,  
=qG@-kQG@,QG@-\\(JmG@  
=p  
tr\$(hU  
Rr\$G@-QG@-W  
=pG@,G@,p  
=J8VIG@Qtr\$(hURr\$G@,QG@,G{G@,=p  
=G@,u\\(JWG@p  
=qtr\$(hURr\$G@,W  
=pG@,zHG@,QG@,p  
=qJ8IyG@p  
=qtr\$(hU  
Rr\$G@,  
=qG@-G@,W  
=pG@-p  
=qJG@p  
=qtr\$(hURr\$G@-\\(G@.QG@-GzHG@-\\(JnSG@\\(tr\$(hURr\$G@-zHG@.#  
=pG@-kQG@.QJhG@  
=p  
tr\$(hURr\$G@.G@..zGG@-  
=pG@.J`T}G@tr\$(hURr\$G@.#  
=pG@.LG@-zGG@-ffffJMG@Gztr\$(hURr\$G@-\\(G@-G{G@-333333G@-RJXG@tr\$(hURr\$G@..zGG@.LG@-  
=pG@.Jh^G@tr\$(hURr\$G@-W  
=pG@-G@,33333G@,p  
=JWG@Qtr\$(hURr\$G@,RG@-\\)G@,p  
=G@-JPc[G@Qtr\$(hURr\$G@-G@-QG@,G@,RJx0aG@tr\$(hURr\$G@,

=pG@-ffffffG@,  
=pG@,G{JBG@\\(tr\$(hURr\$G@,G@-=p  
=G@,p  
=G@-#  
=pJ/OG@Qtr\$(hURr\$G@,)G@-\\(G@,zGG@,GzHJ@G@GzHtr\$(hURr\$G@,ffffffG@,QG@,#  
=pG@,QRJTG@QRtr\$(hURr\$G@,QG@-aGzG@,=p  
G@-333333Jc]G@333333tr\$(hURr\$G@-QG@-ffffffG@,33333G@,QJ  
hOG@Qtr\$(hURr\$G@-  
=p  
G@-W  
=pG@,zHG@,RJOG@tr\$(hURr\$G@-33333G@-ffffffG@,RG@,G{JHkG@\\(tr\$(hURr\$G@-QG@-  
LG@,QG@,fffffJCFG@Gztr\$(hU Rr\$G@-  
=p  
G@-=p  
=G@,GzHG@,aGzJOG@\\(tr\$(hU  
Rr\$G@,ffffffG@,zHG@,ffffffG@,p  
=Jh]:G@Qtr\$(hURr\$G@,G@,GzG@)\\(G@\*ffffffJPG@ffffftr\$(hURr\$G@+kQG@+G@+G@+\\)J0G@\\)tr\$(hU  
Rr\$G@+.zGG@+333333G@\*G@\*zHJ@G@tr\$(hURr\$G@)G{G@+W  
=pG@)  
=pG@\*zG{J)G@zG{tr\$(hURr\$G@\*ffffffG@\*G@)p  
=qG@\*=p  
=JpOG@=p  
=tr\$(hURr\$G@\*B\\(G@\*aGzG@)\\(G@\*GzHJSG@GzHtr\$(hURr\$G@\*\\(G@+=p  
=G@\*.zGG@+QJG@  
=p  
tr\$(hURr\$G@+\\(G@+B\\(G@\*QG@+\\)JXDrG@\\)tr\$(hURr\$G@+  
=p  
G@+8QG@\*G@\*GzJx+G@Gztr\$(hURr\$G@\*QG@+\\)G@\*u\\(G@\*33333JoG@Qtr\$(hURr\$G@\*\\(G@+QG@\*  
\\(G@+QJ[G@Qtr\$(hURr\$G@+\\(G@,QRG@+\\)G@,QJ  
G@Qtr\$(hURr\$G@+\\(G@,33333G@+33333G@,p  
=qJG@p  
=qtr\$(hURr\$G@,G@,zHG@,G@,QJG@Qtr\$(hURr\$G@,QG@-.zGG@,zGG@,fffffJG@Gztr\$(hURr\$G@-=p  
G@0GzG@-G@0  
=pJ(OG@ tr\$(hURr\$G@0QG@1ffffffG@0G@1J(U9G@!tr\$(hURr\$G@1TzGG@2=p  
=G@1\\(G@1ffffJP>G@!  
=ptr\$(hURr\$G@133333G@2RG@1J=p  
G@2JPvG@"tr\$(hU Rr\$G@2TzGG@2ffffffG@1GzG@2LJ(@G@"Ltr\$(hURr\$G@2&ffffffG@2p  
=G@2!GzG@2\\(J@G@"\\(tr\$(hU  
Rr\$G@2nzGG@2QG@133333G@2QJ|G@"zGtr\$(hURr\$G@2zGG@2  
=pG@2nzGG@2JG@="=p  
tr\$(hURr\$G@2G@2G@2xQG@2G{J`OG@"Qtr\$(hURr\$G@2  
=pG@3\\(G@2GzHG@2J,G@"tr\$(hURr\$G@2zHG@2ffffffG@2\\(G@2JxG@"tr\$(hURr\$G@2G@2\\)G@1G@1=  
p  
JhG@!tr\$(hURr\$G@1=p  
G@2  
=pG@1QG@1J7G@!\\(tr\$(hURr\$G@1  
=pG@2ffffffG@1p  
=G@2=p

=J@aG@="p  
=tr\$(hURr%G@25\G@2u\G@1\G@2QRJpG@"QRtr%(hURr%G@1\G@2ffffG@1\G@2GzJG@"Gztr%(hU  
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G@2G@1ffffG@2JHG@"tr%(hURr%G@2QG@2.zGG@1zHG@133333JG@!\tr%(hURr  
%G@2G@2J=p  
G@1EQG@1s33333JG@!u\tr%(hURr%G@1p  
=qG@1QG@1QG@1O\JG@!Ltr  
%(hURr%G@1LG@1=p  
G@1#  
=pG@1J(G@!tr%(hURr%G@1s33333G@1p  
=G@1TzGG@1  
=pJoG@!  
=ptr%(hURr%G@1p  
=G@2  
=p  
G@1#  
=pG@1&ffffJG@!#  
=ptr%(hU Rr%G@0  
=qG@1  
=p  
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JG@  
tr%(hU  
Rr%G@0  
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1s33333G@1QJHG@!zHtr%(hU  
Rr%G@1G@133333G@1!GzG@1kQJx8hG@!kQtr%(hURr%G@1G@2EQG@1s33333G@2EQJG@"GzHtr%(h  
URr %G@2h\G@2G@1p  
=G@20  
=qJ`G@"333333tr!%(hURr"%G@2s33333G@3zG{G@2O\G@3QJ8G@#Qtr#%(hURr\$%G@3\G@3\G@2QG  
@3#  
=pJG@##  
=ptr%%(hURr&%G@3YG@3zGG@2ffffG@3333333JhMG@#333333tr'%(hURr(%G@3LG@3  
=qG@2G@3\JG@#\tr%(hURr\*%G@3xQG@3QG@2QG@2zHJPG@"zHtr+%(hURr,%G@2\G@3ffffG@2(  
G@3  
=pJG@#tr-%(hURr.%G@233333G@3QRG@233333G@3J=p  
J`XG@#Ltr/%(hURr0%G@3LG@3O\G@2zG{G@2G{J@WG@"Qtr1%(hURr2%G@2zGG@35\G@2  
=pG@3\J0yG@#\tr3%(hURr4%G@2QG@3.zGG@2\G@3  
=pJbG@#tr5%(hURr6%G@3zHG@3ffffG@3QG@3EQJFG@#GzHtr7%(hURr8%G@3G@3G@2G{G@3!GzJP  
KG@#Qtr9%(hURr:%G@3EQG@4.zGG@3!GzG@3QJG@#Gztr;%(hURr<%G@3QG@4G@3}p  
=G@4fffffJ0G@\$ffffftr=%(hU Rr>%G@45\G@4s33333G@3  
=pG@3  
=pJxmtG@#Gztr?%(hU  
Rr@%G@3GzG@3  
=qG@3^QG@3zGJ&JG@#zGtrA%(hURrB%G@3\G@4G@3zHG@3JJG@#\trC%(hURrD%G@4\G@4fffffG  
@3QG@3fffffJ`fG@#ffffftrE%(hURrF%G@4QG@4=p  
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=qG@433333G@4!GzG@4fffffJ`G@\$fffftrK%(hURrL%G@4fffffG@5.zGG@4fffffG@4(JG@\$(\trM%(hURr  
N%G@4  
=qG@4G@4LG@4(J\*dG@\$QtrO%(hURrP%G@4QG@4(G@4G@4J"lG@\$trQ%(hURrR%G@433333G@4(G  
@4u\G@4=p  
JMG@\$trS%(hURrT%G@5  
=p  
G@5G@4aGzG@4(Jx|G@\$QtrU%(hURrV%G@4h)G@5RG@4fffffG@5=p  
JvG@%=p  
trW%(hURrX%G@5G@5G@4(\G@4p  
=Jh\G@\$G{trY%(hURrZ%G@4p  
=G@5zGG@4QG@4QJlkG@\$Qtr[(hURr\%G@4QG@4fffffG@4+QG@4GzHJ^G@\$GzHtr](hURr^%G@4p  
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=pG@3kQG@3zGJX\_G@#  
=qtri%(hURrj%G@4(\G@4!GzG@3G@3  
=pJKG@#  
=ptrk%(hURrl%G@3RG@3zGG@3(\G@3)JJG@#)trm%(hURrn%G@3(\G@3G@3u\G@333333JYG@#33333t  
ro%(hU  
Rrp%G@3(\G@4W  
=pG@3zGG@4.zGJ`G@\$zGtrq%(hURrr%G@45(\G@4TzGG@3  
=qG@3QJiG@#(trs%(hURrt%G@4QG@4RG@3)G@3(J`DG@#333333tru%(hURrv%G@3(\G@4h)G@3QG@  
4W  
=pJ  
iG@\$W  
=ptrw%(hURrx%G@4^QG@4s33333G@4G@4QRJHG@\$QRtry%(hURrz%G@4.zGG@5EQG@4#  
=pG@5(JG@%Qtr{%(hURr|%G@5zHG@5(\G@433333G@5zGJP\$G@%zGtr}%(hURr~%G@5(\G@6G@4  
=pG@4GzJbG@\$Gztr%(hURr%G@4zHG@4)G@4}p  
=G@4(\JKG@\$(\tr%(hURr%G@4G@5RG@4YG@5JHYG@%  
=p  
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Rr%G@6)G@6fffffG@6fffffG@6JG@&(\tr%(hU Rr%G@6G@7QRG@6(\G@633333JG@&(\tr%(hU  
Rr%G@7(\)G@7@G@6QG@6zGJlG@&Rtr%(hU Rr%G@6G{G@7&fffffG@6h)G@6JG@&tr%(hU  
Rr%G@6zG{G@6=p  
G@6xQG@6p  
=J\$[G@&p  
=tr%(hU Rr%G@6zHG@6QG@6QG@6^QJHKbG@&aGztr%(hU  
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G@6G@6(JrtG@&(\tr%(hU Rr%G@6(\G@7#  
=pG@6O(\G@7J(bG@tr%(hU Rr%G@6(\G@6fffffG@6QG@65(J{G@&333333tr%(hU Rr%G@65(\G@6  
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=J(G@Pp

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 =G@QG@P  
 =qG@P=p  
 J,J\$G@P=p  
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 J`G@V=p  
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G@a(JB[G@a(tr9-(hURr:-G@a  
=pG@a(G@`p  
=qG@`xQJmG@`xQtr;-(hURr<-G@`zGG@`(\G@\_zG@`JG@`tr=-(hURr>-G@aG@aQG@`G@azHJG@azHtr?-  
(hURr@-G@`QG@`fffffG@`pG@`{33333J  
rG@`{33333trA-(hURrB-G@`G@`  
=qG@`G@`J-G@`trC-(hURrD-G@`zGG@a'zHG@`(\G@`)JG@`)trE-(hURrF-  
G@aQG@aQG@`G@`QJ`G@`QtrG-(hU RrH-G@`cQG@`G@\_E(G@\_)JJeG@\_)trI-(hU  
RrJ-G@^zHG@\_G@^33333G@\_@JG@\_@trK-(hU  
RrL-G@`  
=p  
G@`+33333G@\_G@\_(JMG@\_(trM-(hURrN-G@`GzG@`G@^p  
=G@\_RJG@\_RtrO-(hURrP-G@^(G@\_7  
=pG@]G@]JG@]trQ-(hURrR-G@]@  
=qG@]G@[zHG@]C33333JCG@]C33333trS-(hURrT-G@^  
=qG@^G@]zGG@^  
=pJAG@^  
=ptrU-(hURrV-G@^p  
=G@\_G@^G@^zGJG@^zGtrW-(hURrX-G@^p  
=G@`QG@^@G@\_zGJG@\_zGtrY-(hURrZ-G@`g  
=pG@`G@`J(G@`QJBG@`Qtr[-(hURr'-G@`G{G@`G{G@`8QG@`b=p  
JcG@`b=p  
tr]-(hURr^G@`P)G@`  
=pG@`9RG@`JG@`tr\_-(hURr`-G@`zGG@`QG@`33333G@`J\$G@`tra-(hURrb-  
G@`\_zHG@`QG@\_QG@\_zGJG@\_zGtrc-(hURrd-G@`<(\G@`(\G@`1GzG@`\J{G@`\tre-(hURrf-G@`p  
=G@aHG@`G@aJTG@atrg-(hURrh-G@aazHG@atG@a-QG@aO(JG@aO(tri-(hU Rrj-  
G@a~zGG@b7(G@azG{G@bQJTG@bQtrk-(hU Rrl-G@b  
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G@`QG@`QJG@`Qtro-(hU Rrp-G@`QG@`G@`@G@`x  
=qJ  
G@`x  
=qtrq-(hU  
Rrr-G@azHG@aAGzG@`fffffG@aQJ\*G@aQtrs-(hU Rrt-G@a<G@aIG@`G@`zHJG@`zHtru-(hU Rrv-  
G@`zHG@alG@`G@a33333J]-G@a33333trw-(hU  
Rrx-G@aZ(G@a`G@aG@a&fffffJeG@a&ffffftry-(hU Rrz-G@a=p  
G@a\_(G@afffffG@aYRJG@aYRtr{-(hU Rr|-G@a\_zHG@aG{G@a333333G@aMQJLZG@aMQtr}-(hU Rr~-  
G@aaRG@a33333G@a:(G@ap

=JCG@ap  
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 =qJ/G@a  
 =qtr-(hU Rr-G@aG@aGzG@aj=p  
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 (hU Rr-G@bZG{G@c'  
 =pG@bZ=p  
 G@c%\ (JlG@c%\ (tr-(hU Rr-G@cO  
 =pG@c`G@bG@c  
 =qJzG@c  
 =qtr-(hU Rr-G@c8  
 =qG@cP  
 =qG@c  
 =p  
 G@cPJfG@cPtr-(hU Rr-G@c.zGG@cS33333G@cG@c/  
 =pJ4OG@c/  
 =ptr-(hU  
 Rr-G@cT\ (G@cQG@c\ (G@cG{J\*G@cG{tr-(hU  
 Rr-G@cG@cG{G@c|zGG@cfffffJG@cffffftr-(hU  
 Rr-G@c\ )G@c\ (G@cQG@cp  
 =JdyG@cp  
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 Rr-G@c  
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 Rr-G@d`QG@d\ )G@d9G@dJ`G@dtr-(hU  
 Rr-G@d\ (G@e2=p  
 G@dpG@d\ (JlKG@d\ (tr-(hU  
 Rr-G@dGzG@eE\ (G@dG@e2\ (JEG@e2\ (tr-(hU  
 Rr-G@ezGG@eGzG@e%\ (G@eJfG@etr-(hU  
 Rr-G@epG@ezGG@eaG@eJ(G@etr-(hU  
 Rr-G@ezHG@e\ (G@e@G@eMp  
 =JG@eMp  
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 =pJ"G@g{  
 =ptr-(hURr-G@g)GzG@gQG@gzHG@gE\J=G@gE\tr-(hURr-G@gaG@hG@g(  
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 =qG@e  
 =pJUG@e  
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 =pG@dQG@d  
 =pJL>G@d  
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 =pJ2sG@f  
 =ptr-(hURr-G@fm\G@g%p  
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 (hU  
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 .G@hffffG@i^QG@hG@h=p  
 J4G@h=p  
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 .(hURr.G@hG@iG@hG@h\J%G@h\tr.(hURr.G@h

=qG@iQG@hG@hZG{JLG@hZG{tr.(hURr.G@hmQG@hzGG@hzGG@h](JG@h](tr.(hURr.G@gffffG@h  
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G@ehtr.(hU Rr.G@eiG@fpG@e G@flJ]G@fltr.(hU  
Rr.G@f2(G@fG@eQG@f@  
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@ctzGtr+.(hURr,.G@azGG@aG@\_)G@ab=p  
J'.G@ab=p  
tr-  
. (hURr..G@azHG@affffG@`QG@`3333JTEG@`3333tr/.(hURr0.G@a\_zHG@abG{G@`3QG@`@QJDOG@`  
@Qtr1.(hURr2.G@`QG@`ffffG@\_G@`@QJ#G@`@Qtr3.(hURr4.G@dG@`GzG@`!G@`qGzJlqWG@`qGztr5.(  
hURr6.G@`k  
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G@`J&G@`tr;.(hURr<.G@`QG@`G@`mp  
=G@`tJ,G@`ttr=(.hURr>.G@`M(G@`G@`G@`+QJmG@`+Qtr?.(hURr@.G@`Z(G@` }p  
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@\_7  
=pJ(G@\_7  
=ptrI.(hU  
RrJ.G@\_QG@`8)G@\_hQG@`,J\$G@`,trK.(hURrL.G@`,G@`YG@\_  
=qG@\_p  
=JG@\_p  
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Jh6G@`^zGtrS.(hURrT.G@\_3333G@\_zGG@`^7  
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=qG@`zHG@]p  
=JAG@]p  
=trW.(hURrX.G@](G@`^  
G{G@]\*=p  
G@](J@G@](trY.(hURrZ.G@]h)G@`^E(G@`\G@]JP4G@]tr[.(hURr\G@]QG@`^3333G@](G@`^p  
=J#G@`^p  
=tr].(hURr^.G@\_G@`ffffG@\_qGzG@`=QJqG@`=Qtr\_.(hURr`.G@`)GzG@`FQG@\_33333G@\_AGzJ.G@\_AG  
ztra.(hURrb.G@\_(G@\_~QG@]G@`^nQJ#dG@`^nQtrc.(hURrd.G@`^(\G@\_8QG@`^G@\_`zHJG@\_`zHtre.(hURrf.G  
@`^QG@\_H)G@`^G@\_(JG@\_`(trg.(hURrh.G@\_`^  
=pG@\_G@`^3  
=pG@`^;QJ\$#G@`^;Qtri.(hURrj.G@`^=p  
G@`^QG@]3333G@`^JG@`^trk.(hU  
Rrl.G@`^~QG@`^p  
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G@](\trm.(hURrn.G@\_ffffG@\_QG@^G@\_ffffJxLzG@\_fffftro.(hURrp.G@\_(G@`(\G@\_JG{G@\_RJsAG@\_R  
trq.(hU  
Rrr.G@\_ffffG@`0G@^G@\_(\JG@\_(\trs.(hURrt.G@`<(\G@`IG@\_G@\_  
=pJQvG@\_  
=ptru.(hURrv.G@^33333G@`G{G@^33333G@\_QJHG@\_Qtrw.(hURrx.G@`%(G@`G@`p  
=G@`=p  
JG@`=p  
try.(hURrz.G@`  
=pG@`GzG@`5p  
=G@`5p  
=J&G@`5p  
=tr{.(hURr|.G@`c  
=pG@`GzG@`%(G@`  
=qJ?G@`  
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=J;G@fp  
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/(hURr/G@e2G{G@ep  
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=pJ5G@eC  
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Rr/G@ep  
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user - if the user has a permission attached to the action then the user is

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table\_delete\_synthetic.png | OOo  
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table\_move\_up.png | GV  
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add\_scene.png | Crystal  
add\_source.png | Crystal  
add.ico | GV  
help\_action.png | GV

```

m2.png | GV
mv2.ico | GV
preferences.png | Crystal
P6
# CREATOR: The GIMP's PNM Filter Version 1.0
16 16
255
hIu-=Kx*C[?e?e?e?e?e?e4So*C[?e?e)BZ)BZ)BZ)BZ-G`*C[?e*C[
### MATPLOTLIBRC FORMAT

# This is a sample matplotlib configuration file - you can find a copy
# of it on your system in
# site-packages/matplotlib/mpl-data/matplotlibrc. If you edit it
# there, please note that it will be overridden in your next install.
# If you want to keep a permanent local copy that will not be
# over-written, place it in HOME/.matplotlib/matplotlibrc (unix/linux
# like systems) and C:\Documents and Settings\yourname\.matplotlib
# (win32 systems).
#
# This file is best viewed in a editor which supports python mode
# syntax highlighting. Blank lines, or lines starting with a comment
# symbol, are ignored, as are trailing comments. Other lines must
# have the format
# key : val # optional comment
#
# Colors: for the color values below, you can either use - a
# matplotlib color string, such as r, k, or b - an rgb tuple, such as
# (1.0, 0.5, 0.0) - a hex string, such as ff00ff or #ff00ff - a scalar
# grayscale intensity such as 0.75 - a legal html color name, eg
# red,
# blue, darkslategray

#### CONFIGURATION BEGINS HERE

# the default backend; one of GTK GTKAgg GTKCairo CocoaAgg FltkAgg
# MacOSX QtAgg Qt4Agg TkAgg WX WXAgg Agg Cairo GDK PS PDF SVG Template
# You can also deploy your own backend outside of matplotlib by
# referring to the module name (which must be in the PYTHONPATH) as
# 'module://my_backend'
backend      : GTKAgg

# if you are running pyplot inside a GUI and your backend choice
# conflicts, we will automatically try and find a compatible one for
# you if backend_fallback is True
#backend_fallback: True
#interactive : False
#toolbar      : toolbar2 # None | classic | toolbar2
#timezone     : UTC      # a pytz timezone string, eg US/Central or Europe/Paris

```



```

# Where your matplotlib data lives if you installed to a non-default
# location. This is where the matplotlib fonts, bitmaps, etc reside
#datapath : /home/jdhunter/mpldata

#### LINES
# See http://matplotlib.sourceforge.net/api/artist\_api.html#module-matplotlib.lines for
# more
# information on line properties.
#lines.linewidth : 1.0 # line width in points
#lines.linestyle : - # solid line
#lines.color : blue
#lines.marker : None # the default marker
#lines.markeredgewidth : 0.5 # the line width around the marker symbol
#lines.markersize : 6 # markersize, in points
#lines.dash_joinstyle : miter # miter|round|bevel
#lines.dash_capstyle : butt # butt|round|projecting
#lines.solid_joinstyle : miter # miter|round|bevel
#lines.solid_capstyle : projecting # butt|round|projecting
#lines.antialiased : True # render lines in antialiased (no jaggies)

#### PATCHES
# Patches are graphical objects that fill 2D space, like polygons or
# circles. See
# http://matplotlib.sourceforge.net/api/artist\_api.html#module-matplotlib.patches
# information on patch properties
#patch.linewidth : 1.0 # edge width in points
#patch.facecolor : blue
#patch.edgecolor : black
#patch.antialiased : True
# render patches in antialiased (no jaggies)

#### FONT
#
# font properties used by text.Text. See
# http://matplotlib.sourceforge.net/api/font\_manager\_api.html for more
# information on font properties. The 6 font properties used for font
# matching are given below with their default values.
#
# The font.family property has five values: 'serif' (e.g. Times),
# 'sans-serif' (e.g. Helvetica), 'cursive' (e.g. Zapf-Chancery),
# 'fantasy' (e.g. Western), and 'monospace' (e.g. Courier). Each of
# these font families has a default list of font names in decreasing
# order of priority associated with them.
#
# The font.style property has three values: normal (or roman), italic
# or oblique. The oblique style will be used for italic, if it is not

```

```

# present.
#
# The font.variant property has two values: normal or small-caps. For
# TrueType fonts, which are scalable fonts, small-caps is equivalent
# to using a font size of 'smaller', or about 83% of the current font
# size.
#
# The font.weight
property has effectively 13 values: normal, bold,
# bolder, lighter, 100, 200, 300, ..., 900. Normal is the same as
# 400, and bold is 700. bolder and lighter are relative values with
# respect to the current weight.
#
# The font.stretch property has 11 values: ultra-condensed,
# extra-condensed, condensed, semi-condensed, normal, semi-expanded,
# expanded, extra-expanded, ultra-expanded, wider, and narrower. This
# property is not currently implemented.
#
# The font.size property is the default font size for text, given in pts.
# 12pt is the standard value.
#
#font.family      : sans-serif
#font.style       : normal
#font.variant     : normal
#font.weight      : medium
#font.stretch     : normal
# note that font.size controls default text sizes. To configure
# special text sizes tick labels, axes, labels, title, etc, see the rc
# settings for axes and ticks. Special text sizes can be defined
# relative to font.size, using the following values: xx-small, x-small,
#
small, medium, large, x-large, xx-large, larger, or smaller
#font.size        : 12.0
#font.serif       : Bitstream Vera Serif, New Century Schoolbook, Century Schoolbook L, Utopia, ITC Bookman,
Bookman, Nimbus Roman No9 L, Times New Roman, Times, Palatino, Charter, serif
#font.sans-serif   : Bitstream Vera Sans, Lucida Grande, Verdana, Geneva, Lucid, Arial, Helvetica, Avant Garde,
sans-serif
#font.cursive      : Apple Chancery, Textile, Zapf Chancery, Sand, cursive
#font.fantasy      : Comic Sans MS, Chicago, Charcoal, Impact, Western, fantasy
#font.monospace    : Bitstream Vera Sans Mono, Andale Mono, Nimbus Mono L, Courier New, Courier, Fixed,
Terminal, monospace

### TEXT
# text properties used by text.Text. See
# http://matplotlib.sourceforge.net/api/artist\_api.html#module-matplotlib.text for more
# information on text properties

#text.color       : black

```

```

### LaTeX customizations. See http://www.scipy.org/Wiki/Cookbook/Matplotlib/UsingTex
#text.usetex
    : False # use latex for all text handling. The following fonts
        # are supported through the usual rc parameter settings:
        # new century schoolbook, bookman, times, palatino,
        # zapf chancery, charter, serif, sans-serif, helvetica,
        # avant garde, courier, monospace, computer modern roman,
        # computer modern sans serif, computer modern typewriter
        # If another font is desired which can loaded using the
        # LaTeX \usepackage command, please inquire at the
        # matplotlib mailing list
#text.latex.unicode : False # use "ucs" and "inputenc" LaTeX packages for handling
    # unicode strings.
#text.latex.preamble : # IMPROPER USE OF THIS FEATURE WILL LEAD TO LATEX FAILURES
    # AND IS THEREFORE UNSUPPORTED. PLEASE
DO NOT ASK FOR HELP
    # IF THIS FEATURE DOES NOT DO WHAT YOU EXPECT IT TO.
    # preamble is a comma separated list of LaTeX statements
    # that are included in the LaTeX document preamble.
    # An example:
    # text.latex.preamble : \usepackage{bm},\usepackage{euler}
    # The following packages are always loaded with usetex, so
    # beware of package collisions: color, geometry, graphicx,
    # type1cm, textcomp. Adobe Postscript (PSSNFS) font packages
    # may also be loaded, depending on your font settings

#text.dvipnghack : None    # some versions of dvipng don't handle alpha
    # channel properly. Use True to correct
    # and flush ~/.matplotlib/tex.cache
    # before testing and
False to force
    # correction off. None will try and
    # guess based on your dvipng version

#text.markup      : 'plain' # Affects how text, such as titles and labels, are
    # interpreted by default.
    # 'plain': As plain, unformatted text
    # 'tex': As TeX-like text. Text between $'s will be
    # formatted as a TeX math expression.
    # This setting has no effect when text.usetex is True.
    # In that case, all text will be sent to TeX for
    # processing.

# The following settings allow you to select the fonts in math mode.
# They map from a TeX font name to a fontconfig font pattern.
# These settings are only used if mathtext.fontset is 'custom'.
# Note that this "custom" mode is unsupported and may go away in the

```

```

# future.
#mathtext.cal : cursive
#mathtext.rm : serif
#mathtext.tt : monospace
#mathtext.it : serif:italic
#mathtext.bf : serif:bold
#mathtext.sf
    : sans
#mathtext.fontset : cm # Should be 'cm' (Computer Modern), 'stix',
    # 'stixsans' or 'custom'
#mathtext.fallback_to_cm : True # When True, use symbols from the Computer Modern
    # fonts when a symbol can not be found in one of
    # the custom math fonts.

#mathtext.default : it # The default font to use for math.
    # Can be any of the LaTeX font names, including
    # the special name "regular" for the same font
    # used in regular text.

### AXES
# default face and edge color, default tick sizes,
# default font sizes for tick labels, and so on. See
# http://matplotlib.sourceforge.net/api/axes\_api.html#module-matplotlib.axes
#axes.hold      : True # whether to clear the axes by default on
#axes.facecolor : white # axes background color
#axes.edgecolor : black # axes edge color
#axes.linewidth : 1.0 # edge linewidth
#axes.grid      : False # display
    grid or not
#axes.titlesize : large # fontsize of the axes title
#axes.labelsize : medium # fontsize of the x any y labels
#axes.labelcolor : black
#axes.axisbelow : False # whether axis gridlines and ticks are below
    # the axes elements (lines, text, etc)
#axes.formatter.limits : -7, 7 # use scientific notation if log10
    # of the axis range is smaller than the
    # first or larger than the second
#axes.unicode_minus : True # use unicode for the minus symbol
    # rather than hyphen. See http://en.wikipedia.org/wiki/Plus\_sign#Plus\_sign

#polaraxes.grid : True # display grid on polar axes
#axes3d.grid : True # display grid on 3d axes

### TICKS
# see http://matplotlib.sourceforge.net/api/axis\_api.html#matplotlib.axis.Tick
#xtick.major.size : 4 # major tick size in points
#xtick.minor.size : 2 # minor tick

```

```

size in points
#xtick.major.pad    : 4    # distance to major tick label in points
#xtick.minor.pad    : 4    # distance to the minor tick label in points
#xtick.color        : k    # color of the tick labels
#xtick.labelsize    : medium # fontsize of the tick labels
#xtick.direction    : in    # direction: in or out

#ytick.major.size   : 4    # major tick size in points
#ytick.minor.size   : 2    # minor tick size in points
#ytick.major.pad    : 4    # distance to major tick label in points
#ytick.minor.pad    : 4    # distance to the minor tick label in points
#ytick.color        : k    # color of the tick labels
#ytick.labelsize    : medium # fontsize of the tick labels
#ytick.direction    : in    # direction: in or out

### GRIDS
#grid.color         : black # grid color
#grid.linestyle     : :     # dotted
#grid.linewidth     : 0.5   # in points

### Legend
#legend.fancybox    : False # if True, use a rounded box for the
                        # legend, else a rectangle
#legend.isaxes      : True
#legend.numpoints   : 2     # the number of points in the legend line
#legend.fontsize    : large
#legend.pad         : 0.0   # deprecated; the fractional whitespace inside the legend border
#legend.borderpad   : 0.5   # border whitespace in fontsize units
#legend.markerscale : 1.0   # the relative size of legend markers vs. original
# the following dimensions are in axes coords
#legend.labelsep    : 0.010 # the vertical space between the legend entries
#legend.handlelen   : 0.05  # the length of the legend lines
#legend.handletextsep : 0.02 # the space between the legend line and legend text
#legend.axespad     : 0.02  # the border between the axes and legend edge
#legend.shadow      : False

### FIGURE
# See http://matplotlib.sourceforge.net/api/figure\_api.html#matplotlib.figure.Figure
#figure.figsize     : 8, 6   # figure size in inches
#figure.dpi         : 80     # figure dots
                        # per inch
#figure.facecolor   : 0.75   # figure facecolor; 0.75 is scalar gray
#figure.edgecolor   : white   # figure edgecolor

# The figure subplot parameters. All dimensions are fraction of the
# figure width or height

```

```
#figure.subplot.left : 0.125 # the left side of the subplots of the figure
#figure.subplot.right : 0.9 # the right side of the subplots of the figure
#figure.subplot.bottom : 0.1 # the bottom of the subplots of the figure
#figure.subplot.top : 0.9 # the top of the subplots of the figure
#figure.subplot.wspace : 0.2 # the amount of width reserved for blank space between subplots
#figure.subplot.hspace : 0.2 # the amount of height reserved for white space between subplots
```

#### ### IMAGES

```
#image.aspect : equal # equal | auto | a number
#image.interpolation : bilinear # see help(imshow) for options
#image.cmap : jet # gray | jet etc...
#image.lut : 256 # the size of the colormap lookup table
#image.origin : upper
# lower | upper
#image.resample : False
```

#### ### CONTOUR PLOTS

```
#contour.negative_linestyle : dashed # dashed | solid
```

#### ### Agg rendering

```
### Warning: experimental, 2008/10/10
```

```
#agg.path.chunksize : 0 # 0 to disable; values in the range
# 10000 to 100000 can improve speed slightly
# and prevent an Agg rendering failure
# when plotting very large data sets,
# especially if they are very gappy.
# It may cause minor artifacts, though.
# A value of 20000 is probably a good
# starting point.
```

#### ### SAVING FIGURES

```
#path.simplify : False # When True, simplify paths by removing "invisible"
# points to reduce file size and increase rendering
# speed
#path.simplify_threshold : 0.1 # The threshold of similarity
below which
# vertices will be removed in the simplification
# process
```

```
# the default savefig params can be different from the display params
```

```
# Eg, you may want a higher resolution, or to make the figure
```

```
# background white
```

```
#savefig.dpi : 100 # figure dots per inch
```

```
#savefig.facecolor : white # figure facecolor when saving
```

```
#savefig.edgecolor : white # figure edgecolor when saving
```

```
#cairo.format : png # png, ps, pdf, svg
```

```
# tk backend params
```

```

#tk.window_focus : False # Maintain shell focus for TkAgg
#tk.pythoninspect : False # tk sets PYTHONINSEPCT

# ps backend params
#ps.papersize : letter # auto, letter, legal, ledger, A0-A10, B0-B10
#ps.useafm : False # use of afm fonts, results in small files
#ps.usedistiller : False # can be: None, ghostscript or xpdf
                        # Experimental: may produce smaller files.

                        # xpdf intended for production of publication quality files,
                        # but requires ghostscript, xpdf and ps2eps
#ps.distiller.res : 6000 # dpi
#ps.fonttype : 3 # Output Type 3 (Type3) or Type 42 (TrueType)

# pdf backend params
#pdf.compression : 6 # integer from 0 to 9
                    # 0 disables compression (good for debugging)
#pdf.fonttype : 3 # Output Type 3 (Type3) or Type 42 (TrueType)

# svg backend params
#svg.image_inline : True # write raster image data directly into the svg file
#svg.image_noscale : False # suppress scaling of raster data embedded in SVG
#svg.embed_char_paths : True # embed character outlines in the SVG file

# docstring params
#docstring.hardcopy = False # set this when you want to generate hardcopy docstring

# Set the verbose flags. This controls how much information
# matplotlib gives you at runtime and where it goes. The verbosity
#
# levels are: silent, helpful, debug, debug-annoying. Any level is
# inclusive of all the levels below it. If your setting is "debug",
# you'll get all the debug and helpful messages. When submitting
# problems to the mailing-list, please set verbose to "helpful" or "debug"
# and paste the output into your report.
#
# The "fileo" gives the destination for any calls to verbose.report.
# These objects can a filename, or a filehandle like sys.stdout.
#
# You can override the rc default verbosity from the command line by
# giving the flags --verbose-LEVEL where LEVEL is one of the legal
# levels, eg --verbose-helpful.
#
# You can access the verbose instance in your code
# from matplotlib import verbose.
#verbose.level : silent # one of silent, helpful, debug, debug-annoying
#verbose.fileo : sys.stdout # a log filename, sys.stdout or sys.stderr

```





--\*C[?e\*C[?e?e\*C[?e?e\*C[?e)BZ?e)BZ?e)BZ?e)BZ?e)BZhIuKx4So-G`

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checked.png | GV

image\_not\_found.png | Nuvola

table\_edit.png | OOo

unchecked.png | GV

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file.png | GV  
filter.ico | Nuvola  
module.ico | Crystal  
modulemanager.ico | Crystal  
scene.ico | Crystal  
source.ico | Crystal

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error.png | GV

quantity.png | OOo

P6

# CREATOR: The GIMP's PNM Filter Version 1.0

16 16

255

sOoOoHf3HZ"0;xKjOo3HZOoOoOoOo3HZxOo3HZ3HZx

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  x-axis.png | Eclipse  
  y-axis.png | Eclipse  
  z-axis.png | Eclipse

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P6

# CREATOR: The GIMP's PNM Filter Version 1.0

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P6

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# CREATOR: The GIMP's PNM Filter Version 1.0

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warning.png | GV

<?xml version="1.0" standalone="no"?> <!--\*- mode: xml -\*-->

<!DOCTYPE glade-interface SYSTEM "http://glade.gnome.org/glade-2.0.dtd">

<glade-interface>

<widget class="GtkDialog" id="dialog\_lineprops">

<property name="visible">True</property>

<property name="title" translatable="yes">Line Properties</property>

<property name="type">GTK\_WINDOW\_TOPLEVEL</property>

<property name="window\_position">GTK\_WIN\_POS\_NONE</property>

<property name="modal">False</property>

<property name="resizable">True</property>

<property name="destroy\_with\_parent">False</property>

<property name="decorated">True</property>

<property name="skip\_taskbar\_hint">False</property>

<property name="skip\_pager\_hint">False</property>

<property name="type\_hint">GDK\_WINDOW\_TYPE\_HINT\_DIALOG</property>

<property name="gravity">GDK\_GRAVITY\_NORTH\_WEST</property>

<property name="has\_separator">True</property>

<child internal-child="vbox">

<widget class="GtkVBox" id="dialog-vbox2">

<property

name="visible">True</property>

<property name="homogeneous">False</property>

<property name="spacing">0</property>

<child internal-child="action\_area">

<widget class="GtkHButtonBox" id="dialog-action\_area2">

<property name="visible">True</property>

```

<property name="layout_style">GTK_BUTTONBOX_END</property>

<child>
  <widget class="GtkButton" id="dialog_lineprops_cancelbutton">
    <property name="visible">True</property>
    <property name="can_default">True</property>
    <property name="can_focus">True</property>
    <property name="label">gtk-cancel</property>
    <property name="use_stock">True</property>
    <property name="relief">GTK_RELIEF_NORMAL</property>
    <property name="focus_on_click">True</property>
    <property name="response_id">-6</property>
    <signal name="clicked" handler="on_dialog_lineprops_cancelbutton_clicked" last_modification_time="Mon,
07 Nov 2005 20:52:05 GMT"/>
  </widget>
</child>

<child>
  <widget class="GtkButton" id="dialog_lineprops_okbutton">
    <property name="visible">True</property>
    <property name="can_default">True</property>
    <property name="can_focus">True</property>
    <property name="label">gtk-ok</property>
    <property name="use_stock">True</property>
    <property name="relief">GTK_RELIEF_NORMAL</property>
    <property name="focus_on_click">True</property>
    <property name="response_id">-5</property>
    <signal name="clicked" handler="on_dialog_lineprops_okbutton_clicked" last_modification_time="Mon, 07
Nov 2005 20:51:43 GMT"/>
  </widget>
</child>
</widget>
<packing>
  <property name="padding">0</property>
  <property name="expand">False</property>
  <property name="fill">True</property>
  <property name="pack_type">GTK_PACK_END</property>
</packing>
</child>

<child>
<widget class="GtkVBox" id="vbox_lineprops">
  <property name="visible">True</property>
  <property name="homogeneous">False</property>

  <property name="spacing">0</property>

```



```

<child>
  <widget class="GtkComboBox" id="combobox_lineprops">
    <property name="visible">True</property>
    <property name="items" translatable="yes"></property>
    <signal name="changed" handler="on_combobox_lineprops_changed" last_modification_time="Mon, 07 Nov
2005 20:40:07 GMT"/>
  </widget>
  <packing>
    <property name="padding">0</property>
    <property name="expand">True</property>
    <property name="fill">True</property>
  </packing>
</child>

<child>
  <widget class="GtkFrame" id="frame6">
    <property name="visible">True</property>
    <property name="label_xalign">0</property>
    <property name="label_yalign">0.5</property>
    <property name="shadow_type">GTK_SHADOW_NONE</property>

    <child>
      <widget class="GtkAlignment" id="alignment9">
        <property name="visible">True</property>
        <property name="xalign">0.5</property>
        <property
name="yalign">0.5</property>
        <property name="xscale">1</property>
        <property name="yscale">1</property>
        <property name="top_padding">0</property>
        <property name="bottom_padding">0</property>
        <property name="left_padding">12</property>
        <property name="right_padding">0</property>

      <child>
        <widget class="GtkVBox" id="vbox5">
          <property name="visible">True</property>
          <property name="homogeneous">False</property>
          <property name="spacing">0</property>

          <child>
            <widget class="GtkTable" id="table_lineprops">
              <property name="visible">True</property>
              <property name="n_rows">2</property>
              <property name="n_columns">3</property>
              <property name="homogeneous">False</property>
              <property name="row_spacing">0</property>
              <property name="column_spacing">0</property>

```

```

<child>
  <widget class="GtkLabel" id="label11">
    <property name="visible">True</property>
    <property name="label"
translatable="yes">Marker</property>
    <property name="use_underline">False</property>
    <property name="use_markup">False</property>
    <property name="justify">GTK_JUSTIFY_LEFT</property>
    <property name="wrap">False</property>
    <property name="selectable">False</property>
    <property name="xalign">0.5</property>
    <property name="yalign">0.5</property>
    <property name="xpad">0</property>
    <property name="ypad">0</property>
  </widget>
  <packing>
    <property name="left_attach">0</property>
    <property name="right_attach">1</property>
    <property name="top_attach">1</property>
    <property name="bottom_attach">2</property>
    <property name="x_options">fill</property>
    <property name="y_options"></property>
  </packing>
</child>

<child>
  <widget class="GtkComboBox" id="combobox_linestyles">
    <property name="visible">True</property>

    <property name="items" translatable="yes"></property>
    <signal name="changed" handler="on_combobox_linestyle_changed" last_modification_time="Mon, 07 Nov
2005 20:43:56 GMT"/>
  </widget>
  <packing>
    <property name="left_attach">1</property>
    <property name="right_attach">2</property>
    <property name="top_attach">0</property>
    <property name="bottom_attach">1</property>
    <property name="y_options">fill</property>
  </packing>
</child>

<child>
  <widget class="GtkComboBox" id="combobox_markers">
    <property name="visible">True</property>
    <property name="items" translatable="yes"></property>
    <signal name="changed" handler="on_combobox_marker_changed" last_modification_time="Mon, 07 Nov

```

2005 20:43:14 GMT"/>

```
</widget>
<packing>
  <property name="left_attach">1</property>
  <property name="right_attach">2</property>
  <property name="top_attach">1</property>

  <property name="bottom_attach">2</property>
  <property name="x_options">fill</property>
  <property name="y_options">fill</property>
</packing>
</child>
```

```
<child>
  <widget class="GtkColorButton" id="colorbutton_linestyle">
    <property name="visible">True</property>
    <property name="can_focus">True</property>
    <property name="use_alpha">True</property>
    <property name="title" translatable="yes">Line color</property>
    <property name="focus_on_click">True</property>
    <signal name="color_set" handler="on_colorbutton_linestyle_color_set" last_modification_time="Mon, 07 Nov
2005 22:13:40 GMT"/>
```

```
</widget>
<packing>
  <property name="left_attach">2</property>
  <property name="right_attach">3</property>
  <property name="top_attach">0</property>
  <property name="bottom_attach">1</property>
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  <property
name="y_options"></property>
</packing>
</child>
```

```
<child>
  <widget class="GtkColorButton" id="colorbutton_markerface">
    <property name="visible">True</property>
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    <property name="use_alpha">False</property>
    <property name="title" translatable="yes">Marker color</property>
    <property name="focus_on_click">True</property>
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```

```
</widget>
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  <property name="left_attach">2</property>
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  <property name="top_attach">1</property>
```

```

    <property name="bottom_attach">2</property>
    <property name="x_options">fill</property>
    <property name="y_options"></property>
  </packing>
</child>

<child>
  <widget class="GtkLabel" id="label_linestyle">

    <property name="visible">True</property>
    <property name="label" translatable="yes">Line style</property>
    <property name="use_underline">False</property>
    <property name="use_markup">False</property>
    <property name="justify">GTK_JUSTIFY_LEFT</property>
    <property name="wrap">False</property>
    <property name="selectable">False</property>
    <property name="xalign">0.5</property>
    <property name="yalign">0.5</property>
    <property name="xpad">0</property>
    <property name="ypad">0</property>
  </widget>
  <packing>
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    <property name="right_attach">1</property>
    <property name="top_attach">0</property>
    <property name="bottom_attach">1</property>
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    <property name="y_options"></property>
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</widget>
<packing>
  <property
name="padding">0</property>
  <property name="expand">True</property>
  <property name="fill">True</property>
</packing>
</child>
</widget>
</child>
</widget>
</child>

  <child>
<widget class="GtkLabel" id="fram_lineprops">
  <property name="visible">True</property>
  <property name="label" translatable="yes">&lt;b&gt;Line properties&lt;/b&gt;</property>
  <property name="use_underline">False</property>

```

```

<property name="use_markup">True</property>
<property name="justify">GTK_JUSTIFY_LEFT</property>
<property name="wrap">False</property>
<property name="selectable">False</property>
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<property name="yalign">0.5</property>
<property name="xpad">0</property>
<property name="ypad">0</property>
</widget>
<packing>
  <property name="type">label_item</property>
</packing>
  </child>
</widget>
<packing>
  <property name="padding">0</property>

  <property name="expand">True</property>
  <property name="fill">True</property>
</packing>
</child>
</widget>
<packing>
  <property name="padding">0</property>
  <property name="expand">True</property>
  <property name="fill">True</property>
</packing>
  </child>
</widget>
</child>
</widget>

```

</glade-interface>

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- All

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| filename                                                                                              | source     |
|-------------------------------------------------------------------------------------------------------|------------|
| -----                                                                                                 |            |
| 0_weight.gif                                                                                          | D. Morrill |
| 1_weight.gif                                                                                          | D. Morrill |
| 2_weight.gif                                                                                          | D. Morrill |
| 3_weight.gif                                                                                          | D. Morrill |
| 4_weight.gif                                                                                          | D. Morrill |
| 5_weight.gif                                                                                          | D. Morrill |
| 6_weight.gif                                                                                          | D. Morrill |
| 7_weight.gif                                                                                          | D. Morrill |
| 8_weight.gif                                                                                          | D. Morrill |
| bottom_center_position.gif                                                                            | D. Morrill |
| bottom_left_position.gif                                                                              | D. Morrill |
| bottom_right_position.gif                                                                             | D. Morrill |
| center_align.gif                                                                                      | D. Morrill |
| center_left_position.gif                                                                              | D. Morrill |
| center_position.gif                                                                                   | D. Morrill |
| center_right_position.gif                                                                             | D. Morrill |
| left_align.gif                                                                                        | D. Morrill |
| right_align.gif                                                                                       | D. Morrill |
| top_center_position.gif                                                                               | D. Morrill |
| top_left_position.gif                                                                                 | D. Morrill |
| top_right_position.gif                                                                                | D. Morrill |
| P6                                                                                                    |            |
| 24 24                                                                                                 |            |
| 255                                                                                                   |            |
| :u*lxnY~C~C~C}A @{ @ { ? z ? y ? ab [,jdwMrwzyu } } zywtrY^d&Ytz@iPvtwplhebgBu1\w&YtzH~Mwl`] ZzWvUu`C |            |
| uSt+jzKSyWv2az0`y/x. ]w-                                                                              |            |
| ]vUwBuSt+jzLUyAsSt+jzJPHMLHA =w9s2o+i(d\zSt+jzDzILMKH~By=u6o.i(c!] UuSt+jz>uAxCzDzBy@w<t7p0           |            |
| j*e#_}YyStSt+jz5n7p;r;s^wNdWJ`tNfyIavE]rAZnGcStSt+jz,f.i0j0k0?U*C!OkStSt+jz#_}&a~(b(a~/>T*B'RmStSt+j  |            |
| gWvYyZyQn.<S*B*SnStSt+j:vStStHfVfxScuy(QkStWw[W`Dd{D`uC`uC_tB^sA^sA^sEg`n                             |            |
| P6                                                                                                    |            |
| 24 24                                                                                                 |            |
| 255                                                                                                   |            |
| k<(v\$V"s*{Je&u#))(&#r){9&,01.,)&#m{X@&1;AB=4-)%!lzS{"}.<IQSLAd+'#lz%u*4DSacXX(\$ #us                 |            |
| {,6GWkq]S\$ l s>\$+3CR^aVMt9&w&*.:jzqs\$(+/{izr!%(+)}~yjs!"%'{                                        |            |
| wk{,w!#_~z                                                                                            |            |
| t(tK !! &                                                                                             |            |
| { vnK u                                                                                               |            |
|                                                                                                       |            |
| xsk{2x                                                                                                |            |
| {                                                                                                     |            |

```
xt
n=+zD}z wso!m}[0}~~}
|z
xurol{QG~yyy
x vuspo,s6yD0vrqr)z-vS^A><}P
P6
```

# CREATOR: The GIMP's PNM Filter Version 1.0

16 16

255

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Files and orginal authors:

```
-----
        actor.png | Nuvola
        camera.png | GV
        coordinate.png | Crystal
        filter.png | Nuvola
        lookuptable.png | OOo
        mapper.png | Crystal
        polydata.png | Nuvola
        property.png | Eclipse
        reader.png | Crystal
        renderer.png | Crystal
        rendererwindowinteractor.png | Nuvola
        rendererwindow.png | Crystal

        source.png | OOo
        texture.png | Eclipse
        window.png | Eclipse
        writer.png | GV
```

P6

# CREATOR: The GIMP's PNM Filter Version 1.0

16 16

255

&&&FFFpppFFF%%((FFF \$\$\$\$\$\$\$\$\$FFF %%%FFFmmmFFFFFFF hhh444yyy:::hhh

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Files and original authors:

```

    actor.png | Nuvola
camera.png | GV
    coordinate.png | Crystal
    filter.png | Nuvola
    lookuptable.png | OOo
    mapper.png | Crystal
    polydata.png | Nuvola
    property.png | Eclipse
    reader.png | Crystal
    renderer.png | Crystal
    renderwindowinteractor.png | Nuvola
renderwindow.png | Crystal
    source.png | OOo

texture.png | Eclipse
    window.png | Eclipse
    writer.png | GV

```

P6

24 24

255

[y)pdW^~-qhb^~^~={-

[illegible]

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```
#!/usr/bin/env bash
```

```
# MIT licenses will each have a unique MD5 sum since they contain a unique copyright.
```

```
# This script will read the license file into memory, strip out the copyright, and then
```

```
# generate an MD5 that is not unique and can be matched against a known MIT MD5 sum.
```

```
set -e
```

```
calculate_md5_sum() {
```

```
    local FILE="$1"
```

```
    # Read the contents of the file into a variable
```

```
    local raw_license_text=$(<"$FILE")
```

```
    # Convert to lowercase
```

```

local lowercase_license_text="${raw_license_text,,}"

# Remove anything before the beginning of the license
local stripped_license_text=$(awk '/permission is hereby granted,/{p=1} p' <<< "$lowercase_license_text")

# Replace line breaks (Windows or Linux) with a single space
local replaced_linebreaks=$(tr '\r\n' ' ' <<< "$stripped_license_text")

# Replace multiple spaces with a single space
local normalized_license_text=$(tr -s ' ' <<< "$replaced_linebreaks")

# Strip away any non-printable, non-whitespace characters
local clean_unprintable_license_text=$(tr
-cd '[:print:][:space:]' <<< "$normalized_license_text")

# Remove punctuation and special characters
local clean_license_text=$(echo "$clean_unprintable_license_text" | sed 's/[^a-zA-Z ]//g')

# Calculate the MD5 sum of the cleaned license text
local MD5SUM=$(echo -n "$clean_license_text" | md5sum | awk '{print $1}')

# Output the MD5 sum
echo "$MD5SUM"
}

# Check if the FILE argument is provided
if [ -z "$1" ]; then
    echo "Please provide a FILE as an argument."
    exit 1
fi

# Invoke the function with the provided FILE argument
calculate_md5_sum "$1"

These are my best guesses at where each icon came from,
this file should be updated whenever icons change.

filename          source
-----
about.png         Python Software Foundation
application.ico   Gael Varoquaux
P6
24 24
255
pVpTSXWVZc\pgg|okcQU^nq[SPVSPdLPU[ituk\UQMIEXhOQT[`g`UZWURPuZW[UTXQPWNMUJIRiTm
Please see the LICENSE file.
$Id: LICENSE.txt 15 2009-10-30 18:26:52Z sarkiss $
Copyright (c) [2008-2010], Sargis Dallakyan, The Scripps Research Institute
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```

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| GV (Gael Varoquaux) | Public Domain          | N/A                       |
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| OOo                 | LGPL                   | image_LICENSE_OOo.txt     |

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Files and original authors:

-----  
traitsui/wx/images:

    cb\_hover\_off.png | Enthought  
    cb\_hover\_on.png | Enthought  
    cb\_off.png | Enthought  
    cb\_on.png  
| Enthought  
    file.png | Enthought  
    frame.ico | Enthought  
    group.png | Nuvola

item.png | Eclipse  
list\_editor.png | Enthought  
nb\_open.png | Enthought  
object.png | Enthought  
open.png | Nuvola  
table\_add.png | OOo  
table\_colors.png | GV  
table\_delete.png | OOo  
table\_delete\_synthetic.png | OOo  
table\_display.png | OOo  
table\_move\_down.png | GV  
table\_move\_up.png | GV  
table\_no\_sort.png | OOo  
table\_prefs.png | OOo  
table\_search.png | OOo  
table\_synthetic.png | OOo  
table\_undelete.png | OOo

# 1.341 godspeed\_godlib 1.0

## 1.341.1 Available under license :

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Version 2.1, February 1999

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4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed

under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not compelled to copy the source along with the object code.

5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

However, linking a "work that uses the Library" with the Library creates an executable that is a derivative of the Library (because it contains portions of the Library), rather than a "work that uses the library". The executable is therefore covered by this License.

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When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not.

Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6.

Any executables

containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

6. As an exception to the Sections above, you may also combine or link a "work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer's own use and reverse engineering for debugging such modifications.

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b) Use a suitable shared library mechanism for linking with the Library. A suitable mechanism is one that (1) uses at run time a copy of the library already present on the user's computer system,

rather than copying library functions into the executable, and (2) will operate properly with a modified version of the library, if the user installs one, as long as the modified version is interface-compatible with the version that the work was made with.

c) Accompany the work with a written offer, valid for at least three years, to give the same user the materials specified in Subsection 6a, above, for a charge no more than the cost of performing this distribution.

d) If distribution of the work is made by offering access to copy from a designated place, offer equivalent access to copy the above specified materials from the same place.

e) Verify that the user has already received a copy of these materials or that you have already sent this user a copy.

For an executable, the required form of the "work that uses the Library" must include any data and utility programs needed for reproducing the executable from it. However, as a special exception, the materials to be distributed need not include anything that is normally distributed (in either source or binary form) with the major components (compiler, kernel, and so on) of the operating system on which the executable runs, unless that component itself accompanies the executable.

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7. You may place library facilities that are a work based on the Library side-by-side in a single library together with other library facilities not covered by this License, and distribute such a combined library, provided that the separate distribution of the work based on the Library and of the other library facilities is otherwise permitted, and provided that you do these two things:

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## 1.342 soappy 0.12.0

### 1.342.1 Available under license :

=====  
SOAPpy - Simple to use SOAP library for Python  
=====

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## 1.343 godspeed\_ui\_shared 1.0

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Thus, it is not the intent of this section to claim rights or contest your rights to work written entirely by you; rather, the intent is to exercise the right to control the distribution of derivative or collective works based on the Library.

In addition, mere aggregation of another work not based on the Library with the Library (or with a work based on the Library) on a volume of a storage or distribution medium does not bring the other work under the scope of this License.

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Once this change is made in a given copy, it is irreversible for that copy, so the ordinary GNU General Public License applies to all subsequent copies and derivative works made from that copy.

This option is useful when you wish to copy part of the code of the Library into a program that is not a library.

4. You may copy and distribute the Library (or a portion or derivative of it, under Section 2) in object code or executable form under the terms of Sections 1 and 2 above provided that you accompany it with the complete corresponding machine-readable source code, which must be distributed under the terms of Sections 1 and 2 above on a medium customarily used for software interchange.

If distribution of object code is made by offering access to copy from a designated place, then offering equivalent access to copy the source code from the same place satisfies the requirement to distribute the source code, even though third parties are not

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5. A program that contains no derivative of any portion of the Library, but is designed to work with the Library by being compiled or linked with it, is called a "work that uses the Library". Such a work, in isolation, is not a derivative work of the Library, and therefore falls outside the scope of this License.

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b) Use a suitable shared library mechanism for linking with the Library. A suitable mechanism is one that (1) uses at run time a copy of the library already present on the user's computer system, rather than copying library functions into the executable, and (2) will operate properly with a modified version of the library, if the user installs one, as long as the modified version is interface-compatible with the version that the work was made with.

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```
<signature of Ty Coon>, 1 April 1990  
Ty Coon, President of Vice
```

That's all there is to it!

## 1.344 webtapd 1.0

### 1.344.1 Available under license :

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```
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```

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Found in path(s):

\* /maven-archetype-webapp-1-0-jar-zip/maven-archetype-webapp-1-0-jar/META-INF/maven/org.apache.maven.archetypes/maven-archetype-webapp/pom.xml

## 1.345 pysnmp 2.0.8

### 1.345.1 Available under license :

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# 1.346 pil 1.1.6

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\* /imaging-1-1-6-2-tar-gz/Imaging-1.1.6/Scripts/image2py.py

\* /imaging-1-1-6-2-tar-gz/Imaging-1.1.6/Scripts/gifmaker.py

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/\*

\* The Python Imaging Library

\* \$Id: Fill.c 2134 2004-10-06 08:55:20Z fredrik \$

\*

\* fill image with constant pixel value

\*

\* history:

\* 95-11-26 fl moved from Imaging.c

\* 96-05-17 fl added radial fill, renamed wedge to linear

\* 98-06-23 fl changed ImageFill signature

\*

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Found in path(s):

\* /imaging-1-1-6-2-tar-gz/Imaging-1.1.6/libImaging/Fill.c

No license file was found, but licenses were detected in source scan.

/\*

\* The Python Imaging Library

\* \$Id: Filter.c 2134 2004-10-06 08:55:20Z fredrik \$

\*

\* apply convolution kernel to image

\*

\* history:

\* 1995-11-26 fl Created, supports 3x3 kernels

\* 1995-11-27 fl Added 5x5 kernels, copy border

\* 1999-07-26 fl Eliminated a few compiler warnings

\* 2002-06-09 fl Moved kernel definitions to Python

\* 2002-06-11 fl Support floating point kernels

\* 2003-09-15 fl Added ImagingExpand helper

\*  
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\* /imaging-1-1-6-2-tar-gz/Imaging-1.1.6/libImaging/Filter.c  
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Found in path(s):

\* /imaging-1-1-6-2-tar-gz/Imaging-1.1.6/PIL/WmfImagePlugin.py  
\* /imaging-1-1-6-2-tar-gz/Imaging-1.1.6/PIL/GimpPaletteFile.py  
No license file was found, but licenses were detected in source scan.

/\*  
\* The Python Imaging Library  
\* \$Id: Palette.c 2591 2005-12-08 21:25:29Z fredrik \$  
\*  
\* imaging palette object  
\*  
\* history:  
\* 1996-05-05 fl Added to library  
\* 1996-05-27 fl Added colour mapping stuff  
\* 1997-05-12 fl Support RGBA palettes  
\* 2005-02-09 fl Removed grayscale entries from web palette  
\*  
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Found in path(s):

\* /imaging-1-1-6-2-tar-gz/Imaging-1.1.6/PIL/Image.py  
\* /imaging-1-1-6-2-tar-gz/Imaging-1.1.6/PIL/TiffImagePlugin.py  
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Found in path(s):

\* /imaging-1-1-6-2-tar-gz/Imaging-1.1.6/Sane/\_sane.c

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/\*

\* The Python Imaging Library

\* \$Id: ModeFilter.c 2134 2004-10-06 08:55:20Z fredrik \$

\*

\* mode filter

\*

\* history:

\* 2002-06-08 fl Created (based on code from IFUNC95)

\* 2004-10-05 fl Rewritten; use a simpler brute-force algorithm

\*

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\* /imaging-1-1-6-2-tar-gz/Imaging-1.1.6/PIL/PSDraw.py

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# image from the file; higher resolutions are encoded in a proprietary

Found in path(s):

\* /imaging-1-1-6-2-tar-gz/Imaging-1.1.6/PIL/PcdImagePlugin.py

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/\*

\* The Python Imaging Library

\* \$Id: RankFilter.c 2929 2006-11-22 21:12:55Z fredrik \$

\*

\* min, max, median filters

\*

\* history:

\* 2002-06-08 fl Created

\*

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\*

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\*/

/\* Fast rank algorithm (due to Wirth), based on public domain code

by Nicolas Devillard, available at <http://ndevilla.free.fr> \*/

Found in path(s):

\* /imaging-1-1-6-2-tar-gz/Imaging-1.1.6/libImaging/RankFilter.c

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STARTFONT 2.1

COMMENT \$XConsortium: courB08.bdf,v 1.5 94/04/10 21:46:11 gildea Exp \$

COMMENT

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 COMMENT CONTRACT, NEGLIGENCE OR OTHER TORTIOUS ACTION, ARISING OUT OF OR IN  
 COMMENT CONNECTION WITH THE USE OR PERFORMANCE OF THIS SOFTWARE.  
 COMMENT  
 COMMENT  
 FONT -Adobe-Courier-Bold-R-Normal--11-80-100-100-M-60-ISO8859-1  
 SIZE 8 100 100  
 FONTBOUNDINGBOX 8 11 -1 -2  
 STARTPROPERTIES  
 22  
 COMMENT Begin LogicalFontDescription  
 FONTNAME\_REGISTRY ""  
 FAMILY\_NAME "Courier"  
 FOUNDRY "Adobe"  
 WEIGHT\_NAME "Bold"  
 SLANT "R"  
 SETWIDTH\_NAME "Normal"  
 ADD\_STYLE\_NAME ""  
 PIXEL\_SIZE 11  
 POINT\_SIZE 80  
 RESOLUTION\_X 100  
 RESOLUTION\_Y 100  
 SPACING "M"  
 AVERAGE\_WIDTH 60  
 CHARSET\_REGISTRY "ISO8859"  
 CHARSET\_ENCODING "1"  
 COMMENT END LogicalFontDescription  
 CHARSET\_COLLECTIONS "ASCII ISO8859-1 ADOBE-STANDARD"  
 FACE\_NAME "Courier Bold"  
 COPYRIGHT "Copyright (c) 1987 Adobe Systems, Inc., Portions Copyright 1988 Digital Equipment Corp."  
 COMMENT \*\*\*\*\* end of inserted font properties  
 FONT\_ASCENT 8  
 FONT\_DESCENT 2  
 CAP\_HEIGHT 6  
 X\_HEIGHT 5  
 ENDPROPERTIES  
 CHARS 194  
 STARTCHAR space  
 ENCODING 32

SWIDTH 600 0  
DWIDTH 6 0  
BBX 1 1 0 0  
BITMAP  
00  
ENDCHAR  
STARTCHAR exclam  
ENCODING 33  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 2 6 1 0  
BITMAP  
C0  
C0  
C0  
C0  
00  
C0  
ENDCHAR  
STARTCHAR quotedbl  
ENCODING 34  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 3 3 1 3  
BITMAP  
A0  
A0  
A0  
ENDCHAR  
STARTCHAR numbersign  
ENCODING 35  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 8 0 -1  
BITMAP  
50  
50  
F8  
50  
50  
F8  
50  
50  
ENDCHAR  
STARTCHAR  
dollar  
ENCODING 36  
SWIDTH 600 0

DWIDTH 6 0  
BBX 5 9 0 -1  
BITMAP  
20  
78  
C8  
F0  
78  
18  
D8  
F0  
20  
ENDCHAR  
STARTCHAR percent  
ENCODING 37  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 7 0 0  
BITMAP  
E0  
A8  
F0  
20  
78  
A8  
38  
ENDCHAR  
STARTCHAR ampersand  
ENCODING 38  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 6 -1 0  
BITMAP  
38  
60  
30  
7C  
D8  
7C  
ENDCHAR  
STARTCHAR quoteright  
ENCODING 39  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 3 3 1 4  
BITMAP  
60  
40

80  
ENDCHAR  
STARTCHAR parenleft  
ENCODING 40  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 3 8 1 -1  
BITMAP  
20  
40  
C0  
C0  
C0  
C0  
40  
20  
ENDCHAR  
STARTCHAR parenright  
ENCODING 41  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 3 8 1 -1  
BITMAP  
80  
40  
60  
60  
60  
60  
40  
80  
ENDCHAR  
STARTCHAR asterisk  
ENCODING 42  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 4 4 0 3  
BITMAP  
20  
F0  
60  
90  
ENDCHAR  
STARTCHAR plus  
ENCODING 43  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 5 0 1

BITMAP  
20  
20  
F8  
20  
20  
ENDCHAR  
STARTCHAR comma  
ENCODING 44  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 3 3 1 -2  
BITMAP  
60  
40  
80  
ENDCHAR  
STARTCHAR minus  
ENCODING 45  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 1 0 3  
BITMAP  
F8  
ENDCHAR  
STARTCHAR  
period  
ENCODING 46  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 2 1 1 0  
BITMAP  
C0  
ENDCHAR  
STARTCHAR slash  
ENCODING 47  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 4 8 1 -1  
BITMAP  
10  
10  
20  
20  
40  
40  
80  
80

ENDCHAR  
STARTCHAR zero  
ENCODING 48  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 7 0 0  
BITMAP  
70  
D8  
D8  
D8  
D8  
D8  
70  
ENDCHAR  
STARTCHAR one  
ENCODING 49  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 7 0 0  
BITMAP  
30  
F0  
30  
30  
30  
30  
FC  
ENDCHAR  
STARTCHAR two  
ENCODING 50  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 7 0 0  
BITMAP  
70  
D8  
18  
30  
60  
D8  
F8  
ENDCHAR  
STARTCHAR three  
ENCODING 51  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 7 0 0

BITMAP  
70  
D8  
18  
70  
18  
D8  
70  
ENDCHAR  
STARTCHAR four  
ENCODING 52  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 7 0 0  
BITMAP  
18  
38  
58  
D8  
FC  
18  
18  
ENDCHAR  
STARTCHAR five  
ENCODING 53  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 7 0 0  
BITMAP  
F8  
C0  
F0  
D8  
18  
98  
F0  
ENDCHAR  
STARTCHAR six  
ENCODING 54  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 7 0 0  
BITMAP  
70  
D8  
C0  
F0  
D8

D8  
70  
ENDCHAR  
STARTCHAR seven  
ENCODING 55  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 7 0 0  
BITMAP  
F8  
D8  
18  
30  
30  
60  
60  
ENDCHAR  
STARTCHAR  
eight  
ENCODING 56  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 7 0 0  
BITMAP  
70  
D8  
D8  
70  
D8  
D8  
70  
ENDCHAR  
STARTCHAR nine  
ENCODING 57  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 7 0 0  
BITMAP  
70  
D8  
D8  
78  
18  
D8  
70  
ENDCHAR  
STARTCHAR colon  
ENCODING 58



SWIDTH 600 0  
DWIDTH 6 0  
BBX 2 4 1 0  
BITMAP  
C0  
00  
00  
C0  
ENDCHAR  
STARTCHAR semicolon  
ENCODING 59  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 3 6 0 -2  
BITMAP  
60  
00  
00  
60  
40  
80  
ENDCHAR  
STARTCHAR less  
ENCODING 60  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 4 5 0 1  
BITMAP  
30  
60  
C0  
60  
30  
ENDCHAR  
STARTCHAR equal  
ENCODING 61  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 4 3 0 2  
BITMAP  
F0  
00  
F0  
ENDCHAR  
STARTCHAR greater  
ENCODING 62  
SWIDTH 600 0  
DWIDTH 6 0

BBX 4 5 1 1  
BITMAP  
C0  
60  
30  
60  
C0  
ENDCHAR  
STARTCHAR question  
ENCODING 63  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 6 0 0  
BITMAP  
70  
98  
30  
60  
00  
60  
ENDCHAR  
STARTCHAR at  
ENCODING 64  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 8 0 -1  
BITMAP  
70  
C8  
98  
A8  
A8  
9C  
C0  
70  
ENDCHAR  
STARTCHAR A  
ENCODING 65  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 7 6 -1 0  
BITMAP  
78  
38  
28  
7C  
6C  
EE

ENDCHAR  
STARTCHAR B  
ENCODING 66  
SWIDTH 600 0  
DWIDTH  
6 0  
BBX 6 6 -1 0  
BITMAP  
F8  
6C  
78  
6C  
6C  
F8  
ENDCHAR  
STARTCHAR C  
ENCODING 67  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 6 0 0  
BITMAP  
78  
D8  
C0  
C0  
D8  
70  
ENDCHAR  
STARTCHAR D  
ENCODING 68  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 6 -1 0  
BITMAP  
F8  
6C  
6C  
6C  
6C  
F8  
ENDCHAR  
STARTCHAR E  
ENCODING 69  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 6 -1 0  
BITMAP  
FC

60  
78  
60  
6C  
FC  
ENDCHAR  
STARTCHAR F  
ENCODING 70  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 6 -1 0  
BITMAP  
FC  
60  
78  
60  
60  
F0  
ENDCHAR  
STARTCHAR G  
ENCODING 71  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 6 0 0  
BITMAP  
70  
D8  
C0  
F8  
D8  
78  
ENDCHAR  
STARTCHAR H  
ENCODING 72  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 7 6 -1 0  
BITMAP  
EE  
6C  
7C  
6C  
6C  
EE  
ENDCHAR  
STARTCHAR I  
ENCODING 73  
SWIDTH 600 0

DWIDTH 6 0  
BBX 4 6 0 0  
BITMAP  
F0  
60  
60  
60  
60  
F0  
ENDCHAR  
STARTCHAR J  
ENCODING 74  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 6 -1 0  
BITMAP  
3C  
18  
18  
D8  
D8  
70  
ENDCHAR  
STARTCHAR K  
ENCODING 75  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 7 6 -1 0  
BITMAP  
EC  
68  
70  
78  
6C  
F6  
ENDCHAR  
STARTCHAR L  
ENCODING 76  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 6 -1 0  
BITMAP  
F0  
60  
60  
60  
6C  
FC

ENDCHAR  
STARTCHAR M  
ENCODING  
77  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 6 -1 0  
BITMAP  
C4  
6C  
6C  
7C  
54  
D4  
ENDCHAR  
STARTCHAR N  
ENCODING 78  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 7 6 -1 0  
BITMAP  
EE  
74  
74  
6C  
6C  
E4  
ENDCHAR  
STARTCHAR O  
ENCODING 79  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 6 0 0  
BITMAP  
70  
D8  
D8  
D8  
D8  
70  
ENDCHAR  
STARTCHAR P  
ENCODING 80  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 6 -1 0  
BITMAP  
F8

6C  
6C  
78  
60  
F0  
ENDCHAR  
STARTCHAR Q  
ENCODING 81  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 7 0 -1  
BITMAP  
70  
D8  
D8  
D8  
D8  
70  
18  
ENDCHAR  
STARTCHAR R  
ENCODING 82  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 7 6 -1 0  
BITMAP  
F8  
6C  
6C  
78  
6C  
F6  
ENDCHAR  
STARTCHAR S  
ENCODING 83  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 6 0 0  
BITMAP  
78  
C8  
F0  
38  
98  
F0  
ENDCHAR  
STARTCHAR T  
ENCODING 84

SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 6 -1 0  
BITMAP  
FC  
B4  
30  
30  
30  
78  
ENDCHAR  
STARTCHAR U  
ENCODING 85  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 7 6 -1 0  
BITMAP  
EE  
6C  
6C  
6C  
6C  
38  
ENDCHAR  
STARTCHAR V  
ENCODING 86  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 7 6 -1 0  
BITMAP  
EE  
6C  
28  
38  
38  
10  
ENDCHAR  
STARTCHAR W  
ENCODING 87  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 7 6 -1 0  
BITMAP  
D6  
54  
54  
7C  
38



28  
ENDCHAR  
STARTCHAR  
X  
ENCODING 88  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 6 0 0  
BITMAP  
CC  
78  
30  
30  
78  
CC  
ENDCHAR  
STARTCHAR Y  
ENCODING 89  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 7 6 -1 0  
BITMAP  
E6  
66  
3C  
18  
18  
3C  
ENDCHAR  
STARTCHAR Z  
ENCODING 90  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 6 0 0  
BITMAP  
F8  
D8  
30  
60  
D8  
F8  
ENDCHAR  
STARTCHAR bracketleft  
ENCODING 91  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 3 8 1 -1  
BITMAP

E0  
C0  
C0  
C0  
C0  
C0  
C0  
E0  
ENDCHAR  
STARTCHAR backslash  
ENCODING 92  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 4 8 0 -1  
BITMAP  
80  
80  
40  
40  
20  
20  
10  
10  
ENDCHAR  
STARTCHAR bracketright  
ENCODING 93  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 3 8 1 -1  
BITMAP  
E0  
60  
60  
60  
60  
60  
60  
E0  
ENDCHAR  
STARTCHAR asciicircum  
ENCODING 94  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 3 0 4  
BITMAP  
20  
70  
D8

ENDCHAR  
STARTCHAR underscore  
ENCODING 95  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 1 0 -2  
BITMAP  
FC  
ENDCHAR  
STARTCHAR quoteleft  
ENCODING 96  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 3 3 1 4  
BITMAP  
C0  
40  
20  
ENDCHAR  
STARTCHAR a  
ENCODING 97  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 5 0 0  
BITMAP  
70  
D8  
78  
D8  
FC  
ENDCHAR  
STARTCHAR  
b  
ENCODING 98  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 7 -1 0  
BITMAP  
E0  
60  
78  
6C  
6C  
6C  
F8  
ENDCHAR  
STARTCHAR c  
ENCODING 99

SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 5 0 0  
BITMAP  
70  
D8  
C0  
D8  
70  
ENDCHAR  
STARTCHAR d  
ENCODING 100  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 7 0 0  
BITMAP  
38  
18  
78  
D8  
D8  
D8  
7C  
ENDCHAR  
STARTCHAR e  
ENCODING 101  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 5 0 0  
BITMAP  
70  
D8  
F8  
C0  
78  
ENDCHAR  
STARTCHAR f  
ENCODING 102  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 7 0 0  
BITMAP  
38  
60  
F8  
60  
60  
60

F8  
ENDCHAR  
STARTCHAR g  
ENCODING 103  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 7 0 -2  
BITMAP  
6C  
D8  
D8  
D8  
78  
18  
F0  
ENDCHAR  
STARTCHAR h  
ENCODING 104  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 7 -1 0  
BITMAP  
E0  
60  
78  
6C  
6C  
6C  
6C  
ENDCHAR  
STARTCHAR i  
ENCODING 105  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 7 0 0  
BITMAP  
30  
00  
F0  
30  
30  
30  
FC  
ENDCHAR  
STARTCHAR j  
ENCODING 106  
SWIDTH 600 0  
DWIDTH 6 0

BBX 4 9 0 -2  
BITMAP  
30  
00  
F0  
30  
30  
30  
30  
30  
E0  
ENDCHAR  
STARTCHAR k  
ENCODING 107  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 7 7 -1 0  
BITMAP  
E0  
60  
6C  
78  
70  
78  
6E  
ENDCHAR  
STARTCHAR l  
ENCODING 108  
SWIDTH 600  
0  
DWIDTH 6 0  
BBX 6 7 0 0  
BITMAP  
F0  
30  
30  
30  
30  
30  
FC  
ENDCHAR  
STARTCHAR m  
ENCODING 109  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 5 -1 0  
BITMAP  
F8

7C  
54  
54  
54  
ENDCHAR  
STARTCHAR n  
ENCODING 110  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 5 -1 0  
BITMAP  
D8  
6C  
6C  
6C  
6C  
ENDCHAR  
STARTCHAR o  
ENCODING 111  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 5 0 0  
BITMAP  
70  
D8  
D8  
D8  
70  
ENDCHAR  
STARTCHAR p  
ENCODING 112  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 7 -1 -2  
BITMAP  
F8  
6C  
6C  
6C  
78  
60  
F0  
ENDCHAR  
STARTCHAR q  
ENCODING 113  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 7 0 -2

BITMAP  
6C  
D8  
D8  
D8  
78  
18  
3C  
ENDCHAR  
STARTCHAR r  
ENCODING 114  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 5 0 0  
BITMAP  
DC  
74  
60  
60  
F0  
ENDCHAR  
STARTCHAR s  
ENCODING 115  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 5 0 0  
BITMAP  
78  
E0  
78  
1C  
F8  
ENDCHAR  
STARTCHAR t  
ENCODING 116  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 7 0 0  
BITMAP  
60  
60  
F8  
60  
60  
6C  
38  
ENDCHAR  
STARTCHAR u



ENCODING 117  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 7 5 -1 0  
BITMAP  
EC  
6C  
6C  
6C  
3E  
ENDCHAR  
STARTCHAR v  
ENCODING 118  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 5 -1 0  
BITMAP  
EC  
6C  
38  
38  
10  
ENDCHAR  
STARTCHAR  
w  
ENCODING 119  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 7 5 -1 0  
BITMAP  
D6  
54  
7C  
3C  
28  
ENDCHAR  
STARTCHAR x  
ENCODING 120  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 5 0 0  
BITMAP  
EC  
78  
30  
78  
DC  
ENDCHAR

STARTCHAR y  
ENCODING 121  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 7 7 -1 -2  
BITMAP  
EE  
6C  
6C  
28  
38  
30  
E0  
ENDCHAR  
STARTCHAR z  
ENCODING 122  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 5 0 0  
BITMAP  
F8  
B0  
60  
D8  
F8  
ENDCHAR  
STARTCHAR braceleft  
ENCODING 123  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 4 8 1 -1  
BITMAP  
30  
60  
60  
C0  
60  
60  
60  
30  
ENDCHAR  
STARTCHAR bar  
ENCODING 124  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 1 7 2 -1  
BITMAP  
80

80  
80  
80  
80  
80  
80  
ENDCHAR  
STARTCHAR braceright  
ENCODING 125  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 4 8 0 -1  
BITMAP  
C0  
60  
60  
30  
60  
60  
60  
60  
C0  
ENDCHAR  
STARTCHAR asciitilde  
ENCODING 126  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 2 0 3  
BITMAP  
68  
B0  
ENDCHAR  
STARTCHAR exclamdown  
ENCODING 161  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 2 7 1 -2  
BITMAP  
C0  
00  
C0  
C0  
C0  
C0  
C0  
C0  
ENDCHAR  
STARTCHAR cent  
ENCODING 162  
SWIDTH 600 0

DWIDTH 6 0  
BBX 5 8 0 -1  
BITMAP  
20  
20  
78  
C8  
C0  
78  
20  
20  
ENDCHAR  
STARTCHAR  
sterling  
ENCODING 163  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 7 0 0  
BITMAP  
38  
68  
20  
F8  
20  
64  
F8  
ENDCHAR  
STARTCHAR currency  
ENCODING 164  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 5 0 1  
BITMAP  
88  
70  
50  
70  
88  
ENDCHAR  
STARTCHAR yen  
ENCODING 165  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 7 0 0  
BITMAP  
CC  
48  
FC

30  
FC  
30  
78  
ENDCHAR  
STARTCHAR brokenbar  
ENCODING 166  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 1 9 2 -2  
BITMAP  
80  
80  
80  
80  
00  
80  
80  
80  
80  
80  
ENDCHAR  
STARTCHAR section  
ENCODING 167  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 8 0 -1  
BITMAP  
78  
48  
60  
90  
48  
30  
90  
F0  
ENDCHAR  
STARTCHAR dieresis  
ENCODING 168  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 3 1 1 5  
BITMAP  
A0  
ENDCHAR  
STARTCHAR copyright  
ENCODING 169  
SWIDTH 600 0  
DWIDTH 6 0

BBX 6 7 0 0  
BITMAP  
30  
48  
B4  
A4  
B4  
48  
30  
ENDCHAR  
STARTCHAR ordfeminine  
ENCODING 170  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 4 5 1 2  
BITMAP  
E0  
10  
D0  
00  
F0  
ENDCHAR  
STARTCHAR guillemotleft  
ENCODING 171  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 7 5 -1 0  
BITMAP  
36  
6C  
D8  
6C  
36  
ENDCHAR  
STARTCHAR logicalnot  
ENCODING 172  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 3 0 2  
BITMAP  
F8  
08  
08  
ENDCHAR  
STARTCHAR  
hyphen  
ENCODING 173  
SWIDTH 600 0

DWIDTH 6 0  
BBX 5 1 0 3  
BITMAP  
F8  
ENDCHAR  
STARTCHAR registered  
ENCODING 174  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 7 7 0 0  
BITMAP  
38  
44  
BA  
B2  
AA  
44  
38  
ENDCHAR  
STARTCHAR macron  
ENCODING 175  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 4 1 0 5  
BITMAP  
F0  
ENDCHAR  
STARTCHAR degree  
ENCODING 176  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 4 3 0 4  
BITMAP  
60  
90  
60  
ENDCHAR  
STARTCHAR plusminus  
ENCODING 177  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 6 0 0  
BITMAP  
20  
20  
F8  
20  
00

F8  
ENDCHAR  
STARTCHAR twosuperior  
ENCODING 178  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 3 4 1 3  
BITMAP  
60  
A0  
40  
E0  
ENDCHAR  
STARTCHAR threesuperior  
ENCODING 179  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 3 4 1 3  
BITMAP  
E0  
40  
20  
C0  
ENDCHAR  
STARTCHAR acute  
ENCODING 180  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 2 2 2 5  
BITMAP  
40  
80  
ENDCHAR  
STARTCHAR mu  
ENCODING 181  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 7 7 -1 -2  
BITMAP  
EC  
6C  
6C  
6C  
7E  
40  
40  
ENDCHAR  
STARTCHAR paragraph



ENCODING 182  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 8 0 -1  
BITMAP  
7C  
A8  
A8  
68  
28  
28  
28  
6C  
ENDCHAR  
STARTCHAR periodcentered  
ENCODING 183  
SWIDTH  
600 0  
DWIDTH 6 0  
BBX 2 1 1 3  
BITMAP  
C0  
ENDCHAR  
STARTCHAR cedilla  
ENCODING 184  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 3 3 1 -2  
BITMAP  
40  
20  
C0  
ENDCHAR  
STARTCHAR onesuperior  
ENCODING 185  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 3 4 1 3  
BITMAP  
C0  
40  
40  
E0  
ENDCHAR  
STARTCHAR ordmasculine  
ENCODING 186  
SWIDTH 600 0  
DWIDTH 6 0

BBX 4 5 1 2  
BITMAP  
60  
90  
60  
00  
F0  
ENDCHAR  
STARTCHAR guillemotright  
ENCODING 187  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 7 5 -1 0  
BITMAP  
D8  
6C  
36  
6C  
D8  
ENDCHAR  
STARTCHAR onequarter  
ENCODING 188  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 7 7 -1 0  
BITMAP  
C0  
44  
48  
F4  
2C  
5E  
04  
ENDCHAR  
STARTCHAR onehalf  
ENCODING 189  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 7 7 -1 0  
BITMAP  
C0  
44  
48  
F6  
2A  
44  
0E  
ENDCHAR

STARTCHAR threequarters

ENCODING 190

SWIDTH 600 0

DWIDTH 6 0

BBX 7 7 -1 0

BITMAP

E0

44

28

D4

2C

5E

04

ENDCHAR

STARTCHAR questiondown

ENCODING 191

SWIDTH 600 0

DWIDTH 6 0

BBX 5 7 0 -2

BITMAP

30

00

30

30

60

C8

70

ENDCHAR

STARTCHAR Agrave

ENCODING 192

SWIDTH 600 0

DWIDTH 6 0

BBX 7 9 -1 0

BITMAP

20

10

00

78

38

28

7C

6C

EE

ENDCHAR

STARTCHAR Aacute

ENCODING

193

SWIDTH 600 0

DWIDTH 6 0  
BBX 7 9 -1 0  
BITMAP  
10  
20  
00  
78  
38  
28  
7C  
6C  
EE  
ENDCHAR  
STARTCHAR Acircumflex  
ENCODING 194  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 7 9 -1 0  
BITMAP  
10  
28  
00  
78  
38  
28  
7C  
6C  
EE  
ENDCHAR  
STARTCHAR Atilde  
ENCODING 195  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 7 9 -1 0  
BITMAP  
34  
48  
00  
78  
38  
28  
7C  
6C  
EE  
ENDCHAR  
STARTCHAR Adieresis  
ENCODING 196  
SWIDTH 600 0

DWIDTH 6 0  
BBX 7 8 -1 0  
BITMAP  
28  
00  
78  
38  
28  
7C  
6C  
EE  
ENDCHAR  
STARTCHAR Aring  
ENCODING 197  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 7 9 -1 0  
BITMAP  
30  
48  
30  
78  
38  
28  
7C  
6C  
EE  
ENDCHAR  
STARTCHAR AE  
ENCODING 198  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 7 6 -1 0  
BITMAP  
7E  
3A  
6C  
78  
DA  
DE  
ENDCHAR  
STARTCHAR Ccedilla  
ENCODING 199  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 8 0 -2  
BITMAP  
78

D8  
C0  
C0  
D8  
70  
10  
60  
ENDCHAR  
STARTCHAR Egrave  
ENCODING 200  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 9 -1 0  
BITMAP  
20  
10  
00  
FC  
64  
78  
60  
6C  
FC  
ENDCHAR  
STARTCHAR Eacute  
ENCODING 201  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 9 -1 0  
BITMAP  
10  
20  
00  
FC  
64  
78  
60  
6C  
FC  
ENDCHAR  
STARTCHAR Ecircumflex  
ENCODING 202  
SWIDTH  
600 0  
DWIDTH 6 0  
BBX 6 9 -1 0  
BITMAP  
20

50  
00  
FC  
64  
78  
60  
6C  
FC  
ENDCHAR  
STARTCHAR Edieresis  
ENCODING 203  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 8 -1 0  
BITMAP  
50  
00  
FC  
64  
78  
60  
6C  
FC  
ENDCHAR  
STARTCHAR Igrave  
ENCODING 204  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 4 9 0 0  
BITMAP  
40  
20  
00  
F0  
60  
60  
60  
60  
F0  
ENDCHAR  
STARTCHAR Iacute  
ENCODING 205  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 4 9 0 0  
BITMAP  
20  
40

00  
F0  
60  
60  
60  
60  
F0  
ENDCHAR  
STARTCHAR Icircumflex  
ENCODING 206  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 4 9 0 0  
BITMAP  
40  
A0  
00  
F0  
60  
60  
60  
60  
F0  
ENDCHAR  
STARTCHAR Idieresis  
ENCODING 207  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 4 8 0 0  
BITMAP  
A0  
00  
F0  
60  
60  
60  
60  
F0  
ENDCHAR  
STARTCHAR Eth  
ENCODING 208  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 6 -1 0  
BITMAP  
F8  
6C  
F4



64  
6C  
F8  
ENDCHAR  
STARTCHAR Ntilde  
ENCODING 209  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 7 9 -1 0  
BITMAP  
34  
48  
00  
EE  
64  
74  
7C  
6C  
EC  
ENDCHAR  
STARTCHAR Ograve  
ENCODING 210  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 9 0 0  
BITMAP  
40  
20  
00  
70  
D8  
D8  
D8  
D8  
70  
ENDCHAR  
STARTCHAR Oacute  
ENCODING 211  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 9 0 0  
BITMAP  
20  
40  
00  
70  
D8  
D8

D8  
D8  
70  
ENDCHAR  
STARTCHAR  
Ocircumflex  
ENCODING 212  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 9 0 0  
BITMAP  
20  
50  
00  
70  
D8  
D8  
D8  
D8  
70  
ENDCHAR  
STARTCHAR Otilde  
ENCODING 213  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 9 0 0  
BITMAP  
68  
90  
00  
70  
D8  
D8  
D8  
D8  
70  
ENDCHAR  
STARTCHAR Odieresis  
ENCODING 214  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 8 0 0  
BITMAP  
50  
00  
70  
D8  
D8

D8  
D8  
70  
ENDCHAR  
STARTCHAR multiply  
ENCODING 215  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 5 5 0 1  
BITMAP  
88  
50  
20  
50  
88  
ENDCHAR  
STARTCHAR Oslash  
ENCODING 216  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 7 6 -1 0  
BITMAP  
3A  
6C  
7C  
6C  
6C  
B8  
ENDCHAR  
STARTCHAR Ugrave  
ENCODING 217  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 7 9 -1 0  
BITMAP  
20  
10  
00  
EE  
6C  
6C  
6C  
6C  
38  
ENDCHAR  
STARTCHAR Uacute  
ENCODING 218  
SWIDTH 600 0

DWIDTH 6 0  
BBX 7 9 -1 0  
BITMAP  
08  
10  
00  
EE  
6C  
6C  
6C  
6C  
38  
ENDCHAR  
STARTCHAR Ucircumflex  
ENCODING 219  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 7 9 -1 0  
BITMAP  
10  
28  
00  
EE  
6C  
6C  
6C  
6C  
38  
ENDCHAR  
STARTCHAR Udieresis  
ENCODING 220  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 7 8 -1 0  
BITMAP  
28  
00  
EE  
6C  
6C  
6C  
6C  
38  
ENDCHAR  
STARTCHAR  
Yacute  
ENCODING 221  
SWIDTH 600 0

DWIDTH 6 0  
BBX 7 9 -1 0  
BITMAP  
04  
08  
00  
E6  
66  
3C  
18  
18  
3C  
ENDCHAR  
STARTCHAR Thorn  
ENCODING 222  
SWIDTH 600 0  
DWIDTH 6 0  
BBX 6 6 -1 0  
BITMAP  
E0  
78  
6C  
6C  
78  
E0  
ENDCHAR  
STARTCHAR germandbls  
ENCODING 223  
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Found in path(s):

\* /imaging-1-1-6-2-tar-gz/Imaging-1.1.6/Images/courB08.bdf

No license file was found, but licenses were detected in source scan.

# version.

Found in path(s):

\* /imaging-1-1-6-2-tar-gz/Imaging-1.1.6/PIL/JpegImagePlugin.py



No license file was found, but licenses were detected in source scan.

The Python Imaging Library

\$Id: README 2939 2006-12-03 13:43:51Z fredrik \$

Release 1.1.6 (December 3, 2006)

=====  
The Python Imaging Library 1.1.6  
=====

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- + Support Options
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## ----- Introduction -----

The Python Imaging Library (PIL) adds image processing capabilities to your Python environment. This library provides extensive file format support, an efficient internal representation, and powerful image processing capabilities.

This source kit has been built and tested on Windows NT/2000/XP, Mac OS X, and most major Unix platforms (including Alpha, Solaris, and Intel systems). We believe that it should work on most modern platforms (people are using it on Crays, after all ;-)

The main distribution site for this software is:

<http://www.pythonware.com/products/pil/>

That site also contains information about free and commercial support options, PIL add-ons, answers to frequently asked questions, and more.

Development versions (alphas, betas) are available here:

<http://effbot.org/downloads/>

The PIL handbook is not included in this distribution; to get the latest version, check:

<http://www.pythonware.com/library/>

<http://effbot.org/books/imagingbook/> (drafts)

For installation and licensing details, see below.

---

## Support Options

---

### + Commercial Support

Secret Labs (PythonWare) offers support contracts for companies using the Python Imaging Library in commercial applications, and in mission-critical environments. The support contract includes technical support, bug fixes, extensions to the PIL library, sample applications, and more.

For the full story, check:

<http://www.pythonware.com/products/pil/support.htm>

### + Free Support

For support and general questions on the Python Imaging Library, send e-mail to the Image SIG mailing list:

[image-sig@python.org](mailto:image-sig@python.org)

You can join the Image SIG by sending a mail to:

[image-sig-request@python.org](mailto:image-sig-request@python.org)

Put "subscribe" in the message body to automatically subscribe to the list, or "help" to get additional information. Alternatively, you can send your questions to the Python mailing list, [python-list@python.org](mailto:python-list@python.org), or post them to the newsgroup [comp.lang.python](http://comp.lang.python). DO NOT SEND SUPPORT QUESTIONS TO PYTHONWARE ADDRESSES.

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Python Imaging Library is

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---

Build instructions (all platforms)

---

For a list of changes in this release, see the CHANGES document.

0. If you're in a hurry, try this:

```
$ gunzip Imaging-1.1.6.tar.gz
$ tar xvf Imaging-1.1.6.tar
$ cd Imaging-1.1.6
$ python setup.py install
```

If you prefer to know what you're doing, read on.

## 1. Prerequisites.

If you need any of the features described below, make sure you have the necessary libraries before building PIL.

| feature | library |
|---------|---------|
|---------|---------|

|              |                    |
|--------------|--------------------|
| JPEG support | libjpeg (6a or 6b) |
|--------------|--------------------|

<http://www.ijg.org>  
<http://www.ijg.org/files/jpegsrc.v6b.tar.gz>  
<ftp://ftp.uu.net/graphics/jpeg/>

|             |                                      |
|-------------|--------------------------------------|
| PNG support | zlib (1.2.3 or later is recommended) |
|-------------|--------------------------------------|

<http://www.gzip.org/zlib/>

|                           |                                           |
|---------------------------|-------------------------------------------|
| OpenType/TrueType support | freetype2 (2.1.3 or later is recommended) |
|---------------------------|-------------------------------------------|

<http://www.freetype.org>  
<http://freetype.sourceforge.net>

If you have a recent Linux version, the libraries provided with the operating system usually work just fine. If some library is missing, installing a prebuilt version (jpeg-devel, zlib-devel, etc) is usually easier than building from source.

If you're using Mac OS X, you can use the 'fink' tool to install missing libraries (also see the Mac OS X section below).

Similar tools are available for many other platforms (such as 'apt-get' for Debian).

## 2. To build under Python 1.5.2, you need to install the stand-alone version of the distutils library:

<http://www.python.org/sigs/distutils-sig/download.html>

For newer releases, the distutils library is included in the Python standard library.

## 3. If you didn't build Python from sources, make sure you have Python's build support files on your machine. If you've downloaded a prebuilt package (e.g. a Linux RPM), you probably

need additional developer packages. Look for packages named "python-devel", "py-dev", or similar.

4. When you have everything you need, unpack the PIL distribution (the file Imaging-1.1.6.tar.gz) in your Python extensions directory (if you have one, that is. If not, feel free to unpack it in any other suitable directory).

```
$ cd Python-2.4/Extensions # example
$ gunzip Imaging-1.1.6.tar.gz
$ tar xvf Imaging-1.1.6.tar
```

5. Build the library. We recommend that you do an in-place build, and run the self test before installing.

```
$ cd Imaging-1.1.6
$ python setup.py build_ext -i
$ python selftest.py
```

When the build finishes, a summary report is shown. Make sure that the optional components you need are included.

```
-----
PIL 1.1.6 BUILD SUMMARY
-----
```

```
*** TKINTER support not available (Tcl/Tk 8.3 libraries needed)
--- JPEG support ok
--- ZLIB (PNG/ZIP) support ok
--- FREETYPE support ok
-----
```

If the build script won't find a given component, you can edit the setup.py file and set the appropriate ROOT variable. For details, see instructions in the file.

6. If the setup.py and selftest.py commands finish without any errors, you're ready to install the library:

```
$ python setup.py install
```

(depending on how Python has been installed on your machine, you might have to log in as a superuser to run the 'install' command.)

---

## Additional notes for Mac OS X

---

On Mac OS X you will usually install additional software such as libjpeg or freetype with the "fink" tool, and then it ends up in "/sw". If you have installed the libraries elsewhere, you may have to tweak the "setup.py" file before building.

---

## Additional notes for Windows

---

On Windows, you need to tweak the ROOT settings in the "setup.py" file, to make it find the external libraries. See comments in the file for details.

Make sure to build PIL and the external libraries with the same runtime linking options as was used for the Python interpreter (usually /MD, under Visual Studio).

Note that most Python distributions include libraries compiled for Microsoft Visual Studio. To build extensions using other tool chains, see the "Using non-Microsoft compilers on Windows" section in the distutils handbook:

<http://www.python.org/doc/current/inst/non-ms-compilers.html>

For additional information on how to build extensions using the popular MinGW compiler, see:

<http://mingw.org> (compiler)

<http://sebsauvage.net/python/mingw.html> (build instructions)

<http://sourceforge.net/projects/gnuwin32> (prebuilt libraries)

Found in path(s):

\* /imaging-1-1-6-2-tar-gz/Imaging-1.1.6/README

No license file was found, but licenses were detected in source scan.

# Released to the public domain 16-Jan-2001,

Found in path(s):

\* /imaging-1-1-6-2-tar-gz/Imaging-1.1.6/doctest.py

No license file was found, but licenses were detected in source scan.

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Found in path(s):

\* /imaging-1-1-6-2-tar-gz/Imaging-1.1.6/PIL/PdfImagePlugin.py

No license file was found, but licenses were detected in source scan.

/\*

\* The Python Imaging Library

\* \$Id: Quant.c 2284 2005-02-07 20:58:58Z fredrik \$

\*

\* image quantizer

\*

\* history:

\* 1998-09-10 tjs Contributed

\* 1998-12-29 fl Added to PIL 1.0b1

\* 2004-02-21 fl Fixed bogus free() on quantization error

\* 2005-02-07 fl Limit number of colors to 256

\*

\* Written by Toby J Sargeant <tjs@longford.cs.monash.edu.au>.

\*

\* Copyright (c) 1998 by Toby J Sargeant

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\*

\* See the README file for information on usage and redistribution.

\*/

Found in path(s):

\* /imaging-1-1-6-2-tar-gz/Imaging-1.1.6/libImaging/Quant.c

# 1.347 afero 1.5.1

## 1.347.1 Available under license :

Apache License

Version 2.0, January 2004

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## 1.348 xml-apis 1.3.04

### 1.348.1 Available under license :

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<http://www.w3.org/TR/2004/REC-DOM-Level-3-Core-20040407/java-binding.html>

The specification of DOM Level 3's various parts is at:  
<http://www.w3.org/TR/2004/REC-DOM-Level-3-Core-20040407/>  
<http://www.w3.org/TR/2004/REC-DOM-Level-3-LS-20040407/>  
<http://www.w3.org/TR/2004/NOTE-DOM-Level-3-XPath-20040226/>

The specification of DOM Level 2's various parts is at:  
<http://www.w3.org/TR/2000/REC-DOM-Level-2-Events-20001113/>  
<http://www.w3.org/TR/2000/REC-DOM-Level-2-Style-20001113/>  
<http://www.w3.org/TR/2000/REC-DOM-Level-2-Traversal-Range-20001113/>  
<http://www.w3.org/TR/2000/REC-DOM-Level-2-Views-20001113/>

The specification of DOM Level 1's various parts is at:  
<http://www.w3.org/TR/1998/REC-DOM-Level-1-19981001/level-one-html.html>

Links to all available W3C DOM Java Bindings can be found at:  
<http://www.w3.org/DOM/DOMTR>

The actual classes of The Simple API for CSS (SAC) came from:  
<http://www.w3.org/Style/CSS/SAC/>  
<http://www.w3.org/2002/06/sacjava-1.3.zip>

The actual DOM Java Language Binding  
classes for SMIL came from:  
<http://dev.w3.org/cvsweb/java/classes/org/w3c/dom/smil/>  
(both ElementTimeControl.java and TimeEvent.java were taken at revision 1.1)

The actual DOM Java Language Binding classes for SVG 1.1 came from:  
<http://www.w3.org/TR/SVG11/java.html>

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## 1.353 python-certifi 2018.01.18

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ca-bundle.crt -- Bundle of CA Root Certificates

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```
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```

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```
Yoyodyne, Inc., hereby disclaims all copyright interest in the program
`Gnomovision' (which makes passes at compilers) written by James Hacker.
```

```
<signature of Ty Coon>, 1 April 1989
Ty Coon, President of Vice
```

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## 1.359 wsgiref 0.1.2

### 1.359.1 Available under license :

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```
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```

Found in path(s):

```
* /wsgiref-0-1-2-2-zip/wsgiref-0.1.2/wsgiref/validate.py
```

No license file was found, but licenses were detected in source scan.

Metadata-Version: 1.0

Name: wsgiref

Version: 0.1.2

Summary: WSGI (PEP 333) Reference Library

Home-page: <http://cheeseshop.python.org/pypi/wsgiref>

Author: Phillip J. Eby

Author-email: web-sig@python.org

License: PSF or ZPL

Description: This is a standalone release of the ``wsgiref`` library to be included in Python 2.5. For the standalone version's documentation, see:

HTML

[http://peak.telecommunity.com/wsgiref\\_docs/](http://peak.telecommunity.com/wsgiref_docs/)

PDF

<http://peak.telecommunity.com/wsgiref.pdf>

Platform: UNKNOWN

Found in path(s):

\* /wsgiref-0-1-2-2-zip/wsgiref-0.1.2/wsgiref.egg-info/PKG-INFO

\* /wsgiref-0-1-2-2-zip/wsgiref-0.1.2/PKG-INFO

# 1.360 handlebarsjs 4.0.6

## 1.360.1 Available under license :

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/\*!

handlebars v4.0.4

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\*/

Found in path(s):

\* /handlebars-4-0-6-jar/handlebars-v4.0.4.js

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Manifest-Version: 1.0

Export-Package: com.github.jknack.handlebars.cache;uses:="com.github.jknack.handlebars,com.github.jknack.handlebars.io,org.apache.commons.lang3.tuple";version="4.0.6",com.github.jknack.handlebars.context;uses:="com.github.jknack.handlebars";version="4.0.6",com.github.jknack.handlebars;uses:="com.github.jknack.handlebars.cache,com.github.jknack.handlebars.io";version="4.0.6",com.github.jknack.handlebars.helper;uses:="com.github.jknack.handlebars,com.github.jknack.handlebars.js";version="4.0.6",com.github.jknack.handlebars.io;uses:="javax.servlet";version="4.0.6",com.github.jknack.handlebars.js;uses:="com.github.jknack.handlebars";version="4.0.6"

Built-By: edgar

Tool: Bnd-2.4.1.201501161923

Bundle-Name: Handlebars

Created-By: Apache Maven Bundle Plugin

Require-Capability: osgi.ee;filter:="(&(osgi.ee=JavaSE)(version=1.7))"

Build-Jdk: 1.7.0\_55

Bundle-Version: 4.0.6

Bnd-LastModified:

1470832695806

Bundle-ManifestVersion: 2

Bundle-License: <http://www.apache.org/licenses/LICENSE-2.0.txt>

Bundle-Description: Logic-less and semantic templates with Java

Bundle-SymbolicName: com.github.jknack.handlebars

Import-Package: com.github.jknack.handlebars.io,javax.servlet,org.antlr.v4.runtime;version="[4.5,5)",org.antlr.v4.runtime.atn;version="[4.5,5)",org.antlr.v4.runtime.dfa;version="[4.5,5)",org.antlr.v4.runtime.misc;version="[4.5,5)",org.antlr.v4.runtime.tree;version="[4.5,5)",org.apache.commons.lang3;version="[3.1,4)",org.apache.commons.lang3.builder;version="[3.1,4)",org.apache.commons.lang3.math;version="[3.1,4)",org.apache.commons.lang3.text;version="[3.1,4)",org.apache.commons.lang3.text.translate;version="[3.1,4)",org.apache.commons.lang3.tuple;version="[3.1,4)",org.mozilla.javascript,org.mozilla.javascript.tools,org.slf4j;version="[1.6,2)"

Archiver-Version: Plexus Archiver

Found in path(s):

# 1.361 distlib 0.2.9.post0

## 1.361.1 Available under license :

### A. HISTORY OF THE SOFTWARE

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Python was created in the early 1990s by Guido van Rossum at Stichting Mathematisch Centrum (CWI, see <http://www.cwi.nl>) in the Netherlands as a successor of a language called ABC. Guido remains Python's principal author, although it includes many contributions from others.

In 1995, Guido continued his work on Python at the Corporation for National Research Initiatives (CNRI, see <http://www.cnri.reston.va.us>) in Reston, Virginia where he released several versions of the software.

In May 2000, Guido and the Python core development team moved to BeOpen.com to form the BeOpen PythonLabs team. In October of the same year, the PythonLabs team moved to Digital Creations (now Zope Corporation, see <http://www.zope.com>). In 2001, the Python Software Foundation (PSF, see <http://www.python.org/psf/>) was formed, a non-profit organization created specifically to own Python-related Intellectual Property. Zope Corporation is a sponsoring member of the PSF.

All Python releases are Open Source (see <http://www.opensource.org> for the Open Source Definition). Historically, most, but not all, Python releases have also been GPL-compatible; the table below summarizes the various releases.

| Release        | Derived from | Year      | Owner      | GPL-compatible? (1) |
|----------------|--------------|-----------|------------|---------------------|
| 0.9.0 thru 1.2 |              | 1991-1995 | CWI        | yes                 |
| 1.3 thru 1.5.2 | 1.2          | 1995-1999 | CNRI       | yes                 |
| 1.6            | 1.5.2        | 2000      | CNRI       | no                  |
| 2.0            | 1.6          | 2000      | BeOpen.com | no                  |
| 1.6.1          | 1.6          | 2001      | CNRI       | yes (2)             |
| 2.1            | 2.0+1.6.1    | 2001      | PSF        | no                  |
| 2.0.1          | 2.0+1.6.1    | 2001      | PSF        | yes                 |
| 2.1.1          | 2.1+2.0.1    | 2001      | PSF        | yes                 |
| 2.2            | 2.1.1        | 2001      | PSF        | yes                 |
| 2.1.2          | 2.1.1        | 2002      | PSF        | yes                 |
| 2.1.3          |              |           |            |                     |

|       |       |           |     |     |
|-------|-------|-----------|-----|-----|
| 2.1.2 | 2002  | PSF       | yes |     |
| 2.2.1 | 2.2   | 2002      | PSF | yes |
| 2.2.2 | 2.2.1 | 2002      | PSF | yes |
| 2.2.3 | 2.2.2 | 2003      | PSF | yes |
| 2.3   | 2.2.2 | 2002-2003 | PSF | yes |
| 2.3.1 | 2.3   | 2002-2003 | PSF | yes |
| 2.3.2 | 2.3.1 | 2002-2003 | PSF | yes |
| 2.3.3 | 2.3.2 | 2002-2003 | PSF | yes |
| 2.3.4 | 2.3.3 | 2004      | PSF | yes |
| 2.3.5 | 2.3.4 | 2005      | PSF | yes |
| 2.4   | 2.3   | 2004      | PSF | yes |
| 2.4.1 | 2.4   | 2005      | PSF | yes |
| 2.4.2 | 2.4.1 | 2005      | PSF | yes |
| 2.4.3 | 2.4.2 | 2006      | PSF | yes |
| 2.4.4 | 2.4.3 | 2006      | PSF | yes |
| 2.5   | 2.4   | 2006      | PSF | yes |
| 2.5.1 | 2.5   | 2007      | PSF | yes |
| 2.5.2 | 2.5.1 | 2008      | PSF | yes |
| 2.5.3 | 2.5.2 | 2008      | PSF | yes |
| 2.6   | 2.5   | 2008      | PSF | yes |
| 2.6.1 | 2.6   | 2008      | PSF | yes |
| 2.6.2 | 2.6.1 | 2009      | PSF | yes |
| 2.6.3 | 2.6.2 | 2009      | PSF | yes |
| 2.6.4 | 2.6.3 | 2009      | PSF | yes |
| 2.6.5 | 2.6.4 | 2010      | PSF | yes |
| 3.0   | 2.6   | 2008      | PSF | yes |
| 3.0.1 | 3.0   | 2009      | PSF | yes |
| 3.1   | 3.0.1 | 2009      | PSF | yes |
| 3.1.1 | 3.1   | 2009      | PSF | yes |
| 3.1.2 | 3.1   | 2010      | PSF | yes |
| 3.2   | 3.1   | 2010      | PSF | yes |

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Distutils2 Contributors  
=====

The Distutils2 project was started by Tarek Ziad and is currently maintained by ric Araujo. Many people have contributed to the project.

distlib has started off using some of the code from distutil2.

If you're making a patch, please add your name below in alphabetical order, and welcome into the Fellowship of the Packaging!

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## 1.362 Isof 4.92

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\* /lsof-4-92-1-zip/lsof-4.92.1/dialects/freebsd/dnode2.c

\* /lsof-4-92-1-zip/lsof-4.92.1/dialects/freebsd/dzfs.h

\* /lsof-4-92-1-zip/lsof-4.92.1/util.c

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\* /lsof-4-92-1-zip/lsof-4.92.1/usage.c

\* /lsof-4-92-1-zip/lsof-4.92.1/lib/ckkv.c

\* /lsof-4-92-1-zip/lsof-4.92.1/NEW/usage.c

\* /lsof-4-92-1-zip/lsof-4.92.1/dialects/uw/dnode3.c

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\* /lsof-4-92-1-zip/lsof-4.92.1/tests/LsofTest.h

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```

*
*
4. This notice may not be removed or altered.
*/
/*
* GetOpt() -- Local get option
*
* Borrowed from lsof's main.c source file.
*
* Liberally adapted from the public domain AT&T getopt() source,
* distributed at the 1985 UNIFORM conference in Dallas
*
* The modifications allow '?' to be an option character and allow
* the caller to decide that an option that may be followed by a
* value doesn't have one -- e.g., has a default instead.
*/

```

Found in path(s):

\* /lsof-4-92-1-zip/lsof-4.92.1/tests/LTlib.c

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## Making and Installing Lsof 4

```

*****
| The latest release of lsof is always available via anonymous ftp |
| from lsof.itap.purdue.edu. Look in pub/tools/unix/lsof.      |
*****

```

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=====  
Pre-built Lsof Binaries  
=====

Avoid using pre-built lsof binaries if you can; build your own instead.

I do not support lsof binaries built and packaged by third parties nor lsof binaries built from anything but the latest lsof revision. (See the Bug Reports section for more information on

the details of lsof support.)

One important reason for those support restrictions is that when lsof is built its Configure script tunes lsof to the features available on the building system, often embodied in supporting header files and libraries. If the building system doesn't have support for a particular feature, lsof won't be built to support the feature on any system.

The Veritas VxFS file system is a good example of a feature that requires build-time support.

UNIX dialect version differences -- Solaris 8 versus 9, AIX 4.3.3 versus 5.2, etc. -- can also render a pre-built lsof binary useless on a different version. So can kernel bit size.

There are so many potential pitfalls to using an lsof binary improperly that I strongly recommend lsof be used only where it is built.

=====  
Making Lsof  
=====

```
$ cd <lsof source directory>
$ ./Configure <your dialect's abbreviation>
$ make
```

(Consult the 00FAQ and 00XCONFIG files of the lsof distribution for information about using make command invocations and environment variables to override lsof default Makefile strings.)

This lsof distribution can be used with many UNIX dialects. However, it must be configured specifically for each dialect. Configuration is done in three ways: 1) by changing definitions in the machine.h header file of the UNIX dialect of interest; 2) by defining environment variable values prior to calling Configure (see the 00XCONFIG file, the Environment Variables and Environment Variables Affecting the Configure Script sections of this file); and 3) by running the Configure shell script found in the top level of the distribution directory.

You may not need to change any machine.h definitions, but you might want to look at them anyway. Pay particular attention to the definitions that are discussed in the Security section of this

file. Please read that section.

The Configure script calls three other scripts in the lsof distribution: AFSConfig; Inventory; and Customize. The AFSConfig script is called for selected dialects (AIX, HP-UX, NEXTSTEP, and Solaris) to locate AFS header files and determine the AFS version. See The AFSConfig Script section of this file for more information.

The Inventory script checks the completeness of the lsof distribution. Configure calls Inventory after it has accepted the dialect abbreviation, but before it configures the top-level directory for the dialect. See The Inventory Script section of this file for more information.

Configure calls the Customize script after it has configured the top-level lsof directory for the declared dialect. Customize helps you modify some of the important compile-time definitions of machine.h. See the The Customize Script section.

You should also think about where you will install lsof and its man page, and whom you will let execute lsof. Please read the Installing Lsof section of this file for information on installation considerations.

Once you have inspected the machine.h file for the dialect for which you want to build lsof, and made any changes you need, run the Configure script, supplying it with the abbreviation for the dialect. (See the following table.) Configure selects the appropriate options for the dialect and runs the Mksrc shell script in the dialect sub-directory to construct the appropriate source files in the top-level distribution directory.

Configure may also run the MkKernOpts script in the dialect sub-directory to propagate kernel build options to the dialect Makefile. This is done for only a few dialects -- e.g., DC/OSx, and Reliant UNIX.

Configure creates a dialect-specific Makefile. You may want to inspect or edit this Makefile to make it conform to local conventions. If you want the Makefile to install lsof and its man page, you will have to create an appropriate install rule.

Lsof may be configured using UNIX dialect abbreviations from the following table. Alternative abbreviations are indicated by a separating `|'. For example, for

SCO OpenServer you can use either  
the ``osr" or the ``sco" abbreviation:

\$ Configure osr  
or  
\$ Configure sco

#### Abbreviations UNIX Dialect

-----

aix IBM AIX 5.[23] and 5.3-ML1 using IBM's C Compiler  
aixgcc IBM AIX 5.[12] and 5.3-ML1 using gcc  
darwin Apple Darwin 7.x and 8.x for Power Macintosh systems  
decosf DEC OSF/1, Digital UNIX, Tru64 UNIX 4.0 and 5.1  
digital\_unix Digital UNIX, DEC OSF/1, Tru64 UNIX 4.0 and 5.1  
du Digital UNIX, DEC OSF/1, Tru64 UNIX 4.0 and 5.1  
freebsd FreeBSD 4.x, 4.1x, 5.x and [67].x  
hpux HP-UX 11.00, 11.11 and 11.23, using HP's C  
Compiler, both /dev/kmem-based and PSTAT-based  
hpuxgcc HP-UX 11.00, 11.11 and 11.23, using gcc, both  
/dev/kmem-based and PSTAT-based  
linux Linux 2.1.72 and above for x86-based systems  
netbsd NetBSD 1.[456], 2.x and 3.x  
next NEXTSTEP 3.[13]  
nextstep NEXTSTEP 3.[13]  
ns NEXTSTEP 3.[13]  
nxt NEXTSTEP 3.[13]  
openbsd OpenBSD  
2.[89] and 3.[0-9]  
openstep OPENSTEP 4.x  
os OPENSTEP 4.x  
osr SCO OpenServer Release 5.0.6, using the C compiler  
from the SCO developer's kit  
osrgcc SCO OpenServer Release 5.0.6, using gcc  
osr6 SCO Openserver 6.0.0, using the SCO C compiler  
sco SCO OpenServer Release 5.0.6, using the C compiler  
from the SCO developer's kit  
scogcc SCO OpenServer Release 5.0.6, using gcc  
solaris Solaris 2.x, 7, 8, 9 and 10 using gcc  
solariscs Solaris 2.x, 7, 8, 9 and 10 using Sun's cc  
tru64 Tru64 UNIX, DEC OSF/1, Digital UNIX 4.0 and 5.1  
unixware SCO|Caldera UnixWare 7.1.4  
uw SCO|Caldera UnixWare 7.1.4

If you have an earlier version of a dialect not named in the above  
list, lsof may still work on your system. I have no way of testing  
that myself. Try configuring for the named dialect -- e.g., if  
you're using Solaris 2.1, try configuring for Solaris 2.5.1.

After you have configured lsof for your UNIX dialect and have selected options via the Customize script (See the The Customize Script section.) , use the make command to build lsof -- e.g.,

```
$ make
```

#### Other Configure Script Options

=====

There are three other useful options to the Configure script besides the dialect abbreviation:

-clean      may be specified to remove all traces of a dialect configuration, including the Makefile, symbolic links, and library files.

-h            may be specified to obtain a list of  
-help    Configure options, including dialect abbreviations.

-n            may be specified to stop the Configure script from calling the Customize and Inventory scripts.

Caution: -n also suppresses the AFSConfig step.

#### Environment Variables

=====

Lsof configuration, building, and execution may be affected by environment variable settings. See the Definitions That Affect Compilation section in the 00PORTING file, the General Environment Variables section in the 00XCONFIG file, the Dialect-Specific Environment Variables section in the 00XCONFIG file, and the Environment Variables Affecting the Configure Script section of this file for more information.

Note in the General Environment Variables section of the 00XCONFIG file that there are five environment variables that can be used to pre-define values in lsof's -v output: LSOF\_BLDGMT, LSOF\_HOST, LSOF\_LOGNAME, LSOF\_SYSINFO, and LSOF\_USER.

## Security

=====

If the symbol `HASSECURITY` is defined, a security mode is enabled, and `lsof` will allow only the root user to list all open files.

Non-root users may list only open files whose processes have the same user ID as the real user ID of the `lsof` process (the one that its user logged on with).

However, if `HASNOSOCKSECURITY` is also defined, anyone may list anyone else's open socket files, provided their listing is enabled with the `"-i"` option.

`lsof` is distributed with the security mode disabled -- `HASSECURITY` is not defined. (When `HASSECURITY` is not defined, the definition of `HASNOSOCKSECURITY` has no meaning.) You can enable the security mode by defining `HASSECURITY` in the Makefile or in the `machine.h` header file for the specific dialect you're using -- e.g. `dialects/aix/machine.h`.

The `Customize` script, run by `Configure` when it has finished its work, gives you the opportunity to define `HASSECURITY` and `HASNOSOCKSECURITY`. (See the `The Customize Script` section.)

The `lsof -h` output indicates the state `HASSECURITY` and `HASNOSOCKSECURITY` had when `lsof` was built, reporting:

```
"Only root can list all files;"
if HASSECURITY was defined and HASNOSOCKSECURITY wasn't
defined;
```

```
"Only root can list all files, but anyone can list socket files."
if HASSECURITY and HASNOSOCKSECURITY were both defined;
```

```
"Anyone can list all files;"
if HASSECURITY wasn't defined. (The definition of
HASNOSOCKSECURITY doesn't matter when HASSECURITY isn't
defined.)
```

You should carefully consider the implications of using the default security mode.

When `lsof` is compiled in the absence of the `HASSECURITY` definition, anyone who can execute `lsof` may be able to see the presence of all open files. This may allow the `lsof` user to observe open files -- e.g., log files used to track intrusions

-- whose presence you would rather not disclose.

As distributed, lsof writes a user-readable and user-writable device cache file in the home directory of the real user ID executing lsof. There are other options for constructing the device cache file path, and they each have security implications.

The 00DCACHE file in the lsof distribution discusses device cache file path construction in great detail. It tells how to disable the various device cache file path options, or how to disable the entire device cache file feature by removing the HASDCACHE definition from the dialect's machine.h file. There is also information on the device cache file feature in the 00FAQ file. (The 00DCACHE and 00FAQ files are part of the lsof distribution package.)

The

Customize script, run by Configure after it has finished its work, gives you the opportunity to change the compile-time options related to the device cache file. (See The Customize Script section.)

Since lsof may need setgid or setuid-root permission (See the Setgid Lsof Dialects and Setuid-root Lsof Dialects sections.), its security should always be viewed with skepticism. Lest the setgid and setuid-root permissions allow lsof to read kernel name list or memory files, declared with the -k and -m options, that the lsof user can't normally access, lsof uses access(2) to establish its real user's authority to read such files when it can't surrender its power before opening them. This change was added at the suggestion of Tim Ramsey.

Lsof surrenders setgid permission on most dialects when it has gained access to the kernel's memory devices. There are exceptions to this rule, and some lsof implementations need to run setuid-root. (The Setgid Lsof Dialects and Setuid-root Lsof Dialects sections contains a list of lsof implementations and the permissions recommended in the distribution's Makefiles.)

The surrendering of setgid permission is controlled by the WILLDROPID definition in the dialect machine.h header files.

In the end you must judge for yourself and your installation the risks that lsof presents and restrict access to it according to your circumstances and judgement.

Run-time Warnings

=====

Lsof can issue warning messages when it runs -- e.g., about the state of the device cache file, about an inability to access an NFS file system, etc. Issuance of warnings are enabled by default in the lsof distribution.

Issuance of warnings may be disabled by default by defining WARNINGSTATE in the dialect's machine.h. The Customize script may also be used to change the default warning message issuance state. (See The Customize Script section.)

The ``-w" option description of the ``-h" option (help) output will indicate the default warning issuance state. Whatever the state may be, it can be reversed with ``-w".

#### Device Access Warnings

=====

When lsof encounters a /dev (or /devices) directory, one of its sub-directories, or one of their files that it cannot access with opendir(3) or stat(2), it issues a warning message and continues. Lsof will be more likely to issue such a warning when it has been installed with setgid(<some group name>) permission; it won't have trouble if it has been installed with setuid(root) permission or is being run under the root login.

The lsof caller can inhibit or enable the warning with the -w option, depending on the issuance state of run-time warnings. (See the Run-time Warnings section.)

The warning messages do not appear when lsof obtains device information from a device cache file that it has built and believes to be current or when warning message issuance is disabled by default. (See the "Caches -- Name and Device" section for more information on the device cache file.)

The lsof builder can inhibit the warning by disabling the definition of WARNDEVACCESS in the dialect's machine.h or disable all warnings by defining WARNINGSTATE. WARNDEVACCESS is defined by default for most dialects. However, some dialects have some device directory elements that are private -- e.g., HP-UX -- and it is more convenient for the lsof user if warning messages about them are inhibited.

Output from lsof's -h option indicates the status of WARNDEVACCESS.



If it was defined when lsof was compiled, this message will appear:

```
/dev warnings = enabled
```

If WARNDVACCESS was not defined when lsof was compiled, this message will appear instead:

```
/dev warnings = disabled
```

The Customize script, run by Configure after it has finished its work, gives you the opportunity to change the WARNDVACCESS definition. (See The Customize Script section.)

## NFS Blocks

=====

Lsof is susceptible to NFS blocks when it tries to lstat() mounted file systems and when it does further processing -- lstat() and readlink() -- on its optional file and file system arguments.

Lsof tries to avoid being stopped completely by NFS blocks by doing the lstat() and readlink() functions in a child process, which returns the function response via a pipe. The lsof parent limits the wait for data to arrive in the pipe with a SIGALRM, and, if the alarm trips, terminates the child process with a SIGINT and a SIGKILL.

This is as reliable and portable a method for breaking NFS deadlocks as I have found, although it still fails under some combinations of NFS version, UNIX dialect, and NFS file system mount options. It generally succeeds when the "intr" or "soft" mount options are used; it generally fails when the "hard" mount option is used.

When lsof cannot kill the child process, a second timeout causes it to stop waiting for the killed child to complete. While the second timeout allows lsof to complete, it may leave behind a hung child process. Unless warnings are inhibited by default or with the -w option, lsof reports the possible hung child.

NFS block handling was updated with suggestions made by Andreas Stolcke. Andreas suggested using the alternate device numbers that appear in the mount tables of some dialects when it is not possible to stat(2) the mount points.

The -b option was added to direct lsof to avoid the stat(2) and

readlink(2) calls that might block on NFS mount points and always use the alternate device numbers. If warning message issuance is enabled and you don't want warning messages about what lsof is doing, use the -w option, too.

The -O option directs lsof to avoid doing the potentially blocking operations in child processes. Instead, when -O is specified, lsof does them directly. While this consumes far less system overhead, it can cause lsof to hang, so I advise you to use -O sparingly.

#### Caches -- Name and Device

=====

Robert Ehrlich suggested that lsof obtain path name components for open files from the kernel's name cache. Where possible, lsof dialect implementations do that. The -C option inhibits kernel name cache examination.

Since AFS apparently does not use the kernel's name cache, where lsof supports AFS it is unable to identify AFS files with path name components.

Robert also suggested that lsof cache the information it obtains via stat(2) for nodes in /dev (or /devices) to reduce subsequent running time. Lsof does that, too.

In the default distribution the device cache file is stored in .lsof\_hostname, mode 0600, in the home directory of the login of the user ID that executes lsof. The suffix, hostname, is the first component of the host's name returned by gethostname(2). If lsof is executed by a user ID whose home directory is NFS-mounted from several hosts, the user ID's home directory may collect several device cache files, one for each host from which it was executed.

Lsof senses accidental or malicious damage to the device cache file with extensive integrity checks, including the use of a 16 bit CRC. It also tries to sense changes in /dev (or /devices) that indicate the device cache file is out of date.

There are other options for forming the device cache file path. Methods the lsof builder can use to control and employ them are documented in the separate 00DCACHE file of the lsof distribution.

#### Raw Sockets

=====

On many UNIX systems raw sockets use a separate network control block structure. Display of files for applications using raw sockets -- ping, using ICMP, for example -- need special support for displaying their information. This support is so dialect-specific and information to provide it so difficult to find that not all dialect revisions of lsof handle raw sockets completely.

#### Other Compile-time Definitions

=====

The machine.h and dlsof.h header files for each dialect contains definitions that affect the compilation of lsof. Check the Definitions That Affect Compilation section of the 00PORTING file of the lsof distribution for their descriptions. (Also see The Customize Script section.)

#### The AFSConfig Script

=====

Lsof supports AFS on some combinations of UNIX dialect and AFS version. See the AFS section of this document for a list of supported combinations.

When configuring for dialects where AFS is supported, the Configure script calls the AFSConfig script to determine the location of AFS header files and the AFS version. Configure will not call AFSConfig, even for the selected dialects, unless the file /usr/vice/etc/ThisCell exists.

The AFS header file location is recorded in the AFSHeaders file; version, AFSVersion. Once these values have been recorded, Configure can be told to skip the calling of AFSConfig by specifying its (Configure's) -n option.

#### The Inventory Script

=====

The lsof distribution contains a script, called Inventory, that checks the distribution for completeness. It uses the file 00MANIFEST in the distribution as a reference point.

After the Configure script has accepted the dialect abbreviation, it normally calls the Inventory script to make sure the distribution is complete.

After Inventory has run, it creates the file ".ck00MAN" in the top-level directory to record for itself the fact that the inventory has been check. Should Inventory be called again, it senses this file and asks the caller if another check is in order, or if the check should be skipped.

The -n option may be supplied to Configure to make it bypass the calling of the Inventory script. (The option also causes Configure to avoid calling the Customize script.)

The lsof power user may want to define (touch) the file ".neverInv". Configure avoids calling the Inventory script when ".neverInv" exists.

#### The Customize Script

=====

Normally when the Configure script has finished its work, it calls another shell script in the lsof distribution called Customize. (You can tell Configure to bypass Customize with its -n option.)

Customize leads you through the specification of these important compile-time definitions for the dialect's machine.h header file:

HASDCACHE device cache file control  
HASENVDC device cache file environment  
variable name  
HASPERSDC personal device cache file path  
format  
HASPERSDCPATH name of environment variable that  
provides an additional component  
of the personal device cache file  
path  
HASSYSDC system-wide device cache file path  
HASKERNIDCK the build-time to run-time kernel  
identity check  
HASSECURITY the security option  
HASNOSOCKSECURITY the open socket listing option whe  
HASSECURITY is defined  
WARNDEVACCESS /dev (or /devices) warning message  
control  
WARNINGSTATE warning message issuance state

The Customize script accompanies its prompting for entry of new values for these definitions with brief descriptions of each of them. More information on these definitions may be found in this file or in the 00DCACHE and 00FAQ files of the lsof distribution.

You don't need to run Customize after Configure. You can run it later or you can edit machine.h directly.

The -n option may be supplied to Configure to make it bypass the calling of the Customize script. (The option also causes Configure to avoid calling the Inventory script.)

The lsof power user may want to define (touch) the file ".neverCust". Configure avoids calling the Customize script when ".neverCust" exists.

Customize CAUTION: the Customize script works best when it is applied to a newly configured lsof source base -- i.e., the machine.h header file has not been previously modified by the Customize script. If you have previously configured lsof, and want to rerun the Customize script, I recommend you clean out the previous configuration and create a new one:

```
$ Configure -clean
$ Configure <dialect_abbreviation>
...
Customize in response to the Customize script prompts.
```

Cautions  
=====

Lsof is a tool that is closely tied to the UNIX operating system version. It uses header files that describe kernel structures and reads kernel structures that typically change from OS version to OS version, and even within a version as vendor patches are applied.

DON'T TRY TO USE AN LSOFF BINARY, COMPILED FOR ONE UNIX OS VERSION, ON ANOTHER. VENDOR PATCHES INFLUENCE THE VERSION IDENTITY.

On some UNIX dialects lsof versions may be even more restricted by architecture type.

The bottom line is use lsof where you built it. If you intend to use a common lsof binary on multiple systems, make sure all systems

run exactly the same OS version and have exactly the same patches.

## Warranty

=====

Lsof is provided as-is without any warranty of any kind, either expressed or implied, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. The entire risk as to the quality and performance of lsof is with you. Should lsof prove defective, you assume the cost of all necessary servicing, repair, or correction.

## License

=====

Lsof has no license. Its use and distribution are subject to these terms and conditions, found in each lsof source file. (The copyright year in or format of the notice may vary slightly.)

/\*

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\*

\* Written by Victor A. Abell

\*

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## Bug Reports

=====

Now that the obligatory disclaimer is out of the way, let me hasten to add that I accept lsof bug reports and try hard to respond to them. I will also consider and discuss requests for new features, ports to new dialects, or ports to new OS versions.

PLEASE DON'T SEND BUG REPORTS ABOUT LSOF TO THE UNIX DIALECT OR DIALECT OPTION VENDOR.

At worst such bug reports will confuse the vendor; at best, the vendor will forward the bug report to me.

PLEASE DON'T SEND BUG REPORTS ABOUT LSOF BINARIES BUILT OR DISTRIBUTED BY SOMEONE ELSE, BECAUSE I CAN'T SUPPORT THEM.

Before you send me a bug report,  
please do these things:

- \* Make sure you try the latest lsof revision.

- + Download the latest revision from:

<ftp://lsof.itap.purdue.edu/pub/tools/unix/lsof>

- + Verify the signatures of what you have downloaded;

- + While connected to lsof.itap.purdue.edu, check for patches:

<ftp://lsof.itap.purdue.edu/pub/tools/unix/lsof/patches>

- + If patches exist, install them in the latest revision you just downloaded. Then build the latest revision and see if it fixes your bug.

- \* If you're having trouble compiling lsof with gcc, try the UNIX dialect vendor's compiler. I don't have access to gcc on all test systems, so my support for it is hit-and-miss, and so is my ability to respond to gcc compilation problem reports.

- \* Check the lsof frequently asked questions file, 00FAQ, to see if there's a question and answer relevant to your problem.

\* Make sure you're running the lsof you think you are by checking the path to it with `which(1)`. When in doubt, use an absolute path to lsof. Make sure that lsof binary has sufficient permissions to do what you ask, including internal permissions given it (e.g., restrictions on what files lsof may report for whom) during its build.

When you send a bug report, make sure you include output from your running of lsof's Configure script. If you were able to compile a running lsof, please also include:

- \* Output from `which(1)` that shows the absolute path to the lsof binary in question;
- \* Output from running lsof with its `-h` and `-v` options at lsof's absolute path;
- \* Output from `"ls -l"` directed to lsof's absolute path.

If you weren't able to compile a running lsof, please send me: the compiler error output; identification of the lsof revision you're using (contents of the lsof version.c file); identification of your system (full `uname` output or output from whatever other tool identifies the system); and compiler identification (e.g., `gcc -v` output).

Either set of output will help me understand how lsof was configured and what UNIX dialect and lsof revision is involved.

Please send all bug reports, requests, etc. to me via e-mail at [<abe@purdue.edu>](mailto:abe@purdue.edu). Make sure "lsof" appears in the "Subject:" line so my e-mail filter won't classify your letter as Spam.

#### The 00FAQ File

=====

The lsof distribution contains an extensive frequently asked questions file on lsof features and problems. I recommend you consult it before sending me e-mail. Use your favorite editor or pager to search 00FAQ -- e.g., supplying as a search argument some fixed text from an lsof error message.

#### The lsof-l Mailing List

=====



Information about lsof, including notices about the availability of new revisions, may be found in mailings of the lsof-l listserv. For more information about it, including instructions on how to subscribe, read the 00LSOF-L file of the lsof distribution.

#### Field Output Example Scripts

=====

Example AWK and Perl 4 or 5 scripts for post-processing lsof field output are located in the scripts sub-directory of the lsof distribution. The scripts sub-directory contains a 00README file with information about the scripts.

#### Field Output C Library

=====

The lsof test suite (See "Testing Lsof."), checks basic lsof operations using field output. The test suite has its own library of C functions for common test program operations, including processing of field output. The library or selections of its functions could be adapted for use by C programs that want to process lsof field output. See the library in the file LTlib.c in the tests/ sub-directory

#### Testing Lsof

=====

Lsof has an automated test suite in the tests/ sub-directory that can be used to test some basic lsof features -- once lsof has been configured and made. Tests are arranged in three groups: basic tests that should run on all dialects; standard tests that should run on all dialects; and optional tests that may not run on all dialects or may need special resources to run. See 00TEST for more information.)

CAUTION!!! Before you attempt to use the test suite make sure that the lsof you want to test can access the necessary kernel resources -- e.g., /dev/mem, /dev/kmem, /proc, etc. Usually you want to test the lsof you just built, so this is an important check. (See 00TEST.)

To run the basic and standard tests, using the lsof in the parent

directory of tests/, do this:

```
$ cd tests
$ make test
  or $ make std
  or $ make standard
```

The basic and standard tests may be run as silently as possible, using the lsof in the parent directory of tests/, with:

```
$ cd tests
$ make auto
```

This is the "automatic" test mode, designed for use by scripts that build lsof. The caller is expected to test the make exit code to determine if the tests succeeded. The caller should divert standard output and standard error to /dev/null to suppress make's error exit message.

The optional tests may be run, using the lsof in the parent directory of tests/, with:

```
$ cd tests
$ make opt
  or $ make optional
```

It's possible to execute individual tests, too. See the 00TEST file of this distribution for more information on the tests, what they do, and how to run and possibly customize each test.

It's possible to run the tests, using an lsof other than the one in the parent directory of /tests, too. See 00TEST for information about using the LT\_LSOF\_PATH environment variable to do that.

```
=====
Dialect Notes
=====
```

```
AFS
===
```

Lsof recognizes AFS files on the following combinations of UNIX dialect and AFS versions:

AIX 4.1.4 (AFS 3.4a)

Linux 1.2.13 (AFS 3.3)  
NEXTSTEP 3.2 (AFS 3.3) (untested on recent lsof revisions)  
Solaris 2.6 (AFS 3.4a)  
Ultrix 4.2 RISC (AFS 3.2b) (no longer available)

Lsof has not been tested under other combinations -- e.g. HP-UX  
10.10 and AFS 3.4a  
-- and probably won't even compile there. Often  
when a UNIX dialect version or AFS version changes, the new header  
files come into conflict, causing compiler objections.

AIX  
===

Specify the aix Configure abbreviation for AIX 4.1.[45], 4.2[.1],  
4.3[.123], 5L, and 5.[123].

Specify aixgcc on AIX above 4.1 to use the gcc compiler. (Gcc can't be  
used to compile lsof on AIX 4.1 and below because of kernel structure  
alignment differences between it and xlc.) Gcc results sometimes  
depend on the version of the gcc compiler that is used.

Compilation of lsof with gcc on AIX 4.3[.123], 5L, and 5.[123] has been  
sparsely tested with varying degrees of success: it has been reported  
to succeed on AIX 4.3.3 and 32 bit Power AIX 5.1; to fail on ia64 AIX  
5.1 and 64 bit Power AIX 5.1; and to succeed on 32 and 64 bit Power AIX  
5.2. Lsof compilation with gcc hasn't been tested on AIX 5.3.

At revision 4.61 and above lsof is configured and built to match the  
bit size of the kernel of Power architecture  
AIX 5.1 systems. Lsof  
binaries built for 32 and 64 bit kernels are not interchangeable. See  
00FAQ for more information.

The Configure script uses /usr/bin/oslevel to determine the AIX version  
for AIX less than 5 and ``uname -rv" for AIX 5 and higher. If  
/usr/bin/oslevel isn't executable on AIX less than 5, the Configure  
script issues a warning message and uses ``uname -rv" to determine the  
AIX version.

When Configure must use ``uname -rv" on AIX less than 5 to determine  
the AIX version, the result will lack a correct third component --  
e.g., the `4' of ``4.1.4". If your AIX less than 5 system lacks  
an executable oslevel, I suggest you edit the Configure-produced  
Makefile and complete the \_AIXV definition in the CFGF string.

By default lsof avoids using the kernel's readx() function, causing

it to be unable to report information on some text and library file references. The ``-X" option allows the lsof user to ask for the information readx() supplies.

Lsof avoids

readx() to avoid the possibility of triggering a kernel problem, known as the Stale Segment ID kernel bug. Kevin Ruderman reported this bug to me. The bug shows up when the kernel's dir\_search() function hangs, hanging the application process that called it so completely that the application process can neither be killed nor stopped. The hang is the consequence of another process (perhaps lsof) making legitimate use of the kernel's readx() function to access the kernel memory that dir\_search() is examining. IBM has indicated they have no plans to fix the bug.

A fuller discussion of this bug may be found in the 00FAQ file of the lsof distribution. There you will find a description of the Stale Segment ID bug, the APAR on it, and a discussion of the sequence of events that exposes it.

I added the ``-X" function so you can tell lsof to use readx(), but if you use ``-X", you should be alert to its possibly serious side effects. Although readx() is normally disabled, its state is controlled with the HASXOPT, HASXOPT\_ROOT, and HASXOPT\_VALUE definitions in dialects/aix/machine.h, and you can change its default state by changing those definitions. You can also change HASXOPT\_ROOT via the Customize script.

You can also compile lsof with readx() use permanently enabled or disabled -- see the comments about the definitions in the dialects/aix/machine.h header file. You may want to permanently disable lsof's use of readx() if you plan to make lsof publicly executable. You can also restrict -X to processes whose real UID is root by defining HASXOPT\_ROOT.

I have never seen lsof cause the Stale Segment ID bug to occur and haven't had a report that it has, but I believe there is a possibility it could.

AFS support for AIX was added with help from Bob Cook and Jan Tax who provided test systems.

Henry Grebler and David J. Wilson helped with lsof for AIX 4.2.

Bill Pemberton provided an AIX 4.3 test system. Andrew Kephart and Tom Weaver provided AIX 4.3 technical

assistance. Niklas Edmundsson did 4.3.1 testing. Doug Crabill provided an AIX 4.3.2 test system. Jeff W. Stewart provided an AIX 4.3.3 test system.

The SMT file type for AIX 4.1.[45], 4.2[.1], and 4.3[.12] is my fabrication. See the 00FAQ file more information on it.

Loc Le and Nasser Momtaheni of IBM provided test systems for AIX 5L and 5.1. Lsof for AIX 5L and 5.1 needs setuid-root permission to process the -X option on systems whose architecture type is ia64.

Dale Talcott of Purdue provided AIX 5.1 and 5.2 test systems. Dale and John Jackson of Purdue provided an AIX 5.3 test system.

#### Apple Darwin =====

The Apple Darwin port was provided by Allan Nathanson for version 1.2. Allan also arranged for access to a test system for maintenance and regression testing. Dale Talcott provided a test system, too.

Allan supplied patches for updates to 1.4, 5.x, 6.x, 7.x and 8.x.

#### BSDI BSD/OS =====

As of lsof revision 4.77 support for BSDI BSD/OS has been discontinued.

Lsof revision 4.76 with BSDI BSD/OS support may be found on [lsof.itap.purdue.edu](http://lsof.itap.purdue.edu) in `pub/tools/unix/lsof/src`.

#### DEC OSF/1, Digital UNIX, Tru64 UNIX =====

Robert Benites, Dean Brock, Angel Li, Dwight McKay, Berkley Shands, Ron Young and Steve Wilson have kindly provided test systems. Jeffrey Mogul has provided technical assistance. Dave Morrison and Lawrence MacIntyre did Digital UNIX V3.2 testing.

Lsof supports the ADVFS/MSFS layered file system product. Lsof can locate all the open files of an ADVFS/MSFS file system when its path is specified, provided the file system is listed in `/etc/fstab` with an ```advfs"` type. (This `/etc/fstab` caveat applies only to Digital UNIX 2.0.) At Digital UNIX 4.0 and Tru64 UNIX, using code provided by David Brock, lsof 4.20 and above can locate

ADVFS file paths.

Testing of lsof on DEC OSF/1 and Digital UNIX 4.0 ended with lsof revision 4.74. Hence, the lsof documentation has dropped the claim that it works there.

For a distribution of lsof 4.74 that was tested on DEC OSF/1 and Digital UNIX 4.0, check `pub/tools/unix/lsof/OLD/src` on the lsof ftp home, `lsof.itap.purdue.edu`.

Lsof revisions past 4.74 have only been tested on Tru64 UNIX 5.1.

## FreeBSD

=====

Bill Bormann of Purdue University provided access to several FreeBSD test systems. Ade Barkah, John Clear, Ralph Forsythe, Michael Haro, Kurt Jaeger, and William McVey have also provided FreeBSD test systems.

The FreeBSD distribution header files are augmented by header files in the `dialects/freebsd/include` directory.

Larry Rosenman maintains the lsof FreeBSD port package.

## HP-UX

=====

Lsof has two HP-UX bases: `/dev/kmem` for HP-UX 11.0 and earlier; and `PSTAT` for HP-UX 11.11 and later. The lsof Configure script will pick the appropriate base.

To use the CCITT x.25 socket support for HP-UX, you must have the x.25 header files in `/etc/conf/x25`

Pasi Kaara helped with the HP-UX port, especially with its CCITT x.25 socket support.

## Richard

Allen provided HP-UX 10.x and 11.x test systems, as did Mark Bixby, and Elias Halldor Agustsson. Marc Winkler helped test the 10.20 port. Richard J. Rauenzahn provided a 64 bit HP-UX 11 test system and an HP-UX 11.11 development system.

AFS support for HP-UX was added thanks to help from Chaskiel Moses Grundman, who provided a test system.

The /dev/kmem-based HP-UX 11.00 support is extremely fragile. It depends on privately developed kernel structure definitions. (See ../dialects/hpux/hpux11 for the header files making the definitions.) Those header files and their definitions will not be updated by HP-UX 11.00 patches, making it likely that any patch changing a kernel structure critical to lsof will break lsof in some way.

It's possible to build a 64 bit lsof for 64 bit HP-UX 11.00 with gcc, but you must have a gcc compiler capable of producing 64 bit executables. See the 00FAQ file for more information.

The PSTAT-based lsof for HP-UX 11.11 and later is much more solid.

I

am indebted to the vision of HP for providing an lsof kernel API through the PSTAT implementation. Specifically I appreciate the help of HP staff members Carl Davidson, Louis Huemiller, Rich Rauenzahn, and Sailu Yallapragada that made PSTAT-based HP-UX lsof possible.

IPv6

====

Lsof has IPv6 support that has been tested for these UNIX dialects: AIX 4.3.x; Apple Darwin 5.[12] and 6.0; the INRIA and KAME FreeBSD IPv6 implementations; PSTAT-based HP-UX; /proc-based Linux; the INRIA and KAME NetBSD implementations; and Solaris 8 and 9. Lsof has IPv6 support that hasn't been tested for: OpenBSD (KAME); OpenUNIX 8; Tru64 Unix 5.[01]; and UnixWare 7.1.[34].

Please let me know if your UNIX dialect has IPv6 support and I'll see if it can be supported by lsof.

Linux

=====

Tim Korb, Steve Logue, Joseph J. Nuspl Jr., and Jonathan Sergent have provided Linux test systems.

Michael Shields helped add and test automatic handling of ELF/COFF form names in /System.map, Marty Leisner and Keith Parks have helped test many lsof revisions. Marty has provided valuable suggestions, Linux hints, and code, too.

The 00FAQ file gives some Linux tips, including information on coping with system map file problems.

To determine the state of the Linux 2.1.x C library lseek() function, the lsof Configure script runs a test program that must have permission to read /dev/kmem. The test determines if the lseek() function properly handles kernel offsets, which appear to be negative because their high order bit is set. If the lseek() test reveals a faulty lseek(), Configure activates the use of a private lseek() function for kernel offset positioning. See the Linux problems section of the 00FAQ file of the lsof distribution for more information.

## NetBSD

=====

Greg Earle and Paul Kranenburg have assisted with the NetBSD ports. Paul has provided test systems. Ray Phillips provided a NetBSD Alpha test system. Andrew Brown also provided a test system.

The NetBSD dialect version of lsof is compiled using the dialect sources it shares with OpenBSD in the n+obsd dialect sub-directory.

## NEXTSTEP and OPENSTEP

=====

Virtual memory header files that allow lsof to display text references were derived from the contents of /usr/include/vm of NEXTSTEP 2.0. NeXT did not ship the virtual memory header files with other NEXTSTEP or OPENSTEP versions.

You may use the RC\_FLAGS environment variable to declare compiler options outside the Makefile. A common use of this variable is to define the architecture types to be included in a "fat" executable. See the comments in dialects/next/Makefile for an example.

## OpenBSD

=====

David Mazieres has provided OpenBSD test systems. The OpenBSD dialect version of lsof is compiled using the dialect sources it shares with NetBSD in the n+obsd dialect sub-directory.

Kenneth Stailey has provided OpenBSD testing and advice.

John Dzubera (Zube) reports, "lsof 4.33 compiles and runs on OpenBSD



2.3 for the pmax architecture  
(decstation 3100)."

I have not tested lsof on OpenBSD 3.8, but David Mazieres reports  
revision 4.76 worked on OpenBSD 3.8.

#### Pyramid DC/OSx and Reliant UNIX

=====

As of lsof revision 4.52 support for all Pyramid dialects has been  
discontinued. Lsof revision 4.51 with Pyramid support may be  
obtained upon request. Send the request to [abe@purdue.edu](mailto:abe@purdue.edu).

These two UNIX dialects are very similar and share dialect-specific  
source files from the pyramid sub-directory.

The Reliant Unix Pyramid C compiler issues warning messages that  
I haven't found a convenient way to suppress. You can ignore  
warning messages about casts and conversions that lose bits. The  
message "warning: undefining \_\_STDC\_\_" is intentionally caused by  
the lsof MkKernOpts configuration script to suppress warning messages  
about cast and conversion problems in standard system header files,  
such as <stdio.h> and <string.h>.

Bruce Beare and Kevin Smith provided test systems.

#### Caldera OpenUNIX

=====

Larry

Rosenman provided an OpenUNIX 8 test system. Matthew Thurmaier  
provided technical assistance, along with these people from Caldera:  
Jack Craig, Robert Lipe, and Bela Lubkin.

Robert Lipe supplied changes to lsof for OpenUNIX 8.0.1. Those  
changes were also incorporated in UnixWare 7.1.3 when it became  
the release name for OpenUNIX 8.0.1.

Support for lsof on OpenUNIX ended at lsof revision 4.74. The last  
lsof revision, 4.74, tested on OpenUNIX, may be found at the lsof  
"home" ftp site, [lsof.itap.purdue.edu](ftp://lsof.itap.purdue.edu), in `pub/tools/unix/lsof/OLD/src`.

#### SCO OpenServer

=====

Dion Johnson, Bela Lubkin, and Nathan Peterson of SCO gave me copies of SCO OpenServer and the SCO OpenServer Development System 3.0 and provided technical advice for the lsof port.

Hugh Dickins, Bela Lubkin, Craig B. Olofson, and Nathan Peterson provided version 5.0 and gave technical advice for porting lsof to it. Bela provided the 5.0.4 changes. D. Chris Daniels provided a 5.0.4 test system, Lee Penn provided one for 5.0.5, and John Dubois for 5.0.6.

The <netdb.h> header file was accidentally omitted from some SCO OpenServer Development System releases. The Configure script will sense its absence and substitute an equivalent from the BSD distribution. The BSD <netdb.h> and the <sys/cdefs.h> header file it includes are located in the dialects/os/include sub-directory tree.

To compile lsof from its distribution sources you must have the TCP/IP and NSF headers in /usr/include. While those are optional OpenServer packages, I have access to no system that doesn't have them, so I'm unable to build lsof for such a configuration. However, it should be possible to modify the lsof Configure script and sources so lsof would compile and work without those optional packages.

If you have an OpenServer system configured without the TCP/IP and NFS packages, and want to tackle the job of building lsof for it, contact me via e-mail at <abe@purdue.edu>. I'll identify the Configure script, header file, and source file changes you will need to make. (Caution: this is not a simple task, or I would have already done it.)

The optional osrgcc and scogcc Configure abbreviations construct Makefiles for compiling lsof with gcc.

The UnixWare 7.1.4 sources are used for OpenServer Release 6.0.0. Hence there is a separate Configure abbreviation for it, "osr6". Richard of SCO provided a test system and technical assistance.

SCO|Caldera UnixWare  
=====

D. Chris Daniels, John Hughes, Ken Laing, Andrew Merril, Lee Penn, and Matthew Thurmaier provided test systems. Bela Lubkin provided technical assistance. Larry Rosenman provided 7.1.[34] test systems.

Solaris 2.x, 7, 8, 9 and 10

=====

SEE THE CAUTIONS SECTION OF THIS DOCUMENT.

The latest Solaris revision of lsof 4 might work under Solaris 2.[1-4] and 2.5[.1] and 7 but hasn't been tested there. I have no test systems for those Solaris versions.

Lsof will compile with gcc and the Sun C compiler under Solaris.

If you want to use the Sun compiler, use the solariscc Configure abbreviation. If you use a gcc version less than 2.8 on Solaris, make sure the gcc-specific includes have been updated for your version of Solaris -- i.e., run the gcc fixincludes script.

Solaris 7, 8, 9 and 10 support for 64 bit kernels depends on a Sun WorkShop or Forte C compiler version that supports the "-xarch=v9" flag -- usually 5.0 or greater. Gcc versions 2.95 and above \*may\* be configured and built for 64 bit support, but it takes some extra work, the resulting compiler may be fragile, and the gcc developers discourage it. I've built 64 bit capable gcc compilers for Solaris 7, 8 and 9 from gcc versions 2.95 through 3.0.1 and produced working lsof executables with them. More information on 64 bit gcc for Solaris may be found in the 00FAQ file.

Solaris 10 ZFS support is questionable, because Sun does not distribute the ZFS kernel structure definition header files. The lsof Configure script and source code use some risky work-arounds. ZFS file system support was made possible with help from Horst Scheuermann.

Dave Curry and Steve Kirsch provided resources for Solaris 2.x ports. Casper Dik and Gerry Singleton consulted and provided valuable assistance.

Henry Katz, Joseph Kowalski, Charles Stephens, Mike Sullivan, and Mike Tracy provided technical assistance.

AFS support was added to Solaris lsof with help from Curt Freeland, Heidi Hornstein, Michael L. Lewis, Terry McCoy, Phillip Moore, and Sushila R. Subramanian.

Casper Dik provided valuable assistance for the Solaris 8 support.

Sun has graciously provided me access to BETA versions of Solaris

2.5, 2.6, 7, 8, and 9.

John Dzuberá provided Solaris 7 and 8 test systems.

Mike Miscevic provided Solaris 10 test systems.

Ultrix

=====

As of lsof revision 4.52 support for Ultrix is no longer available, because I no longer have an Ultrix test system.

Terry Friedrichsen, Dwight McKay, and Jeffrey Mogul helped me with this port.

DECnet support was added to Ultrix lsof with the help of John Beacom, who kindly provided a test system. The Configure script decides that DECnet support is available if /usr/lib/libdnet.a and /usr/include/netdnet/dn.h exist and are readable.

Veritas VxFS and VxVM

=====

Lsof supports some versions of Veritas VxFS and VxVM on some UNIX dialects. Consult the lsof Configure script for the specific dialect, and consult the lsof dialect-specific source files for the UNIX dialect of interest. Veritas support will usually be found in a source file named dnode[1-9].c.

Since Veritas rarely has a version number that can be extracted with shell commands, lsof doesn't use it. Instead, when lsof supports Veritas, the Configure script will form compile-time definitions starting with HASVXFS. Check the lsof 00PORTING documentation file for more information.

Lsof Veritas support requires that the supporting Veritas header files be installed -- e.g., in /usr/include/sys/fs.

(The location will depend in the dialect's header file conventions.)

Some information on lsof support for Veritas extensions may be found in the lsof 00DIST file. (The ChangeLog file points to 00DIST.)

Chris Kordish and Andy Thomas have provided Solaris VxFS test

systems.

=====

## User-contributed Dialect Support

=====

There are some user-contributed dialect versions of lsof; more information on them can be found at:

<ftp://lsof.itap.purdue.edu/pub/tools/unix/lsof/contrib>

Check the 00INDEX file there for details.

=====

## Dialects No Longer Supported

=====

Because I don't have access to test systems, these UNIX dialects are no longer supported by lsof:

CDC EP/IX  
/dev/kmem-based Linux  
MIPS RISC/os  
Motorola V/88  
Pyramid DC/OSx  
Pyramid Reliant UNIX  
Sequent DYNIX  
SGI IRIX  
SunOS 4.x  
Ultrix  
UnixWare below 7.0

Remnants of the support lsof once provided for these dialects may be found in:

<ftp://lsof.itap.purdue.edu/pub/tools/unix/lsof/OLD/dialects>

=====

## Installing Lsof

=====

The distributed Makefiles do not have actions that will install lsof. I've come to the conclusion there is no standard for installing lsof or its man page, so I no longer distribute make rules for

installing them. You should adjust the Makefile for your local preferences.

The Makefile does have an install rule that will cause lsof to compile by virtue of its dependency clause. Some Makefiles also have a dependency that causes the production of a man page that is ready to install. However, the actions of the install rule will not cause the lsof executable or its man page to be installed in any UNIX system-wide directory.

Instead, after the compilation and optional man page production are completed, the install rule will produce a brief description of what actions you might add to the install rule. The description will suggest the possible modes, ownerships, permissions, and destinations your install rule might employ to install the lsof executable and man page.

As you form your install rule, keep in mind that lsof usually needs some type of special permission to do its job. That may be permission to read memory devices such as /dev/kmem, /dev/mem, or /dev/swap, or it may be authorization to read entries in the /proc file system.

Memory device access can usually be provided by setting the modes of the lsof executable so that its effective group identifier when it runs is the same as the group that has permission to read the memory devices -- i.e., it is setgid-group. The privileged group is usually kmem, sys, or system.

Don't overlook using ACLs -- e.g., on AIX or Solaris 8 -- to give lsof permission to access memory devices. ACLs, coupled to a separate group like kmem, can be safer than giving lsof setgid authorization to a commonly used system group.

When lsof needs to read /proc file system entries, it must be installed with modes that make its effective user identifier root when it runs -- i.e., it must be setuid-root. If lsof must be installed setuid-root (only the AIX 5L, PSTAT-based HP-UX, and /proc-based Linux, ports need such power.), then access to memory devices is automatic (or not needed in the case of /proc-based Linux).

Your choice of permissions for lsof may also be affected by your desire to allow anyone to use it or your need to restrict its usage to specific individuals. You will have to be guided by local policy and convention in this case.

The next two sections, Setgid Lsof Dialect Versions and Setuid-root Lsof Dialect Versions, list recommended install permissions.

The system directory where you install the lsof executable is also open to choice. A traditional place for a tool like lsof is /usr/local/etc, but recent changes in directory structure organization suggest that somewhere in /opt may be more suitable.

Bear one other factor in mind when choosing a location for the lsof executable -- it usually is a shared executable, requiring access to shared libraries. Thus, locations like /sbin or /usr/sbin are probably unsuitable.

Once you've chosen a location for the executable you may find that the location for the man page follows -- e.g., if the executable goes in /usr/local/etc, then the man page goes in /usr/local/man. If the executable location doesn't imply a location for the man page, you'll have to let local custom guide you.

#### Setuid-root Lsof Dialect Versions

=====

These dialect versions should be installed with setuid-root permission -- i.e., the lsof binary should be owned by root and its setuid execution bit (04000) should be set.

AIX 5L and above for full use of the -X option  
Apple Darwin 8.x for Power Macintosh systems  
PSTAT-based HP-UX 11.11 and 11.23  
/proc-based Linux (generally 2.1.72 and above)

#### Setgid Lsof Dialect Versions

=====

These dialect versions should be installed with setgid permission, owned by the group that can read kernel memory devices such as /dev/drum, /dev/kmem, /dev/ksyms, /dev/mem, /dev/swap. ACLs may be another mechanism (e.g., under AIX or Solaris 8) you can use to grant read permission to the kernel memory devices.

AIX 4.1.[45], 4.2[.1], and 4.3[.123]  
Apple Darwin 7.x for Power Macintosh systems  
DEC OSF/1, Digital UNIX, Tru64 UNIX 2.0, 3.2, 4.0, and 5.[01]  
FreeBSD 2.1.6, 2.2[.x], 3.x, 4.x, 5.x, [6789].x and 1[012].x

NetBSD 1.[456], 2.x and 3.x  
NEXTSTEP 3.[13]  
OpenBSD 2.[89] and 3.[0-9]  
OPENSTEP 4.x  
Caldera OpenUNIX 8  
SCO OpenServer 5.0.[46]  
SCO UnixWare 7.0 and 7.1.[0134]  
Solaris 2.6, 8, 9 and 10  
Ultrix 4.2 (no longer available)

=====  
Porting lsof 4 to a New UNIX Dialect  
=====

If you're brave enough to consider this, look at the 00PORTING file. Please contact me before you start. I might be able to help you or even do the port myself.

Don't overlook  
the contrib/ directory in pub/tools/unix/lsof on my  
ftp server, lsof.itap.purdue.edu. It contains user-contributed ports  
of lsof to dialects I don't distribute, because I can't test new  
revisions of lsof on them.

=====  
Quick Start to Using lsof  
=====

For information on how to get started quickly using lsof, consult the 00QUICKSTART file of the lsof distribution. It cuts past the formal density of the lsof man page to provide quick examples of using lsof to solve common open file display problems.

=====  
Cross-configuring Lsof  
=====

Using environment variables it is possible to Configure (and possibly build) lsof for one UNIX dialect on a different one -- e.g., you are running Configure on a Linux 2.3 system and you want to Configure and build lsof for Linux 2.4.

See the 00XCONFIG file of the lsof distribution for a discussion of how to do this.



=====  
Environment

Variables Affecting the Configure Script  
=====

Configure script actions can be modified by introducing values to the script via environment variables. In many cases the environment variable values take the place of test operations the Configure script makes.

For more information on environment variables that can affect Configure, consult the 00XCONFIG file of the lsof distribution. See the General Environment Variables sections for descriptions of ones that affect all dialects. Consult the Dialect-Specific Environment Variables section for ones that might affect the dialect you are trying to configure.

Vic Abell <abe@purdue.edu>

February 14, 2018

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\*  
\* @(#)netdb.h 5.15 (Berkeley) 4/3/91  
\*/

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\* /lsof-4.92-1-zip/lsof-4.92.1/dialects/osr/include/netdb.h

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/*
    * If this is a regular file with a non-numeric FD, it may be the
    * executable.
    */

```

Found in path(s):

```
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```
* /lsof-4-92-1-zip/lsof-4.92.1/tests/LTnfs.c
```

\* /lsof-4-92-1-zip/lsof-4.92.1/tests/LTsock.c  
\* /lsof-4-92-1-zip/lsof-4.92.1/tests/LTunix.c  
\* /lsof-4-92-1-zip/lsof-4.92.1/tests/LTlock.c  
\* /lsof-4-92-1-zip/lsof-4.92.1/tests/LTbigf.c  
\* /lsof-4-92-1-zip/lsof-4.92.1/tests/LTszoff.c  
\* /lsof-4-92-1-zip/lsof-4.92.1/tests/LTdnlc.c  
\* /lsof-4-92-1-zip/lsof-4.92.1/tests/LTnlink.c

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Found in path(s):

\* /lsof-4-92-1-zip/lsof-4.92.1/dialects/darwin/libproc/dlsof.h  
\* /lsof-4-92-1-zip/lsof-4.92.1/dialects/darwin/libproc/dfile.c

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Frequently Asked Questions about lsof

\*\*\*\*\*

| The latest release of lsof is always available via anonymous ftp |

| from lsof.itap.purdue.edu. Look in pub/lsof.README for its |  
| location. |

\*\*\*\*\*

---

This file contains frequently asked questions about lsof and answers to them.

Vic Abell <abe@purdue.edu>  
October 13, 2014

---

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16.2.3 Why does UnixWare 7.1.1 or above complain about -lcluster, node\_self(), or libcluster.so?

16.2.4 Why does UnixWare 7.1.1 or above lsof complain it can't read the kernel name list?

16.2.5 Why doesn't lsof report link count, node number, and size for some UnixWare 7.1.1 or above CFS files?

16.2.6 Why doesn't lsof report open files on all UnixWare 7.1.1 NonStop Cluster (NSC) nodes?

16.2.7 Why doesn't lsof report the UnixWare 7.1.1 NonStop Cluster (NSC) node a process is using?

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17.7 Why does Solaris lsof say "can't read proc table"?

17.8 Why does Solaris lsof complain about a bad cached clone device?

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17.11 Why does lsof Configure say "WARNING: no cc in ..."?

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17.12.3 How do I build lsof for a 64 bit Solaris kernel under a 32 bit Solaris kernel?

17.12.4 How do I install lsof for Solaris 7, 8 or 9?

17.12.5 Why does my Solaris 7, 8 or 9 system say it cannot execute lsof?

17.12.6 What gcc will produce 64 bit Solaris 7, 8 and 9 executables?

17.12.7 Why does lsof on my Solaris 7, 8 or 9 system say, "can't read namelist from /dev/ksyms?"

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device number?

17.14 Why don't lsof and Solaris pfiles reports always match?

17.15 Why does lsof say, "kvm\_open(namelist=default, core=default): Permission denied?"

17.16 Why is lsof slow on my busy Solaris UFS file system?

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17.18 Solaris and VxFS

17.18.1 Why doesn't lsof support VxFS 3.4 on Solaris 2.6, and above?

17.18.2 Why does lsof report "vx\_inode: vxfsu\_get\_iooffsets error" for open Solaris 2.6 and above VxFS 3.4 and above files?

17.18.3 Why does Solaris Configure claim there is no VxFS library?

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17.23 Solaris and SAM-FS

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17.23.2 Why can't lsof locate named SAM-FS files?

17.24 Lsof and Solaris 10 zones

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17.25.2 Why does Solaris 10 lsof sometimes report only the mounted-on directory and device?

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17.26 Solaris contract file problems

17.26.1 Why doesn't lsof report size, link count and node number for Solaris 10 contract files?

17.26.2 Why can't lsof locate a Solaris 10 contract file by path name?

17.27 Solaris 10 and above ZFS problems

17.27.1 Why does Configure warn that ZFS support is not enabled?

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17.28.1 Why does the compiler complain about lgrp\_root on Solaris 9 and above?



## 18.0 Lsof Features

18.1 Why doesn't lsof report on /proc entries on my system?

18.2 How do I disable the device cache file feature or alter its behavior?

18.2.1 What's the risk with a perverted device cache file?

18.2.2 How do I put the full host name in a personal device cache file path?

18.2.3 How do I put the personal device cache file in /tmp?

18.3 Why doesn't lsof know about AFS files on my favorite dialect?

18.3.1 Why doesn't lsof report node numbers for all AFS volume files, or how do I reveal dynamic module addresses to lsof?

---

## 1.0 General Concepts

### 1.1 Lsof -- what is it?

Lsof is a UNIX-specific tool. Its name stands for LiSt Open Files, and it does just that. It lists information about files that are open by the processes running on a UNIX system.

See the lsof man page, the 00DIST file, the 00QUICKSTART file, and the 00README file of the lsof distribution for more information.

### 1.2 Where do I get lsof?

Lsof is available via anonymous ftp from lsof.itap.purdue.edu. Look in the pub/tools/unix/lsof sub-directory.

`ftp://lsof.itap.purdue.edu/pub/tools/unix/lsof`

Bzip2'd, compressed and gzip'd tar files with GPG certificates are available.

#### 1.2.1 Are there mirror sites?

On March 21, 2013 these sites appeared to have the latest lsof revision:

`ftp://ftp.fu-berlin.de/pub/unix/tools/lsof`

`ftp://sunsite.ualberta.ca/pub/Mirror/lsof`

`http://www.mirrorservice.org/sites/lsof.itap.purdue.edu/pub/tools/unix/lsof/`

<ftp://ftp.mirrorservice.org/sites/lsof.itap.purdue.edu/pub/tools/unix/lsof/>  
<rsync://rsync.mirrorservice.org/lsof.itap.purdue.edu/pub/tools/unix/lsof/>

### 1.2.2 Are lsof executables available?

Some lsof executables are available in the subdirectory tree `pub/tools/unix/lsof/binaries`. These are neither guaranteed to be current nor cover every dialect and machine architecture.

I don't recommend you use pre-compiled lsof binaries; I recommend you obtain the sources and build your own binary. Even if you're a Sun user without a Sun C compiler, you can use gcc to compile lsof.

If you must use a binary file, please be conscious of the security and configuration implications in using an executable of unknown or different origin. The lsof binaries are accompanied by GPG certificates. Please use them!

Three additional cautions apply to executables:

1. Don't try to use an lsof executable, compiled for one version of a UNIX dialect, on another. Patches can make the dialect version different.
2. If you want to use an lsof binary on multiple systems, they must be running the same dialect OS version and have the same patches and feature support.

### 1.2.3 How do I check the validity of an lsof distribution?

There are two ways to check the validity of an lsof distribution:

1. Follow the instructions in the `CHECKSUMS_<revision>` file found with the lsof distribution.

Checking with GPG is the best method.

2. Follow the instructions in the "Security" section of the `README.lsof_<revision>` file found inside the lsof distribution.

Again, checking with GPG is the best method.

### 1.2.4 Why can't I get the sum(1) result reported in

README.lsof\_<revision>?

The "Security" section of the README.lsof\_<revision> file found inside the lsof distribution gives md5, sum, and GPG certificate information.

The simplest, the sum(1) signature, seems to be the trickiest. That's because there are different sum(1) methods, BSD systems usually have cksum(1) instead of sum(1), and different systems compute the block size value differently.

First, the lsof sum results are computed with the old, "alternate" algorithm. On newer systems, you can use sum's "-r" option to get that computation result.

Second, on BSD systems you usually must use cksum(1) instead of sum(1), because they have no sum(1). To tell cksum(1) to use the old, "alternate" algorithm, use its "-o1" option.

Third, the second value that sum reports, the block count, may be computed differently on different systems -- usually block size is considered to be 512 or 1,024. The lsof block counts were computed on a system with a sum(1) option that considers block size to be 512. The BSD system cksum(1) -o1 option considers block size to be 1,024. If your sum(1) or cksum(1) doesn't report a block count that matches the sum(1) signature given in README.lsof\_<revision>, check its man page to see what block size it uses, then adjust its reported block count appropriately.

#### 1.2.5 Why won't gpg accept the lsof-signing PGP public key?

An older PGP key that once signed lsof distributions is included in lsof revisions prior to 4.70. The PGP key is indeed my key, but is incompatible with GPG. It was created about ten years ago and is still acceptable to PGP versions 2.6.2 through 6.5.2.

Lsof revisions 4.70 and above are signed with a copy of my PGP key that has been made acceptable for use with GPG by importing it under GPG's "--allow-non-selfsigned-uid" option.

You can find my GPG compatible key in lsof revisions 4.70 and above and at:

[ftp://lsof.itap.purdue.edu/pub/Victor\\_A\\_Abell.gpg](ftp://lsof.itap.purdue.edu/pub/Victor_A_Abell.gpg)

If you have an older lsof revision with my PGP key, there are two possible ways to use it:

- \* Use it with a PGP version from 2.6.2 through 6.5.2.

- \* Use GPG's "--allow-non-selfsigned-uid" option when you import my PGP key into your GPG key ring.

```
$ gpg --allow-non-selfsigned-uid --import Victor_A_Abell.pgp
```

### 1.3 Where can I get more lsof documentation?

A significant set of documentation may be found in the lsof distribution (See "Where can I get lsof?"). There is a manual page, copious documentation in files whose names begin with 00, and a copy of this FAQ in the file 00FAQ (perhaps slightly less recent than this file if you're reading it via a web browser.)

Two URLs provide some documentation that appears in the lsof distribution:

FAQ: <ftp://lsof.itap.purdue.edu/pub/tools/unix/lsof/FAQ>

man page: [ftp://lsof.itap.purdue.edu/pub/tools/unix/lsof/lsof\\_man](ftp://lsof.itap.purdue.edu/pub/tools/unix/lsof/lsof_man)

### 1.4 How do I report an lsof bug?

If you believe you have discovered a bug in lsof, you can report it via e-mail to <[abe@purdue.edu](mailto:abe@purdue.edu)>. Do NOT report lsof bugs to the UNIX dialect vendor. Make sure "lsof" appears in the "Subject:" line so my e-mail filter won't classify your letter as Spam.

Before you send me a bug report, please read the "Bug Reports" section of the 00README file of the lsof distribution. It lists the steps you should take before and when reporting a suspected bug.

### 1.5 Where can I get the lsof FAQ?

This lsof FAQ is available in the file 00FAQ in the lsof distribution and at the URL:

<ftp://lsof.itap.purdue.edu/pub/tools/unix/lsof/FAQ>

### 1.5.1 How timely is the on-line FAQ?

The on-line FAQ is sometimes too timely. :-)

I

update it as soon as new information is available. That may include information about support that won't appear in the lsof source distribution until the next revision. If you encounter something like that, please send me e-mail at <abe@purdue.edu>. I may be able to point you at a pre-release distribution that contains the support of interest. Make sure "lsof" appears in the "Subject:" line so my e-mail filter won't classify your letter as Spam.

### 1.6 Is there a test suite?

Yes, as of lsof revision 4.63 there's an automated lsof test suite in the tests/ sub-directory of the lsof top-level directory.

More information on using the test suite, what it does, how to use it and how to configure it may be found in the 00TEST file of the lsof distribution. That file also explains where the test suite has been tested.

Frequently asked questions about the test suite will be asked and answered here in the FAQ. (See "Test Suite Problems.")

After lsof has been configured with the Configure script, lsof can be made and tested with:

```
$ make
$ cd tests
$ make
```

Under normal conditions -- i.e., unless the lsof tree has been cleaned or purged severely -- all tests or individual tests may be run by:

```
$ cd test
$ make
or
$ <run a single test> (See 00TEST.)
```

### 1.7 Is lsof vulnerable to the standard I/O descriptor attack?

Lsof revisions 4.63 and above are not vulnerable.

Lsof revisions 4.62 and below are vulnerable, but no damage scenarios have so far been demonstrated.

The standard I/O descriptor attack is a local programmed assault on setuid and setgid programs that tricks them into opening a sensitive file with write access on a standard descriptor, usually stderr (2), and writing error messages to stderr. If the attacker can control the content of the error message, the attacker may gain elevated privileges.

The attack was first described in Pine Internet Advisory PINE-CERT-20020401, available at:

<http://www.pine.nl/advisories/pine-cert-20020401.txt>

If you are using an lsof revision below 4.63, you should remove any setuid or setgid permissions you might have given its executable. Then you should upgrade to lsof revision 4.63.

#### 1.8 Can I alter lsof's make(1) behavior?

Yes. There are at least two ways to do that.

You can put replacements for lsof Makefile strings in your environment. If you specify the -e make option, make will give environment variable values precedence over strings from the Makefile. For example, to change the compiler string CC from the environment, you might do this with the Bourne shell:

```
$ CC=foobar; export CC
$ make -e
```

You can also replace lsof Makefile strings in the make command invocation. Here's the previous example done that way:

```
$ make CC=foobar
```

Changing the CFGF, CFGL, and DEBUG strings used in lsof Makefiles, either from the environment or from the make invocation, can significantly alter lsof make(1) behavior.

I

commonly use DEBUG to change the -O option to -g so I can build an lsof executable for debugging -- e.g.,

\$ make DEBUG=-g

(Look for DEBUG in this FAQ for other examples of its use.)

Consult the Makefiles to see what CFGL, CFGL, and other lsof Makefile strings contain, and to see what influence their alteration might have on lsof make(1) behavior.

#### 1.9 Is there an lsof license?

No.

The only restriction on the use or redistribution of lsof is contained in this copyright statement, found in every lsof source file. (The copyright year in or format of the notice may vary slightly.)

```
/*
 * Copyright 2002 Purdue Research Foundation, West Lafayette,
 * Indiana 47907. All rights reserved.
 *
 * Written by Victor A. Abell
 *
 * This software is not subject to any license of the American
 * Telephone and Telegraph Company or the Regents of the
 * University of California.
 *
 * Permission is granted to anyone to use this software for
 * any purpose on
 * any computer system, and to alter it and
 * redistribute it freely, subject to the following
 * restrictions:
 *
 * 1. Neither the authors nor Purdue University are responsible
 *    for any consequences of the use of this software.
 *
 * 2. The origin of this software must not be misrepresented,
 *    either by explicit claim or by omission. Credit to the
 *    authors and Purdue University must appear in documentation
 *    and sources.
 *
 * 3. Altered versions must be plainly marked as such, and must
 *    not be misrepresented as being the original software.
 *
 * 4. This notice may not be removed or altered.
 */
```

## 1.10 Language locale support

### 1.10.1 Does lsof support language locales? How do I use the support?

Most UNIX dialect versions of lsof support 8 bit language locale characters -- e.g., the ability to print 8 bit characters that have accents and other marks over them.

See the answer to the "Does lsof support wide characters in language locales?" question for information on when lsof's language locale support covers characters wider than 8 bits.

To see if lsof supports language locales for your dialect, look in the dialect's machine.h header file for the HASSETLOCALE definition. If it is present and not disabled, then lsof has language locale support for the dialect.

To enable lsof's language locale support, you must specify in a locale environment variable (e.g., LANG) a language locale known to your system that supports the printing of marked characters -- e.g., en\_US. (On some dialects locale(1) may be used to list the known language locales.)

Note that LANG=C and LANG=POSIX are NOT language locales that support the printing of marked characters.

If the language locale doesn't support the printing of marked characters, lsof's OUTPUT of them follows the rules for non-printable characters described in the OUTPUT section of lsof(8).

Consult your dialect's setlocale(3) man page for the names of environment variables other than LANG -- e.g., LC\_ALL, LC\_TYPE, etc. -- which may be used to define language locales.

### 1.10.2 Does lsof support wide characters in language locales?

When lsof's language locale support is enabled with the HASSETLOCALE definition, for selected dialects lsof will also print wide characters (e.g., from UTF-8) when iswprint(3) reports them to be printable.

Wide character support is available when HASWIDECHAR is defined in a dialect's machine.h header file. As of this writing on July 22, 2004, the following dialect versions have wide character support:



AIX >= 4.3.2  
Apple Darwin >= 7.3.0  
FreeBSD >= 5.2  
HP-UX >= 11.00  
/proc-based Linux  
NetBSD >= 1.6  
SCO OpenServer >= 5.0.6  
Solaris >= 2.6  
Tru64 UNIX 5.1

#### 1.11 Are any files in the lsof distribution copyrighted?

Yes. Most files carry the copyright of the Purdue Research Foundation and may be redistributed under the terms that accompany the copyright notice. Those terms may also be found in the answer to the question, "Is there an lsof license?")

A few files carry other copyright notices. Some are BSD notices and they explain the terms under which they are included in the lsof distribution.

Those that carry vendor copyright notices have been reproduced in their original or modified forms with permission from the copyright owners. That permission is indicated in the README files that accompany the files.

#### 1.12 Are there other lsof-related resources?

There are other resources available, connected to lsof. Among them are FreeBSD and Linux packages whose products use lsof and two particularly interesting resources.

The two interesting resources are a Gnome Tool Kit (GTK) GUI for lsof and a Perl wrapper module.

The GTK GUI is called Glsof and was developed by Gnele. It can be found at:

<http://www.sourceforge.net>

The Perl wrapper module by Marc Beyer can be found at:

<http://search.cpan.org/dist/Unix-Lsof/>

#### 1.13 What

does the "WARNING: unsupported dialect or version" mean?

The Lsof configure script issues that message for UNIX dialects or their versions where I have been unable to test the current revision of Lsof. The message doesn't mean that Lsof won't work, just that I have no direct evidence that it will.

If the COnfigure script succeeds, except for the warning, try compiling Lsof. If that succeeds, try the Lsof test suite.

## 2.0 Lsof Ports

### 2.1 What ports exist?

The pub/Lsof.README file carries the latest port information:

AIX 5.[23] and 5.3

FreeBSD 4.9 and 6.4 for x86-based systems

FreeBSD 8.[234], 9.0, 10.0 and 11.0 for AMD64-based systems

Linux 2.1.72 and above for x86-based systems

Solaris 9, 10 and 11

In the above list the only UNIX dialects present are ones for which I test the current Lsof revision. Lsof may still support unlisted dialect versions -- e.g., HP-UX 10.20, Solaris 7, etc. -- but I don't have access to systems where I could test Lsof on them, so I can't claim Lsof works on them. If your dialect isn't in the list, you should try building Lsof on it anyway.

Lsof version 4 predecessors, versions 2 and 3, may support older version of some dialects. Contact me via e-mail at <abe@purdue.edu> if you're interested in their distributions. Make sure "Lsof" appears in the "Subject:" line so my e-mail filter won't classify your letter as Spam.

### 2.2 What about a new port?

The 00PORTING file in the distribution gives hints on doing a port. I will consider doing a port in exchange for permanent access to a test host. I require permanent access so I can test new Lsof revisions, because I will not offer distributions of dialect ports I cannot upgrade and test.

#### 2.2.1 User-contributed Ports

Sometimes I receive contributions of ports of Lsof to systems where I can't test future revisions of Lsof. Hence,

I don't incorporate these contributions into my lsof distribution.

However, I do make descriptions of these contributions available. You can find them in the 00INDEX and README files at:

<ftp://lsof.itap.purdue.edu/pub/tools/unix/lsof/contrib>

Consult the 00INDEX file in the contrib/ directory for a list of the available contributions and consult README there for information on how to obtain them.

### 2.3 Why isn't there an AT&T SVR4 port?

I haven't produced an AT&T SVR4 port because I haven't seen a UNIX dialect that is strictly limited to the AT&T System V, Release 4 source code. Every one I have seen is a derivative with vendor additions.

The vendor additions are significant to lsof because they affect the internal kernel structures with which lsof does business. While some vendor derivatives of SVR4 are similar, each one I have encountered so far has been different enough from its siblings to require special source code.

If you're interested in an SVR4 version of lsof, here are some existing ports you might consider:

DC/OSx (This obsolete port is only available upon special request.)  
Reliant UNIX (This obsolete port is only available upon special request.)  
SCO|Caldera UnixWare (This is the most likely choice.)  
Solaris

### 2.4 Why isn't there an SGI IRIX port?

Lsof support for IRIX was terminated at lsof revision 4.36, because it had become increasingly difficult for me to obtain information on the IRIX kernel structures lsof needs to access.

At IRIX 6.5 I decided the obstacles were too large for me to overcome, and I stopped supporting lsof on IRIX. I have sources to the last revision of lsof (4.36) for IRIX, but

that version of lsof does not work on IRIX 6.5 and is vulnerable to the standard I/O descriptor attack. (See the "Is lsof vulnerable to the standard I/O descriptor attack?" Q&A for more information.) Contact me to discuss obtaining those sources.

If you wish to pursue the issue, don't contact me, contact SGI. This case was opened with SGI on the subject:

Case ID: 0982584

Category: Unix

Priority: 30-Moderate Impact

Problem Summary:

kernel structure header files needed for continued lsof support

Problem Description:

Email In 07/17/98 19:09:23

## 2.5 Why does lsof's Configure script report "WARNING: unsupported dialect or version"?

Lsof's Configure script issues this message when it encounters a dialect or its version that lsof once supported, but no longer does. Usually I drop support for a dialect or version when I can no longer test lsof on it.

However, it's worth trying to compile and use lsof. Be sure to run the test suite. (See the answer to the "Is there a test suite?" question for information on the test suite.)

If you have problems with an unsupported dialect or version, contact me via e-mail at <abe@purdue.edu> and I may be able to help. Make sure "lsof" appears in the "Subject:" line so my e-mail filter won't classify your letter as Spam.

## 3.0 Lsof Problems

### 3.1 Configuration Problems

#### 3.1.1 Why

can't Configure determine the UNIX dialect version?

The lsof Configure script uses UNIX shell commands, often in a command pipeline, to determine the UNIX dialect version.

(Consult the dialect stanza in Configure to determine which commands are used.) If Configure can't determine the dialect version, probably one of the commands is not behaving as Configure expects.

Symptoms of the failure include Configure warning messages and incorrect version definitions in the Makefile CFLAGS.

If you suspect that the lsof Configure script is failing to determine the dialect version correctly, try running the commands from Configure stanza one at a time. That will usually reveal the source of the problem. Be particularly mindful that the PATH environment variable can cause commands to be executed from non-standard directories.

If you can't determine the source of the problem, there is a work-around. You can supply the UNIX dialect version in the LSOF\_VSTR environment variable. Use Configure as a guide to forming what it expects in LSOF\_VSTR. There is also some information on LSOF\_VSTR in the 00XCONFIG documentation file of the lsof distribution.

## 3.2 Compilation Problems

### 3.2.1 Why does the compiler complain about missing header files?

When you use make to build lsof, the compiler may complain that it can't find header files -- e.g.,

```
$ make
(cd lib; make DEBUG="-O" CFGF="-DAIXA=0 -DAIXV=4330 \
-DLSOF_VSTR=\"4.3.3.0\"")
gcc -DAIXA=0 -DAIXV=4330 -DLSOF_VSTR="4.3.3.0" -O \
-c ckkv.c
In file included from ckkv.c:33: ../machine.h:70: \
sys/types.h: A file or directory in the path name \
does not exist. \
```

That type of complaint doesn't represent an lsof problem. It represents a problem with a missing system header file that probably should be found in /usr/include or in the system source tree.

As a first step try using find(1) to locate the problem header file.

If it's a system header file and can't be found, here are some possible causes:

1. The file set, RPM or package containing the header files has not been installed. Instructions for doing that are specific to the UNIX dialect and beyond the scope of this document.

2. If the compiler is gcc, the private gcc header files:

- \* May not have been installed;
- \* May have been installed incorrectly;
- \* May not have been updated properly after the last compiler or system update;
- \* Ones from a previous installation may not have been removed.

A path leading to the gcc private header files can be found with ``gcc -v``. Consult the gcc documentation for instructions on proper installation of the private gcc header files.

3. On some dialects -- e.g., FreeBSD, NetBSD, OpenBSD -- lsof may need to use header files that are located in the system source tree -- /sys or /usr/src/sys, for example. Make sure the system source tree has been installed.

### 3.2.2 Why does gcc complain about the contents of header files distributed by the system's vendor?

When you use make to build lsof and gcc to compile it, gcc may complain that it finds errors in system header files -- e.g.,

```
$ make
(cd lib; make DEBUG="-O" CFGF="-Dsolaris=80000 \
-DHASPR_GWINDOWS -m64 -DHASIPv6 -DHAS_VSOCK \
-DLSOF_VSTR=\"5.8\"")
gcc -Dsolaris=80000 -DHASPR_GWINDOWS -m64 -DHASIPv6 \
-DHAS_VSOCK -DLSOF_VSTR="5.8" -O -c dvch.c
In file included from /usr/include/sys/proc.h:31, \
    from /homes/abe/gnu/gcc-3.2.1/lib/gcc-lib/sparcv9-sun-solaris2/\
3.2.1/include/sys/user.h:267, from /usr/include/kvm.h:13, \
from ../dlsof.h:53, from ../lsof.h:172, from dvch.c:43: \
/homes/abe/gnu/gcc-3.2.1/lib/gcc-lib/sparcv9-sun-solaris2/
```

3.2.1/include/sys/task.h:59: parse error before "uint\_t"

Errors like the above are most likely not problems in the system's header files, but in the private copies of them that were created when gcc was made or installed. Note the presense of  
".../gcc-3.2.1/lib/gcc-lib/sparcv9-sun-solaris2/3.2.1/include/..."  
in the paths for user.h and task.h. It indicates both header files are gcc-specific.

To solve errors like this requires comparing the header files in the vendor's /usr/include tree to the gcc-specific ones in gcc's private gcc-lib/.../include tree. It may be necessary to regenerate gcc-specific header files, correct them or remove them. See the gcc distribution for the appropriate tools.

A possible temporary work-around is to direct gcc to use the vendor's header files instead of its temporary ones by declaring -I/usr/include in the compilation flags.

### 3.2.3 Other header file problems

Don't overlook any vendor tools that might validate the vendor header files installed on the system -- e.g., the Solaris pkgchk tool can be used to check the header files that were installed from the SUNWhea package.

For other header file problems contact me at <abe@purdue.edu>. Please follow the reporting guidelines in the "How do I report an lsof bug?" section of this FAQ.

### 3.3 Why doesn't lsof report full path names?

Lsof reports the full path name when it is specified as a search argument for open files that match the argument. However, if the argument is a file system mounted-on directory, and lsof finds additional path name components from the kernel name cache, it will report them.

Lsof reports path name for file system types that have path name lookup features -- e.g., some versions of AdvFS for Digital and Tru64 UNIX. The Linux /proc-based lsof reports full path names, because the Linux /proc file system provides them. Lsof on recent builds of Solaris 10 also report full path names, because those Solaris kernels record the full path

name in the vnode structure.

Otherwise, lsof uses the kernel name cache, where it exists and can be accessed, and reports some or all path name components (e.g., the sys and proc.h components of /usr/include/sys/proc.h) for these dialects:

Apple Darwin  
DC/OSx  
FreeBSD  
HP-UX, /dev/kmem and PSTAT based  
Linux, /dev/kmem-based  
NetBSD  
NEXTSTEP  
OpenBSD  
OPENSTEP  
Reliant UNIX  
SCO OpenServer  
SCO|Caldera UnixWare  
Solaris 2.x, 7, 8 and 9 (except for some VxFS versions; see the "Why doesn't Solaris lsof report VxFS path name components?" section for more information)  
Solaris 10 (early builds) Tru64 UNIX

As far as I can determine, AFS path lookups don't share in kernel name cache operations, so lsof can't identify open AFS path name components. Apparently Solaris VxFS versions 4 and above don't share in kernel name cache operations, either, so lsof can't display path name components for those open files.

Since the size of the kernel name cache is limited and the cache is in constant flux, it does not always contain the names of all components in an open file's path; sometimes it contains none of them.

Lsof reports the file system directory name and whatever components of the file's path it finds in the cache, starting with the last component and working backwards through the directories that contain it. If lsof finds no path components, lsof reports the file system device name instead.

When lsof does report some path components in the NAME column, it prefixes them with the file system directory name, followed by " -- ", followed by the components --



e.g., /usr -- sys/path.h for /usr/include/sys/path.h. The "--" is omitted when lsof finds all the path name components of a file's name.

The PSTAT-based HP-UX lsof relies on kernel name cache contents, too, even though its information comes to lsof via pstat() function calls. Consequently, PSTAT-based HP-UX lsof won't always report full paths, but may use the "--" partial path name notation, or may occasionally report no path name at all but just the file system mounted-on directory and device names.

Lsof can't obtain path name components from the kernel name caches of the following dialects:

#### AIX

Only the Linux kernel records full path names in the structures it maintains about open files; instead, most kernels convert path names to device and node number doublets and use them for subsequent file references once files have been opened.

To convert the device and node number doublet into a complete path name, lsof would have to start at the root node (root directory) of the file system on which the node resides, and search every branch for the node, building possible path names along the way. That would be a time consuming operation and require access to the raw disk device (usually implying setuid-root permission).

If the prospect of all that local disk activity doesn't concern you, think about the cost when the device is NFS-mounted.

Try using the file system mount point and node number lsof reports as parameters to find -- e.g.,

```
$ find <mount_point> -inum <node_number> -print
```

and you may get an appreciation of what a file system directory tree search would cost.

#### 3.3.1 Why do lsof -r reports show different path names?

When you run lsof with its repeat ("`-r") option, you may

notice that the extent to which it reports path names for the same files may vary from cycle to cycle. That happens because other processes are making kernel calls affecting the cache and causing entries to be removed from and added to it.

### 3.3.2 Why does lsof report the wrong path names?

Under some circumstances lsof may report an incorrect path name component, especially for files in a rapidly changing directory like /tmp.

In a rapidly changing directory, like /tmp, if the kernel doesn't clear the cache entry when it removes a file, a new file may be given the same keys and lead lsof to believe that the old cache entry with the same keys belongs to the new file.

Lsof tries to avoid this error by purging duplicate entries from its copy of the kernel name cache when they have the same device and inode number, but different names.

This error is less likely to occur in UNIX dialects where the keys to the name cache are node address and possibly a capability ID. The Apple Darwin, Digital UNIX, FreeBSD, HP-UX, NEXTSTEP, OPENSTEP, Solaris, Tru64 UNIX, and UnixWare dialects use node address. Apple Darwin, FreeBSD, NetBSD, OpenBSD, Tru64 UNIX, and also use a capability ID to further identify name cache entries.

### 3.3.3 Why doesn't lsof report path names for unlinked (rm'd) files?

When lsof gets path name components from the kernel's name cache, it does not report the path names of a file that has been unlinked from its parent directory -- e.g., deleted via rm, or the unlink() system call -- even when some process may still hold the file open; lsof reports only the file system's mounted-on directory and device. That's because path name components are removed from the kernel name cache when the file is unlinked.

Unlinked open files are sometimes used by applications for temporary, but invisible storage (i.e., ls won't show them, and no other process can open them.) However, they may occasionally consume disk space to excess and cause concern for a system administrator, who will be unable to locate

them with find, ls, du, or other tools that rely on finding files by examining the directory tree.

By using lsof's +L option you can see the link count of open files -- in the NLINK column. An unlinked file will have an NLINK value of zero. By using the option +L1 you can tell lsof to display only files whose link count is less than one (i.e., zero).

There are some UNIX dialect-specific exceptions to lsof's inability to report unlinked path names. They are described in the answer to the "When will lsof report path names for deleted files?" question.

### 3.3.4 Why doesn't lsof report the "correct" hard linked file path name?

When lsof reports a rightmost path name component for a file with hard links, the component may come from the kernel's name cache. Since the key which connects an open file to the kernel name cache may be the same for each differently named hard link, lsof may report only one name for all open hard-linked files. Sometimes that will be "correct" in the eye of the beholder; sometimes it will not. Remember, the file identification keys significant to the kernel are the device and node numbers, and they're the same for all the hard linked names.

### 3.3.5 When will lsof report path names for deleted files?

Lsof will report path names for deleted files for two dialects: Linux and later builds of Solaris 10.

Deleted Linux path names are reported by default and have "(deleted)" at their ends.

The display of Solaris 10 deleted path names may be selected with the -X option. When selected they are also reported with "(deleted)" at their ends.

### 3.4 Why is lsof so slow?

Lsof may appear to be slow if network address to host name resolution is slow. This can happen, for example, when the name server is unreachable, or when a Solaris PPP cache daemon is malfunctioning.

To see if name lookup is causing lsof to be slow, turn it off with the `--n` option.

Port service name lookup or portmap registration lookup may also be causes of slow-down. To suppress port service name lookup, specify the `--P` option.

Lsof doesn't usually make direct portmap calls -- only when `+M` is specified, or when `HASPMAPENABLED` is defined during lsof construction. (The lsof help panel, produced with `lsof -h` will display the default portmap registration reporting state.) The quickest first step in checking if lsof is slow because of the portmapper is to use lsof's `--M` option.

Lsof may be slow if UID to login name lookups are slow. Suppress them with `--l`.

On dialects where lsof uses the kernel name cache, try disabling its use with `--C`.

(You can tell if lsof uses the kernel name cache by looking for `--C` in lsof's `--h` output.) Of course, disabling kernel name cache use will mean that lsof won't report full or partial path names, just file system and character device names.

If you're just interested in the open files of one process, try using the `--p <Process-ID>` option to limit lsof to that process. (The `--p` option may also be followed with a list of Process-IDs.)

If you're interested in including or excluding certain commands, try lsof's `-c[^]cmd` option.

If you're interested in certain Internet TCP and UDP states (e.g., `ESTABLISHED`) or in excluding some (e.g., `CLOSE_WAIT`), try lsof's `-s p:s` option, available where shown on the lsof help output, obtained with `-h` or `-?`. More information on it may be found in the answer to the "How are protocol state name exclusion and inclusion used?" question.

Your UNIX dialect may not support `-s p:s` and its associated performance improvements to Internet-only file processing. You can find more information on those topics in the answer to the "Why doesn't my dialect support state name exclusion and inclusion?" question.

Older AIX lsof may be slow to start because of its oslevel identity comparison. (Newer AIX lsof uses uname(2).) See the "Why does AIX lsof start so slowly?" and "Why does lsof warn "compiled for x ... y; this is z.?" sections for more information.

### 3.5 Why doesn't lsof's setgid or setuid permission work?

If you install lsof on an NFS file system that has been mounted with the nosuid option, lsof may not be able to use the setgid or setuid permission you give it, complaining it can't open the kernel memory device -- e.g., /dev/kmem.

The only solution is to install lsof on a file system that doesn't inhibit setgid or setuid permission.

### 3.6 Does lsof have security problems?

I don't think so. However, lsof does usually start with setgid permission, and sometimes with setuid-root permission. Any program that has setgid or setuid-root permission, should always be regarded with suspicion.

Lsof drops setgid power, holding it only while it opens access to kernel memory devices (e.g., /dev/kmem, /dev/mem, /dev/swap). That allows lsof to bypass the weaker security of access(2) in favor of the stronger checks the kernel makes when it examines the right of the lsof process to open files declared with -k and -m. Lsof also restricts some device cache file naming options when it senses the process has setuid-root power.

On a few dialects lsof requires setuid-root permission during its full execution in order to access files in the /proc file system. These dialects include:

- DC/OSx 1.1 for Pyramid systems
- Reliant UNIX 5.4[34] for Pyramid systems

When lsof runs with setuid-root permission it severely restricts all file accesses it might be asked to make with its options.

The device cache file (typically .lsof\_hostname in the home directory of the real user ID that executes lsof) has 0600 modes. (The suffix, hostname, is the first component of

the host's name returned by `gethostname(2)`.) However, even when `lsuf` runs `setuid-root`, it makes sure the file's ownerships are changed to that of the real user and group. In addition, `lsuf` checks the file carefully before using it (See the question "How do I disable the device cache file feature or alter its behavior?" for a description of the checks.); discards the file if it fails the scrutiny; complains about the condition of the file; then rebuilds the file.

See the `00DCACHE` file of the `lsuf` distribution for more information about device cache file handling and the risks associated with the file.

### 3.7 Will `lsuf` show remote hosts using files via NFS?

No. Remember, `lsuf` displays open files for the processes of the host on which it runs. If the host on which `lsuf` is running is an NFS server, the remote NFS client processes that are accessing files on the server leave no process records on the server for `lsuf` to examine.

### 3.8 Why doesn't `lsuf` report locks held on NFS files?

Generally lock information held by local processes on remote NFS files is not recorded by the UNIX dialect kernel. Hence, `lsuf` can't report it.

One exception is some patch levels of Solaris 2.3, and all versions of Solaris 2.4 and above. `lsuf` for those dialects does report on locks held by local processes on remotely mounted NFS files.

#### 3.8.1 Why does `lsuf` report a one byte lock on byte zero as a full file lock?

When a process has a lock of length one, starting at byte zero, `lsuf` can't distinguish it from a full file lock. That's because most UNIX dialects represent both locks the same way in their file lock (`flock` or `eflock`) structures.

### 3.9 Why does `lsuf` report different values for open files on the same file system (the automounter phenomenon)?

On UNIX dialects where file systems may be mounted by an automounter with the ```direct"` type, `lsuf` may

sometimes  
report difference DEVICE, SIZE/OFF, INODE and NAME values  
when asked to report files open on the file system.

This happens because some files open on the file system --  
e.g., the current directory of a shell that changed its  
directory to the file system as the file system's first  
reference -- may be characterized in the kernel with  
temporary automounter node information. The cd doesn't  
cause the file system to be mounted.

A subsequent reference to the file system -- e.g., an ls  
of any place in it -- will cause the file system to be  
mounted. Processes with files open to the mounted file  
system are characterized in the kernel with data that  
reflects the mounted file system's parameters.

Unfortunately some kernels (e.g., some versions of Solaris  
2.x) don't revisit the process that did only a change-directory  
for the purpose of updating the data associated with the  
open directory file. The file continues to be characterized  
with temporary automounter information  
until it does another  
directory change, even a trivial ``cd .".

Lsof will report on both reference types, when supplied  
the file system name as an argument, but the data lsof  
reports will reflect what it finds in the kernel. For the  
different types lsof will display different data, including  
different major and minor device numbers in the DEVICE  
column, different lengths in the SIZE/OFF column, different  
node numbers in the INODE column, and slightly different  
file system names in the NAME column.

In contrast, fuser, where available, can only report on  
one reference type when supplied the file system name as  
an argument. Usually it will report on the one that is  
associated with the mounted file system information. If  
the only reference type is the temporary automounter one,  
fuser will often be silent about it.

### 3.10 Why don't lsof and netstat output match?

Lsof and netstat output don't match because lsof reports  
the network information it finds in open  
file system objects  
-- e.g., socket files -- while netstat often gets its  
information from separate kernel tables.

The information available to netstat may describe network activities never or no longer associated with open files, but necessary for proper network state machine operation.

For example, a TCP connection in the FIN\_WAIT\_[12] state may no longer have an associated open file, because the connection has been closed at the application layer and is now being closed at the TCP/IP protocol layer.

### 3.10.1 Why can't lsof find accesses to some TCP and UDP ports?

Lsof stands for LiSt Open Files. If there is no open file connected to a TCP or UDP port, lsof won't find it. That's the most common reason why lsof doesn't find a port netstat might report open.

One reason I've found on some UNIX dialects is that their kernels set aside TCP and UDP ports for communicating with support activities, running in application layer servers -- the automounter daemons, and the NFS biod and nfsd daemons are examples. Netstat may report the ports are in use, but lsof doesn't.

Another reason is that netstat may also be able to report a port is open on a particular dialect, because it uses a source of data different from what lsof uses -- e.g., netstat might examine kernel tables or use streams messages to MIB2, while lsof relies on the information it finds in open file structures and their descendants.

Sometimes it's possible to search the data netstat and lsof use. For example, on Linux /proc/tcp and /proc/udp can be examined. There might an entry there for a particular protocol and port, but if the line on which the port appears doesn't have an inode number that matches an inode number of an open file, lsof won't be able to identify the process using the port.

This is a tough question to which there is no easy answer.

### 3.11 Why does lsof update the device cache file?

At the end of the lsof output you may see the message:

lsof:



WARNING: /Homes/abe/.lsof\_vic was updated.

In this message /Homes/abe/.lsof\_vic is the path to the private device cache file for login abe. (See 00DCACHE.)

Lsof issues this message when it finds it necessary to recheck the system device directory (e.g., /dev or /devices) and rebuild the device cache file during the open file scan. Lsof may need to do these things it finds that a device directory node has changed, or if it cannot find a device in the cache.

### 3.12 Why doesn't lsof report state for UDP socket files?

Lsof reports UDP TPI connection state -- TS\_IDLE (Idle), TS\_BOUND (Bound), etc. -- for some, but not all dialects. TPI state is stream-based TCP/IP information that isn't available in many dialects.

A fairly weak general rule is if netstat(1) reports UDP TPI state, lsof may be able to report it, too. But don't be surprised if lsof fails to report UDP TPI state for your dialect. Other factors influence lsof's ability to report UDP TPI state, including the availability of state number data in kernel structures, and state number to state name conversion data.

### 3.13 I am editing a file with vi; why doesn't lsof find the file?

Classic implementations of vi usually don't keep open the file being edited. (Newer ones may do so in order to maintain an advisory lock.) Instead classic vi opens the file, makes a temporary copy (usually in /tmp or /usr/tmp), and does its work in that file. When you save the file being edited from a classic vi implementation, it reopens and rewrites the file.

During a classic vi session, except for the brief periods when vi is reading or rewriting the file, lsof won't find an open reference to the file from the vi process, because there is none.

### 3.14 Why doesn't lsof report TCP/TPI window and queue sizes for my dialect?

Lsof only reports TCP/TPI window sizes for Solaris, because only its netstat reports them. The intent of providing TCP/TPI information in lsof NAME column output is to make

it  
easier to match netstat output to lsof output.

In general lsof only reports queue sizes for both TCP and UDP (TPI) connections on BSD-derived UNIX dialects, where both sets of values appear in kernel socket queue structures. SYSV-derived UNIX dialects whose TCP/IP implementations are based on streams generally provide only TCP queue sizes, not UDP (TPI) ones.

While you may find that netstat on some SYSV-derived UNIX dialects with streams TCP/IP may report UDP (TPI) queue sizes, you will probably also find that the sizes are always zero -- netstat supplies a constant zero for UDP (TPI) queue sizes to make its headers align the same for TCP and UDP (TPI) connections. Solaris seems to get it right -- i.e., its netstat does not report UDP (TPI) queue sizes.

When in doubt, I chose to avoid reporting UDP (TPI) queue sizes for UNIX dialects whose netstat-reported values I knew to be a constant zero or whose origin I couldn't determine. OSR is a dialect in this category.

#### 3.14.1 Why

doesn't lsof report socket options, socket states, and TCP flags and values for my dialect?

The lsof -T argument, 'f', that selects the reporting of socket options, socket states and TCP flags was implemented at lsof revision 4.71 for the following UNIX dialects, providing the indicated information:

AIX 4.3.2 and 5.1 and above

All socket options and values, socket states, and TCP flags and values described in lsof(8) are reported.

Apple Darwin 7.2 and above

All socket options and values, socket states, and TCP flags and values described in lsof(8) are reported.

Digital UNIX and Tru64 UNIX 4.0

All socket options and values, socket states, and TCP flags and values described in lsof(8) are reported.

FreeBSD 4.9 and above

All socket options and values, socket states, and TCP flags and values described in lsof(8) are reported.

HP-UX 11.00 (/dev/kmem-based lsof)

All socket options and values are reported. No socket states

are reported. Only the TF\_NODELAY TCP flag and the TF\_MSS value are reported.

HP-UX 11.11 and iiiv2 (PSTAT-based lsof)

All socket options and values, and socket states are reported. No TCP flags or values are reported.

Linux

No socket options and values, socket states, or TCP flags and values are reported. The support for "-Tf" could not be added to Linux, because socket options, socket states, and TCP flags and values are not available via the /proc file system.

NetBSD 1.6G and above

All socket options and values, socket states, and TCP flags and values described in lsof(8) are reported.

OpenBSD 3.4 and above

All socket options and values, socket states, and TCP flags and values described in lsof(8) are reported.

OPENSTEP 4.2

All socket options and values, socket states, and TCP flags and values described in lsof(8) are reported.

OpenUNIX 8

All socket options and values, socket states, and TCP flags and values described in lsof(8) are reported.

SCO OpenServer Release 5.0.6

All socket options and values, socket states, and TCP flags and values described in lsof(8) are reported.

Solaris 2.6, 8 and above

The socket option display is limited to BROADCAST, DEBUG, DGRAM\_ERRIND, DONTROUTE and OOBINLINE. Socket values are limited to KEEPALIVE and LINGER. No socket states are reported. The TCP DELACK, NODELAY and SENTFIN flags are reported. The TCP MSS value is reported.

UnixWare 7.1.[134]

All socket options and values, socket states, and TCP flags and values described in lsof(8) are reported.

### 3.14.2 Why doesn't lsof report the partial listen queue connection count for my dialect?

The reporting of partial listen queue connections was added to -Tf processing at lsof revision 4.76. Currently it is reported for these dialects:

AIX 4.3.2

This dialect is no longer supported, so no attempt was made to add partial listen queue length support

for it.

AIX 5.1

and above

Partial listen queue information is available.

Apple Darwin 7.2 and above

Partial listen queue information is available.

Digital UNIX 4.0

This dialect is no longer supported, so no attempt was made to add partial listen queue length support for it.

FreeBSD 4.9 and above

Partial listen queue information is available.

HP-UX 11.00 (/dev/kmem-based lsof)

No partial listen queue information is available.

HP-UX 11.11 and iiiv2 (PSTAT-based lsof)

No partial listen queue information is available.

Linux

No partial listen queue information is available.

NetBSD 1.6G and above

Partial listen queue information is available.

OpenBSD 3.4 and above

Partial listen queue information is available.

OPENSTEP 4.2

Partial listen queue information is available.

OpenUNIX 8

This dialect is no longer supported, so no attempt was made to add partial listen queue length support for it.

SCO OpenServer Release 5.0.6

No

partial listen queue information is available.

Solaris 2.6, 8 and above

Partial listen queue information is available.

Tru64 UNIX 5.0

This dialect is no longer supported, so no attempt was made to add partial listen queue length support for it.

Tru64 UNIX 5.1

Partial listen queue information is available.

UnixWare 7.1.[134]

Partial listen queue information is available.

### 3.15 What does "no more information" in the NAME column mean?

When lsof can find no successor structures -- a gnode, inode, socket, or vnode -- connected to the file structure of an open descriptor of a process, it reports "no more

information" in the NAME column. The TYPE, DEVICE, SIZE/OFF, and INODE columns will be blank.

Because the file structure is supposed to contain a pointer to the next structure of a file's processing support, if the pointer is NUL, lsof can go no further.

Some UNIX dialects have file structures for system processes -- e.g., the sched process -- that have no successor structure pointers. The "no more information" NAME will commonly appear for these processes in lsof output.

It may also be the case that lsof has read the file structure while it is being assembled and before a successor structure pointer value has been set. The "no more information" NAME will again result.

Unless lsof output is filled with "no more information" NAME column messages, the appearance of a few should be no cause for alarm.

### 3.16 Why doesn't lsof find a process that ps finds?

If lsof fails to display open files for a process that ps indicates exists, there may be several reasons for the difference.

The process may be a "zombie" for which ps displays the "(defunct)" state. In that case, the process has exited and has no open file information lsof can display. It does still have a process structure, sufficient for the needs of ps.

Another possible explanation is that kernel tables and structures may have been changing when lsof looked for the process, making lsof unable to find all relevant process structures. Try repeating the lsof request.

### 3.17 Why doesn't -V report a search failure?

The usual reason that -V won't report a search failure is that lsof located the search item, but was prevented from listing it by an option that doesn't participate in search failure reporting.

For example, this lsof invocation:

```
$ lsof -V -i TCP@foobar -a -d 999
```

won't report it can't find the Internet address TCP@foobar, even if there is an open file connected to that address, unless the open file also has a file descriptor number of 999 (the ``-a -d 999" options).

Compile-time options can also affect -V results in much the same way. For example, if HASSECURITY and HASNOSOCKSECURITY are defined at compile time, this lsof invocation, run by a non-root user:

```
$ lsof -V -c inetd
```

won't report that it can't find the inetd command, even if there is a process running the inetd command, because the HASSECURITY and HASNOSOCKSECURITY options prevent the listing of all but the socket files of another user, and no socket file selector (e.g., "-i") was specified.

### 3.18 Portmap problems

#### 3.18.1 Why isn't a name displayed for the portmap registration?

When portmap registration reporting is enabled, any time there is a registration for a local TCP or UDP port, lsof displays it in square brackets, following the port number or service name -- e.g., ``:1234[name]" or ``:name[100083]".

The TCP or UDP port number or service number (what follows the `:') is displayed under the control of the lsof -P option. The registration identity is held by the portmapper and may be a name or a number, depending on how the registration's owner declared it. Lsof reports what the port map holds and cannot derive a registration name from a registration number.

Lsof can be compiled with registration reporting enabled or disabled by default, under the control of the HASPMAPENABLED #define (usually in machine.h). The lsof help panel (`lsof -h`) will show the default. Lsof is distributed with reporting disabled by default.

#### 3.18.2 How can I display only portmap registrations?

Lsof doesn't have an option that will display only TCP or UDP ports with portmap registrations. The +M option only enables the reporting of registration information when Internet socket files are displayed; +M doesn't select the displaying of Internet socket files -- the -i option does that.

This simple lsof pipe to grep will do the job:

```
$ lsof -i +M | grep "["
```

This works because -i selects Internet socket files, +M enables portmap registration reporting, and only output lines with opening square brackets will have registrations.

When portmap registration reporting is enabled by default, because the lsof builder constructed it that way, +M is not necessary. (The lsof help panel, produced with `lsof -h` will display the default portmapper registration reporting state.)

However, specifying +M when reporting is already enabled is acceptable, as is specifying -M when reporting is already disabled.

Digression: lsof will accept `+' or `-' as a prefix to most options. (That isn't documented in the man page or help panel to reduce confusion and complexity.) The -i option is as acceptable as +i, so the above example could be written a little more tersely as:

```
$ lsof +Mi | grep "["
```

But be careful to use the `Mi' ordering, since `iM' implies M is an address argument to `i'.

### 3.18.3 Why doesn't lsof report portmap registrations for some ports?

Lsof reports portmap registrations for local TCP and UDP ports only. It identifies local ports this way:

- \* The port appears in the local address section of the kernel structure that contains it.
- \* The port appears in the foreign address section of a kernel structure whose local and foreign Internet addresses are the same.

\* The port appears in the foreign address section of a kernel address structure whose Internet address is INADDR\_LOOPBACK (127.0.0.1).

Following these rules, lsof ignores foreign portmapped ports. That's done for reasons of efficiency and possible security prohibitions. Contacting all remote portmappers could take a long time and be blocked by network difficulties (i.e., be inefficient). Many firewalls block portmapper access for security reasons.

Lsof may occasionally ignore portmap registration information for a legitimate local port by virtue of its local port rules. This can happen when a port appears in the foreign part of its kernel structure and the local and foreign Internet addresses don't match (perhaps because they're on different interfaces), and the foreign Internet address isn't INADDR\_LOOPBACK (127.0.0.1).

#### 3.18.4 Why doesn't lsof report portmap registrations for some Solaris versions?

In some versions of Solaris -- 9 and 10 are known to exhibit this problem -- lsof is unable to display portmap registrations.

This portmap registration reporting failure occurs when the Solaris netconfig field (in /etc or etc/inet) has its first two non-comment lines enabling tcp6 and udp6. When netconfig is configured in that fashion, lsof's attempt to read the portmap via an RPC function fails.

I don't have an explanation for the failure, but this comment in the netconfig(4) man page appears to have some bearing on the problem:

```
# The following two entries starting with udp6 and tcp6 are
# meant to be used for IPv6. If you have Ipv6 enabled on your
# machine then you can uncomment these two lines to enable
# RPC and NFS to use the Ipv6 stack.
...
#udp6 tpi_clts    v inet6 udp /dev/udp6 -
#tcp6 tpi_cots_ord v inet6 tcp /dev/tcp6 - "
```

My interpretation of that comment is that there is a different RPC interface to the portmap when IPv6 is enabled. However, I can't find any documentation on it in the RPC man pages. If



anyone has  
information on it, please send it to me at  
<abe@purdue> and put "lsof Solaris portmap" in the subject  
line.

A work-around may be to move the ucp6 and tcp6 lines after the  
udp and tcxp lines in netconfig. I don't know if that change  
has any unacceptable consequences, but it works for me on my  
Solaris 9 test system, and I have a report that it also works  
on Solaris 10.

### 3.19 Why is `lsof | wc` bigger than my system's open file limit?

There is a strong temptation to count open files by piping  
lsof output to wc. If your purpose is to compare the number  
you get to some Unix system parameter that defines the  
number of open files your system can have, resist the  
temptation.

One reason is that lsof reports a number of "files" that  
don't occupy Unix file table space -- current working  
directories, root directories, jail directories, text files,  
library files, memory mapped files are some. Another reason  
is that lsof can report a file shared by more than one  
process that  
itself occupies only one file table slot.

If you want to know the number of open files that occupy  
file table slots, use the +ff option and process the lsof  
output's FILE\_ADDR column information with standard Unix  
tools like cut, grep, sed, and sort.

You might also consider using use lsof's field output with  
+ff, selecting the file struct address with -FF, and  
processing the output with an AWK or Perl script. See the  
list\_fields.awk, list\_fields.perl, and shared.perl5 scripts  
in the scripts/ subdirectory of the lsof distribution for  
hints on file struct post-processing filters.

### 3.20 Why doesn't lsof report file offset (position)?

Lsof won't report a file offset (position) value if the -s  
option (without parameters) has been specified, or if the  
dialect doesn't support the displaying of file offset  
(position). (Note that on selected dialects the help output,  
obtained with -h or -?, may show that the -s option can also be  
supplied the "p:s" parameters; for more

information on that  
addition, see the answer to the "How are protocol state name  
exclusion and inclusion used?" question.)

That lsof is reporting only file size is indicated by the  
fact that the appropriate column header says SIZE instead  
of SIZE/OFF.

If lsof doesn't support the displaying of file offset  
(position) -- e.g., for Linux /proc-based lsof -- the -h  
or -? output panel won't list the -o option.

Sometimes the availability of file offset information  
depends on the dialect's kernel. This is particularly true  
for socket file offsets.

Maintenance of offsets for pseudo-terminal devices varies  
by UNIX dialect and is related to how the dialect kernel  
implements pseudo-terminal support. Kernels like AIX, for  
example, that short-circuit the transfer of data between  
socket and pseudo devices to reduce TCP/IP daemon interrupt  
rates won't advance offsets in the TCP/IP daemon socket  
files. Instead they will advance offsets in the open  
standard I/O files of the shell  
child process where the  
pseudo-terminal devices are used.

When in doubt about the behavior of lsof in reporting file  
offset information, do some carefully measured experiments,  
consult the lsof sources, or contact me at <abe@purdue.edu>  
to discuss the matter. Please follow the reporting guidelines  
in the "How do I report an lsof bug?" section of this FAQ.

3.20.1 What does lsof report for size when the file doesn't really have  
one?

When a file has no true size -- e.g., it's a socket, a  
FIFO, or a pipe -- lsof tries to report the information it  
finds in the kernel that describes the contents of associated  
kernel buffers.

Thus, for example, size for most TCP/IP files is socket  
buffer size. The size of the socket read buffer is reported  
for read-only files; the size of the write buffer for  
write-only files; and the sum of the buffers sizes for  
read-write files.

3.21 Problems with path name arguments

### 3.21.1 How do I ask lsof to search a file system?

You can ask lsof to search for all open files on a file system by specifying its mounted path name as an lsof argument -- e.g.,

```
$ lsof /
```

Output of the mount command will show file system mounted path names. It will also show the mounted-on device path for the file system.

If the mounted-on device is a block device (the permission field in output of `ls -l <device>` starts with a ``b/`), you can specify it's name, too -- e.g.,

```
$ lsof /dev/sd0a
```

If the mounted-on device isn't a block device -- for example, some UNIX dialects call a CD-ROM device a character device (ls output starts with a ``c'`) -- you can force lsof to assume that the specified device names a file system with the `+f` option -- e.g.,

```
$ lsof +f -- /dev/sd0a
```

(Note: you must use ```--`" after `+f` or `-f` if a file name follows immediately, because `+f` and `-f` can be followed by characters that specify flag output selections.)

When you use `+f` and lsof can't match the device to a file system, lsof will issue a complaint.

The `+f` option may be used in some dialects to ask lsof to search for an NFS file system by its server name and server mount point. If the mount application reports an NFS file system mounted-on value that way, then this sample lsof request should work.

```
$ lsof +f -- fleet:/home/fleet/u5
```

Finally, you can use `-f` if you don't want a mounted file system path name to be considered a request to report all open files on the file system. This is useful when you want to know if anyone is using the file system's mounted

path name. This example directs lsof to report on open access to the '/' directory, including when it's being used as a current working or root directory.

```
$ lsof -f -- /
```

The lsof -f option performs the same function as -f does in some fuser implementations. However, since the lsof -c option was chosen for another purpose before the -f option was added to lsof, +f was selected as the analogue to the fuser -c option. (Sorry for the potential confusion.)

### 3.21.2 Why doesn't lsof find all the open files in a file system?

Lsof may not find all the open files in a file system for several reasons.

First, some processes with files open on the file system may have been changing status when lsof examined the process table, and lsof "missed" them. Remember, the kernel changes much faster than lsof can respond to the changes.

Second, be sure you have specified the file system correctly. Perhaps you specified a file instead. You can use lsof's -V option to have lsof report in detail on what it couldn't find. Make sure the report for the file system you specified says "file system." Here's some -V output:

```
$ /lsof -V /tmp ./lsof.h ./lsof
COMMAND PID USER  FD  TYPE DEVICE SIZE/OFF INODE NAME
lsof    2688 abe  txt  VREG 18,1,7 1428583 226641 ./lsof
lsof    2689 abe  txt  VREG 18,1,7 1428583 226641 ./lsof
lsof: no file use located: ./lsof.h
```

You can also use lsof's +f option to force it to consider a path name as a file system. If lsof can't find a file system by the specified name, it will issue a complaint -- e.g.,

```
$ lsof +f -- /usr
lsof: not a file system: /usr
```

(/usr is a directory in the / file system.)

### 3.21.3 Why does the lsof exit code report it didn't find open files when some files were listed?

Sometimes lsof will list some open files, yet return a non-zero exit code, suggesting it hasn't found all the specified files.

The first thing you should when you suspect lsof is incorrect is to repeat the request, adding the -V option. In the resulting report you may find that your file system specification really wasn't a file system specification, just a file specification.

Finally, if you specify two files or two file systems twice, lsof will credit all matches to the first of the two and believe that there were no matches for the second. It's possible to specify a single file system twice with different path names by using both its mounted directory path name and mounted-on device name.

```
$ lsof +f -V spcuna:/sysprog /sysprog
COMMAND  PID USER  FD   TYPE DEVICE SIZE/OFF INODE NAME
ksh      11092 abe   cwd   VDIR 39,0,1  1536 226562 /sysprog
(spcuna:/sysprog)
...
lsof: no file system use located: spcuna:/sysprog
```

All matches were credited to /sysprog; none to spcuna:/sysprog.

#### 3.21.4 Why won't lsof find all the open files in a directory?

When you give lsof a simple directory path name argument (not a file system mounted-on name), you are asking it to search for processes that have the directory open as a file, or as a process-specific directory -- e.g., root or current working directory.

If you want to list instances of open files inside the directory, you need to specify the individual path names of those files, or use the lsof +D and +d options.

See the answer to the question "Why are the +D and +d options so slow?" before you use +D or +d casually.

See the answer to the question "Why do the +D and +d options produce warning messages?" for an explanation of some process authority limitations of +D and +d.

### 3.21.5 Why are the +D and +d options so slow?

The +D and +d options cause lsof to build a path name search list for a specified directory. +D causes lsof to descend the directory to its furthest subdirectory, while +d restricts it to the top level. In both cases, the specified directory itself is included in the search list. In both symbolic links are ignored.

Building such a search list can take considerable time, especially when the specified directory contains many files and subdirectories -- lsof must call the system readlink() and stat() functions for each file and directory. Storing the search list can cause lsof to use more than its normal amount of dynamic memory -- each file recorded in the search list consumes dynamic memory for its path name, characteristics, and search linkages. Using the list means lsof must search it for every open file in the system.

Building the search list for a directory specified on some file systems can be slow -- e.g., for an NFS directory with many files. Some file systems have special logging features that can introduce additional delays to the building of the search list -- e.g., NFS logging, or logging on a Solaris UFS file system. The bottom line is that slow search list construction may not be so much an lsof problem as a file system problem. (Hint: if you're using Solaris UFS logging, consider specifying the "logging,noatime" option pair to reduce the number of atime writes to the UFS logging queue and disk.)

A somewhat risky way to speed up lsof's building of the search list is to use lsof's ``-O" option. It forces lsof to do all system calls needed to build the search list directly, rather than in a child process. While direct system calls are much faster, they can block in the kernel -- e.g., when an NFS server stops responding -- stopping lsof until the kernel operation unblocks.

As an example of the load +D can impose, consider that an `lsof +D /` on a lightly loaded NeXT '040 cube with a 1GB root file system disk took 4+ minutes of real time. It also generated several hundred error messages about files and directories the lsof process didn't have permission to access with stat(2).

The bottom line is that +D and +d should be used cautiously. +D is more costly than +d for deeply nested directory trees, because of the full directory descent it causes. So use +d where possible. And you might need to consider the performance of the file system that holds the directory you name with +d or +D.

In view of these warnings, when is it appropriate to use +D or +d? Probably the most appropriate time is when you would specify the directory's contents to lsof with a shell globbing construct -- e.g., ``lsof *``. If that's what you need to do, ``lsof +d `` is probably more efficient than having the shell produce a directory list, form it into an argument vector, and pass the vector to lsof for it to unravel.

See the answer to the question "Why do the +D and +d options produce warning messages?" for an explanation of some process authority limitations of +D and +d.

### 3.21.6 Why do the +D and +d options produce warning messages?

+D and +d option processing is limited by the authority of the lsof process -- i.e., lsof can only examine (with `lstat(2)` and `stat(2)`) files the owner of the process can access.

If the ownership, group membership, or permissions of the specified directory, file within it, or directory within it prevents the owner of the lsof process from using `lstat(2)` or `stat(2)` on it, lsof will issue a warning message, naming the path and giving the system's (`lstat(2)`'s or `stat(2)`'s) reason (errno explanation text) for refusing access.

As an example, assume user abc has a subdirectory in /tmp, owned by abc and readable, writable and searchable by only its owner. If user def asks lsof to search for all /tmp references with +D or +d, lsof will be unable to `lstat(2)` or `stat(2)` anything in abc's private subdirectory, and will issue an appropriate warning.

Lsof warnings can usually be suppressed with the -w option. However, using -w with +D or +d means that there will be no indication why lsof couldn't find an open reference to a restricted directory or something contained in it.

Hint: if you need to use +D or +d and avoid authority warnings, and if you have super-user power, su and use lsof with +D or +d as root.

### 3.22 Why can't my C compiler find the rpcent structure definition?

When you try to compile lsof your compiler may complain that the rpcent structure is undefined. The complaints may look like this:

```
>print.c: In function `fill_portmap':  
>print.c:213: dereferencing pointer to incomplete type  
>...
```

The most likely cause is that someone has allowed a BIND installation to update /usr/include/netdb.h (or perhaps /usr/include/rpc/netdb.h), removing the rpcent structure definition that lsof expects to find there.

Only Solaris has an automatic work-around. (See dlsof.h in dialects/sun.). The Solaris work-around succeeds because there is another header file, <rpc/rpcent.h>, with the rpcent structure definition, and there is a Solaris C pre-processor test that can tell when the BIND <netdb.h> is in place and hence <rpc/rpcent.h> must be included.

Doubtlessly there are similar work-arounds possible in other UNIX dialects whose header files have been "touched" by BIND, but in general I recommend restoration of the vendor's <netdb.h> and any other header files BIND might have replaced. (I think BIND replaces <resolv.h>, <sys/bitypes.h>, <sys/cdefs.h> -- and maybe others.)

### 3.23 Why doesn't lsof report fully on file "foo" on UNIX dialect "bar?"

Lsof sometimes won't report much information on a given file, or may even report an error message in its NAME column. That's usually because the file is of a special type -- e.g., in a file system specific to the UNIX dialect -- and I haven't used a system where the file appeared during my testing.

If you encounter such a situation, send me e-mail at <abe@purdue.edu> and we may be able to devise an addition to lsof that will report on the file in question. Please follow



the reporting guidelines in the "How do I report an lsof bug?" section of this FAQ. Make sure "lsof" appears in the "Subject:" line so my e-mail filter won't classify your letter as Spam.

### 3.24 Why do I get a complaint when I execute lsof that some library file can't be found?

On systems where the LIBPATH (or the equivalent) environment variable is used to record the library search path in executable files when they are built, an incorrect value may make it impossible for the system to find the shared libraries needed to load lsof for execution.

This may be particularly true on systems like AIX >= 4.1.4, where the lsof Makefile takes the precautionary step of using the -bnolibpath loader flag to insure that the path to the private static lsof library is not recorded in the lsof binary. Should LIBPATH be invalid when lsof is built, it will be recorded in the lsof binary as the default library path search order and lead to an inability to find libraries when lsof is executed.

So, if you get missing library complaints when you try to execute lsof, check LIBPATH, or whatever environment variable is used on your system to define library search order in executable files. Use the tools at your disposal to look at the library paths recorded in the lsof binary -- e.g., chatr on HP-UX, dump on AIX, ldd on Solaris.

Make sure, too, that when the correct library search path has been recorded in the executable file, the required library files exist at one or more of the search paths.

### 3.25 Why does lsof complain it can't open files?

When lsof begins execution, unless it has been asked to report only help or version information, typically it will attempt to access kernel memory and symbol files -- e.g., /unix, /dev/kmem. Even though lsof needs only permission to open these files for reading, read access to them might be restricted by ownerships and permission modes.

So the first step to diagnosing lsof problems with opening files is to use ls(1) to examine the ownerships and permission

modes of the files that lsof wants to open. You may find that lsof needs to be installed with some type of special ownership or permission modes to enable it to open the necessary files for reading. See the "Installing Lsof" section of 00README for more information.

### 3.26 Why does lsof warn "compiled for x ... y; this is z."?

Unless warnings are suppressed (with -w) or the kernel identity check symbol (HASKERNIDCK) definition has been deleted, all but one lsof dialect version (exception: /proc-based Linux lsof) compare the identity of the running kernel to that of the one for which lsof was constructed. If the identities don't match, lsof issues a warning like this:

```
lsof: WARNING: compiled for Solaris release 5.7; this is 5.6.
```

Two kernel identity differences can generate this warning -- the version number and the release number.

Build and running identity differences are usually significant, because they usually indicate kernels whose structures are different -- kernel structures commonly change at dialect version releases. Since lsof reads data from the kernel in the form of structures, it is sensitive to changes in them. The general rule is that an lsof compiled for one UNIX dialect version will not work correctly when run on a different version.

There are three work-arounds: 1) use -w to suppress the warning -- and risk missing other warnings; 2) permanently disable the identity check by deleting the definition of HASKERNIDCK in the dialect's machine.h header file -- with the same risk; or 3) rebuild lsof on the system where it is to be run. (Deleting HASKERNIDCK can be done with the Customize script or by editing machine.h.)

Generally checking kernel identity is a quick operation for lsof. However, it is potentially slow under AIX, where lsof must run /usr/bin/oslevel. To speed up lsof, use -w to suppress the /usr/bin/oslevel test. See "Why does AIX lsof start so slowly?" for more information.

### 3.27 How can I disable the kernel identity check?

The kernel identity check is controlled by the HASKERNIDCK definition. When it is defined, most dialects (exclusion: /proc-based Linux lsof) will compare the build-time kernel identity with the run-time one.

To disable the kernel identity check, disable the HASKERNIDCK definition in the dialect's machine.h header file. The Customize script can be used to do that in its section about the kernel identity check.

Caution: while disabling the kernel identity check may result in smaller lsof startup overhead, it comes with the risk of executing an lsof that may produce warning messages, error messages, incorrect output, or no output at all.

### 3.28 Why don't ps(1) and lsof agree on the owner of a process?

Generally the user ID lsof reports in its USER column is the process effective user ID, as found in the process structure. Sometimes that may not agree with what ps(1) reports for the same process.

There are sundry reasons for the difference. Sometimes ps(1) uses a different source for process information, e.g., the /proc file system or the psinfo structure. Sometimes the kernel is lax or confused (e.g., Solaris 2.5.1) about what ID to report as the effective user ID. Sometimes the system carries only one user ID in its process structure (some BSD derivatives), leaving lsof no choice.

The differences between lsof and ps(1) user identifications should be small and normally it will be apparent that the confusion is over a process whose application has changed to an effective user ID different from the real one.

### 3.29 Why doesn't lsof find an open socket file whose connection state is past CLOSE\_WAIT?

TCP/IP connections in states past CLOSE\_WAIT -- e.g., FIN\_WAIT\_1, CLOSING, LAST\_ACK, FIN\_WAIT\_2, and TIME\_WAIT -- don't always have open files associated with them. When they don't, lsof can't identify them. When the connection state advances from CLOSE\_WAIT, sometimes the open file associated with the connection is deleted.

### 3.30 Why don't machine.h definitions work when the surrounding

comments are removed?

The machine.h header files in dialect subdirectories have some commented-out definitions like:

```
/* #define HASSYSDC "/your/choice/of/path */
```

You can't simply remove the comments and expect the definition to work. That's intended to make you think about what value you are assigning to the symbol. The assigned value might have a system-specific convention. HASSYSDC, for example, might be /var/db/lsof.dc for FreeBSD, but it might be /var/adm/lsof.dc for Solaris.

Symbols defined in the lsof documentation are described in 00PORTING, other machine.h comments, and other lsof documentation files. HASSYSDC, for example, is discussed in 00DCACHE. When comments and documentation don't suffice, consult the source code for hints on how the symbol is used.

3.31 What do "can't read inpcb at 0x...", "no protocol control block", "no PCB, CANTSENDMORE, CANTRCVMORE", etc. mean?

Sometimes lsof will report "can't read inpcb at 0x00000000", "no protocol control block", "no PCB, CANTSENDMORE, CANTRCVMORE" or a similar message in the NAME column for open TCP socket files. These messages mean the file's socket structure lacks a pointer to the INternet Protocol Control Block (inpcb) where lsof expects to find connection addresses -- local and foreign ports, local and foreign IP addresses. The socket file has probably been submitted to the shutdown(2) function for processing.

In some implementations lsof issues the "no PCB, CANTSENDMORE, CANTRCVMORE" message, which tries to explain the absence of a protocol control block by showing the socket state settings that have been made by the shutdown(2) function.

If a non-zero address follows the "0x" in the "can't read inpcb" message, it means lsof couldn't read inpcb contents from the indicated address in kernel memory.

3.32 What do the "unknown file system type" warnings mean?

Lsof may report a message similar to"

unknown file system type, v\_op: 0x10472f10

in the NAME column for some files.

This means that lsof has encountered a vnode for the file whose operation switch address (from v\_op) references a file system type for which there is no support in lsof.

After lsof identifies the file system type, it uses pre-compiled code to locate the file system specific node for the file where lsof finds information like file size, device number, node number, etc.

To get some idea of what the file system type might be, use

nm on your kernel symbol file to locate the symbol name that corresponds to the v\_op address -- e.g., on Solaris do:

```
$ nm -x /dev/ksyms | grep 0x10472f10
0x10472f10 ... |file_system_name_vnodeops
```

Where "file\_system\_name" is the clue to the unsupported file system.

Lsof doesn't use the v\_op address to identify file system types on all dialects. Sometimes it uses an index number it finds in the vnode. It will translate that symbol to a short name in the warning message -- e.g., "nfs3" -- if possible.

### 3.33 Installation

#### 3.33.1 How do I install lsof?

There is no "standard" way to install lsof. Too much depends on local conditions for me to be able to provide working install rules in the lsof make files. (The skeleton install rules you will find just give "hints.") See the "Installing Lsof" section of 00README for a fuller explanation.

To install lsof you will need to consider these questions:

- \* Who should be able to use lsof? (See HASSECURITY and HASNOSOCKSECURITY in the "Security" section of 00README.)

- \* Where should lsof be installed? This is a decision

mostly dictated by local conditions. Somewhere in /usr/local -- etc/ or sbin/ -- is a common choice.

\* What permissions should I give the lsof executable?

The answer to this varies by dialect. The make files have install rules that give hints. The "Installing lsof" section of 00README gives information, too.

\* What if I want to install lsof in a shared file system for machines that require different lsof configurations?

See the next question and answer, "How do I install a common lsof when I have machines that need differently constructed lsof binaries?"

### 3.33.2 How do I install a common lsof when I have machines that need differently constructed lsof binaries?

A dilemma that faces some system administrators when they install lsof in a shared file system -- e.g., NFS -- is that they must have different lsof executables for different systems.

The answer is to build an lsof wrapper script that is executed in place of lsof. The script can use system commands to determine which lsof binary should be executed.

Consider this example. You have HP-UX machines with 32 and 64 bit kernels that share the /usr/local/sbin directory where you want to install lsof. Consequently, on each system you must use a different lsof executable, built for the system's bit size. (That's because lsof reads kernel structures, sized by the kernel's bit size.)

One answer is to install three things in /usr/local/sbin:

1) a 32 bit lsof as lsof32; 2) a 64 bit lsof as lsof64; and 3) an lsof script. The script might look like this one, based on work by Amir J. Katz:

```
#!/bin/sh
x=`usr/bin/getconf KERNEL_BITS` # returns 32 or 64
if /usr/bin/test "X$x" = "X32"
then
    lsof32 $*
else
    if /usr/bin/test "X$x" = "X64"
    then
        lsof64 $*
```

```

else
echo "Can't determine which
lsf executable to use;"
echo "getconf KERNEL_BITS says: $x"
exit 1
fi
fi

```

Solaris users should consult "How do I install lsf for Solaris 7, 8 or 9?" for information on a similar trick using the Solaris `isaexec` command.

Users of other dialects might be able to use a command like `uname(1)` that can identify a distinguishing feature of the system to be incorporated in pre-installed lsf executable names. For example, use ``uname -r`` and install binaries with suffixes that match ``uname -r`` output.

### 3.34 Why do lsf 4.53 and above reject device cache files built by earlier lsf revisions?

When lsf revisions 4.53 run and encounter a device cache file built by an earlier revision, it will reject the file and build a new one. The rejection will be advertised with these messages:

```

lsf: WARNING: no /dev device in <name>: 2 sections
...
lsf: WARNING: created device cache file: <name>

```

This happens because the header line of the device cache file was changed at revision 4.53 to contain the number of the device on which the device directory resides. The old device cache file header line -- the "2 sections" line in the above warning message, now reads "2 sections, dev=600".

This is not a serious problem, since lsf automatically rebuilds the device cache file with the correct header line.

### 3.35 What do "like block special" and "like character special" mean in the NAME column?

When lsf comes across an open block or character file whose device, raw device and inode place it somewhere other than `/dev` (or `/devices`), lsf doesn't report the `/dev` (or `/devices`) name in the NAME column. Instead lsf reports

the file system name and device or path name in the NAME column and parenthetically adds "like block special <path>" or "like character special <path>".

The value for <path> will point to a block or character device in /dev (or /devices) whose raw device number matches that of the open file being reported, but whose device number or node number (or both) don't match.

Such an open file is connected to a device node that has been created in a directory other than /dev (or /devices.) See `mknod(8)` for information on how such nodes are created. (Generally one needs root power to create device nodes with `mknod`.)

### 3.36 Why does an lsof make fail because of undefined symbols?

When lsof is compiled via the ``make`` step and the final load step fails because of missing symbols, the problem may not be lsof. The problem may be that ld, called by the compiler as part of the ``make`` step, can't find some library that lsof needs.

First check the last compiler line of the make operation -- e.g., the last line with cc or gcc in it before the undefined symbol report -- for loader arguments, i.e., ones beginning with "-l". Except for "-llsof" the rest name system libraries. ("-L./lib" precedes "-llsof" to tell the loader its location.)

Check that all the named system libraries exist. Look in /lib and /usr/lib as a start, but that may not be the only place system libraries live. Consult your dialect's documentation, e.g., the compiler and loader man pages, for other possible locations.

If some system library doesn't exist, that may mean it was never installed or was removed. You'll have to re-install the missing library.

You may find that all the system libraries lsof uses exist. Your next step might be to use nm and grep to see if any of them contain the undefined symbols.

```
$ nm library | grep symbol
```



If the undefined symbol exists in some library named by the lsof make step, then you might have a problem with some environment variable that controls the load step. The most common is LD\_LIBRARY\_PATH. It may have a setting that causes ld to ignore a directory containing a library lsof names. If this is the case, try unsetting LD\_LIBRARY\_PATH in the environment of the ld process -- e.g., do:

```
$ unset LD_LIBRARY_PATH
or
% unsetenv
LD_LIBRARY_PATH
```

Consult your ld man page for other environment variables that might affect library searching -- e.g., LIBPATH, LPATH, SHLIB\_PATH, etc.

If the undefined function doesn't exist in any libraries lsof names, check other libraries. See if the function has a man page that names its library. If the latter is true, please let me know, because that is an lsof problem I need to fix.

If none of these solutions work for you, send me some documentation via e-mail at <abe@purdue.edu>. Include `uname -a` output, the output of the lsof `Configure ...` and `make` steps, and the contents of the environment in force when the `make` step was executed -- e.g., `env` or `printenv` output. If you've located the libraries lsof names, send me that information, too. Make sure "lsof" appears in the "Subject:" line so my e-mail filter won't classify your letter as Spam.

### 3.37 Command Regular Expressions (REs)

#### 3.37.1 What are basic and extended regular expressions?

Lsof's ``-c" option allows the specification of regular expressions (REs), enclosed in two slash (/) characters and followed by these modifiers:

- b the RE is a basic RE.
- i ignore case.
- x the RE is an extended RE (the default).

Note: the characters of the regular expression may need to be quoted to prevent their expansion by the shell.

Example: this RE is an extended RE that matches exactly four characters, whose third may be an upper ('O') or lower case ('o') oh:

```
-c /^..o.$/i
```

For simplicity's sake, an RE that is acceptable to `egrep(1)` is usually called an extended RE.

REs suitable for the old line editor, `ed(1)`, are often called basic REs (and sometimes also called obsolete).

These are some ways basic REs usually differ from extended REs. (There are other differences.)

- \* ``|', `+', `?', `{', and `}'` are ordinary characters.

- \* ``^'` is an ordinary character except at the beginning of the RE.

- \* ``$'` is an ordinary character except at the end of the RE.

- \* ``*'` is an ordinary character if it appears at the beginning of the RE.

For more information on REs and the distinction between basic and extended REs, consult your dialect's man pages for `ed(1)`, `egrep(1)`, `sed(1)`, and possibly `regex(5)` or `regex(7)`.

### 3.37.2 Why can't I put a slash in a command regular expression?

Since a UNIX command name is the last part of a path to the command's executable, the `lsuf` command regular expression (RE) syntax uses slash ('/') to mark the beginning and end of an RE. Slash may not appear in the RE and the ``\'` back-slash escape is ineffective for "hiding" it.

More likely than not, if you try to put a slash in an `lsuf` command RE, you'll get this response:

```
$ lsuf -s/.\/ ...
lsuf: invalid regexp modifier: /
```

`lsuf` is complaining the the first character it found after the second slash isn't an `lsuf` command RE modifier -- 'b',

'i', or 'x'.

### 3.37.3 Why does lsof say my command regular expression wasn't found?

When

you use both forms of lsof's -c option --

```-c <command>"` and ```-c /RE/[m]"` -- and ask that lsof do a verbose search (```-V"`), you may be surprised that lsof will say that the regular expression wasn't found.

This can happen if the ```-c <command>"` form matches first, because then the ```-c/RE/[m]"` test will never have been applied. For example:

```
$ ./lsof -clsof -c/^..o.$/ -V -adcwd
COMMAND PID USER  FD  TYPE DEVICE SIZE/OFF  NODE NAME
lsof    7850 abe cwd  VDIR  6,0  2048 96442 / (/dev/sd0a)
lsof: no command found for regex: ^..o.$
```

The ```-clsof"` option matched first, so the ```-c/^..o.$/` option wasn't tested.

### 3.38 Why doesn't lsof report on shared memory segments?

Lsof reports on shared memory segments only if they're associated with an open file. That's consistent with lsof's mission -- to LiSt Open Files. Shared memory segments with no file associations aren't open files.

That's not to say that a report on shared memory segments and their associated processes wouldn't be useful. But it calls for a new tool, not more baggage for lsof.

### 3.39 Why does lsof report two instances of itself?

When you ask lsof to report all open files and it has permission to do so, you may see two lsof processes in the output. The processes are connected via pipes -- e.g., here's an HP-UX 11 example.

```
COMMAND  PID USER  FD  TYPE  DEVICE ...
...
lsof    29450 abe   7w PIPE 0x48732408 ...
lsof    29450 abe   8r PIPE 0x48970808 ...
...
lsof    29451 abe   6r PIPE 0x48732408 ...
lsof    29451 abe   9w PIPE 0x48970808 ...
```

The first process will usually be the lsof you initiated; the second, an lsof child process that is used to isolate its parent process from kernel functions that can block -- e.g., readlink() or stat().

Information to and from the kernel functions is exchanged via the two pipes. When the parent process detects that the child process has become blocked, it attempts to kill the child. Depending on the UNIX dialect that may succeed or fail, but the parent won't be blocked in any event.

See the "BLOCKS AND TIMEOUTS" and "AVOIDING KERNEL BLOCKS" sections of the lsof man page for more information on why the child process is used and how you can specify lsof options to avoid it. (Caution: that may be risky.)

### 3.40 Why does lsof report '\n' in device cache file error messages?

Lsof revisions prior to 4.58 may report '\n' in error messages it delivers about problems in the device cache file -- e.g.,

```
lsof: WARNING: no ...: 4 sections\n
```

That's deliberately done to show the exact contents of the device cache file line about which lsof is complaining, including its terminating NL (New Line) '\n' character. In the above example the line in the device cache file causing the lsof complaint contains "4 sections" and ends with a '\n'.

At revision 4.58 and above, device cache error messages like the one in the above example have been changed to read:

```
lsof: WARNING: no ...: line "4 sections"
```

The terminal '\n' is no longer reported, the line contents are enclosed in double quote marks (""), and the word "line" has been added as a prefix to denote that what follows is a line from the device cache file.

### 3.41 Kernel Symbol and Address Problems

#### 3.41.1 What does "lsof: WARNING: name cache hash size length error: 0"

mean?

When run on some systems, lsof may issue this warning:

```
lsof: WARNING: name cache hash size length error: 0
```

That is an example from a FreeBSD system where lsof reads the kernel's `_nchash` variable and finds its value is zero.

Similar warnings include:

```
WARNING: kernel name cache size:
WARNING: can't read kernel's name cache:
WARNING: no name cache address
WARNING: name cache hash size length error:
WARNING: unusable name cache size:
```

These warnings are issued when lsof is attempting to read the kernel's name cache information.

They are usually the result of a mis-match between the addresses for kernel symbols lsof gets via `nlist(2)` and the addresses in use by the kernel.

Lsof usually gets kernel symbol addresses from what it believes to be the kernel boot file. In FreeBSD, for example, that's the path returned by `getbootfile(3)`, usually `/kernel`. The boot file can have other names in other UNIX dialects -- `/unix`, `/vmunix`, `/bsd`, `/netbsd`, `/mach`, `/stand/vmunix`, etc.

Lsof will get incorrect (mismatched) addresses from the boot file if it has been replaced by a newer one which hasn't yet been booted -- e.g., if this is done in FreeBSD:

```
# mv /kernel /kernel.OLD
# mv /kernel.NEW /kernel
```

Until the FreeBSD system is rebooted, the booted kernel is `/kernel.OLD`, but `getbootfile()` says it is `/kernel`. If symbol addresses important to lsof in `/kernel.OLD` and `/kernel` don't match, the lsof WARNING messages result.

### 3.41.2 Why does lsof produce "garbage" output?

Kernel name cache warnings may not be the only sign that lsof is using incorrect symbol addresses to read kernel

values. If there's no reasonable test lsof can make on what it reads from the kernel, it may issue other warnings or even report nonsensical results.

The warnings may appear on STDERR, such as:

```
lsof: can't read proc table info
```

Or the warnings may appear in the NAME column as messages saying lsof can't read or interpret some kernel structure -- e.g.,

```
... NAME
... can't read file struct from 0x12345
```

One possible work-around is to point lsof's kernel symbol address gathering at the proper boot file. That can be done with lsof's -k option -- e.g.,

```
$ lsof -k /kernel.OLD
```

The best work-around is to make sure the standard boot file is properly sited -- e.g., if you've moved a new /kernel in place, boot it.

3.42 Why does lsof report open files when run as super user that it doesn't report when run with lesser privileges?

The most likely cause is that the HASSECURITY option was selected when the lsof executable was built.

If HASSECURITY is defined when lsof is built, and lsof is run with the privileges of a non-ROOT user, it will only list open files belonging to the user. The same lsof executable, when run with root user privileges, will list all open files.

However, if HASSECURITY and HASNOSOCKSECURITY are both defined when lsof is built, lsof will list open files belonging to the user and will also list anyone else's open socket files, provided their listing is selected with the "-i" option.

So first ask yourself if the process whose open files lsof won't list belong to a user other than the one under which you're running lsof, and are not open socket files. If either is true, use lsof's help (-h or -?) option and look

for a line near the bottom of the help panel that says:

"... can list all files..."

If the leading "..." says "Only root" then HASSECURITY was defined when lsof was built. If the trailing "..."

says

", but anyone can list socket files" then HASNOSOCKSECURITY was also defined.

Should you want an lsof not built with HASSECURITY defined, rerun the lsof Configure script. If you let Configure do customization, make sure you answer 'n' when it asks if you want to enable HASSECURITY and HASNOSOCKSECURITY. If you don't need to do customization, you can rebuild lsof with the "-n" option to Configure. Here's an example of such a rebuild sequence:

```
$ Configure -clean
$ Configure -n <dialect-abbreviation>
$ make
```

More information on the HASSECURITY and HASNOSOCKSECURITY options may be found in the "Security" section of the 00README file of the lsof distribution.

### 3.43 Test Suite Problems

#### 3.43.1 Errors all tests can report:

##### 3.43.1.1 Why do tests complain "ERROR!!! can't execute ../lsof"?

All tests in the test suite expect an executable lsof file to exist in the tests parent directory, ../lsof.

If there's none there, the tests/Makefile has a rule to make it, but there are probably circumstances where that rule may fail.

The work-around is to re-Configure and re-make lsof, then run the test suite.

##### 3.43.1.2 Why do tests complain "ERROR!!! can't find ..." a file?

Many tests create (or use from a supplied environment variable path) a test file and use lsof to find it. When lsof can't find the file, the tests report the error with

messages of the form:

```
ERROR!!! can't find ... : <some file path>
```

or

```
ERROR!!! lsof couldn't find ...
```

These type of error messages mean that the lsof field output delivered to the test didn't contain a file that the test could identify as the one it intended lsof to find. It might also mean that the process information -- command name, PID or parent PID -- didn't match what the test expected.

This could imply a bug in the test or a bug in lsof. Try using lsof to find a known file that is open. For example, while in the tests sub-directory, do this:

```
$ sleep 30 <
Makefile
$ ../lsof Makefile
```

If lsof doesn't report that Makefile is open, then the fault may be with lsof. If lsof reports the file is open, search further in the test code for the failure cause.

#### 3.43.1.3 Why do some tests fail to compile?

If a test suite program fails to compile, it may be because I've never had an opportunity to compile the test on the particular UNIX version you are using.

See Appendix B in 00TEST for a list of the UNIX dialects where the test suite has been validate.

#### 3.43.1.4 Why do some tests always fail?

There are several tests in the optional group that have conflicting or special requirements:

LTbigf    needs a dialect and file system that support large files.

LTlock    won't work if the tests/ sub-directory is on an NFS file system.

LTnfs     won't work if the tests/ sub-directory is not on an NFS file system.



So for two tests in particular, LTlock and LTnfs, one will generally fail.

Some failing tests  
can be run successfully by supplying to  
them a path to the appropriate type of file system with  
the -p option.

3.43.1.5 Why does the test suite say it hasn't been validated on  
my dialect?

When you use the default rule of the test suite's Makefile,  
it may issue this complaint:

```
$ cd tests
$ make
!!!WARNING!!!
```

This dialect or its particular version may not have  
been validated with the lsof test suite. Consequently  
some tests may fail or may not even compile.

```
!!!WARNING!!!
```

You are then given the opportunity to answer 'y' to have  
the test suite operation continue.

This message means that the tests/TestDB file in the tests  
sub-directory doesn't show that the test suite has been  
run with the combination of compiler flags found in  
tests/config.cflags. The tests might not run; they may  
encounter compiler failures.

See 00TEST for more information on the UNIX dialects where  
the test suite has been validated and on the workings of  
TestDB  
and its supporting scripts.

When the tests/Makefile "auto" rule is used, the message  
is more terse and the condition is fatal.

This suite has not been validated on:

<dialect\_description>

No opportunity to continue is offered.

The tests/Makefile "silent" rule will skip checking for

the validation footprint.

#### 3.43.1.6 Why do the tests complain they can't stat() or open() /dev/mem or /dev/kmem?

When the tests detect that lsof for the dialect reads its information from kernel memory (i.e., the LT\_KMEM definition is present in tests/config.cflags), and when the lsof executable path is ../lsof, the tests make sure they can stat() and open() for read access the relevant kernel memory devices, /dev/kmem and possibly /dev/mem.

If those stat() or open() operations fail, the tests issue an error message and quit. The message explains why the system rejected the operation in terms of system "errno" symbols and messages. More often than not the explanation will be that the process lacks permission to access the indicated device node.

One work-around is to give the lsof executable being tested the necessary permission -- e.g., via chgrp, chmod, etc. -- and set its path in the LT\_LSOF\_PATH environment variable. (See 00TEST.)

Another work-around is to make sure the process that runs the tests has the necessary permissions -- e.g., run it as root, or enable the process login to access the resources. For example, I can run the tests on my personal work-station because /dev/kmem and /dev/mem are readable by the "kmem" group and my login is in that group.

#### 3.43.2 LTbigf test issues

##### 3.43.2.1 Why does the LTbigf test say that the dialect doesn't support large files?

Large file support is defined dialect by dialect in the lsof source files and Configure script. If large file support isn't defined there, it isn't defined in the LTbigf test.

If you think that's wrong for a particular dialect, contact me via e-mail at <abe@purdue.edu>.

Make sure "lsof" appears in the "Subject:" line so my e-mail filter won't classify your letter as Spam.

### 3.43.2.2 Why does LTbigf complain about operations on its config.LTbigf\* file?

The LTbigf must be able to write a large file test (size > 32 bits) and seek within it and the process file ulimit size must permit the operation. If the default location for the test file, tests/, isn't on a file system enabled for large file operations or if the process ulimit file block size is too small, lsof will get file operation errors, particularly when seeking

There may be a work-around. Specify the path to a file LTbigf can write in a file system enabled for large file operations a the -poption. Make sure that the ulimit file block size permits writing a large file. For example, presuming /scratch23 is large-file-enabled, and presuming you have permission to raise the ulimit file block size, this shell commands will allow the LTbigf test to run on AIX:

```
$  
./LTbigf -p /scratch23/abe/bigfile
```

(Note: syntax for the ulimit command varies by dialect and by shell. Discovering the proper variant is left to the reader.)

More information on this subject can be found in the LTbigf description in the 00TEST file. If course, the LTbigf.c source file in tests/ is the ultimate source of information,

### 3.43.2.3 Why does LTbigf warn that lsof doesn't return file offsets?

On some dialects (e.g., Linux) lsof can't report file offsets, because the data access method underlying lsof doesn't provide them. If LTbigf knows that lsof can't report file offsets for the dialect, it issues this warning:

```
LTbigf ... WARNING!!! lsof can't return file offsets  
for this dialect, so offset tests have  
been disabled.
```

LTbigf then performs the size test and skips the offset tests.

For more information see 00TEST and the "Why doesn't /proc-based lsof report file offsets (positions)?" Q&A of

this file.

### 3.43.3 Why does the LTbasic test complain

"ERROR!!! lsof this ..."

and "ERROR!!! lsof that ..."?

The LTbasic test program uses lsof to examine a running lsof process. It looks for the lsof current working directory, executable (if possible), and kernel memory file (if applicable).

Failures to find those things result in the LTbasic error messages. More information on how LTbasic produces the error messages may be found in the LTbasic.c source file.

On HP-UX 11.11 and higher, for example, if the test's current working directory is on a loopback (LOFS) file system, LTbasic won't be able to find the current working directory of the lsof process because of a bug in the HP-UX kernel.

The solution for that HP-UX problem is to install an HP-UX patch. See the answer to the "Why doesn't PSTAT-based lsof report a CWD that is on a loopback (LOFS) file system?" question for more information on the patch.

### 3.43.4 NFS test issues

#### 3.43.4.1 Why does the LTnfs test complain "couldn't find NFS file ..."?

The LTnfs test must work with an NFS test file. After it opens the file it asks lsof to find it on an NFS file system. If the file isn't on an NFS file system, lsof won't find it, and the NFS test script complains and fails.

The work-around is to use -p option to supply a path to a regular NFS file (not a directory) that is on an NFS file system that LTnfs can read. Presuming /share/bin/file is such a file and can be opened for reading by the LTnfs test, this sample shell command could be used to run the LTnfs test successfully:

```
$ ./LTnfs -p /share/bin/file
```

(If the NFS file system is enabled for large files, the NFS test will produce the error message described in the following Q&A.)

### 3.43.5 LTnlink test issues

#### 3.43.5.1 Why does the LTnlink test complain that its test file is on an NFS file system?

The LTnlink test may complain:

```
LTnlink ... WARNING!!! test file <path> is NFS mounted.
```

and then issue an explanation and a hint about using the -p option.

The LTnlist

test does this because of the way NFS file links are managed when an NFS file is unlinked and the unlinking process still has the file open. Unlike with files on a local file system, when an NFS file that is still open is unlinked, its link count is not reduced.

The file name is changed to a name of the form .nfsxxxx and the link count is left unchanged until the process holding the file open closes it. That's done by NFS so it can keep proper track of the file on NFS clients and servers.

Since the link count isn't reduced when the LTnlink test program closes the NFS test file it still has open, lsof won't find it for LTnlink with a link count of zero. Consequently, LTnlink disables that test section and issues its warning.

The warning suggests that the unlink test section can be run by giving LTnlink a path to a test file with the -p option. That path must name a file LTnlink can write and unlink. Presuming /scratch23/abe/nlinkfile is on a local file system and the LTnlink test can write to it and unlink it, this sample shell command can be used to run the complete LTnlink test successfully:

```
$ LTnlink -p /scratch23/abe/nlinkfile
```

#### 3.43.5.2 Why does LTnlink delay and report "waiting for link count update: ..."?

On some UNIX dialects and file system combinations the updating of link count after a file has been unlinked can be delayed. Consequently, lsof won't be able to report the updated link count to LTnlink for a while.

When lsof doesn't report the proper link count to LTnlink, it sleeps and repeats the lsof call, using the "waiting for link count update: ..." message as a signal that it is waiting for the expected lsof response. The wait cycle duration is limited to approximately one minute.

#### 3.43.5.3 Why does LTnlink fail because of an unlink error?

LTnlink may fail with an error similar to:

```
LTnlink ... ERROR!! unlink(<name>) failed: (Permission denied).
```

That message will be followed by a short explanation.

The error means that the kernel support for the file system on which the file <name> resides does not allow a process to unlink a file while it has the file open. (When LTnlink is run without the "-p path" option, it creates a <name> that begins with "./config.LTnlink" and ends with the LTnlink process ID number.)

An unlink failure of this type runs counter to original UNIX file system behavior, but it has been observed on some file system types, especially on the ZFS file system.

The work-around is to run LTnlink on a file system that allows a process to unlink a file it has open. Usually /tmp has that support. So, try running LTnlink this way:

```
$ ./LTnlink -p /tmp/<name>
```

where <name> is a unique name in /tmp of your choosing. To be safe, create a subdirectory in /tmp, named by your login:

```
$ rm -f /tmp/<login>
$ mkdir /tmp/<login>
$ ./LTnlink -p /tmp/<login>/<name>
```

#### 3.43.6 LTdnlc test issues

##### 3.43.6.1 Why won't the LTdnlc test run?

Lsof is unable to access the DNLC cache on AIX, because the kernel symbols for the DNLC aren't exported. Contact IBM to learn why that decision was made.

The LTdnlc test won't work on Apple Darwin because lsof can't obtain reliable DNLC information.

The LTdnlc test may fail on other dialects. Failure causes include: a busy system with a DNLC that is changing rapidly; path name components too large for the DNLC; a file system -- e.g., NFS, /tmp, loopback -- which doesn't fully participate in the DNLC; or DNLC limitations (Many DNLC implementations will only store path name components if they are 31 characters or less.)

If you suspect the file system doesn't fully participate in kernel DNLC processing, as a work-around rebuild and test lsof on one that does.

#### 3.43.6.2 What does the LTdnlc test mean by "... <path> found: 100.00%"?

Even when it succeeds the LTdnlc test will report:

```
LTdnlc ... /export/home/abe/src/lsof4/tests found: 100.00%
```

This message means that the LTdnlc test asked lsof to find the file at the indicated path five times and lsof found the full path name in the indicated percentage of calls. The LTdnlc test considers it a failure if the percentage falls below 50.0%

#### 3.43.6.3 Why does the DNLC test fail?

The DNLC test may fail when some component of the lsof tests/ sub-directory can't be cached by the kernel DNLC. Some kernels have a limit on the length of individual components (typically) 32.

#### 3.43.7 Why hasn't the test suite been qualified for 64 bit HP-UX 11 when lsof is compiled with gcc?

When I attempted to qualify lsof for HP-UX 11, compiled with gcc 3.0, the LTsock test failed. I traced the failure to a gcc compilation error. Because LTsock is an important test, I didn't feel that the test suite was qualified if it failed.

LTsock compiles and runs correctly on 64 bit HP-UX 11 when compiled with HP's ANSI-C.

### 3.43.8 LTszoft test issues

#### 3.43.8.1 Why does LTszoft warn that lsof doesn't return file offsets?

On

some dialects (e.g., Linux) lsof can't report file offsets, because the data access method underlying lsof doesn't provide them. If LTszoft knows that lsof can't report file offsets for the dialect, it issues this warning:

```
LTszoft ... WARNING!!! lsof can't return file offsets
for this dialect, so offset tests have
been disabled.
```

LTszoft then performs the size test and skips the offset tests.

For more information see 00TEST and the "Why doesn't /proc-based lsof report file offsets (positions)?" Q&A of this file.

### 3.43.9 LTlock test issues

#### 3.44 File descriptor list (the ``-d" option) problems

##### 3.44.1 Why does lsof reject a ``-d" FD list?

Lsof rejects ``-d" FD lists that contain both exclusions and inclusions with messages like:

```
lsof: exclude in an include list: ^1
lsof: include in an exclude list: 2
```

That's because ``-d" FD lists are processed as ORed lists, so it makes no sense for them to contain both exclusions and inclusions.

I.e.,

if a ``-d" FD list were to contain ``^cwd,1", the ``^cwd" member is useless, because the ``1" member dominates by saying "include only FD 1". That effectively excludes ``cwd" FD.

Note that lists may have multiple members of the same type, exclude or include. They are processed as an ORed set. If an FD isn't excluded by any member of an exclude list, it is selected. If an FD is included by any member of an include list, it is selected.



### 3.44.2 Why are file descriptors other than those in my FD list reported?

The FD list that follows `--d` excludes or includes file descriptors, but unless the `--a` (AND) option is specified, the FD list selections are ORed to the other selections.

For example, the following `lsof` command will cause all file descriptors to be listed for the `lsof` command, and all but the `cwd` descriptor for all other commands, probably not what was intended.

```
$ lsof -c lsof -d ^cwd
```

Hint: use `--a` -- e.g.,

```
$ lsof -c lsof
-a -d ^cwd
```

### 3.45 How can I supply device numbers for inaccessible NFS file systems?

When `lsof` can't get device numbers for inaccessible NFS file systems via `stat(2)` or `lstat(2)`, it attempts to get them from the mount table's `dev=xxx` options. Successes are reported with a warning message that indicates the source of the device number and that output might be incomplete as a consequence of the warnings.

Some system mount tables -- e.g., Linux `/proc/mounts` -- don't have a `dev=xxx` option. In that case, and provided `lsof` for the dialect supports them, you can use the `+m` option to create a mount table supplement file and the `" +m m"` option to use it.

First check the `lsof -h` (help) output to see if the `+m` and `" +m m"` options are supported. If they are, use `+m` to create a mount table supplement file when all mounted file systems are accessible. Use `" +m m"` later to make the supplement available when some mounted file systems might not be available.

Here's an example that creates a mount supplement file in `$HOME/mnt-sup` and later makes it available to `lsof`.

```
$ rm -f $HOME/mnt-sup
$ lsof +m > $HOME/mnt-sup
...
```

`$ lsof +m $HOME/mnt-sup <other lsof options>`

If lsof has to get the device number from the supplement, it will issue an informative warning message. The warning can be suppressed with lsof's -w option.

Caution! Since the mount table supplement file is static, it is its supplier's responsibility to update it as file system mounts change.

For more information, consult the lsof man page. The "ALTERNATE DEVICE NUMBERS" section has useful information on how lsof acquires device numbers when stat(2) or lstat(2) fail.

### 3.46 Why won't lsof find open files on over-mounted file systems?

When a file system, /xyz for example, is mounted on the same mount point as another file system, /abc for example, running lsof with an argument of the path of the first file system's mount point -- the over-mounted one, /abc -- probably will not reveal any files open on /abc.

That's because lsof looks for open files on a file system by looking for files with the file system's device number. The two file systems usually have different device numbers and lsof determines the device number search key from the supplied name of the second file system.

A general work-around exists only for Linux. On that UNIX dialect, when you know the over-mounted file system's mount point path, you can ask lsof to report on all open files and grep that output for the path of the over-mounted file system mount point.

### 3.47 What can be done when lsof reports no more space?

Many lsof methods cache information in memory, using the dialects malloc() library function. When malloc() can't allocate the requested amount of memory, lsof exits with warning messages similar to this AIX message:

lsof: no more dev-ch space at pid 2257750: 0x82a8e600

Lsof then exits immediately and produces no more output.

A possible work-around

is to increase the memory foot print of the shell that runs lsof. That is often done with the `ulimit(1)` shell command.

### 3.48 What if the lsof build encounters ar and ld problems?

The lsof main and library Makefiles use the library archiver, `ar`, and the system loader, `ld`, applications. Improperly located, installed or configured versions of them may cause the lsof build to encounter errors with them.

The application producing the error should identify itself in its error messages.

The first thing to check the path of the application that is being used. Try ``which ar`` or ``which ld`` to see if perhaps the `PATH` used during the build might be causing the wrong archiver or loader to be used.

If the problem is with the use of the wrong archiver, and it's not possible to correct the `PATH` to it, try using the `LSOF_AR` environment variable to specify the path to and arguments for the correct archiver. See `00XCONFIG` for more information and note that `LSOF_AR` must specify the path to the archive application and the arguments for it, less the terminating library and module name arguments.

If the problem is with the loader, there is no lsof work-around. That's because lsof calls the loader via the C compiler, so the problem must be fixed at the compiler (system) level.

### 3.49 Why does lsof -i report an open socket file for a process, but lsof -p on that process' ID report nothing?

The lsof in use was probably built with the `HASSECURITY` and `HASNOSOCKSECURITY` options and the process in question does not belong to the user of lsof.

The `HASSECURITY` option limits lsof output to processes owned by the user invoking lsof and the `HASNOSOCKSECURITY` option weakens that slightly to allow output of open socket file information for all processes.

For example, if process PID 12345 is owned by some user other than the one invoking lsof, and lsof has been compiled with the `HASSECURITY` and `HASNOSOCKSECURITY` options, the following lsof

command

will display the open socket files of process 12345:

```
$ lsof -p 12345 -a -i
```

This security restriction is described in the `lsof(8)` manual page.

## 4.0 AIX Problems

### 4.1 What is the Stale Segment ID bug and why is `-X` needed?

Kevin Ruderman reports that he has been informed by IBM that processes using the AIX 3.2.x, 4.1[.12345], 4.2[.1], and 4.3.x kernel's `readx()` function can cause other AIX processes to hang because of what appears to be file system corruption.

This failure, known as the Stale Segment ID bug, is caused by an error in the AIX kernel's journaled segment memory handler that causes the kernel's `dir_search()` function erroneously to believe directory entries contain zeroes. The process using the `readx()` call need not be doing anything wrong. Usually the system must be under such heavy load that the segment ID being used in the `readx()` call has been freed and then reallocated to another process since it was obtained from kernel memory.

`Lsof` uses the `readx()` function to access library entry structures, based on the segment ID it finds in the `proc` structure of a process. Since IBM probably will never fix the kernel bug, I've added an AIX-specific option to `lsof` that controls its use of the `readx()` function.

By default `lsof` `readx()` use is disabled; specifying the ```-X"` option enables `readx()` use.

If you want to change the default `readx()` behavior of AIX `lsof`, change the `HASXOPT`, `HASXOPT_ROOT`, and `HASXOPT_VALUE` definitions in `dialects/aix/machine.h`. You can also use these definitions to enable or disable `readx()` -- consult the comments in `machine.h`. You may want to disable `readx()` use permanently if you plan to make `lsof` publicly executable.

When `HASXOPT_ROOT` is defined, `lsof` will restrict use of the `-X` option to processes whose real UID is root; if

HASXOPT\_ROOT isn't defined, any user may specify the -X option. The Customize script offers the option to change HASXOPT\_ROOT when HASXOPT is defined and HASXOPT\_ROOT is named in any dialect's machine.h header file.

I have never seen lsof cause a problem with its use of readx(), but I believe there is some chance it could, given the right circumstances.

#### 4.1.1 Stale Segment ID APAR

Here are the details of the Stale Segment ID bug and IBM's response, provided by Kevin Ruderman.

##### AIX V3

APAR=ix49183

user process hangs forever in kernel due to file system corruption

STAT=closed prs TID=tx2527 ISEV=2 SEV=2

(A "closed prs" is one closed with a Permanent Restriction.)

RCOMP=575603001 aix v3 for rs/6 RREL=r320

##### AIX V4 (internal defect, no apar #)

prefix p

name 175671

abstract KERMP: loop for ever in dir\_search()

##### Problem description:

1. Some user application -- e.g., lsof -- gets the segment ID (SID) for the process private segment of a target process from the process table.
2. The target process exits, deleting the process private segment.
3. The SID is reallocated for use as a persistent segment.
4. The user application runs again and tries to read the user area structure from /dev/mem, using the SID it read from the process table.
5. The loads done by the driver for /dev/mem cause faults in the directory; new blocks are allocated; the size changed; and zero pages created.

6. The next application that looks for a file in the affected directory hangs in the kernel's `dir_search()` function because of the zero pages. This occurs because the kernel's `dir_search()` function loops through the variable length entries one at a time, moving from one to the next by adding the length of the current entry to its address to get the address of the next entry. This process should end when the current pointer passes the end of the known directory length.

However, while the directory length has increased, the entry length data has not, so when `dir_search()` reaches the zero pages, it loops forever, adding a length of zero to the current pointer, never passing the end of the directory length. The application process is hung; it can't be killed or stopped.

IBM closed the problem with a PRS code (Permanent ReStriction) under AIX Version 3 and had targeted a fix for AIX 4.2. They have recently (I became aware of it September 10, 1996) cancelled the defect report altogether and have indicated they are not going to fix the defect.

#### 4.2 Gcc Work-around for AIX 4.1x

When gcc is used to compile `lsof` for AIX 4.1x, it doesn't align one element of the user structure correctly. `Xlc` sees the `U_irss` element as a type "long long" and aligns it on an 8 byte boundary. That's because the default mode of `xlc` is `-qlonglong`; when `-qlonglong` is enabled, the `_LONG_LONG` symbol is also defined.

Gcc sees `U_irss` as a two element array of type long, because `_LONG_LONG` isn't defined. Hence gcc aligns the `U_irss` element array on a 4 byte boundary, rather than an 8 byte one, making the gcc incantation of the user structure 4 bytes shorter than `xlc`'s.

When the length of gcc's user structure is supplied as argument 4 to the undocumented `getuser()` function of the AIX kernel, `getuser()` rejects it as an incorrect size and returns `EINVAL`.

`Lsof` has a work-around for this problem. It involves a special test in the `Configure` script when the "aixgcc"

Configure abbreviation is used -- e.g.,

```
$ Configure -n aixgcc
```

The test is to compile a small program with gcc and check the alignment of U\_irss. If it's not aligned on an 8 byte boundary, the Configure script makes a special copy of <sys/user.h> in ./dialects/aix/aix<AIX\_version> whose U\_irss will align properly, and generates compile time options to use it.

While I have tested this work-around only with 4.1.4, it should work with earlier versions of AIX 4.1. It does not work for AIX 4.2; a different work-around is employed there. (See the next section.)

If you want to use this technique to compile other AIX 4.1x programs with gcc for using getuser(), check the Configure script.

Stuart D. Gathman identified this gcc AIX alignment problem.

#### 4.3 Gcc and AIX 4.2[.1]

Alignment problems with gcc and AIX 4.2[.1] inside the user structure are more severe, because there are some new 64 bit types in AIX that gcc doesn't yet (as of 2.7.x) support. The <sys/user.h> U\_irss element problem, discussed in 4.3 above, doesn't exist in 4.2[.1].

The AIX lsof machine.h header file has a work-around, provided by Henry Grebler, that bypasses gcc alignment problems. Later versions of gcc (e.g., 2.8.x) will probably bypass the problems as well.

#### 4.4 Why won't lsof's Configure allow the use of gcc for AIX below 4.1?

Gcc can't reliably be used to compile lsof for AIX versions below AIX 4.1 because of possible kernel structure element alignment differences between it and xlc.

#### 4.5 What is an AIX SMT file type?

When you run AIX X clients with the DISPLAY environment variable

set to ``:0.0" they communicate with the AIX X server via files whose kernel file structure has an undefined type (`f_type == 0xf`) -- at least there's no definition for it in `<sys/file.h>`.

These are Shared Memory Transport (SMT) sockets, an artifact of AIXWindows, designed for more efficient data transfers between the X server and its clients.

Henry Grebler and David J. Wilson alerted me to the existence of these files. Mike Feldman and others helped me identify them as SMT sockets.

The curious reader can find more about SMT sockets in `/usr/lpp/X11/README.SMT`.

#### 4.6 Why does AIX lsof start so slowly?

When AIX lsof starts it compares the running kernel's identity to the one for which it was built, using `/usr/bin/oslevel`. That comparison can sometimes take a long time to complete, depending on the system's maintenance level and how recently it was examined with `oslevel`.

AIX revisions 4.67 and above for AIX 5 and above don't use `oslevel` to determine the kernel identity. They use `uname(2)` instead, and it is much faster.

You can skip the `oslevel` test by suppressing warning messages with lsof's `-w` option. Doing that carries with it the risk of missing other warning messages, however.

You can also disable the kernel identity check by disabling the definition of the `HASKERNIDCK` symbol by editing AIX `machine.h` header file or by using the `Customize` script to disable it.

See the "Why does lsof warn "compiled for x ... y; this is z.?" section for more information.

#### 4.7 Why does exec complain it can't find libc.a[shr.o]?

When you try to execute lsof you may get this complaint:

```
exec(): 0509-036 Cannot load program ./lsof because of
the following errors:
0509-022 Cannot load library libc.a[shr.o].
```



0509-026 System error: A file or directory in the path name does not exist.

This is probably the result of making lsof when the LIBPATH environment variable contained a directory path that doesn't contain

libc.a. You can see what LIBPATH contained when lsof was made by using the dump application on lsof. For example, if LIBPATH contained /foo/bar when lsof was made, you will see this (partial) dump output:

```
$ dump -H lsof
...
***Import File Strings***
INDEX PATH          BASE    ...
0    /foo/bar
```

To correct the problem, revisit the lsof source directory and remake lsof this way:

```
$ unset LIBPATH; make (sh or ksh)
or
% unsetenv LIBPATH; make (csh or tcsh)
```

4.8 What does lsof mean when it says, "no PCB, CANTSENDMORE, CANTRCVMORE" in a socket file's NAME column?

When an AIX application calls shutdown(2) on an open socket file, but hasn't called close(2) on the file, the file will remain visible to lsof as an open socket file without any extended protocol information.

Lsof reports that state in the NAME column by saying that there is "no PCB" (Protocol Control Block) for the protocol (e.g., TCP in the NODE column). If the open socket file has the state variables SO\_CANTSENDMORE and SO\_CANTRCVMORE set -- i.e., from the shutdown(2) call -- lsof reports them with the CANTSENDMORE and CANTRCVMORE notes in the NAME column.

4.9 When the -X option is used on AIX 4.3.3, why does lsof disable it, saying "WARNING: user struct mismatch; -X option disabled?"

The -X option causes lsof to read the loader information of the user structure from virtual memory via the readx() system call. It does that with the user structure definition from <sys/user.h> that was compiled into the lsof executable.

On AIX 4.3.3 there are two different user structure definitions in two separate <sys/user.h> header files, distributed at different times by IBM. If lsof was compiled with one and the kernel on which lsof is being run was compiled with the other, lsof normally won't get correct loader information when it calls readx().

In an attempt to compensate for that difference, lsof makes an independent check of the loader information by getting the user structure's open file count via readx() and comparing it to the open file count obtained independently via getprocs(). When the two counts don't match, lsof tries to read the count (and re-read the loader information) with two offsets, based on observed differences between the two user structures.

When one of the three attempts produces a correct open file count, lsof uses its corresponding offset on subsequent readings of the loader information.

When none of the three attempts produces a correct open file count, lsof issues the WARNING message and disables -X processing.

To eliminate this problem, obtain an lsof binary that matches the kernel of the AIX 4.3.3 system where you want to run lsof. Compiling lsof on the target system is the preferred way to get a matching binary.

#### 4.10 Why doesn't the -X option work on my AIX 5L or 5.[123] system?

If your AIX 5L or 5.[123] system uses the ia64 architecture, lsof needs setuid-root permission to be able to do the processing that -X requires.

Check the output of `uname -a` to determine the architecture type.

The work-around is to give lsof setuid-root permission.

#### 4.11 Why doesn't /usr/bin/oslevel report the correct AIX version?

The oslevel man page says, "The oslevel command reports the level of the operating system using a subset of all filesets installed on your system."

You can see which fileset is below the expected level with oslevel's -l option. For example, if you believe your system is at AIX level 4.3.3, but oslevel reports 4.3.2, use this oslevel command to find the filesets below 4.3.3:

```
$ /usr/bin/oslevel -l 4.3.3.0
```

If you don't know what level argument to supply to oslevel's -l option, use oslevel's -q option first.

#### 4.11.1 Why doesn't /usr/bin/oslevel report the correct AIX version on AIX 5.1?

The subset list for oslevel on AIX 5.1 seems to include at least two filesets, xlsmp.msg.en\_US.rte and xlsmp.rte, that do not install from AIX 5.1 media with a 5.1.0.0 level. Hence, oslevel reports 5.0.0.0 instead of the expected 5.1.0.0.

If either xlsmp.msg.en\_US.rte or xlsmp.rte is installed, lsof's Configure script and run-time tests will identify the AIX version incorrectly. The run-time test will issue a complaint message of this form:

```
lsof: WARNING: compiled for AIX version xxx; this is yyy.
```

You can correct the Configure test by pre-defining the oslevel value, setting the correct value in the LSOF\_VSTR environment variable before running the Configure script -- e.g., to pre-define AIX 5.1 when using ksh, do this:

```
$ LSOF_VSTR=5.1.0.0 Configure -n aix
```

You can't affect oslevel output without uninstalling xlsmp.msg.en\_US.rte and xlsmp.rte. If you can't do that, you'll have to put up with the run-time complaint.

#### 4.12 Why does lsof for AIX 5.1 or above Power architecture complain about kernel bit size?

When you run an lsof binary on an AIX 5.1 or above Power system, it might complain:

```
lsof: FATAL: compiled for a 32 bit kernel.  
The bit size of this kernel is 64.
```

or

exec: 0509-036 Cannot load program ./lsof because of the following errors:

0509-032 Cannot run a 64-bit program on a 32-bit machine.

Starting at lsof revision 4.61, lsof binaries for Power architecture systems running AIX 5.1 or above are closely tied to the kernel bit size. lsof must do that so it can read and understand kernel structures.

lsof's Configure script tunes the lsof configuration so that the binary built in the make(1) step is adjusted to the kernel bit size.

An lsof binary knows the bit size for which it was constructed, tests the bit size of the kernel under which it is running, and objects if the two sizes don't match. To see the bit size for which lsof was constructed, run it with its -v option and look for these lines in the output:

configuration info: 32 bit kernel

or

configuration info:

64 bit kernel

(Note: these lines will appear only in -v output for AIX 5.1 and above lsof binaries, built for Power architecture.)

You can see the kernel bit size test method in the aix stanza of the lsof Configure script and in the get\_kernel\_access() function of the lsof ../dialects/aix/dproc.c source file.

There is more information on pre-defining the kernel bit size when building lsof in Configure, 00PORTING, and 00XCONFIG.

The only work-around is to use an lsof binary built to match the running kernel bit size.

#### 4.13 What can't gcc be used to compile lsof on the ia64 architecture for AIX 5 and above?

Gcc can't be used to compile lsof on the ia64 architecture for AIX 5 and above because I haven't had access to a system that has a working gcc compiler. The gcc compiler on my one and only ia64 AIX 5.1 test system, provided by IBM, didn't work at all.

4.14 Why does lsof get a segmentation fault when compiled with gcc for a 64 bit Power architecture AIX 5.1 kernel?

When

lsof is configured with the lsof "aixgcc" Configure abbreviation, the resulting lsof executable may cause a segmentation violation when it is run. I've observed this with gcc version 2.9-aix43-010414-7.

As far as I have been able to tell, the segmentation fault is the result of a gcc compilation, loading, or library error. Watching lsof run with gcc's companion debugger, gdb, shows no error in the lsof source code that might explain the fault.

The only work-around I know is to use the IBM C compiler in place of gcc -- i.e., use the "aix" lsof Configure abbreviation.

4.15 Why does lsof ignore AFS on my AIX system?

The lsof Configure script quits on AIX when AFS is present, the AIX version is greater than 4.3.3.0 or the AFS version is greater than 3.5. That's because I have no test systems available for those AIX and AFS version combinations.

When the lsof Configure script detects an AIX and AFS version combination that is unsupported, it will report:

```
!!!FATAL: Lsof does not support AFS on this combination of
AIX and AFS versions. To disable AFS, set the
value of the AIX_HAS_AFS environment variable to
"no".
```

The only work-around is to set the AIX\_HAS\_AFS environment variable as explained in the error message:

```
$ AIX_HAS_NSF=no; export AIX_HAS_NSF
$ ./Configure -n aix
```

4.16 Why does lsof report "system paging space is low" and exit?

When AIX paging space runs low, the AIX kernel sends a SIGDANGER signal to processes, warning them that they should reduce their memory usage.

When lsof receives that signal, it issues the following fatal error message and exits:

lsof: FATAL: system paging space is low.

A possible work-around is to limit the amount of information lsof must cache in its process memory with the "-c", "-g", "-l" and "-p" options.

Also see the answer to the "What can be done when lsof reports no more space?" question.

#### 4.17 Why does lsof have a compilation problem on AIX 5.3 above maintenance level 1?

On some AIX 5.3 systems with maintenance levels 2 and higher installed, lsof 4.77 and below may not compile properly. The compiler complains the snapshotObject structure definition, needed by <j2/j2\_inode.h>, is missing.

That problem is fixed in the 4.78 revision.

### 5.0 Apple Darwin Problems

#### 5.1 What do /dev/kmem-based and libproc-based mean?

Lsof for Apple Darwin currently uses /dev/kmem to read kernel data structures from which it gathers and reports open file information. That version of lsof is called /dev/kmem-based lsof.

At an upcoming release lsof will use a library called libproc to obtain information about open files. That version of lsof will be called libproc-based lsof.

The /dev/kmem-based lsof sources may be found in the kmem subdirectory of the dialects/darwin branch of the lsof source tree. When the supporting version of Apple Darwin is released, the libproc-based lsof sources will be found in .../dialects/darwin/libproc.

#### 5.2 /dev/kmem-based Apple Darwin Questions

##### 5.2.1 Why does Configure ask for a path to the Darwin XNU kernel header files?

When lsof was ported to Apple Darwin by Allan Nathanson at revision 4.53, some kernel header files needed by lsof weren't being exported by the developers. (That's still true at lsof revision 4.76.)

At first a shell script that Allan provided would get the missing header files by checking them out from the CVS root. Although the script was updated from time to time, eventually the re-organization of Darwin sources has made it impossible to update the script to do an automatic download of the missing header files.

At lsof revision 4.69 and above it is necessary for the Darwin lsof builder to download the Darwin XNU kernel headers before attempting to build lsof. The download may be done via a web browser, starting at this URL:

<http://www.opensource.apple.com/darwinsource/index.html>

Once there, select the link to the Mac OS X version that matches the one on the system where lsof is to be built.

Follow that link's "[ Source ]" link. Once there, select the tar.gz link of the xnu\* entry near the bottom of the page. That entry should have a name that matches the xnu\* name shown by `uname -a` -- e.g., if `uname` reports:

```
$ uname -a
... root:xnu/xnu-517.7.21 ...
```

Then the appropriate xnu\* entry is xnu-517.7.21. Clicking its link should lead to an "Apple Open Source" page requesting an Apple ID and password.

Enter them if they're available. If an Apple ID and password are not available, get them by following the instructions on the page -- i.e., follow the [signin.apple.com](http://signin.apple.com) link.

Once a valid Apple ID and its password have been entered, the download will begin. Select the saving of the downloaded xnu\*.tar.gz file in an appropriate place on the Mac OS X system.

Once the download completes, install it. Use `gunzip` to decompress the download and `tar` to extract the archive -- e.g.,

```
$ gunzip -c xnu-517.7.21.tar.gz | tar xf -
```

Remember the absolute path to the extracted archive. That is its installed place. E.g., if the xnu-517.7.21.tar archive was extracted to the lsof builder's home directory, its full installation path will be something like:

```
~/xnu-517.7.21
```

Now run the lsof Configure script. When it asks for the path to the installed Darwin XNU kernel header files, supply the path to the gunzip'd and extracted xnu\* archive -- e.g.,  
~/xnu-517.7.21.

The path to the Darwin XNU kernel headers may also be supplied to the Configure script in the DARWIN\_XNUDIR environment variable, eliminating the need to enter it interactively -- e.g.,

```
$ DARWIN_XNUDIR=~/xnu-344.49 ./Configure -n darwin
```

#### 5.2.1.1 Why does Configure complain that Darwin XNU kernel header files are missing?

These are some reasons why the lsof Configure script might claim that Darwin XNU header files are missing:

- \* The wrong path to them was specified.

- \*

The files and directories in the path are not readable and searchable -- i.e., check the modes and ownerships.

- \* The downloaded archive doesn't match the Mac OS X version of the system.

If in doubt, revisit the Darwin XNU kernel header file download instructions in the answer to the question "Why does Configure ask for a path to the Darwin XNU kernel header files?"

If Configure still can't find Darwin XNU kernel header files, contact me via e-mail at <abe@purdue.edu> for help. Make sure "lsof" appears in the "Subject:" line so my e-mail filter won't classify your letter as Spam.

#### 5.2.2 Why doesn't Apple Darwin lsof report text file information?



At the first port of lsof to Apple Darwin, revision 4.53, insufficient information was available -- logic and header files -- to permit the installation of VM space scanning for text files. As of lsof 4.70 it is still not available.

Text file support will be added to Apple Darwin lsof after the necessary information becomes available.

### 5.2.3 Why doesn't Apple Darwin lsof support IPv6?

At the first port of lsof to Apple Darwin, revision 4.53, Apple Darwin lacked IPv6 support. IPv6 became available in Apple Darwin version 1.5 and support for it was added to lsof then.

### 5.2.4 Why does lsof complain about a mismatch between the release for which lsof was compiled and the booted Mac OS X release?

When lsof is started on the "Gold Master" Darwin release (aka Mac OS X), it complains:

lsof: compiled for 1.0 release; this is 1.3.2.

This happens because the lsof binary released with Mac OS X was built on a system whose release number (1.0) doesn't match that of the released system -- usually 1.3.x. Lsof makes this check because UNIX dialect OS changes are often accompanied by header file changes that affect lsof.

In this specific case, this error can be ignored. If you don't want to do that, get the lsof distribution and build lsof so its built-on and running-on Mac OS X release numbers match.

### 5.2.5 Why does lsof for Apple Darwin 8 and higher report "stat(...): ..." in the NAME column?

Lsof for Apple Darwin 8 may report messages like these in the NAME column:

stat(/private/var/run/asl\_prune): No such file or directory  
or  
stat(/private/var/db/netinfo/local.nidb/Config): Permission denied

Those messages indicate that lsof was unable to collect open

file information for the paths enclosed in "stat(...)" with the stat(2) function, because the function encountered the reported error.

A work-around for the "Permission denied" error is to run lsof with elevated privileges -- e.g., when logged on as the super user.

If the stat(2) error message is "No such file or directory", the file probably has been unlinked (removed) and there is no lsof work-around.

#### 5.2.6 What are the limitations of Apple Darwin lsof link count reporting?

Lsof for Apple Darwin cannot report link count information reliably.

For Apple Darwin below 8 link count information is not always available in the kernel node structures available to lsof. When link count information is available, however, it includes link counts of zero. Thus, using lsof's +L1 option may result in the finding of some files whose link counts are zero.

Lsof can report only some link count information for Apple Darwin 8 and above. Link count information is only available for files where lsof can assemble the full file path and has permission to apply stat(2) to it. (See the answer to the "Why does lsof for Apple Darwin 8 and higher report "stat(...): ..." in the NAME column?" question for more information on stat(2) failures.)

Apple Darwin 8 and above files that have been unlinked and thus have a link count of zero cannot be found by stat(2) -- i.e., stat(2) returns a "No such file or directory" error. As a result lsof never displays link counts of zero and the use of lsof's +L1 option to find them always fails.

#### 5.2.7 Why does Apple Darwin report process group IDs incorrectly?"

The kmem version of lsof for Apple Darwin does not report process group IDs correctly when requested to do so with its ``-g" option. This is a bug that surfaced after the libproc version was released and access to kmem test systems has prevented patching the bug.

If you are using the kmem version and would like a fix for this problem, please send e-mail to me <abe@purdue.edu>. Make sure "lsof" appears in the "Subject:" line so my e-mail filter won't classify your letter as Spam.

### 5.3 Libproc-based Apple Darwin Questions

## 6.0 BSD/OS BSDI Problems

### 6.0.5 Statement of deprecation

As of lsof revision 4.76 support for BSDI BSD/OS has been dropped. The 4.76 distribution of lsof for BSDI BSD/OS may be found on [lsof.itap.purdue.edu](http://lsof.itap.purdue.edu/pub/tools/unix/lsof/OLD/src) in `pub/tools/unix/lsof/OLD/src`.

## 7.0 DEC OSF/1, Digital UNIX, and Tru64 UNIX Problems

### 7.1 Why does lsof complain about non-existent /dev/fd entries?

When you run lsof for Digital UNIX 3.2, lsof may complain:

```
lsof: can't lstat /dev/fd/xxx: No such file or directory
lsof: can't lstat /dev/fd/yyy: No such file or directory
```

(Or it may warn about other missing /dev/fd paths.) When you do an `ls /dev/fd` none of the missing paths are listed.

This is caused by a bug in the DEC library function `getdirentries()`. For some reason, when /dev/fd is a file system mount point, `getdirentries()` returns an incorrect size for it to `readdir()`. (Lsof calls `readdir()` in its `ddev.c readdev()` function.) Because of the incorrect size, `readdir()` goes past the end of the /dev/fd directory buffer, encounters random paths and returns them to lsof. Lsof then attempts to `lstat(2)` the random paths, gets error replies from `lstat(2)`, and complains about the paths.

Duncan McEwan discovered this error and has reported it to DEC. Duncan also supplied an alternate `readdir()` function as a work-around. I've incorporated his `readdir()` in `dialects/osf/ddev.c` (as the static `ReadDir()` function) with some slight modifications, and enabled its use when the `USELOCALREADDIR` symbol is defined.

The Configure script defines USELOCALREADDIR for Digital UNIX version and 3.2. If you don't want to use Duncan's local readdir() function, edit the Makefile and remove -DUSELOCALREADDIR from the CFGF string. When DEC releases a corrected getdirentries() function, I'll modify the Configure script to stop defining USELOCALREADDIR.

## 7.2 Why does the Digital UNIX V3.2 ld complain about Ots\* symbols?

When you compile lsof on your Digital UNIX V3.2 system, ld may complain:

```
ld:
Unresolved:
knlist
_OtsRemainder32Unsigned
_OtsDivide64Unsigned
_OtsRemainder64Unsigned
_OtsDivide32Unsigned
_OtsMove
_OtsDivide32
_OtsRemainder32
*** Exit 1
```

Chris Eleveld reports this happens on Digital UNIX V3.2 systems after the Fortran compiler has been installed.

The best work-around seems to be to remove -lmld from the CFGF string in the Makefile produced by Configure -- i.e., change:

```
CFGF= -lmld
to
CFGF=
```

According to the V3.2 man page for nlist(3), this shouldn't work, but my testing shows that it does. Although I haven't been able to test this second work-around, you might try adding -lots to CFGF, rather than removing -lmld -- i.e., change:

```
CFGF= -lmld
to
CFGF= -lmld -lots
```

WARNING: my testing also shows that the V2.0 nlist(3) man page means what it says when it calls for -lmld -- lsof

loaded without -mld under V2.0 can't locate the proc (process) table address.

DON'T REMOVE -lml from THE DIGITAL UNIX V2.0 MAKEFILE.

If you run into this problem, please let me know what problem you encountered and how you solved it.

### 7.3 Why can't lsof locate named pipes (FIFOs) under V3.2?

While lsof for V3.2 can report on named pipes (FIFOs), it can't find them by name. That appears to happen because of the way the V3.2 kernel lstat(2) function reports named pipe device numbers.

The V3.2 kernel reports the device number as 0xffffffff, while the kernel structures for named pipes that lsof examines contain the device number of the file system on which the named pipe resides.

Consequently, lsof can't match the device and inode number pair it receives from applying lstat(2) to the named pipe with any device and inode number pair it finds when scanning kernel structures.

I don't have a work-around. You can, of course, ask for full lsof output and use a post-processing filter (e.g., grep) to locate the named pipe of interest.

This problem doesn't exist under V2.0.

### 7.4 Why does lsof use the wrong configuration header files? For example, why can't the lsof compilation find cpus.h?

DEC OSF/1, Digital UNIX, and Tru64 UNIX configuration header files describe the hardware and software environment for which your kernel boot file was constructed. For example, /sys/<name>/cpus.h defines the number of CPUs in its NCPUS #define.

Lsof searches for the configuration header file subdirectory in /sys (/usr/sys for Digital UNIX version 4.0 and Tru64 UNIX) by converting the first host name component to capital letters -- e.g., TOMIS is derived from tomis.bio.purdue.edu. If that subdirectory exists, lsof uses header files from it. (Configure reports what subdirectory is being used.)

If Configure doesn't find a host-name derived subdirectory, it prompts you for the entry of a subdirectory name. If you can't find one, quit Configure and run the kernel generation process to create a proper configuration subdirectory. If you don't identify a proper configuration subdirectory and you try to compile lsof, the compiler will complain about missing header files -- e.g., a missing cpus.h.

Once you have located or generated a proper configuration subdirectory, rerun Configure. If you have generated a configuration subdirectory whose name is derived from the host name, Configure will find and use it. If not, you will have to specify its name to Configure.

#### 7.5 Why does lsof indicate incomplete paths with " -- " for Tru64 UNIX 5.1 files?

When lsof can't find a component of a path in the kernel's name cache (aka DNLC), or can't determine that the left-most component has as its parent the file system root, it uses an "incomplete path" notation. That notation begins with the file system root name, followed by " -- ", followed by the consecutive path name components lsof was able to find in the DNLC -- e.g., "/" -- init".

Because the DNLC was significantly redesigned in Tru64 UNIX 5.1, lsof's handling of the cache had to be completely redone. As part of the DNLC redesign a name cache entry parameter lsof formerly used to locate the file system root of a path was removed. With help from Chang Song I've been able to implement an alternate method for detecting the root of these file system types: AdvFS (MSFS), CDFS, DVDFS, FDFS, NFS, NFS3, and UFS.

When lsof doesn't know how to identify the root for a file system type, it will resort to the " -- " incomplete path notation.

#### 7.6 Why doesn't lsof report link count, node number, and size for some Tru64 5.x CFS files?

Lsof reports link count, node number, and size for open CFS files as recorded in their kernel node structure's cached attributes. Sometimes not all attributes are cached

on the system where lsof runs, so lsof cannot report them.

## 7.7 Why does lsof say it can't read the kernel name list or proc table on Digital UNIX 4.x or Tru64 UNIX?

By default on Digital UNIX 4 and Tru64 UNIX lsof reads the addresses for kernel symbols with the knlist(3) function.

That function can fail, for example, when the kloadsv daemon isn't running or is malfunctioning. When that happens, lsof may abort with one of these error messages:

```
lsof: can't read kernel name list from knlist(3): ...  
or  
lsof: can't read proc table info
```

The first message suggests a complete knlist(3) or kloadsv failure;  
the second, a partial one.

If you know the name of the file from which the running system was booted, e.g., /vmunix, you can use lsof's -k option to direct it to read kernel symbol addresses from the name list of that file --

```
$ lsof -k /vmunix ...
```

If that works, then knlist(3) is malfunctioning and you need to fix it.

## 8.0 FreeBSD Problems

### 8.1 Why doesn't lsof report on open kernfs files?

Lsof doesn't report on open FreeBSD kernfs files because the structures lsof needs aren't defined in the kernfs.h header file in /sys/misc/kernfs.

### 8.2 Why doesn't lsof work on my FreeBSD system?

If lsof doesn't work on your FreeBSD system, first make sure you have the latest lsof revision. See the answer to the "Where do I get lsof?" question for information on how to get the latest lsof revision.

Once you have gotten the latest lsof revision, Configure and make it. If Configure fails -- e.g., it complains about an unknown FreeBSD version -- then lsof probably

hasn't been ported to your FreeBSD version yet, and there's no need to go any further. Follow the answer to the "How do I report an lsof bug" to report the Configure complaint to me.

If you are able to Configure and make lsof, run its test suite. (See the answer to the "Is there a test suite?" question for more information on how to use lsof's test suite.)

If lsof still fails, make sure your kernel sources, kernel header files, kernel boot file, standard header files and libraries are synchronized. They should all be built from the same CVS refresh. (Don't forget to do a "make buildworld" followed by a "make installworld".) If they aren't, then the KVM library or lsof may be using kernel structure definitions that don't match the booted kernel; or lsof may fail to compile properly because of header files in /usr/src/sys/sys and /usr/include/sys that don't match.

If you have synchronized your kernel, header files and libraries, and still can't get lsof to work, follow the steps in the answer to the "How do I report an lsof bug" question to report the problem to me.

### 8.3 Why doesn't lsof work on the RELEASE version of CURRENT?

Lsof tracks the CURRENT release of the current leading edge FreeBSD version, because my access to leading edge FreeBSD is limited to FreeBSD.org reference systems, all running the CURRENT release.

Sometimes that tracking leads to changes in lsof that won't work on an earlier RELEASE version of the current leading edge version.

When that happens, please send e-mail to me <abe@purdue.edu>. Make sure "lsof" appears in the "Subject:" line so my e-mail filter won't classify your letter as Spam.

### 8.4 Why does kvm\_open() complain it can't find some file?

If lsof issues this complaint:

```
lsof: kvm_open(execfile=/boot/kernel/kernel,  
corefile=/dev/mem: No such file or directory
```



Your FreeBSD system might not have a /dev/mem device. If not, create one -- e.g., as root do:

```
# mknod /dev/mem c <major> 0
```

```
# chmod 440 /dev/mem
# chgrp kmem /dev/mem
```

For <major> use /dev/kmem's major device number.

You may have to run kldload, too -- again as root do:

```
# kldload mem
```

## 8.5 FreeBSD ZFS Problems

### 8.5.1 Why does FreeBSD lsof report "WARNING: no ZFS support has been defined."?

Lsof issues that message when it detects a file on a ZFS file system, but has not been built with support for ZFS. Lsof's Configure script detects support can be added for ZFS when it finds this file:

```
/usr/src/sys/contrib/opensolaris/uts/common/fs/zfs/sys/zfs_znode.h
```

That header file and others in the OpenSolaris files in /usr/src enable lsof to extract information about ZFS files from the kernel structures associated with them.

### 8.6 Why can't Configure create lsof\_owner.h for FreeBSD 6 and above?

Lsof may report:

```
Creating ./lockf_owner.h from /usr/src/sys/kern/kern_lockf.c
FATAL ERROR: can't read /usr/src/sys/kern/kern_lockf.c
FATAL ERROR: ./lockf_owner.h creation failed (see
00FAQ)
```

or

```
Creating ./lockf_owner.h from /usr/src/sys/kern/kern_lockf.c
FATAL ERROR: ./lockf_owner.h creation failed (see 00FAQ)
```

Those messages mean that lsof's Configure script failed to create a local header file, ./lockf\_owner.h, needed to use the new kernel file locking code of some versions of FreeBSD 6 and above.

The changes that implement that new locking code alter the lockf structure in <sys/lockf.h> and introduce a new structure, lockf\_entry, to that header file. When Configure detects the presence of the lockf\_entry definition in <sys/lockf.h>, it tries to construct the local header file, ./lockf\_owner.h.

Configure has to do that because an unfortunate side effect of the new kernel file locking code is that <sys/lockf.h> doesn't contain the lockf\_owner structure definition referenced in its own lockf structure. Lsof needs to access elements of that lockf\_owner structure to determine if a lock belongs to the process that has a file open.

The missing lockf\_owner structure definition is in the kernel source file, typically /usr/src/sys/kern/kern\_lockf.c. Configure tries to extract the lockf\_owner structure definition from kern\_lockf.c into lsof's local header file, ./lockf\_owner.h. If Configure can't do that, it reports:

```
FATAL ERROR: ./lockf_owner.h creation failed
```

If Configure can't even read kern\_lockf.c, it first reports:

```
FATAL ERROR: can't read /usr/src/sys/kern/kern_lockf.c
```

The work-around for this problem is to update the FreeBSD kernel /usr/src tree (e.g., do a CVSup or csup) on the system where lsof is to be built and then do a "make buildworld" followed by a "make installworld".

#### 8.6.1 Why are there lockf structure compiler errors for FreeBSD 6.0 and higher lsof?

If, when compiling lsof, the compiler complains with error messages like:

```
dnode.c: In function 'get_lock_state':
dnode.c:113: error: 'struct lockf' has no member named 'lf_flags'
dnode.c:115: error: 'struct lockf'
has no member named 'lf_id'
...
```

Then lsof is being built on a system that has new kernel file locking code and lsof's Configure script failed to build a local lockf\_owner.h header file with a structure definition lsof needs.

See the "Why can't Configure create lsof\_owner.h for FreeBSD 6 and above?" section for more information and a work-around.

#### 8.6.2 Why don't /usr/src/sys/sys/lockf.h and /usr/include/sys/lockf.h match?

This mismatch can cause the errors explained in the answer to the "Why are there lockf structure compiler errors for FreeBSD 6.0 and higher lsof?" question.

If /usr/src/sys/sys/lockf.h has been updated with a CVSup or csup, the new lockf.h won't be propagated to /usr/include/sys until the "make buildworld" and "make installworld" steps have been completed.

#### 8.7 FreeBSD and clang

As of lsof revision 4.87, lsof may be compiled with clang.

##### 8.7.1 Why does clang complain about VOP\_FSYNC?

There is an error in the Solaris ZFS compatibility vnode.h header file with use of VOP\_FSYNC before it is defined. No work-around is possible that will eliminate the clang compile-time warning message about the invalid declaration of the VOP\_FSYNC function.

#### 9.0 HP-UX Problems

##### 9.1 What do /dev/kmem-based and PSTAT-based mean?

Lsof for HP-UX 11.0 and below uses /dev/kmem to read kernel data structures from which it gathers and reports open file information. That version of lsof is called /dev/kmem-based lsof.

Starting with HP-UX 10.10, finding definitions for the necessary kernel structures became more difficult as HP no longer distributed header files in /usr/include that defined all kernel structures. So I started "inventing" structure definitions by using Q4 to display them.

By HP-UX 11, the process of invention became extremely intensive to support. Following a patch to the ipc\_s structure in early 1999, my invented definition of that structure became incorrect. Although I was able to devise

a work-around  
test for the patch with Q4, it was clear that  
my inventions were bound to cause more problems.

Discussion with HP about the patch led to my proposing that  
an lsof API in the HP-UX kernel was the proper solution.  
Much to my surprise, HP agreed. I believe Carl Davidson  
was the prime mover behind that decision, but I know others  
participated, among them Louis Huemiller, Rich Rauenzahn,  
and Sailu Yallapragada. I am indebted to these folks and  
HP for their willingness to do this work.

The API was added to the PSTAT interface in a project named  
PEGL, Pstat Enhancements for Glance and Lsof. Louis and  
Sailu did the bulk of the design and implementation work  
and testing began in March, 2000

HP-UX 11.11 is the first version that provides PSTAT support  
for lsof. HP-UX versions in between 11.0 and 11.11 -- all  
Beta versions as far as I can determine -- have no lsof  
support.

See the "PSTAT-based HP-UX lsof Questions" section for  
questions and answers specific to PSTAT-based  
HP-UX lsof.

The next section, "Why doesn't a /dev/kmem-based HP-UX lsof  
compilation use -O?" covers /dev/kmem-based HP-UX lsof.

The /dev/kmem-based lsof sources may be found in the kmem  
subdirectory of the dialects/hpux branch of the lsof source  
tree. The PSTAT-based lsof sources may be found in  
.../dialects/hpux/pstat.

## 9.2 /dev/kmem-based HP-UX lsof Questions

The sources for /dev/kmem-based lsof for HP-UX may be found  
in lsof\_<revision>/dialects/hpux/kmem.

Lsof's Configure shell script decides to use these sources  
when it finds that the /usr/include/sys/pstat subdirectory  
doesn't exist.

Lsof can be forced to use the /dev/kmem sources by setting  
"/dev/kmem" in the HPUX\_BASE environment variable. Consult  
the Configure shell script and 00XPORTING for more information.

### 9.2.1 Why doesn't a /dev/kmem-based HP-UX lsof compilation use -O?

If you only have the standard (bundled) HP-UX C compiler and haven't purchased and installed the optional one, then you can't use cc's -O option. The HP-UX cc(1) man page says this:

"Options

Note that in the following list, the cc and c89 options -A , -G , -g , -O , -p , -v , -y , +z , and +Z are not supported by the C compiler provided as part of the standard HP-UX operating system. They are supported by the C compiler sold as an optional separate product."

Lsof's Configure script tries to detect what C compiler product you have installed by examining your compiler. If that examination reveals a standard (bundled) compiler, lsof avoids using -O.

If the Configure compiler test fails, the C compiler will complain that it doesn't support -O. You can suppress that complaint with this make invocation:

```
$ make DEBUG=""
```

#### 9.2.2 Why doesn't the /dev/kmem-based CCITT support work under 10.x?

Pasi Kaara, who originally provided the HP-UX CCITT support, reports that it no longer works under HP-UX 10.x. Consequently, at lsof revision 4.02 it has been disabled.

#### 9.2.3 Why

can't /dev/kmem-based lsof be compiled with `cc -Aa` or `gcc -ansi` under HP-UX 10.x?

Some HP-UX 10.x header files, needed by lsof, can't be compiled properly in ANSI\_C mode; structure element definition and alignment problems result. The f\_offset member of the file structure, for example, is incorrect.

This ANSI-C obstacle extends to using the -Aa option of the HP C compiler and the -ansi option of gcc.

#### 9.2.4 Why does /dev/kmem-based lsof complain about no C compiler?

Lsof's Configure script looks in /bin and /usr/ccs/bin for an HP C compiler, because it needs to know if the compiler is the standard (bundled) one or the optional separate product. If it finds no compiler in either place, Configure

quits after complaining:

No executable cc in /bin or /usr/ccs/bin

If you don't have a C compiler in either of these standard places, you should consider installing it. If you have gcc installed, you can use it by declaring the ``hpuxgcc" abbreviation to lsof's

Configure script.

If you have a C compiler in a non-standard location, you can use the HPUX\_CC\_DIR[12] environment variables to name the path to it. Consult the 00XCONFIG file of the lsof distribution for more information.

#### 9.2.5 Why does Configure complain about q4 for /dev/kmem-based lsof for HP-UX 11?

When you run Configure on an HP-UX 11 system, it may complain:

```
!!!ERROR!!!  !!!ERROR!!!  !!!ERROR!!!  !!!ERROR!!!  
Configure can't use /usr/contrib/bin/q4 to examine the ipis_s  
structure. You must do that yourself, report the result in  
the HPUX_IPC_S_PATCH environment variable, then repeat the  
Configure step. Consult the Configure script's use of  
/usr/contrib/bin/q4 and the 00XCONFIG file for information  
on ipis_s testing and the setting of HPUX_IPC_S_PATCH.  
!!!ERROR!!!  !!!ERROR!!!  !!!ERROR!!!  !!!ERROR!!!
```

This message states that Configure cannot use q4 from /usr/contrib/bin to examine the kernel's boot image for the ipis\_s structure. Maybe q4 hasn't been installed, or perhaps Configure can't execute it.

Lsof needs to gather information about ipis\_s to determine if the ipis\_s structure is defined in the kernel boot image, if the ipis\_s structure of the kernel boot image has an ipis\_msgsqueued member, and if the ipc\_s structure of the kernel boot image uses has an ipc\_ipis member.

The ipis\_s structure isn't described in any header file HP-UX releases with HP-UX 11. It appears in the private lsof header file ../dialects/hpux/kmem/hpux11/ipc\_s.h. Lsof gets local and remote connection addresses (IP and port numbers) from ipc\_s, so an incorrect ipc\_s definition may cause incorrect reporting of TCP/IP connection addresses. It definitely will cause incorrect reporting on 32 bit

kernels. In any case lsof should be compiled with a correct ipcs definition no matter the kernel bit size, so the Configure script always tests for it when the HP-UX version is 11.

For lsof's Configure script to gather the necessary ipcs information q4 needs to be installed in /usr/contrib/bin and the kernel boot image, /stand/vmunix, needs to have been processed with pxdb. If either is untrue, lsof issues the above error message, perhaps preceded by q4 messages. (Note: lsof's use of q4 may also fail if q4 can't execute nm -- e.g., it can't find /usr/bin/nm, or there is a conflicting, private version of nm earlier in the path.)

If /stand/vmunix hasn't been processed by pxdb, the q4 messages will include:

```
q4: (error) vmunix not pxdb'd
or
q4: (warning) /stand/vmunix has not been processed by pxdb.
```

It's possible to make a suitable private copy of /stand/vmunix for configuring lsof. That requires /opt/langtools/bin/pxdb or the q4 version of pxdb from /usr/contrib/bin/q4pxdb. The path to the result is supplied to the lsof Configure script in the HPUX\_BOOTFILE environment variable. Configure still requires /usr/contrib/bin/q4.

The following sample Bourne shell commands make a private copy of /stand/vmunix in /tmp, process it with pxdb or q4pxdb, and supply its path to lsof's Configure script in HPUX\_BOOTFILE.

```
$ cp /stand/vmunix /tmp/vmunix.lsof

$ /opt/langtools/bin/pxdb /tmp/vmunix.lsof
or
$ /usr/contrib/bin/q4pxdb /tmp/vmunix.lsof

... pxdb messages ...
$ HPUX_BOOTFILE=/tmp/vmunix.lsof Configure -n hpx
```

It may also be necessary to use q4 outside the lsof Configure script. In that case q4 can be used to determine the state of ipcs and ipc\_s with these q4 commands:

```
$ /usr/contrib/bin/q4 /stand/vmunix
```

```
...
```

```
q4> fields -c struct ipc_s
```

```
...
```

```
q4> fields -c struct ipis_s
```

Look in the q4 output for the ipc\_ipis member of the ipc\_s structure, and look in the q4 output for the ipis\_s structure for the ipis\_msgsqueued member. If ipc\_s has ipc\_ipis but ipis\_s lacks ipis\_msgsqueued, set HPUX\_IPC\_S\_PATCH environment variable to "1". If ipc\_s has ipc\_ipis and ipis\_s has ipis\_msgsqueued, set HPUX\_IPC\_S\_PATCH to "2" -- e.g.,

```
$ HPUX_IPC_S_PATCH=1 Configure -n hpx
```

or

```
$ HPUX_IPC_S_PATCH=2 Configure -n hpx
```

If ipc\_s has no ipc\_ipis member, set HPUX\_IPC\_S\_PATCH to "N" -- e.g., use this Configure step:

```
$ HPUX_IPC_S_PATCH=N Configure -n hpx
```

9.2.6 When compiling /dev/kmem-based lsof for HP-UX 11 what do the "aCC runtime: ERROR..." messages mean?

When the lsof Makefile asks the HP-UX unbundled compiler to load lsof, it may complain:

```
/bin/cc -o lsof -DHPUXV=1100 -DHASVXFS -DHPUXKERNBITS=64 \
-I/home/abe/src/lsof4/dialects/hpux/kmem/hpux11 +DD64 \
-DHAS_IPC_S_PATCH=2 -I/home/abe/src/lsof4/dialects/hpux/kmem \
-DLSOF_VSTR="B.11.00" -g dfile.o dmnt.o dnode.o dnode1.o \
dnode2.o dproc.o dsock.o dstore.o arg.o main.o misc.o \
node.o print.o proc.o store.o usage.o -L./lib -llsof -lelf \
-lnsl
aCC runtime: ERROR: Unexpected use of shared libraries
aCC runtime: ERROR: Read aCC manpage, +A option
/usr/lib/nls/loc/locales.1//is_IS.iso88591
```

This is a bug in the HP-UX national language support. (Notice the last message with "locales" in it?) Complain to HP -- then use this work-around before executing make:

```
$ unset LANG
```

```
$ make
```



### 9.2.7 Why doesn't /dev/kmem-based lsof for HP-UX 11 report VxFS file link counts, node numbers, and sizes correctly?

This is usually the result of running an lsof binary whose revision number is less than 4.57 on a system that has OnlineJFS support installed. It can also happen with lsof 4.57 binaries when the OnlineJFS support with which they were built doesn't match the OnlineJFS status of the system on which they are run.

The OnlineJFS status of lsof 4.57 and higher binaries can be determined by running:

```
$ lsof -v 2>&1 | grep HASONLINEJFS
```

If that shell pipe produces output, lsof was compiled with OnlineJFS support enabled; no output, disabled.

If OnlineJFS is installed on an HP-UX 11 system the /sbin/fs/vxfs/subtype executable exists and outputs "vxfs3.3" when run.

The problem occurs because the optional OnlineJFS support installation doesn't update <sys/fs/vx\_inode.h>. Consequently lsof can be compiled with an incorrect definition of the vx\_inode structure and look for link counts, node numbers, and sizes in the wrong places in the structure.

The current response I have gotten from HP is that no <sys/fs/vx\_inode.h> update will be provided for OnlineJFS.

I've addressed this problem temporarily with a work-around (hack) in lsof revision 4.57.

### 9.2.8 Why can't /dev/kmem-based lsof be built with gcc for 64 bit HP-UX 11?

When Configure is given the "hpuxgcc" abbreviation, the HP-UX version is 11, and the kernel bit size is 64, the lsof Configure script may abort with the messages:

```
!!!!!!!!!!!!!! FATAL ERROR !!!!!!!!!!!!!!!
```

```
APPARENTLY GCC CANNOT BUILD 64 BIT EXECUTABLES.  
A COMPILER MUST BE USED THAT CAN. SEE 00FAQ  
FOR MORE INFORMATION.
```

(This is the "more information" in 00FAQ.)

This means the Configure script compiled a test program with gcc the result wasn't an ELF-64 binary. Lsof tries two gcc modes, one with no options and another with the -mlp64 option, before it concludes gcc can't be used.

See the "How can I acquire a gcc for building lsof for 64 bit HP-UX 11?" answer for information on where you might be able to get a gcc for HP-UX 11 that can produce ELF-64 executables.

#### 9.2.8.1 How can I acquire a gcc for building lsof for 64 bit HP-UX 11?

Check this HP URL:

[http://h21007.www2.hp.com/dspp/tech/tech\\_TechSoftwareDetailPage\\_IDX/1,1703,547,00.html](http://h21007.www2.hp.com/dspp/tech/tech_TechSoftwareDetailPage_IDX/1,1703,547,00.html)

(That's one very long link; be careful you cut 'n paste it all.)

In November 2001 that URL led to a web page whose title was "gcc for hp-ux 11." The page offered a link for downloading a 64 bit gcc 3.0 compiler for HP-UX 11.0 and 11i. Rich Rauenzahn of HP installed that compiler on an HP test system he allows me to use and I successfully built a 64 bit lsof with it.

The HP package may install the 64 bit capable gcc in /usr/local/pa20\_64/bin/gcc, so you may have to adjust your path or set the LSOFC environment variable to compensate.

#### 9.2.9 Why does /dev/kmem-based lsof for HP-UX 11 report "unknown file system type" for some open files?

The lsof binary being used probably doesn't have support for the VxFS file system.

To confirm that, check `lsof -v` output for "-DHASVXFS". If it's not present, lsof doesn't have VxFS support.

You also need to establish that lsof really is complaining about VxFS files by checking the kernel boot file for the symbol associated with the hexadecimal address reported in the "unknown file system type" message -- e.g., "v\_op: 0x8711c8." Use nm(1) to do that:

```
$ nm -x /stand/vmunix | grep 8711c8
```

If nm reports the symbol associated with the address is vx\_vnodeops, then lsof is complaining about an open VxFS file.

The solution in that case is to build lsof yourself (The bundled C compiler will do it.), making sure that lsof's Configure script detects the presence of VxFS. Configure does that by finding these two header files:

```
/usr/include/sys/fs/vx_hpx.h  
/usr/include/sys/fs/vx_inode.h
```

If the system where you are building lsof doesn't have those header files, but does have VxFS, you might be able to install the header files by installing the HP JournalFS package from the CoreOS CD -- in particular the file set JournalFS.VXFS-PRG and its associated patch, PHKL\_18543. (My thanks to Steve Bonds for that information.)

Finally, if you find that lsof isn't complaining about VxFS when it complains about an unknown file system type, send e-mail to me <abe@purdue.edu> for further assistance. Make sure "lsof" appears in the "Subject:" line so my e-mail filter won't classify your letter as Spam.

#### 9.2.10 Why does the ANSI-C compiler complain about comments in HP-UX 11 header files?

When compiling lsof on HP-UX 11, the HP ANSI-C compiler's pre-processor, cpp, may complain about comments in HP-UX header files -- e.g.,

```
cpp: "/usr/include/sys/cdfs.h", line 232: warning 2028:  
Found comment inside comment started on line 232.  
cpp: "/usr/include/sys/cdnode.h", line 196: warning 2028:  
Found comment inside comment started on line 196.  
cpp: "/usr/include/nfs/snode.h", line 30: warning 2028:  
Found comment inside comment started on line 30
```

This is not a problem with lsof. It is a problem with the HP-UX header files; they have non-compliant ANSI-C comment sequences in them -- e.g.,

```
<sys/cdfs.h>: 232
```

```
/* struct cdfs *cdfs_link; /* linked list of file systems */
```

The initial `"/*` is not terminated by an ending `*/` before the appearance of a second `"/*`.

#### 9.2.11 Why does `dnodel.c` cause the HP-UX 11 compiler to complain that `<sys/fs/vx_inode.h>` is missing or incorrect?

If `CFLAGS` in the `lsof` Makefile for an HP-UX 11 compilation includes `HASONLINEJFS`, indicating the system has OnlineJFS support, `lsof` needs the `<sys/fs/vx_inode.h>` header file.

Sometimes it is missing from `/usr/include/sys/fs`.

`<sys/fs/vx_inode.h>` is a header file that must be obtained from Veritas. If that proves impossible, please contact me via e-mail at `<abe@purdue.edu>`. Make sure "lsof" appears in the "Subject:" line so my e-mail filter won't classify your letter as Spam.

### 9.3 PSTAT-based HP-UX `lsof` Questions

The sources for PSTAT-based `lsof` for HP-UX may be found in `lsof_<revision>/dialects/hpux/pstat`.

`lsof`'s `Configure` shell script decides to use these sources when it finds that the `/usr/include/sys/pstat` subdirectory exists.

`lsof` can be forced to use the PSTAT-based sources by setting "pstat" in the `HPUX_BASE` environment variable. Consult the `Configure` shell script and `00XPORTING` for more information.

#### 9.3.1 Why does PSTAT-based `lsof` complain about `pst_static` and other PSTAT structures?

When `lsof` starts it may issue one of these fatal error messages:

`lsof: FATAL: can't determine PSTAT static size`

`lsof: FATAL: can't read <n> bytes of pst_static`

`lsof: FATAL: pst_static doesn't contain <name>_size`

`lsof: FATAL: <name>_size should be <n>`

These messages indicate that `lsof`'s tests for the proper level of PSTAT support have failed. The structure names,

given in <name>, and sizes, given in <n>, identify the support deficiency more precisely.

You may need to upgrade the PSTAT support in your kernel to be able to use PSTAT-based lsof.

### 9.3.2 Why does PSTAT-based lsof complain it can't read pst\_\* structures?

Lsof may put messages like the following in the NAME column of its output.

```
can't read cwd pst_filedetails: Permission denied
can't read mem pst_filedetails: Permission denied
can't read rtd pst_filedetails: Permission denied
can't read txt pst_filedetails: Permission denied
can't read pst_filedetails: Permission denied
can't read 3 stream structures: Permission denied
can't read pst_socket: Permission denied
```

These messages indicate that the lsof binary lacks the authority to read the name structures for processes other than ones belonging to the UID under which lsof is running. Authority to read the structures of other processes is limited to root processes -- i.e., lsof must have setuid-root permission if it is to list open files for arbitrary processes.

If you want to eliminate these errors, you must run lsof as root or install it with setuid-root permission.

### 9.3.3 Why does PSTAT-based lsof rebuild the device cache file after each reboot?

After each HP-UX rebuild, the first time a user runs lsof it will report:

```
lsof: WARNING: device cache mismatch: /dev/tun...
lsof: WARNING: created device cache file: /<user_path>
```

This happens because the device numbers on /dev/tun\* device nodes are recalculated at each reboot. When lsof detects a change in the device number of a /dev/tun\* file, it rebuilds its local device cache file.

### 9.3.4 Why doesn't PSTAT-based lsof report TCP addresses

for  
telnetd's open socket files?

When lsof can't report TCP addresses for telnetd's open socket files it is because an unpatched PSTAT kernel interface doesn't report the addresses to lsof.

This has been addressed in PSTAT kernel patch PHKL\_24047. It is available from the HP IT Resource Center at:

<http://itrc.hp.com>

In the page's "maintenance / support" box select the "individual patches" link. Once at its page, select the "hp-ux" link. On that page select the "Series 800" or "Series 700" radio button and select "11.11" from the pull-down list to the right of the button. Under "search or browse the path list" select "Search by Patch IDs" from the pull down list, enter PHKL\_24047 in the following text box, and select search. That should lead to information about PHKL\_24047 and a link for downloading it. (You may have to log in first and you may have to create a login identity by registering before you can log in.)

Some time in March 2006 the PHKL\_24047 patch was "lost" by the HP-UX networking lab. It has been "found" again in August 2006 and will be re-released as a GRO patch "some time." I don't yet know when that will be. You must contact HP to learn about the availability of the GRO patch.

#### 9.3.5 Why does PSTAT-based lsof cause an HP-UX 11.11 kernel panic?

When PSTAT-based lsof runs on some HP-UX 11.11 kernels, the kernel may panic. Symptoms include:

Console message:

```
0xFB0000301100EF00 00000000 0000EF00 -  
type 31 = legacy PA HEX chassis-code
```

/var/adm/syslog:

```
... vmunix: Trap Type 15 (Data page fault)  
... vmunix: Instruction Address (pcsq.pcoq) = 0x...
```

The panic is caused by a bug in the way PSTAT's pstat\_getstream() function obtains module names from streams managed by the otsam stream driver (part of OSI Transport Services). Lsof

calls `pstat_getstream()` when it encounters an open `otsam` stream file. An HP-UX 11.11 system uses `otsam` if `otsam` appears in `/stand/system`.

#### HP-UX

11.11 patch PHKL\_24507 (available some time after July 15, 2001) fixes the `pstat_getstream()` bug. See the information in the answer to the "Why doesn't PSTAT-based `lsof` report TCP addresses for `telnetd`'s open socket files?" question for information on how to obtain the patch.

#### 9.3.6 Why doesn't PSTAT-based `lsof` report a CWD that is on a loopback (LOFS) file system?

When PSTAT-based `lsof` reports on processes whose current working directory (CWD) is on a loopback file system, `lsof` can't report the open CWD file. The reason is that the HP-UX 11.11 and above kernel's loopback file system code is not passing the CWD file ID to the kernel's `pstat(2)` code. Hence `lsof` is given no information on the `lofs` CWD.

The problem was first reported to me by Ermin Borovac and an internal bug report was filed with the HP-UX file system group on October 26, 2004. That report has now been answered by the patch PHKL\_33200 -- s700\_800 11.11 `lofs` cumulative patch. The HP IT Resource Center (<http://itrc.hp.com>) is a source for the patch.

#### 9.3.7 Why do some `swinstall` packages for PSTAT-based HP-UX 11.11 packages complain about `setgid` and `setuid` bits?

First, let me explain that I do not provide `lsof` `swinstall` packages for `lsof`. Others provide them and they should be contacted about problems with their packages.

However, I have become aware of a problem with one package about which I have some information I can share. The problem shows up in these `swinstall` messages:

```
ERROR: Unknown owner and/or group for file
"/usr/local/bin/lsof". SUID and/or SGID bit was
not set.
ERROR: Failed installing fileset "lsof.lsof-RUN,r=4.73".
Check the above output for details.
```

The `swpackage` SUID/SGID functionality was restricted by changes for POSIX compliance, breaking backward compatibility. The

patch PHCO\_27671 allows SUID/SGID for uid/gid of 0 only, as a compromise between backward compatibility and POSIX conformance.

If the setuid bit is to be set on the executable, the UID and GID of the executable must be 0 (zero).

#### 9.3.8 Why won't the bundled C compiler build PSTAT-based lsof for PA-RISC HP-UX 11.23?

A PA-RISC HP-UX 11.23 bundled C compiler dated May 2005 or later will not build PSTAT-based lsof. It will deliver error messages related to the system's <gssapi/gssapi.h> header file.

There is nothing wrong with that header file or lsof. The problem is that the bundled C compiler can't cope with the gssapi.h header file.

The work-around is to use the HP ANSI C compiler. Using gcc is not a satisfactory work-around. See the answer to the "Why won't gcc build PSTAT-based lsof for PA-RISC HP-UX 11.23?" question for more information.

#### 9.3.9 Why won't gcc build PSTAT-based lsof for PA-RISC HP-UX 11.23?

Gcc will not even compile PSTAT-based lsof revisions below 4.77 for PA-RISC HP-UX 11.23 dated May 2005 or later. It reports errors in lsof's print.c fill\_portmap() function about missing members of the rpcent structure. That happens because gcc defines \_XOPEN\_SOURCE\_EXTENDED which disables the definition of the rpcent structure in <netdb.h>.

Using the HP bundled C compiler is not a viable work-around. That is explained in the answer to the "Why won't the bundled C compiler build PSTAT-based lsof for PA-RISC HP-UX 11.23?"

While an lsof revision 4.77 or higher can be compiled with gcc, the results are unreliable. Lsof will compile, but it occasionally produces segment faults when it runs. I have not been able to reproduce the failure reliably or locate a debugger that will work with the gcc-compiled lsof.

The only reliable work-around is to use the HP ANSI C compiler.

#### 9.3.10 Why does PSTAT-based lsof complain, "FATAL: pst\_stream\_size



should be: 672; is 72" on HP-UX 11.11 and above?

This message indicates a mismatch between the PSTAT header files used to build lsof (<sys/pstat.h> and those in the /usr/include/sys/pstat subdirectory), and those that built the running kernel.

Unfortunately the June 2008 patch set for HP-UX 11.23 creates this inconsistency, because it does not contain all the patches needed to match the kernel with the PSTAT header files. Even more serious is that the missing patches update the kernel's PSTAT support to provide TCP/UDP endpoint information to lsof from TCP/TLI streams.

The patch inconsistency comes about because, while the following patch is installed,

PHKL\_36577 1.0 PM-PSTAT section 2 manpage changes

other kernel patches are not.

The PHKL\_36577 patch updates the PSTAT header files and manual pages to match kernel changes that other patches with the following numbers (or patches that contain or supersede them) contain:

PHNE\_36575 1.0 Cumulative STREAMS Patch  
PHNE\_37670 1.0 cumulative ARPA Transport patch  
PHNE\_37851 1.0 NFS cumulative patch

Those patches implement the kernel changes that support the delivery of information promised in patch PHKL\_36577.

The work-around is to install the missing patches.

#### 9.4 Why won't the HP-UX depot install?

I don't distribute lsof depots, so I can't support them.

From time to time depots prepared by various sites -- e.g., usually HP-UX software collection sites -- will contain errors that cause installation of the depot to fail.

Do not contact me when this happens. Instead, contact the administrator of the site that prepared the depot.

As should be clear from the bulk of the lsof documentation, I do not recommend you use pre-built lsof binaries in any form. Instead, I recommend you obtain the lsof source distribution and build lsof yourself.

## 10.0 Linux

### 10.1 What do /dev/kmem-based and /proc-based lsof mean?

At approximately Linux 2.1.72 and exactly at lsof revision 4.23 support for Linux forks. The first fork, containing the oldest lsof form is based on access to kernel memory structures, and is called /dev/kmem-based lsof. A /dev/kmem-based lsof is heavily intertwined with the Linux kernel version, its header files, and its system map file. Typically a /dev/kmem-based lsof needs only setgid permission to local all open file information.

After approximately Linux 2.1.72 and at revision 4.23 lsof obtains all its information from the /proc file system. That lsof is called the /proc-based lsof. A /proc-based lsof does not read kernel memory, needs neither kernel header files nor the system map file, and is less likely to be affected by Linux kernel changes. However, it does require setuid-root permission to list all open files, and it can't report file offsets (positions).

After revision 4.52 the /dev/kmem-based Linux sources for lsof are no longer distributed. Information about them may be found in the 00INDEX and README files at:

<ftp://lsof.itap.purdue.edu/pub/tools/unix/lsof/OLD/src>

### 10.2 /proc-based Linux lsof Questions

#### 10.2.1 Why doesn't /proc-based lsof report file offsets (positions)?

/proc-based lsof revisions 4.79 and above can only report file offsets (positions) for the files of Linux kernels 2.6.22 and above.

During its initialization /proc-based lsof tests to see if offset information can be obtained. If it cannot, lsof disables offset reporting. If the -o option was selected, lsof also issues this warning:

lsof: WARNING: can't report offset; disregarding -o.

### 10.2.2 Why does /proc-based lsof report "can't identify protocol" for some socket files?

/proc-based lsof may report:

```
COMMAND PID ... TYPE ... NODE NAME
pump    226 ... sock ... 309 can't identify protocol
```

This means that it can't identify the protocol (i.e., the AF\_\* designation) being used by the open socket file. Lsof identifies protocols by matching the node number associated with the /proc/<PID>/fd entry to the node numbers found in selected files of the /proc/net sub-directory. Currently /proc-based lsof examines these protocol files:

```
/proc/net/ax25 (untested)
/proc/net/icmp
```

```
/proc/net/ipx (needs kernel patch)
```

```
/proc/net/netlink
/proc/net/packet
/proc/net/raw
/proc/net/raw6
/proc/net/sctp/assocs
/proc/net/sctp/eps
/proc/net/sockstat
/proc/net/sockstat6
/proc/net/tcp
/proc/net/tcp6
/proc/net/udp
/proc/net/udp6
/proc/net/udplite
/proc/net/udplite6
/proc/net/unix
```

If /proc-based lsof says it can't identify the protocol for an open socket file, you may be able to identify the protocol yourself by using `grep` to look for the specific node number in the files of /proc/net -- e.g.,

```
$ grep <node_number> /proc/net/*
```

You may not be able to find the desired node number, because not all kernel protocol modules fully support /proc/net

information.

If you find a matching node number in a /proc/net file that is not currently being processed by lsof, contact me via e-mail at <abe@purdue.edu>. I'll discuss adding support to /proc-based lsof for the protocol of the /proc/net file with you. Make sure "lsof" appears in the "Subject:" line so my e-mail filter won't classify your letter as Spam.

The code that matches node numbers of open IPX protocol socket files to those in /proc/net/ipx requires Jonathan Sergent's Linux 2.1.79 patch to /usr/src/linux/net/ipx/af\_ipx.c. The patch, suitable for input to Larry Wall's patch program, may be found in the lsof distribution file:

```
.../dialects/linux/proc/patches/net_ipx_af_ipx.c.patch
```

#### 10.2.3 Why does /proc-based lsof warn about unsupported formats?

Lsof may issue the following warning:

```
lsof: WARNING: unsupported format: /proc/net/<file>
```

if the header line of the indicated <file> in /proc/net -- ax25, ipx, raw, tcp, udp, or unix -- doesn't match what lsof expects to find.

When the header line of a /proc/net file isn't what lsof expects, lsof probably can't parse the rest of the file correctly and doesn't try. As a result, lsof can't report any NAME column information (e.g., local and remote addresses) for socket files bound to the indicated network protocol.

If you get this warning, please send me e-mail at <abe@purdue.edu>. Include the contents of the file lsof claims has an unsupported format. Make sure "lsof" appears in the "Subject:" line so my e-mail filter won't classify your letter as Spam.

#### 10.2.4 Why does /proc-based lsof report "(deleted)" after a path name?

The "(deleted)" notation following a path name in /proc-based lsof's NAME column comes from the /proc/<PID>/fd/<FD> entry for the open file. It's the Linux kernel's way of indicating the file is open but has been unlinked (rm'd).

#### 10.2.5 Why doesn't /proc-based lsof report full open file information

for all processes?

/proc-based lsof can only report on processes whose /proc files it has permission to read. /proc normally grants permission to read all its files only to root or to the owning user ID.

Without permission to read most /proc files, lsof can only report full information for processes belonging to the user who is running lsof. /proc-based lsof may be able to report some information for all processes, depending on the permissions of their associated /proc files, but usually /proc-based lsof won't be able to access the files in /proc/<PID>/fd/ that describe regular open files.

If you want /proc-based lsof to report on all processes, you must install it with setuid-root permission.

#### 10.2.6 Why won't Customize offer to change HASDCACHE or WARNDEVACCESS for /proc-based lsof?

/proc-based lsof doesn't read device information from /dev or the device cache file, so it makes no sense to change the state of device cache processing or /dev node accessibility warnings.

#### 10.2.7 /proc-based lsof Linux NFS questions

##### 10.2.7.1 Why can't lsof find files on an accessible NFS file system?

On occasion lsof may be unable to identify that an open file is on an NFS file system. This is most likely the result of a bug in the way the Linux kernel supplies information to the reader of /proc/mounts (lsof) -- sometimes that pseudo-file is truncated by the kernel.

One way to see if this is the case is to search for the NFS file system in /proc/mounts -- e.g.,

```
$ grep <NFS_file_system_mount_point> /proc/mounts
```

If you get no output or the third word of the output isn't "nfs", then lsof won't consider the file system an NFS file system.

A second test is to look at the end of /proc/mounts --

e.g.,

```
$ tail /proc/mounts
```

If tail reports "# truncated" then /proc/mounts is incomplete because of a Linux kernel bug. The bug is documented at:

<http://www.xss.co.at/sysinfo/mounts.html>

The bug is fixed in Linux kernel 2.4.18, and possibly in some earlier Linux kernel versions.

#### 10.2.7.2 Why can't lsof find files on an inaccessible NFS file system?

If lsof issues this message about a Linux file system, mounted from an NFS server:

```
lsof: WARNING: can't stat() nfs file system /xxx/yyy
```

Then lsof won't be able to find any open files on the file system.

That's because of an inadequacy in the Linux /proc file system. Its /proc/mounts file doesn't give the device doublet (major and minor numbers) of the file system as do many UNIX systems (e.g., Solaris). The only way lsof can get the device doublet for a Linux file system is to call stat(2) on the file system path, which fails if the NFS server isn't accessible.

When lsof doesn't know the device doublet of a file system, it can't find open files on the inaccessible file system, because it can't match the doublets of open files to the doublet of the inaccessible file system.

This topic is covered extensively in lsof(8) in its ALTERNATE DEVICE NUMBERS and BLOCKS AND TIMEOUTS sections.

#### 10.2.8 Why doesn't /proc-based Linux lsof report socket options and values, socket state flags, and TCP options and values?

The Linux /proc file system doesn't report socket options and values, socket states, and TCP options and values to lsof.

#### 10.2.9 Does

/proc-based Linux lsof use a device cache?

No. The Linux /proc/<PID>/fd/\* entries provide device names to lsof via readlink(2). It is not necessary to enable device cache processing for /proc-based Linux lsof via the Customize script or modifications to the Linux machine.h header file.

10.2.10 Why doesn't /proc-based Linux lsof report any or all file structure values for its +fcfgGn option?

/proc-based lsof revisions 4.79 and above can only report some file structure values for Linux kernels below 2.6.22.

When running on Linux kernels at 2.6.22 and above lsof 4.79 can report some file flag values -- i.e., in response to the +fg or +fG options. The flag values are obtained from the /proc/<PID>/fdinfo/ files introduced at Linux kernel 2.6.22.

/proc-based Linux lsof tests its availability to obtain file flag values at initialization. If values are not available, lsof disables file flag reporting. If the flags were requested with +fg or +fG, lsof displays this warning:

lsof: WARNING: can't report file flags; disregarding +f.

As a special note, when Linux lsof can report flag bits, it will not report 'R' for a read-only file. There is no read-only flag bit O\_\* symbol in <fcntl.h> (or <bits/fcntl.h>) and lsof reports only bits that are set. The absence of O\_RDWR and O\_WRONLY flag bits implies the file is read-only.

## 10.3 Special Linux file types

### 10.3.1 Why is ``DEL" reported as a Linux file type?

Lsof usually reports entries from the Linux /proc/<PID>/maps file with ``mem" in the TYPE column. However, when lsof can't stat(2) a path in the process' ``maps" file and the ``maps" file entry contains ``(deleted)", indicating the file was deleted after it had been opened, lsof reports the file type as ``DEL".

### 10.3.2 Why is ``unknown" reported as a Linux file type?

Lsof may report a Linux file's type as ``unknown" in the TYPE column when lsof can't obtain complete stat(2) results for the file.

Usually the NAME column will contain a `(stat: xxx)` error message, but that could have been suppressed with the `ls -w` option.

## 10.4 Linux `mem` Entry Problems

### 10.4.1 What do `path dev=xxx` and `path inode=yyy` mean in the NAME column of Linux `mem` file types?

When the device or inode number in the process' `maps` file entry doesn't match the `stat(2)` results from the file path, `ls` reports the inconsistent information from the `stat(2)` of the path parenthetically after the path in the NAME column in one of these forms:

(path dev=xxx)      only the device number, `xxx`, from a `stat(2)` of the `maps` file entry path differs from the `maps` file entry value reported in the DEVICE column.

(path inode=yyy)      only the inode number, `yyy`, from a `stat(2)` of the `maps` file entry path differs from the `maps` file entry value reported in the NODE column.

(path dev=xxx inode=yyy)      Both device and inode numbers differ.

`ls` reports the `maps` file device number in the DEVICE column and the inode number in the NODE column.

When device and inode mismatches occur, `ls` suppresses the reporting of link count and size. See the answer to the "Why is neither link count nor size reported for some Linux `DEL` and `mem` file types?" question for more information.

Device and inode inconsistencies can occur when a file at a `maps` path is replaced after the process has started, or when a different file system with similar path names is mounted on top of the original file system.



The device inconsistency parenthetical messages can be suppressed with lsof's `--w` option.

#### 10.4.2 Why is neither link count nor size reported for some Linux `DEL` and `mem` file types?

Link count and size are not reported for some entries from the process' `maps` file because a `stat(2)` of the entry file path failed or `stat(2)` delivered device or inode numbers that don't match the ones in the `maps` entry.

When the `stat(2)` device or inode numbers don't match those in the `maps` file entry, it is likely that the `stat(2)` results don't apply to the file that was originally mapped by the process and whose path appears in the `maps` file entry, so lsof tries to avoid reporting possibly incorrect information.

See the answer to the "What do `path dev=xxx` and `path inode=yyy` mean in the NAME column of Linux `mem` file types?" for more information on how mismatched `stat(2)` device and inode numbers are reported.

#### 10.5 Special Linux NAME column messages

##### 10.5.1 What does `(stat: xxx)` mean in the NAME column of Linux files?

When lsof tried to `stat(2)` the path in the NAME column, the `stat(2)` system call failed and produced an error message of `xxx`.

This situation usually occurs if the lsof process lacks permission to `stat(2)` the path -- e.g., the lsof executable lacks root permission, or lsof is attempting to `stat(2)` a path on an NFS device mounted with the `root_squash` option.

The message can be suppressed with lsof's `--w` option.

##### 10.5.2 What does `(readlink: xxx)` mean in the NAME column of Linux files?

When lsof tried to convert the `/proc/<PID>/fd` path, reported in the NAME column, to its full and more meaningful path, the `readlink(2)` system call used to do the conversion failed. The `readlink(2)` failure message is `xxx`.

This situation usually occurs if the lsof process lacks permission to readlink(2) some part of the path -- e.g., the lsof executable lacks root permission, or lsof is attempting to stat(2) a path on an NFS device mounted with the root\_squash option.

The message can be suppressed with lsof's `--w` option.

#### 10.6 Why is `NOFD` reported as a Linux file type?

When lsof lacks permission to use opendir() on the fd/ subdirectory of a process' /proc/<PID> directory, it reports a single file of the type `NOFD` (for no file descriptors).

Lsof reports the the /proc/<PID>/path in the NAME column, followed by "(opendir: xxx)", where `xxx` is the error message returned by opendir().

The `NOFD` entry can be suppressed with lsof's `--w` option.

#### 10.7 Why does Linux lsof report a NAME column value that begins with `/proc`?

When lsof has problems processing a `/proc/<PID>` entry -- e.g., it can't convert the entry to a full and more meaningful path name, or it can't access the /proc/<PID>/fd subdirectory with opendir() -- it will report the /proc/<PID> path in the NAME column.

#### 10.8 Linux /proc/net/tcp\* and /proc/net/udp\* issues

##### 10.8.1 Why use the Linux `-X` option?

If you're not interested in TCP/IP socket information for a particular use of lsof, adding the `-X` option will make lsof run more quickly, because `-X` inhibits the reading of the /proc/net/tcp\* and /proc/net/udp\* files. For example, you may only be interested in knowing what process has a particular file open.

When the Linux system has a large number of open TCP/IP socket files, the time savings provided by `-X` can be significant.

##### 10.8.2 Why does lsof say `--i` is useless when `-X` is specified?

If `-X` is specified, lsof can't report much information on open

TCP/IP socket files. However, lsof's -i option requests that information. Hence, the two options conflict and can't be used together.

### 10.8.3 Why does lsof say ``can't identify protocol (-X specified)'`?

If the Linux lsof -X option is specified and an open socket file can't be identified without accessing the /proc/net/tcp\* and /proc/net/udp\* files, lsof will report that it can't identify the socket's protocol and that the failure may be caused by the -X specification

## 11.0 NetBSD Problems

### 11.1 Why doesn't lsof report on open kernfs files?

Lsof doesn't report on open NetBSD kernfs files because the structures lsof needs aren't defined in the kernfs.h header file in /sys/misc/kernfs.

### 11.2 Why doesn't lsof report on open files on:

file systems; /proc

file systems; 9660 (CD-ROM) file systems;

MS-DOS (floppy disk) file systems; or kernel file systems?

Lsof is not able to report on open files on certain file system if /usr/src/sys/msdosfs didn't exist when the lsof Configure script ran and lsof was made. /usr/src/sys/msdosfs contains header files lsof needs for collecting data on certain file system files.

You can tell if an lsof executable above) lacks support for a file system if the following test of `lsof -v` produces nothing:

```
$ lsof -v 2>&1 | grep <support_enabled_definition>
```

The <support-enabled\_definition> will be:

File System Type Definition Note

-----

File descriptor HASFDESCFS

/proc HASPROCFS

9660 HAS9660FS

MS-DOS HASMSDOSFS (lsof 4.61 and above)

Kernel HASKERNFS

The work-around is to install `/usr/src/sys`, rerun the `lsof` Configure script, and remake `lsof`.

### 11.3 Why does `lsof` produce confusing results for `nullfs` file systems?

Consider  
this report from `/sbin/mount`:

```
/usr/home on /home type null (local)
```

(According to `/sbin/mount` `/usr/home` is the mounted-on device and `/home` is the mounted-on directory.)

When `lsof` is asked to report on open files on `/home`, it will report them as files on `/usr/home` instead. That's an artifact of the NetBSD kernel's dynamic name lookup cache (DNLC) and the way the kernel handles `nullfs` mounted-on directories.

While `lsof` will report all open files on `/home` when given `/home` as a file system directory argument, even though reporting them as located on `/usr/home`, `lsof` will not find the same files when asked to report on all open files on `/usr/home` when given `/usr/home` as a file system device argument. That's because from the mount perspective `/usr/home` is equivalent to a device, but from the device perspective it is still a directory.

So, what this `lsof` command reports:

```
$ lsof /home
... NAME
... /usr/home/...
```

Won't be duplicated by this `lsof` command:

```
$ lsof /usr/home
```

Another way to look at this confusing `/home` and `/usr/home` example is to consider what `stat(2)` reports. For `/home` `stat(2)` reports a device doublet that matches what `lsof` finds in open file node structures, while the device doublet `stat(2)` reports for `/usr/home` won't match what `lsof` finds. Nor does the mode reported by `stat(2)` indicate a block devices, as is the expected case.

There is no simple answer to this confusion, nor is there even a simple explanation. Simply be aware that when supplying file system arguments to lsof on NetBSD, use the mounted-on directory name for a nullfs as the lsof argument, and don't be surprised when the NAME column reports the mounted-on device name.

## 11.4 NetBSD header file problems

### 11.4.1 Why can't the compiler find some NetBSD header files?

If the compiler's pre-processor complains it can't find some header files when it compiles lsof source files, /usr/include and /usr/src may not have all the header files lsof needs.

As a work-around use the NETBSD\_SYS environment variable to specify to lsof the location of the additional header files -- e.g.,

```
% setenv NETBSD_SYS /my_source
% ./Configure -n netbsd
```

or

```
$ NETBSD_SYS=/mys_source ./Configure -n netbsd
```

Caution: using this work-around may cause the lsof Configure script to activate or omit different features, depending on where it finds the header files that determine the state of the features.

### 11.4.2 Why does NetBSD lsof produce incorrect output?

If the NetBSD system's kernel was built from header files that don't match those in /usr/include -- e.g., //usr/src has the ones from which the kernel was built -- lsof may build, but won't produce correct output.

As a possible work-around, try directing the C compiler to select header files from /usr/src before it selects them from /usr/include. That can be done with the DEBUG make string -- e.g.,

```
$ make DEBUG="-I/usr/src -I/usr/include"
```

If that work-around fails, try using the LSOF\_INCLUDE and NETBSD\_SYS environment variables to swap /usr/include and

/usr/src when running the Configure script, then use the make DEBUG string when running make -- e.g.,

```
$ LSOF_INCLUDE=/usr/src; export LSOF_INCLUDE
$ NETBSD_SYS=/usr/include; export NETBSD_SYS
$ ./Configure -n netbsd
$ make DEBUG="-I/usr/src -I/usr/include"
```

## 11.5 Why isn't lsof feature xxx enabled for NetBSD?

Lsof's Configure script enables NetBSD features by locating and examining header files associated with the features, and based on what it finds, setting compile-time definitions in Makefiles. (See 00PORTING for a list of the definitions.)

When Configure doesn't find header files or doesn't find appropriate values in header files, that may mean the header file tree lsof is searching is incomplete or out of date.

Lsof normally looks for NetBSD header files in /usr/include. It can also be directed to look in other directories -- e.g., /sys -- if told to do so with the contents of the LSOF\_INCLUDE and NETBSD\_SYS environment variables.

To determine what header file enables a missing feature, check the NetBSD stanza in the Configure script. Then check the locations it checks for the indicated header files and contents.

See 00XCONFIG for more information on LSOF\_INCLUDE and NETBSD\_SYS.

## 12.0 NEXTSTEP and OPENSTEP Problems

### 12.1 Why can't lsof report on 3.1 lockf() or fcntl(F\_SETLK) locks?

Lsof has code to test for locks defined with lockf() or fcntl(F\_SETLK) under NEXTSTEP 3.1, but that code has never been tested. I couldn't test it, because my NEXTSTEP 3.1 lockf() and fcntl(F\_SETLK) functions return "Invalid argument" every way I have tried to invoke them.

If your NEXTSTEP 3.1 system does allow you to use lockf() and fcntl(F\_SETLK) and lsof doesn't report locks set with them, then the code in .../dialects/next/dnode.c probably

isn't correct. Please contact me via e-mail at <abe@purdue.edu> and tell me how you got your lockf() and fcntl(F\_SETLK) system calls to work. Make sure "lsof" appears in the "Subject:" line so my e-mail filter won't classify your letter as Spam.

## 12.2 Why doesn't lsof compile for NEXTSTEP with AFS?

I no longer have a NEXTSTEP test system that has AFS. Changes to lsof since I once had a test system have caused me to change the AFS code in NEXTSTEP without being able to test the changes.

If you need AFS support for NEXTSTEP and can't get it to compile, please contact me. Perhaps we can jointly fix the problems.

## 13.0 OpenBSD Problems

### 13.1 Why doesn't lsof support kernfs on my OpenBSD system?

Lsof supports the kernel file system on OpenBSD versions whose /sys/miscfs/kernfs/kernfs.h (or <miscfs/kernfs/kernfs.h> header file correctly defines the kern\_target structure. The lsof Configure script's openbsd stanza checks for the presence of the structure's kt\_name element and activates kernfs support for the CFLAGS -DHASKERNFS definition only when it finds kt\_name.

The kernfs.h header file is scheduled to be updated in the OpenBSD 2.1 release, according to Kenneth Stailey, who authored its changes.

### 13.2 Will lsof work on OpenBSD on non-x86-based architectures?

I've not tested lsof on an OpenBSD system that uses a non-x86-based architecture, but I've had one report that lsof 4.33 compiles and works on OpenBSD for the pmax architecture (decstation 3100).

### 13.3 <sys/pipe.h> problems

#### 13.3.1 Why does the compiler claim nbpg isn't defined?

When compiling lsof on some (older) OpenBSD SPARC versions, the compiler may complain:

In file included from ../dlsof.h:191,  
from ../lsof.h:166,  
from fino.c:52:  
/usr/include/sys/pipe.h:83: `nbpq' undeclared here  
(not in a function)  
/usr/include/sys/pipe.h:83: size of array `ms' has  
non-integer type

This happens because <sys/pipe.h> uses NBPG from  
<machine/param.h> to size the `ms' array, and some OpenBSD  
systems define  
NBPG in terms of a kernel integer variable,  
nbpq.

Lsof revisions 4.46 and above have a hack to dlsof.h,  
developed by Volker Borchert that avoids the compiler  
problem for SPARC OpenBSD 2.3. The hack might work for  
other OpenBSD SPARC versions, but hasn't been tested there.

If you want to enable the hack for your OpenBSD SPARC  
version, modify this code in ../dialects/n+obsd/dlsof.h:

```
# if defined(OPENBSDV)
# if OPENBSDV==2030 && defined(__sparc__)
# if defined(nbpq)
#undef nbpq
# endif /* defined(nbpq) */
#define nbpq 4096 /* WARNING!!! ... */
# endif /* OPENBSDV==2030 && defined(__sparc__) */
#include <sys/pipe.h>
#endif /* defined(OPENBSDV) */
```

You will probably want to change the second #if test to  
match your OpenBSD version. You may also want to change  
what value is assigned to nbpq. See the next section,  
"What value should I assign to nbpq?"

### 13.3.2 What value should I assign to nbpq?

If you need to enable the nbpq hack, described in "Why does  
the compiler claim nbpq isn't defined?", you may also need  
to assign a value other than 4096 to nbpq. 4096 works for  
the sun4c processor and should work for sun4m, but 8192  
may be needed for sun4.

Check <machine/param.h> and other OpenBSD documentation to



determine the correct nbpg assignment.

### 13.4 Why doesn't lsof report on open MS-DOS file system (floppy disk) files?

Lsof is not able to report on open MS-DOS file system files if `/usr/src/sys/msdosfs` didn't exist when the lsof Configure script ran and lsof was made. `/usr/src/sys/msdosfs` contains header files lsof needs for collecting data on MS-DOS file system files.

You can tell if an lsof executable (revisions 4.61 and above) lacks MS-DOS file system support if the following command reports nothing:

```
$ lsof -v 2>&1 | grep HASMSDOSFS
```

The work-around is to install `/usr/src/sys`, rerun the lsof Configure script, and remake lsof.

### 13.5 Why isn't lsof feature xxx enabled for OpenBSD?

Lsof's Configure script enables OpenBSD features by locating and examining header files associated with the features, and based on what it finds, setting compile-time definitions in Makefiles. (See `00PORTING` for a list of the definitions.)

When Configure doesn't find header files or doesn't find appropriate values in header files, that may mean the header file tree lsof is searching is incomplete or out of date.

Lsof normally looks for OpenBSD header files in `/usr/include` and `/sys`. It can also be directed to look in other directories if told to do so with the contents of the `LSOF_INCLUDE` and `NETBSD_SYS` environment variables.

To determine what header file enables a missing feature, check the OpenBSD stanza in the Configure script. Then check the locations it checks for the indicated header files and contents.

See `00XCONFIG` for more information on `LSOF_INCLUDE` and `NETBSD_SYS`.

## 14.0 Output Problems

#### 14.1 Why do the lsof column sizes change?

Lsof dynamically sizes its output columns each time it runs to make sure that each column takes the minimum space. Column parsing -- e.g., with awk -- is possible, because each column is guaranteed to be separated from the preceding one by at least one space, and no column except the last (NAME) contains embedded spaces.

#### 14.2 Why does the offset have ``0t' and ``0x" prefixes?

The offset value that appears in the SIZE/OFF column has ``0t' and ``0x" prefixes to distinguish it from size values that may appear in the same column.

Normally if the offset value is less than 100,000,000 (8 digits), it appears in decimal with a ``0t' prefix; over 99,999,999, in hexadecimal with a ``0x" prefix.

A decimal offset is handy, for example, when tracking the progress of an outbound ftp transfer. When lsof reports on the ftp process, it will report the size of the file being sent with its open descriptor; it will report the progress of the transfer via the offset of the outbound open ftp data socket descriptor.

The ``-o [n]" option may be used to specify the maximum number of decimal digits to be printed after ``0t" before lsof switches to the hexadecimal digits after ``0x". As already noted, the default decimal digit count is 8.

#### 14.3 What are the values printed in the FILE\_FLAG column and why is 0x<value> sometimes included?

The two comma separated lists, separated by a semicolon, printed in the FILE-FLAG column (when the "+fg" option is specified), are short-hand names or hexadecimal values for the bits lsof finds in the `f_flag` or `f_flags` member of file structures for files (the first list, the one before the semicolon), and process open files flags found in various kernel structures, often named "pofile" (the second list, the one after the semicolon).

Lsof determines the short-hand names from symbols in the `<fcntl.h>`, `<linux/fs.h>`, `<sys/fcntl.h>`, `<sys/fcntlcom.h>`, `<sys/file.h>`, and `<sys/user.h>` header files.

See

the discussion of FILE-FLAG in the OUTPUT section of the lsof man page, and the FF\_\* and POF\_\* symbols in lsof.h for a list of the names.

Bits with no names defined for them are represented by an 0x<value> member of the comma-separated list -- a hexadecimal integer. When "+fG" is specified (instead of "+fg"), lsof will list all flag values as two hexadecimal integers, separated by a semicolon.

When "-FG" is specified to get the flags in an output field, the format defaults to hexadecimal. You can get names instead by following "-FG" with "+fg" -- e.g.,

```
$ lsof -FG +fg ...
```

However, when you precede "-FG" with "+fg" -- e.g.,

```
$ lsof +fg -FG
```

the format will be hexadecimal; order is important.

#### 14.3.1 Why doesn't lsof display FILE\_FLAG values for my dialect?

All versions of lsof except the /proc-based Linux lsof report FILE-FLAG values. Lsof can't obtain FILE-FLAG information from the Linux /proc interface.

### 14.4 Network Addresses

#### 14.4.1 Why

does lsof's -n option cause IPv4 addresses, mapped to IPv6, to be displayed in IPv6 notation?

When you use the -n option to tell lsof to display numeric network addresses, and an IPv4 address has been mapped to IPv6, lsof displays the address in IPv6 format and puts "ipv4" in the TYPE column. That combination indicates the IPv4 address has been mapped to IPv6.

For example, the IPv4 address 1.2.3.4, when mapped to an IPv6 address, will be displayed by lsof as:

```
[::ffff:1.2.3.4]
```

The enclosing brackets are lsof's signal that this is an

IPv6 address. Inside the brackets is a standard IPv6 address, reported by `inet_ntop()`. The first two colons, signifying zeroes in the first 64 bits of the IPv6 address, and the hexadecimal `ffff` in the next 32 bits, indicate that the last 32 bits contains a mapped IPv4 address, which is then displayed in IPv4 dot notation.

14.5 Why does `lsof` output `\x`, `^x`, or `\xnn` for characters sometimes?

`Lsof` displays only printable ASCII characters.

`Lsof` considers a character printable if `isprint(3)` says it is. If `isprint(3)` says a character isn't printable, the `lsof` man page explains:

"... Non-printable characters are printed in one of three forms: the C ```\[bfrnt]'` form; the control character `^'` form (e.g., ```^@'`); or hexadecimal leading ```\x'` form (e.g., ```\xab'`). Space is non-printable in the `COMMAND` column (```\x20'`) and printable elsewhere."

14.5.1 Why is space considered a non-printable character in command names?

Space is considered an unprintable character in command names because it is sometimes possible to hide the full command name from scripts that parse `ps(1)` output by embedding a space in the name.

14.6 Why doesn't `lsof` print all the characters of a command name?

By default `lsof` prints the first nine characters of the names of commands associated with processes. If more characters are required, the `"w"` value of the `"+c w"` option may be used to specify a larger width.

If `"w"` is zero (`'0'`) `lsof` will print all characters of all command names up to the limit of the number of characters supplied by the particular UNIX dialect. When reporting command names, `lsof` replaces non-printable characters as discussed in the answer to "Why does `lsof` output `\x`, `^x`, or `\xnn` for characters sometimes?"

See the answer to the "Why is space considered a non-printable character in command names?" question for an explanation of why

spaces are replaced by the `\\x20` representation in command names.

The number of command name characters supplied to lsof by UNIX dialects in files and structures varies by dialect. For example, Linux 2.4.27 supplies lsof the first 15 characters of command names and Solaris 9 supplies 16. Thus, even if "w" is zero ('0'), lsof can't report more characters for command names on those two UNIX dialects than they provide lsof.

14.7 Why does lsof reject some -c command names, saying their lengths are "> what system provides (nn)"?

The command name length that a specific system provides varies from dialect to dialect. As noted in the answer to the "Why doesn't lsof print all the characters of a command name?" question, Linux and Solaris provide a limited number of command name characters.

When more characters are specified in the parameter to the -c option, lsof considers it an error and issues a fatal error message -- e.g.,

lsof: "-c xxxxyyyy" length (8) > what system provides (7)

The only work-around is to specify no more characters to -c than the system provides to lsof.

14.8 Why does lsof sometimes print TYPE numbers instead of names?

When lsof can't convert a type number to a name for printing in the TYPE column, it will report the number as four octets.

14.9 Marker line format problems

14.9.1 Why won't lsof accept a marker line format?

Lsof's Configure script must find the localtime(3) and strftime(3) functions in the dialect's C library in order to enable support for marker line formats.

Check the output of lsof's -v option for the presence of -DHAS\_STRFTIME in the compiler flags. If it isn't there, Configure didn't find the necessary two C library functions.

If you think lsof should have found the functions, make a copy

of the C test program in the Configure script that it uses to find the functions. Then use the copy, or a more informative modification of it, to learn why Configure can't find the functions. You can find that program by searching for `strftime`.

#### 14.9.2 Why does `lsf` reject the NL (%n) marker line format?

When repeat mode and field output (with `-F`) have both been specified, `lsf` won't allow new line (NL) formats to be specified with ```%n"`. That's because the marker line is always guaranteed to be a single line.

There is no work-around to this restriction.

#### 14.10 How are protocol state name exclusion and inclusion used?

Protocol state name inclusion and exclusion with the ```-s p:s"` option and its arguments have some issues to consider. Note: the ```-s p:s"` option is only available when the help output, obtained with `-h` or `-?`, shows it; it was a recent addition to `lsf` and is supported only on dialects where it could be tested.

First, there is the problem of determining what state names, if any, the dialect produces. Try running this `lsf` command to find them:

```
$ lsf -i
```

Knowing the state names of interest, the next problem is to decide on the `lsf` options and their parameters that will produce the desired output. Here some examples are probably the most useful.

To list only TCP socket files in `LISTEN` and `CLOSE_WAIT` states, use:

```
$ lsf -itcp -stcp:listen,close_wait  
or  
$ lsf -iTCP -sTCP:LISTEN,CLOSE_WAIT
```

Case isn't important to `lsf` in protocol and state names.

To exclude TCP socket files in `CLOSE_WAIT` state, use:

```
$ lsf -itcp -stcp:^^close_wait
```

Note the '^' preceding close\_wait; it selects exclusion. You can mix included and excluded names in a comma separated list, but you may not include and exclude the same name for the same protocol.

To list TCP files in LISTEN state and UDP files in Idle state, use:

```
$ lsof -i -stcp:listen -sudp:idle
```

Note: if you don't accompany the '-s p:s' list option and arguments with the -i option, lsof will list all other regular files, while applying the specified inclusion and exclusion specifications to network files. Generally, then, you want to use -i with -s.

#### 14.10.1 Why doesn't my dialect support state name exclusion and inclusion?

When state name inclusion and exclusion was added, I had access to test systems for AIX, Darwin, FreeBSD, Linux, PSTAT-based HP-UX and Solaris.

Therefore, I was unable to add and test the support to any other UNIX dialects.

If a dialect has the support, then the HASTCPUDPSTATE definition in its machine.h header file will be active; if not, it will be absent or commented out.

If your dialect doesn't have the support and you want it added, you will have to provide me Internet access to a test host, where I can compile lsof and have the credentials to test the changes the support requires. If that's possible for you, please contact me via e-mail at <abe@purdue.edu>. Make sure "lsof" appears in the "Subject:" line so my e-mail filter won't classify your letter as Spam.

### 15.0 Pyramid Version Problems

#### 15.0.5 Statement of deprecation

As of lsof revision 4.52 support for all Pyramid versions has been dropped. Contact me via e-mail at <abe@purdue.edu> if you are interested in obtaining the last lsof Pyramid distribution.

Make sure "lsof" appears in the "Subject:" line so my e-mail filter won't classify your letter as Spam.

## 16.0 SCO Problems

### 16.1 SCO OpenServer Problems

#### 16.1.1 How can I avoid segmentation faults when compiling lsof?

If you have an older SCO OpenServer compiler, it may get a segmentation fault when compiling some lsof modules. That appears to happen because of the -Ox optimization action requested in the lsof Makefile.

Try changing -Ox to -O with this make invocation:

```
$ make DEBUG=-O
```

Bela Lubkin supplied this tip and Steve Williams verified it.

#### 16.1.2 Where is libsocket.a?

If you compile lsof and the loader says it can't find the socket library, libsocket.a, called by the -lsocket option in the lsof compile flags, you probably are running an SCO OpenServer release earlier than 5.0 and don't have the TCP/IP Development System package installed.

You may have the necessary header files, because you have the TCP/IP run-time package installed, but if you don't have the TCP/IP Development System package installed, you won't have libsocket.a.

Your choices are to install the TCP/IP Development System package or upgrade to OpenServer Release 5.0. You will find libsocket.a in 5.0 -- you'll find all the libraries and header files there, in fact -- and you can use gcc to compile lsof if you don't want to install the 5.0 Development System package.

#### 16.1.3 Why do I get "warning C4200" messages when I compile lsof?

When you compile lsof under OSR 3.2v4.2 (and perhaps under earlier versions as well), you may get many compiler warning



messages of the form:

```
node.c(183) : warning C4200: previous declarator is not
compatible with default argument promotion
```

In my opinion this is a bug in the OSR compiler. Because the compiler cannot handle full ANSI-C prototypes, it assumes default types for function parameters as it encounters untyped in a function prototype -- e.g., in this function declaration from node.c,

```
readrnode(ra, r)
KA_T ra;
struct rnode *r;
{
...

```

the compiler assigns default int types to the ra and r arguments.

Then, when the compiler encounters the fully typed parameters after the function skeleton and sees parameters with types that don't match the assumptions it previously made, it whines about its own assumptions.

You can ignore these messages.

## 16.2 SCO|Caldera UnixWare Problems

### 16.2.1 Why doesn't lsof compile on my UnixWare 7.1.1 or above system?

When you Configure lsof with the "uw" abbreviation and try to compile it for UnixWare 7.1.1, you may get compiler error messages like this:

```
UX:acomp: ERROR: "dproc.c", line 98:
undefined struct/union member: p_pgidp
```

This suggests that you probably have a non-stop cluster UnixWare 7.1.1 system. Its <sys/proc.h> header file differs from the one on the system where I did the lsof port to UnixWare 7.1.1. I currently don't have access to a non-stop cluster system to be able to develop changes to lsof that would make it compile and work there.

If you have a non-stop cluster UnixWare 7.1.1 system, want lsof

for it, and can offer me a test account on the system, please contact me via e-mail at <abe@purdue.edu>. Make sure "lsof" appears in the "Subject:" line so my e-mail filter won't classify your letter as Spam.

If you have a system with nsc\_cfs and can offer me a test account on it, please contact me via e-mail at <abe@purdue.edu>. Make sure "lsof" appears in the "Subject:" line so my e-mail filter won't classify your letter as Spam.

#### 16.2.2 Why does lsof complain about node\_self() on my UnixWare 7.1.1 or above system?

If lsof exits immediately after issuing this message:

```
can't identify process NSC node; node_self(): <message>
```

It means that lsof has been built to run on a NonStop Cluster (NSC) UnixWare 7.1.1 or higher system and can't get the number of the node on which it is running. lsof uses the node number to determine the path to the kernel boot file.

You can tell if lsof has been built for NSC by looking for "-DHAS\_UW\_NSC" in lsof's "-v" option output.

If the system on which you're trying to run lsof isn't running an NSC kernel, you will need to build a non-NSC lsof.

#### 16.2.3 Why does UnixWare 7.1.1 or above complain about -lcluster, node\_self(), or libcluster.so?

When you build, compile, and load lsof for UnixWare 7.1.1 and above, ld may complain that it can't find the -lcluster library or that the node\_self symbol is undefined. When you try to run an existing lsof binary it may complain that libcluster.so can't be found.

These messages mean the tests made by Configure on your system led it to believe your system is running a NonStop Cluster (NSC) kernel, or the lsof binary you're trying to use was built on a NonStop Cluster system. If an lsof binary was built for NSC, this shell command produces output:

```
$ strings <lsof_binary> | grep HAS_UW_NSC
```

If that's not the case, and you can rebuild lsof, set the UW\_HAS\_NSC environment variable to "N" and do this:

```
$ Configure -n clean
$ UW_HAS_NSC=N
$ export UW_HAS_NSC
$ Configure -n uw
$ make
```

You can also edit Makefile and lib/Makefile. Remove -DHAS\_UW\_NSC from the CFGF strings. Remove -lcluster from the CFGF strings. Then run make again.

If you have an existing NSC lsof binary and you want one for a non-NSC system, you will have to build lsof yourself on the system where you want to use it. (That's always a good idea anyway.)

16.2.4 Why does UnixWare 7.1.1 or above lsof complain it can't read the kernel name list?

If lsof complains:

```
can't read kernel name list from <path>
```

It means that lsof can't find the booted kernel image file at <path>. On NonStop Cluster (NSC) UnixWare 7.1.1 or higher systems lsof determines the booted file path by examining this file:

```
/stand/^node_self/boot
```

If examining that file doesn't lead to an NSC path, lsof uses:

```
/stand/1/unix
```

On non-NSC systems lsof expects the booted kernel image to be in /stand/unix.

If your booted kernel image is in a different place, use lsof's "-k <path>" option to specify its path.

16.2.5 Why doesn't lsof report link count, node number, and size

for some UnixWare 7.1.1 or above CFS files?

Lsof reports link count, node number, and size for open CFS files as recorded in their kernel node structure's cached attributes. Sometimes not all attributes are cached on the node where lsof runs, so lsof cannot report them.

#### 16.2.6 Why doesn't lsof report open files on all UnixWare 7.1.1 NonStop Cluster (NSC) nodes?

Lsof can only report on files open on the node on which it runs, because the information lsof reports comes from the private kernel memory of the node. This may mean that asking lsof to find a specific open file, or use of a specific Internet address or port, may not report all open instances on nodes other than the one used to run lsof.

You can use the NSC onnode(1) command to run lsof on specific nodes, or the onall(1) command to run lsof on all nodes -- e.g.,

```
$ onall lsof [options] 2>&1 | less
```

or

```
$ onnode node-number lsof [options] 2>&1 | less
```

Note that, when lsof is run all nodes, the path name component assembly results it reports in its NAME column may vary, because the dynamic name cache from which lsof gets the components is private to the kernel of each node.

Also note the use of shell redirection in the examples to merge the standard error file information from onnode and onall with lsof's standard output file output. That will put the onnode and onall node announcements in proper sequence with lsof's output.

#### 16.2.7 Why doesn't lsof report the UnixWare 7.1.1 NonStop Cluster (NSC) node a process is using?

To induce lsof to report the node on which a process runs would be a significant, non-standard modification to lsof. It has much wider implications than merely the printing of a number in an output column. I'm not currently (April 2001) prepared to undertake such a modification.

If you want node-specific NSC information about open files,

run lsof under the control of onall(1) or onnode(1).

```
$ onall lsof [options] 2>&1 | less
```

or

```
$ onnode node-number lsof [options] 2>&1 | less
```

#### 16.2.8 Why does the compiler complain about missing UnixWare 2.1[.x] header files?

SCO|Caldera didn't ship the following header files with UnixWare 2.1 through 2.1.3:

```
<fs/proc/prdata.h>  
<fs/procfs/prdata.h>  
<sys/fs/fifonode.h>  
<sys/fs/namenode.h>
```

Lsof needs those header files for its compilation. Contact SCO|Caldera to get copies of those header files.

If you can't get the header files from SCO|Caldera, please contact me via e-mail at <abe@purdue.edu>. Make sure "lsof" appears in the "Subject:" line so my e-mail filter won't classify your letter as Spam.

### 17.0 Sun Problems

#### 17.0.5 Statement of deprecation

Lsof support for SunOS 4.1.x was last tested at revision 4.51. Contact me via e-mail at <abe@purdue.edu> if you're interested in obtaining it. Make sure "lsof" appears in the "Subject:" line so my e-mail filter won't classify your letter as Spam.

#### 17.1 My Sun gcc-compiled lsof doesn't work -- why?

Gcc can be used to build lsof successfully. However, an improperly installed Sun gcc compiler will usually not produce a working lsof.

If your Sun gcc-compiled lsof doesn't report anything, or reports "can't read proc table," or gcc refuses to compile lsof without error, check that the gcc step that "fixes" Sun header files was run on the system where you're using gcc to compile lsof. As an alternative, if you have the

SunPro C 5.0 compiler or later available, use it to compile  
lsof -- e.g., use the solariscc Configure abbreviations.

17.2 How can I make lsof compile with gcc under Solaris 2.[456],  
2.5.1, 7, 8 or 9?

Presuming your gcc-specific header files are wrong for  
Solaris, edit the lsof Configure-generated Makefile and  
lib/Makefile and make this change:

```
CFGF= -Dsolaris=20400 ...  
to  
CFGF= -Dsolaris=20400 -D__STDC__=0 -I/usr/include ...
```

or change:

```
CFGF= -Dsolaris=20500 ...  
to  
CFGF= -Dsolaris=20500 -D__STDC__=0 -I/usr/include ...
```

or change:

```
CFGF= -Dsolaris=20501 ...  
to  
CFGF= -Dsolaris=20501 -D__STDC__=0 -I/usr/include ...
```

This is only a temporary  
work-around. You really should  
instruct gcc to to update your gcc-specific header files  
or install a recent gcc (e.g., 3.2), which has no need for  
private copies of Solaris include files.

17.3 Why does Solaris Sun C complain about system header files?

You're probably trying to use /usr/ucb/cc if you get compiler  
complaints like:

```
cc -O -Dsun -Dsolaris=20300 ...  
"/usr/include/sys/machsig.h", line 81: macro BUS_OBJERR  
redefines previous macro at "/usr/ucbinclude/sys/signal.h",  
line 444
```

Note the reference to "/usr/ucbinclude/sys/signal.h". It  
reveals that the BSD Compatibility Package C compiler is  
in use. Lsof requires the ANSI C version of the Solaris  
C compiler, usually found in /usr/opt/bin/cc or  
/opt/SUNWspro/bin/cc.

Try adding a CC string to the lsof Makefile that points to the Sun ANSI C version of the Sun C compiler -- e.g.,

```
CC= /usr/opt/bin/cc  
or  
CC= /opt/SUNWspro/bin/cc.
```

#### 17.4 Why doesn't lsof work under my Solaris 2.4 system?

If lsof doesn't work under your Solaris 2.4 system -- e.g., it produces no output, little output, or the output is missing command names or file descriptors -- you may have a pair of conflicting Sun patches installed.

Solaris patch 101945-32 installs a kernel that was built with a `<sys/auxv.h>` header file whose `NUM_*_VECTORS` definitions don't match the ones in the `<sys/auxv.h>` updated by Solaris patch 102303-02.

`NUM_*_VECTORS` in the kernel of patch 101945-32 are smaller than the ones in the `<sys/auxv.h>` of patch 102303-02. The consequence is that when lsof is compiled with the `<sys/auxv.h>` whose `NUM_*_VECTORS` definitions are larger than the ones used to compile the patched kernel, lsof's user structure does not align with the one that the kernel employs.

If you have these two patches installed, contact Sun and complain about the mis-match.

You may be able to work around the problem by editing `/usr/include/sys/auxv.h` to have the following `NUM_*_VECTORS` definitions:

```
#define NUM_GEN_VECTORS 4  
#define NUM_SUN_VECTORS 8
```

The Configure script issues a prominent WARNING that you should try the work-around.

I thank Leif Hedstrom for identifying the offending patches.

#### 17.5 Where are the Solaris header files?

If you try to compile lsof under Solaris and get a compiler complaint that it can't find system header files, perhaps you forgot to add the header file package, `SUNWhea`.

## 17.6 Where is the Solaris /usr/src/uts/<architecture>/sys/machparam.h?

When you try to Configure lsof for Solaris 2.[23456], 2.5.1, and 7 -- e.g., on a `uname -m` == sun4m system -- Configure complains:

```
grep: /usr/src/uts/sun4m/sys/machparam.h:
No such file or directory
grep: /usr/src/uts/sun4m/sys/machparam.h:
No such file or directory
```

And when you try to compile the configured lsof, cc or gcc complains:

```
dproc.c:530: `KERNELBASE' undeclared (first use this function)
```

The explanation is that somehow your Solaris system doesn't have the header files in /usr/src/uts it should have. Perhaps someone removed the directory to save space. Perhaps you're using a gcc installation, copied from another system. In any event, you will have to load the header files from the SUNWhea package of your Solaris distribution.

KERNELBASE is an important symbol to lsof -- it keeps lsof from sending an illegal kernel value to kvm\_read() where a segmentation violation might result (a bug in the kvm library). Lsof can get illegal kernel values because it reads kernel values slowly with kvm\_read() calls that the kernel is changing rapidly.

Lsof doesn't need KERNELBASE at Solaris 2.5 and above, because it has a KERNELBASE value whose address lsof can find with /dev/ksyms and whose value it can read with kvm\_read(). Under Solaris 2.5 /usr/src/uts has moved to /usr/platform.

## 17.7 Why does Solaris lsof say ``can't read proc table"?

When lsof collects data on processes, using the kvm\_\*() functions to scan the kernel's proc structure table, it checks to make sure it has identified a reasonable number of them -- a minimum of three. When lsof can't identify three processes during a scan, it repeats the scan.

When five scans fail to yield three processes, lsof issues



the fatal message:

lsof: can't read proc table

and exits.

Usually lsof fails to identify three processes during a scan because its idea of the form of the proc structure differs from that being used by the kernel. Since the proc structure is defined in `<sys/proc.h>` and other `/usr/include` header files, the root cause of a proc structure discrepancy usually can be found in the composition of `/usr/include`.

One common way that `/usr/include` header files can be incorrect is that gcc was used to compile lsof, gcc used its special (i.e., "fixed") header files instead of the ones in `/usr/include`, and the special gcc header files weren't updated when Solaris was. Answers to these questions:

My Sun gcc-compiled  
lsof doesn't work -- why?

How can I make lsof compile with gcc under Solaris 2.[456],  
2.5.1, 7, 8 or 9?

Why does Solaris Sun C complain about system header files?

discuss the gcc header file problem and offer suggestions  
on how to fix it or work around it.

It may also be that you are trying to run a version of lsof that was compiled on an older version of Solaris. For example, an lsof executable, compiled for Solaris 2.4, will produce the "can't read proc table" message if you try to run it under Solaris 2.5. If you have compiled lsof under Solaris 2.5 and it still won't work, see if the header files in `/usr/include` have been updated to 2.5, or still represent a previous version of Solaris.

Another source of header file discrepancies to consider is the Solaris patch level and whether a binary kernel patch was not matched with a corresponding header file update. See the "Why doesn't lsof work under my Solaris 2.4 system?" question for an example of one in Solaris 2.4 -- there may be other such patch conflicts I don't know about.

17.8 Why does Solaris lsof complain about a bad cached clone device?

When lsof revisions below 4.04 have been run on a Solaris system and have been allowed to create a device cache file, the running of revisions 4.04 and above on the same systems may produce this complaint:

```
lsof: bad cached clone device: ...  
lsof: WARNING: created device cache file: ...
```

This is the result of a change in the device cache file that took place at lsof revision 4.04. The change introduced a node number into the clone device lines of the device cache file and was done in such a way that lsof could detect device cache files whose clone lines don't have node numbers (lines created by previous lsof revisions) and recognize the need to regenerate the device cache file.

#### 17.9 Why doesn't Solaris make generate .o files?

Solaris /usr/ccs/bin/make won't generate .o files from .c files if /usr/share/lib/make/make.rules is missing. It may be found in and installed from the SUNWsport package.

#### 17.10 Why does lsof report some Solaris 2.3 and 2.4 lock types as `N'?

For Solaris 2.3 with patch P101318 installed at level 45 or above, and for all versions of Solaris 2.4, NFS locks are represented by a NFS-specific kernel lock structure that sometimes lacks a read or write lock type indicator. When lsof encounters such a lock structure, it reports the lock type as `N'.

#### 17.11 Why does lsof Configure say "WARNING: no cc in ..."?

When lsof's Configure script is executed with the solarisc compiler abbreviation it tries to make sure it's using the Sun C compiler and not the UCB substitute from /usr/ucb/cc. Thus, it looks for cc in the "standard" Sun compiler location, /opt/SUNWspro/bin.

If Configure can't find cc there, it issues the warning:

```
lsof: WARNING: no cc in /opt/SUNWspro/bin;  
using cc without path.
```

and uses cc for the compiler name, letting the shell find cc with

its PATH environment variable.

You can tell Configure where to find your cc with the SOLARIS\_CCDIR cross-configuration environment variable. (See 00XCONFIG for more information on SOLARIS\_CCDIR). For example, use this Configure shell command:

```
SOLARIS_CCDIR=/usr/special/bin Configure -n solariscc
```

(SOLARIS\_CCDIR should be the full path to the directory containing your cc.)

## 17.12 Solaris 7, 8 and 9 Problems

### 17.12.1 Why does lsof say the compiler isn't adequate for Solaris 7, 8 or 9?

Solaris 7, 8 and 9 kernels come in two flavors, 32 and 64 bit. 64 bit kernels run on machines that support the SPARC v9 instruction set architecture. Separate executables for some programs, -- e.g., ones using libkvm like lsof -- must be built for 32 and 64 bit kernels.

Previous Sun (e.g., SC4.0) and earlier gcc compilers will build lsof for 32 bit kernels, but they won't build it for 64 bit kernels. Compilers that will build lsof for 64 bit Solaris 7, 8 and 9 kernels are the Sun WorkShop Compilers C 5.0 and above, and recent gcc versions, e.g., 3.2.

When given the "-xarch=v9" flag, the C 5.0 compiler and above, and associated loader and 64 bit libraries will build a 64 bit lsof executable; when given the "-m64" or "-mcpu=v9" (deprecated) flags, an appropriate gcc compiler will build a 64 bit lsof executable.

When the lsof Configure script detects a 64 bit kernel is in use (e.g., by executing `/bin/isainfo -kv`), and when it finds that the specified compiler is inappropriate, it complains with these messages:

For gcc:

```
!!!!WARNING!!!!=====!!!!WARNING!!!!=====!!!!WARNING!!!!
"!
!"
"! LSOF NEEDS TO BE CONFIGURED FOR A 64 BIT KERNEL, BUT !"
"! THIS GCC DOESN'T SUPPORT THE BUILDING OF 64 BIT !"
"! SOLARIS EXECUTABLES. LSOF WILL BE CONFIGURED FOR A !"
!"
```

```

"! 32 BIT echo KERNEL.          !"
"!
          !"
"!!!WARNING!!!=====!!!WARNING!!!=====!!!WARNING!!!"

```

For Sun C:

```

!!!WARNING!!!=====!!!WARNING!!!=====!!!WARNING!!!
!
!
! LSOF NEEDS TO BE CONFIGURED FOR A 64 BIT KERNEL, BUT |
! THE VERSION OF SUN C AVAILABLE DOESN'T SUPPORT THE  !
! -xarch=v9 FLAG. LSOF WILL BE CONFIGURED FOR A 32 BIT  !
! KERNEL.          !
!
!
!!!WARNING!!!=====!!!WARNING!!!=====!!!WARNING!!!

```

17.12.2 Why does Solaris 7, 8 or 9 lsof say "FATAL: lsof was compiled for..."?

Solaris 7, 8 or 9 lsof may say:

```

lsof: FATAL: lsof was compiled for a xx bit kernel,
but this machine has booted a yy bit kernel.

```

Where: xx = 32 or 64  
yy = 64 or 32

(xx and yy won't match.)

This message indicates that lsof was compiled for one size kernel and is being asked to execute on a different size one. That's not possible for programs like lsof that use libkvm.

Depending on the instruction sets for which you need Solaris 7, 8 or 9 lsof, you may need two or more versions of lsof, compiled for each kernel size, installed for use with /usr/lib/isaexec. See the "How do I install lsof for Solaris 7, 8 or 9?" section of this document for more information on that.

17.12.3 How do I build lsof for a 64 bit Solaris kernel under a 32 bit Solaris kernel?

If your Solaris system has an appropriate compiler (e.g., WorkShop Compilers C 5.0 and above, or a recent gcc like 3.2) and the 64 bit libraries have been installed, you can

force lsof's Configure script to build a 64 bit version of lsof with:

```
$ SOLARIS_KERNBITS=64 Configure -n solariscc
```

The SOLARIS\_KERNBITS environment variable is part of the lsof cross-configuration support, described in the 00XCONFIG file of the lsof distribution.

#### 17.12.4 How do I install lsof for Solaris 7, 8 or 9?

If you are installing lsof where it will be used only under the bit size kernel for which it was built, no special installation is required.

If, however, you are installing different versions of lsof for different bit sizes -- e.g., for use on a 64 bit NFS server and from its 32 bit clients -- you should read the man page for isaexec(3C) and install lsof according to its instructions.

The executable at the directory where lsof is to be found should be a hard link to /usr/lib/isaexec or a copy of it. In the directory there must be instruction architecture subdirectories -- e.g., .../sparc/ and .../sparcv9/. The lsof for 64 bit size kernels is installed in the .../sparcv9/ subdirectory; the one for 32 bit size kernels, in .../sparc/.

For example, if you're installing 32 and 64 bit lsof executables in /usr/local/etc, you would:

```
# cd /usr/local/etc
# ln /usr/lib/isaexec lsof
# mkdir sparc sparcv9
# install the 32 bit lsof as sparc/lsof
# install the 64
bit lsof as sparcv9/lsof
# chmod, chown, and chgrp sparc/lsof and
sparcv9/lsof appropriately
```

Lsof permissions and ownerships are the same whether one or more lsof executables are being installed, with or without the /usr/lib/isaexec hard link.

#### 17.12.5 Why does my Solaris 7, 8 or 9 system say it cannot execute lsof?

When you attempt to execute lsof, your Solaris 7, 8 or 9 shell may complain:

```
ksh: ./lsof: cannot execute
```

If the lsof executable exists and has the proper execution permissions, this error may be the result of trying to execute an lsof, built for a 64 bit kernel, on a 32 bit kernel.

This will tell you about the lsof executable:

```
$ file lsof
lsof: ELF 64-bit MSB executable SPARCV9 Version 1,
dynamically linked, not stripped
```

The "64-bit" notation indicates the binary was built for a 64 bit kernel. To see the running kernel bit size, use this command:

```
$ isainfo -kv
32-bit sparc kernel modules
```

The "32-bit" notation indicates a 32 bit kernel has been booted.

The only work-around is to obtain, or Configure and make, an lsof for the appropriate kernel bit size. If you Configure and make lsof on the kernel where you wish to run it the proper compiler, the lsof Configure step will generate Makefiles that can be used with make to build an appropriate lsof executable.

To compile a 64 bit lsof, you must have an appropriate compiler -- i.e., Sun WorkShop Compilers C 5.0 or higher or a recent gcc like 3.2.

17.12.6 What gcc will produce 64 bit Solaris 7, 8 and 9 executables?  
8 and 9 executables?

Properly built and installed recent gcc versions -- e.g., 3.2 -- will build lsof for 64 bit Solaris kernels.

If you update your gcc version to 3.2 or later, make sure the private gcc header files become current -- i.e., clear out any private header files from a previous gcc or Solaris installation before installing the new ones, or build to

a new --prefix root and replace the old root with it after the build and installation are complete.

17.12.7 Why does lsof on my Solaris 7, 8 or 9 system say, "can't read namelist from /dev/ksyms?"

You're probably trying to use an lsof executable built for an earlier Solaris release on a 64 bit Solaris 7, 8 or 9 kernel. The output from ``lsof -v`` will tell you the build environment of your lsof executable. You should also have gotten a warning message that lsof is compiled for a different Solaris version than the one under which it is running -- something like this:

lsof: WARNING: compiled for Solaris release X; this is Y

You need to build lsof on the system where you want to use it. For 64 bit Solaris 7, 8 and 9 you need a compiler that can generate 64 bit Solaris executables -- e.g., the Sun Workshop 5 C compiler or later, or a recent gcc version like 3.2. See the "Why does lsof say the compiler isn't adequate for Solaris 7, 8 or 9?" section and the ones following it for a discussion of building lsof for 64 bit Solaris 7, 8 or 9.

## 17.13 Solaris and COMMON

17.13.1 What does COMMON mean in the NAME column for a Solaris VCHR file?

When lsof puts COMMON or (COMMON) in the NAME column of a Solaris VCHR file, it means that the file is handled by the special file system functions of the kernel through a common vnode.

17.13.2 Why does a COMMON Solaris VCHR file sometimes seem to have an incorrect minor device number?

When lsof reports on an open file in a Solaris special file system that uses a COMMON vnode, and the file is a VCHR file, lsof tries to locate the associated device node by looking for matches on the major and minor device numbers first.

If no major and minor match results, lsof then looks for a match on pseudo and clone device files. (See `/devices/pseudo`.)

Those device nodes are matched specially by either their major or minor device numbers, but not both. Hence, when lsof finds a match under those special conditions, it may report a value in its output DEVICE column that differs from one of the major and minor numbers of the device node.

Here's an example from a sun4m Solaris 7 system:

```
$ ls -li /devices/pseudo/pm@0:pm
151261 crw-rw-rw- 1 root  sys  117, 0 ...
$ lsof /devices/pseudo/pm@0:pm
COMMAND ... DEVICE ...  NODE NAME
powerd    117,1 ... 151261 /devices/pseudo/pm@0:pm (COMMON)
Xsun      ... 117,0 ... 151261 /devices/pseudo/pm@0:pm
```

Note that the DEVICE value for the file with (COMMON) in its name field has a different minor device number (1) from what ls reports (0), while the DEVICE value for the file without (COMMON) matches the ls output exactly. Both match on the major device number, 117. The minor device number mis-match is a result of the way the Solaris kernel handles special file system common vnodes, and it's the reason lsof puts (COMMON) after the name to signal that a mis-match is possible.

#### 17.14 Why don't lsof and Solaris pfiles reports always match?

/usr/proc/bin/pfiles  
for Solaris 2.6, 7, 8, and 9 also  
reports information on open files for processes. Sometimes the information it reports differs from what lsof reports.

There are several reasons why this might be true. First, because pfiles is a Sun product, based on Sun kernel features, its developers have a better chance of knowing exactly how open file information is organized. I sometimes have to guess at how kernel file structure linkages are constructed by gleaning hints from header files.

Second, lsof is aimed at providing information, specifically device and node numbers, that can be used to identify named file system objects -- i.e., path names. Thus, lsof tries to make sure its device and node numbers match those reported by stat(2). Pfiles doesn't always report numbers that match stat(2) -- e.g., for files using clone and pseudo devices via common vnodes like the nlist() /dev/ksyms usage.



Here's the Solaris 7 COMMON VCHR example again with additional pfiles output:

```
$ ls -li /devices/pseudo/pm@0:pm
151261 crw-rw-rw- 1 root  sys  117, 0 ...
$ lsof /devices/pseudo/pm@0:pm
vic1: 10 = lsof /dev/pm
COMMAND ... DEVICE ...  NODE NAME
powerd ... 117,1 ... 151261 /devices/pseudo/pm@0:pm (COMMON)
Xsun ... 117,0 ... 151261 /devices/pseudo/pm@0:pm
$ pfiles ...
0: S_IFCHR ... dev:32,24 ino:61945 ... rdev:117,1
...
14: S_IFCHR ... dev:32,24 ino:151261 ... rdev:117,0
```

Note that the NODE number, reported by lsof, matches what ls(1) and stat(2) report, while the ino value pfiles reports doesn't. Lsof also indicates with the (COMMON) notation that the DEVICE number is a pseudo one, derived from the character device's value. The lsof DEVICE value matches the pfiles rdev value, correct behavior for a character device, but pfiles gives no sign that it's not possible to find that character device number in /devices with ls(1) or stat(2).

17.15 Why does lsof say, "kvm\_open(namelist=default, core=default):  
Permission denied?"

Lsof needs permission to read from the /dev/kmem and /dev/mem memory devices. Access to them is opened via a call to the kvm\_open() library function and it reports the indicated message.

You must give lsof permission to read the memory devices. The super user can almost always do that, but other lsof users can do it if some group -- e.g., sys -- has permission to read the memory devices, and the lsof binary is installed with the group's ownership and with the setgid permission bit enabled.

17.16 Why is lsof slow on my busy Solaris UFS file system?

Lsof may be slow on a busy Solaris UFS file system when UFS logging has been enabled with the "logging" mount option. That option can significantly increase disk operations under certain conditions -- e.g., when a lot of

files are accessed quickly.

When only the "logging" option is specified to mount, all file accesses (atime updates) are logged to the UFS logging queue.

Each atime update requires two writes to the disk to complete it.

If you want to do UFS logging -- and there are reliability advantages to it -- consider using the "logging,noatime" mount options instead. That will shift atime updates from the logging queue to fewer and independent asynchronous operations, consequently making the UFS logging queue a smaller bottleneck.

Consult mount\_ufs(1M) for more information on the logging and noatime options.

(My thanks to Casper Dik for this tip on improving the performance of UFS logging.)

#### 17.17 Why is lsof so slow on my Solaris 8 or 9 system?

Solaris 8 has a post-release feature upgrade modifying kernel name cache (DNLC) handling that can slow lsof throughput dramatically. The feature, sometimes called negative DNLC caching, is standard in Solaris 9.

As best I can tell, when you install the Solaris 8 MU1 package, you get negative DNLC caching. If this pipe produces any output, your system has negative DNLC caching.

```
$ nm /dev/ksyms | grep negative_cache_vnode
```

The reason negative DNLC caching perturbs lsof is that a single vnode address (found in the negative\_cache\_vnode kernel variable) is used to mark entries in the DNLC that are not (the negative part) found on disk.

Since a single vnode address (the DNLC key lsof uses) can represent many (I've seen upwards of 30,000.) DNLC entries, their presence overloads lsof's internal DNLC hashing function. An overloaded hash function is a slow hash function, and lsof's slows to a crawl when it encounters thousands of keys that produce the same value when the lsof DNLC hash function is applied to them.

The solution is simple -- ignore negative DNLC cache keys. They don't represent path name components lsof can use. Lsof revisions 4.50 and above have an addition that ignores them and the performance of those lsof revisions improves significantly when presented with negative DNLC cache keys.

If you don't have an lsof revision at 4.51 or later, there's a work-around. Use lsof's ``-C" option. It disables lsof's DNLC caching. Of course, that also inhibits the reporting of any path name components from the kernel DNLC. When ``-c" is used, lsof will continue to report file system and character device paths.

## 17.18 Solaris and VxFS

### 17.18.1 Why doesn't lsof support VxFS 3.4 on Solaris 2.6, and above?

Lsof will not support VxFS version 3.4 on Solaris 2.6 and above unless some files from VxFS Update 2 have been installed. VxFS 3.4 FCS and VxFS 3.4 update 1 lack the header files lsof normally uses to obtain information from the VxFS 3.4 kernel node structure, vx\_inode. VxFS 3.4 Update 2 provides a method whereby lsof can obtain the necessary vx\_inode information from the vxfsu\_get\_ioffsets() function in Veritas utility libraries.

The utility libraries (32 bit and 64 bit versions) may be found in /opt/VRTSvxfs/lib. An ancillary header file may be found in /opt/VRTSvxfs/include/sys/fs/vx\_libutil.h. Documentation of the vxfsu\_get\_ioffsets(3) function may be found in /opt/VRTS/man/man3/vxfsu\_get\_ioffsets.3.

Those files of VxFS 3.4 Update 2 may be downloaded from:

[ftp://ftp.veritas.com/pub/support/vxfs\\_34.i64243.tar](ftp://ftp.veritas.com/pub/support/vxfs_34.i64243.tar)

The vxfs\_34.i64243.tar archive will unpack into an i64243 directory containing these files:

```
$ ls i64243
README
libvxfsutil.sol26.sum
libvxfsutil.sol26.tar.Z
libvxfsutil.sol27.sum
libvxfsutil.sol27.tar.Z
libvxfsutil.sol28.sum
```

libvxfstutil.sol28.tar.Z

Read README. Select the \*.tar.Z file appropriate for your Solaris version. Its contents will unpack into /opt/VRTS and /opt/VRTSvxfs, so you will need sufficient permission -- e.g., do it as root -- to unpack the uncompressed archive. Once you've done that, it's a good idea to compare the checksums of the archive you unpacked with the ones recorded in the appropriate \*.sums file. Use `sum -r` to verify the checksums.

For example, if you want the Solaris 8 version, uncompress and unpack libvxfstutil.sol28.tar.Z -- e.g.,

```
$ su
...
# cd i6423
# zcat libvxfstutil.sol28.tar.Z | tar xf -
```

That should create these new files and subdirectories with the indicated checksums:

```
File or subdirectory  sum -r

/opt/VRTSvxfs/include/vxfstutil.h 03938
/opt/VRTSvxfs/lib/libvxfstutil.a 51794
/opt/VRTSvxfs/lib/sparcv9/
/opt/VRTSvxfs/lib/sparcv9/libvxfstutil.a 07420
/opt/VRTS/man/man3/
/opt/VRTS/man/man3/vxfstu_get_ioffsets.3 62480
```

Once these files are in place, run lsof's Configure script for the solaris or solariscc abbreviation. Configure will locate the appropriate VxFS 3.4 Update 2 files and set up for the making of an lsof that will properly display open VxFS 3.4 file information.

17.18.2 Why does lsof report "vx\_inode: vxfstu\_get\_ioffsets error" for open Solaris 2.6 and above VxFS 3.4 and above files?

Even when lsof supports VxFS 3.4 and above on Solaris 2.6 and above, it may report "vx\_inode: vxfstu\_get\_ioffsets error" in the NAME column for all VxFS files.

The usual cause is that lsof doesn't have permission to read the file at the end of the /dev/vxportal symbolic

link. If, for example, lsof has been installed setgid(sys), then the /dev/vxportal symbolic link destination should be owned by the sys group and readable by it.

Update 2 for VxFS 3.4 sets the modes of the /dev/vxportal symbolic link destination to 0640 and the group ownership to sys. But I have had a report that the modes are wrong in a VxFS 4.0 installation.

Another cause may be that the system has more than one version of VxFS installed (Only one can be active.), and lsof's Configure script did not choose the header files and libraries for the active VxFS version. Configure opts for VxFS 4.0 and above header files and libraries (in /opt/VRTS) in preference to those for VxFS below 4.0 (in /opt/VRTSvxfs).

Look for the directories /opt/VRTS and /opt/VRTSvxfs. If you have /opt/VRTS, make sure its header and library symbolic links point to those of the active VxFS version.

If you have both directories, look at the CFLAGS that Configure constructed for making lsof and see which directory path follows a -I option. If that doesn't match the directory path of the active VxFS version, try pointing Configure at the correct directory with the SOLARIS\_VXFSINCL environment variable -- e.g.,

```
$ SOLARIS_VXFSINCL=/opt/.../include ./Configure -n solaris
```

#### 17.18.3 Why does Solaris Configure claim there is no VxFS library?

The lsof Configure script, when configuring for Solaris, may report:

```
FATAL: no VxFS .../libvxfsutil.a
```

That fatal error message indicates lsof has found the VxFS utility library's header files, but can't find the library itself in the expected location adjacent to the header files.

One possible cause is an incorrect symbolic link from /opt/VRTS/lib/sparcv9/libvxfsutil.a to the library's real location. (Some VxFS distributions declared the link incorrectly.) Use `ls -lL` on that path to see if it exists. If it doesn't exist, the link may be missing an additional leading "../" component.

If the problem is a missing "../" from the library's link, you can correct the link or check with Veritas/Symantec for the patch that corrects it.

If the problem is not a missing "../", and you know the libvxfsutil.a location, you can define its path in the SOLARIS\_VXFSLIB environment variable before running the lsof Configure script. (See 00XCONFIG for information about using the SOLARIS\_VXFSLIB environment variable.)

If you have no libvxfsutil.a, you must obtain it from Veritas/Symantec or find it in your VxFS installation package.

#### 17.18.4 Why doesn't Solaris lsof report VxFS path name components?

Solaris lsof will report path name components for VxFS versions that use the common Solaris Dynamic Name Lookup Cache (DNLC) or on some file systems of VxFS versions that support the VxFS Reverse Name Lookup (RNL) facility.

VxFS versions 3.3 (approximately) and below use the common Solaris DNLC. (I haven't been able to determine exactly when VxFS stopped using the DNLC.) For versions above that boundary, but below 4.0, lsof can't report path name components.

At VxFS 4.0 and above, lsof can be compiled to use the VxFS RNL facility for reporting path names. If "-DHASVXFSRNL" appears in the compiler flags section of lsof "-v" option output, then the lsof Configure script detected the VxFS RNL facility and lsof has been compiled to use it.

Lsof's use of the RNL facility can fail when the VxFS file system disk layout version is below 6. In that case, lsof can report no path name components. For more information, see the vxfs\_inotopath(3) manual page. any of the following commands will show the disk layout version for a VxFS file system, when supplied the block device or mount point on which the file system is mounted.

```
fstyp -v <block_device>
or
mkfs -m
<block_device>
or
vxupgrade <mount_point>
```

You must have permission to read the block device -- e.g., be the root user.

You may also be able to upgrade an older disk layout to one that will work with the RNL. See the vxupgrade(1M) man page for more information on that.

When lsof can't report VxFS path name components, it reports the file system mount point and the path name of device on which it is mounted. The device path name is enclosed in parentheses.

#### 17.18.5 Why does Solaris 10 lsof report scrambled VxFS paths?

Solaris 10 lsof may report a bogus, scrambled path for an open VxFS file, when lsof obtains the path from a vnode's cached path. Veritas/Symantec reports that their Solaris 10 implementation has bugs in the way it handles the Solaris 10 vnode cached path and those bugs will be fixed in an upcoming patch some time after August 15, 2005.

When Solaris 10 lsof reports a path for an open VxFS file obtained via the VxFS Reverse Name Lookup facility, the path will be correct.

Also see the answers to the questions "Why does Solaris 10 lsof sometimes report the wrong path name?" and "Why doesn't Solaris lsof report VxFS path name components?"

#### 17.19 Large file problems

##### 17.19.1 Why does lsof complain it can't stat(2) a Solaris 2.5.1 large file?

When given an argument that is the path to a Solaris 2.5.1 file, enable for large file operations with the O\_LARGEFILE open(2) option, lsof complains that it can't stat(2) the file. That's because lsof isn't using a stat(2) call and associated structure enabled for large files.

This error has been fixed, starting at lsof revision 4.58 for Solaris 2.6 and above. That fix won't work on Solaris 2.5.1 and I no longer have access to a Solaris 2.5.1 test system to develop a separate fix.

The work-around is to avoid specifying a O\_LARGEFILE path as an argument to lsof on Solaris 2.5.1. Instead use a

combination of lsof and grep to achieve the same results, albeit more clumsily.

#### 17.20

Why does lsof get a segmentation fault on 64 bit Solaris 8 using NIS+?

I have received a report from Gary Craig that lsof produces a segmentation fault on his 64 bit Solaris 8 system using NIS+. Via an independent test program we have exonerated lsof and tracked the fault to the NIS+ `__nis_server_name()` function in the C name server library, `-lnsl`.

Lsof causes the `__nis_server_name()` NIS+ function to be called by calling `getservent()` to read entries of the port number to service name map.

The only Sun bug ID that appears to describe the problem is 4304244, although its text is unclear enough to leave room for doubt.

Until Sun eliminates the `__nis_server_name()` segmentation fault cause, a work-around for lsof is to use its `"-P"` option, causing lsof to avoid port to service name lookups.

#### 17.21 Will lsof crash the Solaris kernel?

I've received and investigated one report that it has when the Sun hardware (a QME interface) was faulty. Today (May 23, 2002) I've learned that Sun has reports of kernel crashes caused by adb, lsof, and mdb.

The Sun investigation pinpointed a problem in the `/dev/kmem` kernel driver and there is a Sun bug report, 4344513, about the problem. There is a fix in Solaris 9, and patches for Solaris 7 and 8 (SPARC and x86).

To see if your Solaris system is fixed, look for a `/devices/pseudo/*allkmem` node.

Extensive address filtering was added to lsof revision 4.50 to forestall what I then (July 2001) believed to be only the possibility that lsof might crash Solaris. However, the filtering isn't perfect, since a filtered address might become invalid after lsof has filtered it but before lsof has delivered it to `/dev/kmem`. That filtering work is described in `.../dialects/sun/solaris_kaddr_filters`, also



available at:

[ftp://lsof.itap.purdue.edu/pub/tools/unix/lsof/solaris\\_kaddr\\_filters](ftp://lsof.itap.purdue.edu/pub/tools/unix/lsof/solaris_kaddr_filters)

The best and safest work-around is to upgrade to Solaris 9 or install an appropriate patch or its equivalent from this list:

|         | Solaris SPARC | x86       |
|---------|---------------|-----------|
| Version | Patch         | Patch     |
| =====   | =====         | =====     |
| 7       | 106541-20     | 106542-20 |
| 8       | 108528-14     | 108529-14 |

17.22 Why does lsof on Solaris 7, 8, or 9 report a `kvm_open()` failure?

When lsof is started on some Solaris 7, 8, and 9 systems it may report:

```
lsof: kvm_open(namelist=default, corefile=default): \
No such file or directory
```

Lsof revisions 4.65 and later will first report:

```
lsof: cannot stat /dev/allkmem
```

The second message, not delivered in lsof revisions below 4.65, explains the cause of the `kvm_open()` failure; it can't find `/dev/allkmem`.

`/dev/allkmem` is a device added to Solaris 7 and 8 in patches and in the Solaris 9 FCS. See the preceding "Will lsof crash the Solaris kernel?" section for more information on `/dev/allkmem` and the patches.

The `kvm_open(3KVM)` function in the KVM library of patched Solaris 7 and 8 systems and in Solaris 9 expects to find `/dev/allkmem` and exits on error when it does not.

If you have installed the patch that updated your KVM library to a version that expects `/dev/allkmem` to be present and it is not, you may need to reconfigure your system's devices with `devfsadm(1M)` or enter "boot -r" to the OpenBoot monitor's prompt (usually "ok").

## 17.23 Solaris and SAM-FS

### 17.23.1 Why does Solaris lsof report "(limited SAM-FS info)"?

Lsof 4.68 and above report "(limited SAM-FS info)" on Solaris in the NAME column after the path or file system name for all files it finds on SAM-FS file systems.

That's because no more information is known about the composition of the nodes that follow SAM-FS vnodes. If you can provide that information, please contact me via e-mail at <abe@purdue.edu>. Make sure "lsof" appears in the "Subject:" line so my e-mail filter won't classify your letter as Spam.

### 17.23.2 Why can't lsof locate named SAM-GS files?

Solaris lsof 4.68 and above can't locate files on SAM-FS file systems when the files are named as lsof arguments because lsof doesn't know how to locate open SAM-FS file device and node number information. (See also 'Why does Solaris lsof report "(limited SAM-FS info)?"')

## 17.24 Lsof and Solaris 10 zones

### 17.24.1 How can I make lsof list the Solaris zone?

Use the lsof "-z [z]" option.

### 17.24.2 Why doesn't lsof work in a Solaris 10 zone?

When run from within a Solaris 10 zone, lsof will usually report:

lsof: can't stat(/devices): No such file or directory

That's because a Solaris zone usually has no /devices subdirectory, a restriction of the zone implementation intended to limit the ability of zone processes to control global system resources, including physical devices.

While a zone may have a /dev subdirectory, that subdirectory usually lacks the /dev/allkmem, /dev/mem and /dev/kmem devices lsof and the KVM library it uses require.

The work-around is to run lsof in the global zone. When it is run in a global zone lsof will be able to report on processes

running  
in any zone, including the global zone.

### 17.24.3 Why does lsof complain it can't stat() Solaris 10 zone file systems?

When run from the global zone on Solaris 10 lsof may complain:

```
lsof: WARNING: can't stat() 15 zone file systems;  
using dev= options
```

The warning message means lsof found the reported number of file system entries in the mount table for which it didn't have permission to get stat(2) results, but which had "zone=" and "dev=" mount table options.

That is a normal restriction of Solaris 10 zones. Since the lsof warning message indicates it was able to find "dev=" options for the file systems, lsof will probably work correctly.

One work-around is to relax the restrictions on zone mount points, so that lsof can stat() them. While that may be possible by changing directory modes or group ownerships, it is probably not a good idea, because it weakens the restrictions zones are intended to provide.

Another work-around is to suppress the warning message with lsof's "-w" option. The down side of that is that it causes the suppression of all warning messages, leading to the possibility that some non-stat() warning messages will be suppressed.

### 17.25 Solaris 10 problems

#### 17.25.1 Why does Solaris 10 lsof sometimes report the wrong path name?

When a path name component is renamed -- e.g., with mv(1) -- Solaris 10 lsof may report the old component for an open file that used the component in its path before the rename. That's because Solaris 10 lsof reports the path name cached in the open file's vnode and the Solaris 10 kernel doesn't update the open vnode's cached path name when a component of it is changed.

When an open file is deleted -- e.g., with rm(1) -- the path name by which it was opened remains cached in the vnode. Lsof can be instructed to display that path name with the -X option.

The path name might be incorrect because of the rename problem described above. See the answer to the "What does "(deleted)" mean in the NAME column of a Solaris 10 open file?" question for more information.

Lsof is sometimes able to detect that cached path name is incorrect. In that case lsof may report only the mounted-on directory and device of the file system or it may report that the path name is of questionable accuracy by appending a trailing "(?)" to it in the NAME column.

See the answer to the "Why does Solaris 10 lsof sometimes report only the mounted-on directory and device?" and "What does "(?)" mean in the NAME column of a Solaris 10 open file?" questions for more information.

#### 17.25.2 Why does Solaris 10 lsof sometimes report only the mounted-on directory and device?

For some regular open files lsof may report only the mounted-on directory and device of the file system on which the file resides. That's because lsof was able to determine that the path name cached in the open file's vnode is incorrect.

Lsof detects the cached path name is incorrect by applying stat(2) to it, provided that no error was detected when stat(2) was applied to the file system mounted-on directory during lsof setup. If a mounted-on directory stat(2) error was detected during setup, lsof does no cached path name analysis and simply reports it.

When the application of stat(2) to the cached path name returns a no-entry reply (the ENOENT error number), lsof concludes the path no longer exists (i.e., has been unlinked) and reports the mounted-on directory and device of the file system. That behavior can be modified with the -X option in lsof revisions 4.77 and above. See the answer to the "What does "(deleted)" mean in the NAME column of a Solaris 10 open file?" for more information.

When the application of stat(2) to the cached path name returns a permission error reply (the EACCES or EPERM error numbers), lsof reports the cached path name and adds a trailing "(?)" to indicate the reported path name is of questionable accuracy. See the answer to the question

'What does "(?)" mean in the NAME column of a Solaris 10 open file?' for more information.

If the application of stat(2) to the cached path name yields any other error reply, lsof reports the mounted-on directory and device of the file system.

When the application of stat(2) to the cached path name succeeds, lsof compares the reported device and node numbers to what it has obtained for the open file from kernel structures. If they match, lsof reports the cached path name. If they don't match, lsof instead reports the mounted-on directory and device of the file system.

A work-around that allows lsof to apply stat(2) successfully to cached path names is to give lsof sufficient permission to do it -- i.e., run lsof as the root user.

17.25.3 What does "(deleted)" mean in the NAME column of a Solaris 10 open file?

When the -X option is specified to Solaris 10 lsof, it will report in its NAME column the path name cached for a deleted file in its vnode. The path name will be followed by "(deleted)".

Note that the path name cached in a file's vnode is the path name by which the file was opened. It is not updated by the Solaris kernel when any path name component is changed. Hence, it may not represent the final path name the open file had.

See the answer to the "Why does Solaris 10 lsof sometimes report the wrong path name?" question for more information on how changing a path name component affects the correctness of a what lsof reports.

17.25.4 What does "(?)" mean in the NAME column of a Solaris 10 open file?

When lsof encounters a path name cached in the open file's vnode that stat(2) reports lsof lacks permission to access, lsof adds "(?)" to the path name reported in the NAME column to indicate the path name is of questionable accuracy.

See the answers to the "Why does Solaris 10 lsof sometimes report the wrong path name?" and "Why does Solaris 10 lsof sometimes report only the mounted-on directory and device?"

questions

for more information on why lsof may report a path name of questionable accuracy.

A work-around that allows lsof to apply stat(2) successfully to cached path names is to give lsof sufficient permission to do it -- i.e., run lsof as the root user.

## 17.26 Solaris contract file problems

### 17.26.1 Why doesn't lsof report size, link count and node number for Solaris 10 contract files?

Lsof doesn't report size, link count or node number for Solaris 10 contract files because I don't know how to obtain them from contract file kernel structures.

### 17.26.2 Why can't lsof locate a Solaris 10 contract file by path name?

Because lsof can't find the node number of Solaris contract files, it can't match the device and node numbers it gets from applying stat(2) to the contract file path name with what it finds in kernel data.

## 17.27 Solaris 10 and above ZFS problems

### 17.27.1 Why does Configure warn that ZFS support is not enabled?

To provide ZFS support it is necessary that lsof have access to the definitions of ZFS structures used by the kernel. Those definitions are made available to lsof when it runs by the libctl library.

If lsof's Configure script finds that ZFS is indicated by the presence of the <sys/fs/zfs.h> header file, but the libctl library is not indicated via the <libctl.h> header file, the script concludes that ZFS support is not possible and issues the following warning:

WARNING: ZFS support not enabled; libctf.h missing.

Install libctf support to remedy this problem.

## 17.28 Problems with Solaris 9 and above

### 17.28.1 Why does the compiler complain about lgrp\_root on Solaris 9

and above?

When compiling lsof 4.84 on later Solaris 9 and 10 systems, the compiler may report the following error:

```
/usr/include/sys/lgrp.h", line ...: identifier redeclared: lgrp_root
```

This error results from a conflict between usage of `lgrp_root` in both `<sys/lgrp.h>` and `<sys/lgrp_user.h>` when `_KMEMUSER` or `_KERNEL` is `#define'd` before `<sys/lgrp.h>` is `#include'd`. This problem is noted in SunSolve bug ID 5064229.

The work-around is to use lsof revision 4.85 sources.

## 18.0 Lsof Features

### 18.1 Why doesn't lsof report on /proc entries on my system?

/proc file system support is generally available only for BSD, SYSV R4 dialects, and Tru64 UNIX (Digital UNIX, DEC OSF/1). It's also available for Linux, and Pyramid DC/OSx and Reliant UNIX.

Even on some SYSV R4 dialects I encountered many problems while trying to incorporate /proc file system support. The chief problem is that some vendors don't distribute the header file that describes the /proc file system node -- usually called `prdata.h`.

### 18.2 How do I disable the device cache file feature or alter its behavior?

To disable the device cache file feature for a dialect, remove the `HASDCACHE` definition from the `machine.h` file of the dialect's `machine.h` header file. You can also use `HASDCACHE` to change the default prefix (``.lsof'``) of the device cache file.

Be sure you consider disabling the device cache file feature carefully. Having a device cache file significantly reduces lsof startup overhead by eliminating a full scan of `/dev` (or `/devices`) once the device cache file has been created. That full scan also overloads the kernel's name cache with the names of the `/dev` (or `/devices`) nodes, reducing the

opportunity for lsof to find path name components of open files.

If you're worried about the presence of mode 0600 device cache files in the home directories of the real user IDs that execute lsof, consider these checks that lsof makes on the file before using it:

1. To read the device cache file, lsof must gain permission from access(2).
2. The device cache file's modes must be 0600 (0644 if lsof is reading a system-wide device cache file) and its size non-zero.
3. There must be a correctly formatted section count line at the beginning of the file.
4. Each section must have a header line with a count that properly numbers the lines in the section. Legal sections are device, clone, pseudo-device, and CRC.
5. The lines of a section must have the proper format.
6. All lines are included in a 16 bit CRC, and it is recorded in a non-checksummed section line at the end of the file.
7. The checksum computed when the file is read must match the checksum recorded when the file was written.
8. The checksum section line must be followed by end-of-information.
9. Lsof must be able to get matching results from stat(2) on a randomly chosen entry of the device section.

For more information on the device cache file, read the 00DCACHE file of the lsof distribution.

#### 18.2.1 What's the risk with a perverted device cache file?

Even with the checks that lsof makes on the device cache file, it's conceivable that an intruder could modify it so



it would pass lsof's tests.

The only serious consequence I know of this change is the removal of a file whose major device number identifies a socket from some user ID's device cache file. When such a device has been removed from the device cache file, and when lsof doesn't detect the removal, lsof may not be able to identify socket files when executed by the affected user ID. Only certain dialects are at risk to this attack -- e.g., SCO OpenServer and Solaris 2.x, 7, 8, and 9.

If you're tracking a network intruder with lsof, that could be important to you. If you suspect that someone has corrupted the device cache file you're using, I recommend you use lsof's -Di option to tell it to ignore it and use the contents of /dev (or /devices) instead; or remove the device cache file (usually .lsof\_hostname, where hostname is the first component of the host's name returned by gethostname(2)) from the user ID's home directory and let lsof create a new one for you.

#### 18.2.2 How do I put the full host name in a personal device cache file path?

Lsof constructs the personal device cache file path name from a format specified in the HASPERSDC #define in the dialect's machine.h header file. As distributed HASPERSDC declares the path to be ``.lsof\_" plus the first component of the host name with the format ``.lsof\_%L".

If you want to change the way lsof constructs the personal device cache file path name, you can change the HASPERSDC #define and recompile lsof. If, for example, you #define HASPERSDC to be ``.lsof\_%l" (note the lower case 'l'), Configure and remake lsof, then the personal device cache file path will be ``.lsof\_" plus the host name returned by gethostname(2).

See the 00DCACHE file of the lsof distribution for more information on the formation of the personal device cache file path and the use of the HASPERSDC #define.

#### 18.2.3 How do I put the personal device cache file in /tmp?

Change the HASPERSDC definition in your dialect's machine.h header file.

When you redefine HASPERSDC, make sure you put at least one user identification conversion in it to keep separate the device cache files for each user of lsof. Also give some thought to including the ``%0" conversion to define an alternate path for setuid-root and root processes.

Here's a definition that puts a personal device cache file in /tmp with the name ``lsof\_login\_hostname\_pers".

```
#define HASPERSDC "/tmp/.lsof_%u_%l_pers"
```

Thus the /tmp personal device cache file path for login "abe" on host "lsof.itap.purdue.edu" would be:

```
/tmp/.lsof_abe_lsof.itap.purdue.edu_pers
```

You can add the User ID (UID) with the "%U" conversion and the first host name component with the ``%L" conversion.

CAUTION: be careful using absolute paths like /tmp lest lsof processes that are setuid-root or whose real UID is root be used to exploit some security weakness via /tmp. Elect instead to add an alternate path for those processes with the ``%0" conversion. Here's an extension of the previous HASPERSDC format for /tmp that declares an alternate path:

```
#define HASPERSDC "/tmp/.lsof_%u_%l_pers%0%h/.lsof_%L"
```

When the lsof process is setuid-root or its real UID is root, presuming root's home directory is `/ and the host's name is ``lsof.itap.purdue.edu", the extended format yields:

```
/.lsof_vic
```

### 18.3 Why doesn't lsof know about AFS files on my favorite dialect?

Lsof currently supports AFS for these dialects:

- AIX 4.1.4 (AFS 3.4a)
- Linux 1.2.13 (AFS 3.3)
- NEXTSTEP 3.2 (AFS 3.3)
- Solaris 2.[56] (AFS 3.4a)

It may recognize AFS files on other versions of these

dialects, but I have no way to test that. Lsof may report correct information for AFS files on other dialects, but I can't test that either.

AFS support must be custom crafted for each UNIX dialect and then tested. If lsof supports your favorite dialect, but doesn't recognize its AFS files, probably I don't have access to a test system. If you want AFS support badly for your dialect, consider helping me do the development and testing.

### 18.3.1 Why doesn't lsof report node numbers for all AFS volume files, or how do I reveal dynamic module addresses to lsof?

When AFS is implemented via dynamic kernel modules -- e.g., in NEXTSTEP -- lsof can't obtain the addresses of AFS variables in the kernel that it uses to identify AFS vnodes. It can guess that a vnode is assigned to an AFS file and it can obtain other information about AFS files, but it has trouble computing AFS volume node numbers.

To determine node numbers for AFS volumes other than the root volume, /afs, lsof needs access to a hashed volume structure pointer table. When it can't find the address of that table, because AFS support is implemented via dynamic kernel modules, lsof will return blanks in the INODE column for AFS volume files. Lsof can identify the root volume's node number (0), and can compute the node numbers for all other AFS files.

If you have a name list file that contains the addresses of the AFS dynamic modules -- e.g., you saved module symbols when you created a loadable module kernel with modload(8) by specifying -sym -- lsof may be able to find the kernel addresses it needs in that file.

Lsof looks up AFS dynamic kernel addresses for these dialects at these default paths:

NEXTSTEP 3.2 /usr/vice/etc/afs\_loadable

A different path to a name list file with AFS dynamic kernel addresses may be specified with the -A option, when the -A option description appears in lsof's -h or -? (help) output.

If any addresses appear in the -A name list file that also

appear in the regular kernel name list file -- e.g., /vmunix  
-- they must match, or lsof will silently ignore the -A  
addresses on the presumption that they are out of date.

Found in path(s):

\* /lsof-4-92-1-zip/lsof-4.92.1/00FAQ

No license file was found, but licenses were detected in source scan.

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Found in path(s):

\* /lsof-4-92-1-zip/lsof-4.92.1/scripts/list\_NULf.perl5

\* /lsof-4-92-1-zip/lsof-4.92.1/scripts/list\_fields.perl

\* /lsof-4-92-1-zip/lsof-4.92.1/scripts/ldrlogin.perl5

\* /lsof-4-92-1-zip/lsof-4.92.1/scripts/shared.perl5

\* /lsof-4-92-1-zip/lsof-4.92.1/scripts/list\_fields.awk

\* /lsof-4-92-1-zip/lsof-4.92.1/scripts/ldrlogin.perl

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\*/

Found in path(s):

- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/freebsd/machine.h
- \* /lsof-4-92-1-zip/lsof-4.92.1/OLD/misc.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/n+obsd/dmmt.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/du/dnode.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/hpux/kmem/dfile.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/darwin/kmem/ddev.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/sun/dfile.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/lsof.h
- \* /lsof-4-92-1-zip/lsof-4.92.1/arg.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/n+obsd/dstore.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/darwin/kmem/dmmt.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/sun/dproc.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/n+obsd/dsock.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/freebsd/dsock.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/n+os/dstore.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/freebsd/dmmt.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/hpux/kmem/dstore.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/n+os/dproto.h
- \*
- /lsof-4-92-1-zip/lsof-4.92.1/dialects/freebsd/dproto.h
- \* /lsof-4-92-1-zip/lsof-4.92.1/node.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/aix/dsock.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/n+os/machine.h
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/darwin/kmem/machine.h
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/du/dmmt.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/hpux/kmem/dmmt.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/sun/dproto.h
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/sun/dsock.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/n+obsd/dlsof.h
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/aix/ddev.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/aix/dlsof.h
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/hpux/kmem/machine.h
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/aix/dproto.h
- \* /lsof-4-92-1-zip/lsof-4.92.1/proto.h
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/hpux/kmem/dnode.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/aix/dnode.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/aix/dstore.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/n+os/dsock.c
- \*
- /lsof-4-92-1-zip/lsof-4.92.1/dialects/darwin/kmem/dproto.h
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/du/dsock.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/n+obsd/dnode.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/misc.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/darwin/kmem/dlsof.h
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/darwin/kmem/dstore.c

```

* /lsof-4-92-1-zip/lsof-4.92.1/dialects/n+os/dnode.c
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/du/dproc.c
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/du/dlsof.h
* /lsof-4-92-1-zip/lsof-4.92.1/OLD/proc.c
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/darwin/kmem/dsock.c
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/hpux/kmem/dproc.c
* /lsof-4-92-1-zip/lsof-4.92.1/proc.c
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/du/dstore.c
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/aix/dproc.c
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/du/dfile.c
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/sun/dmnt.c
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/hpux/kmem/dproto.h
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/sun/dnode.c
*
/lsof-4-92-1-zip/lsof-4.92.1/dialects/hpux/kmem/dsock.c
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/sun/machine.h
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/n+obsd/dproc.c
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/freebsd/dproc.c
* /lsof-4-92-1-zip/lsof-4.92.1/OLD/lsof.h
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/aix/machine.h
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/sun/dlsof.h
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/n+obsd/machine.h
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/n+os/dlsof.h
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/du/dproto.h
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/aix/dfile.c
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/darwin/kmem/dproc.c
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/aix/dmnt.c
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/n+os/dproc.c
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/hpux/kmem/dlsof.h
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/sun/ddev.c
* /lsof-4-92-1-zip/lsof-4.92.1/lsof_fields.h
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/n+obsd/dproto.h
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/freebsd/dstore.c
*
/lsof-4-92-1-zip/lsof-4.92.1/dialects/sun/dstore.c
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/darwin/kmem/dnode.c
* /lsof-4-92-1-zip/lsof-4.92.1/store.c
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/freebsd/dnode.c
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/freebsd/dlsof.h
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/du/machine.h
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*/
/*
* GetOpt() -- Local get option
*
* Liberally adapted from the public domain AT&T getopt() source,
* distributed at the 1985 UNIFORM conference in Dallas
*
* The modifications allow '?' to be an option character and allow
* the caller to decide that an option that may be followed by a
* value doesn't have one -- e.g., has a default instead.
*/

```

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```

* /lsof-4-92-1-zip/lsof-4.92.1/OLD/main.c.old
* /lsof-4-92-1-zip/lsof-4.92.1/main.c
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- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/osr/dnode.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/freebsd/dnode1.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/osr/dstore.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/osr/dproc.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/osr/dmnt.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/osr/dlsof.h
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/osr/machine.h
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/osr/dsock.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/osr/dproto.h
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/osr/dfile.c
- \* /lsof-4-92-1-zip/lsof-4.92.1/dialects/hpux/kmem/dnode1.c
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\* \$Id: pfsnode.h,v 1.1 1993/12/12 12:26:39 davidg Exp \$

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\* /lsof-4-92-1-zip/lsof-4.92.1/dialects/uw/dproto.h

\* /lsof-4-92-1-zip/lsof-4.92.1/dialects/uw/dstore.c

\* /lsof-4-92-1-zip/lsof-4.92.1/dialects/uw/machine.h

\* /lsof-4-92-1-zip/lsof-4.92.1/dialects/n+os/dnode1.c

\* /lsof-4-92-1-zip/lsof-4.92.1/dialects/sun/dnode1.c

\* /lsof-4-92-1-zip/lsof-4.92.1/dialects/uw/dlsof.h

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\* /lsof-4-92-1-zip/lsof-4.92.1/dialects/uw/dnode1.c  
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\* /lsof-4-92-1-zip/lsof-4.92.1/dialects/uw/dnode2.c  
\* /lsof-4-92-1-zip/lsof-4.92.1/dialects/uw/dproc.c  
\* /lsof-4-92-1-zip/lsof-4.92.1/dialects/uw/dfile.c  
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From: Sandel, Ken L. <sandel@purdue.edu>  
Sent: Tuesday, July 10, 2018 14:28  
To: Victor Abell  
Subject: RE: One more question regarding GitHub release

Vic,

For clarity I approved the release.

Ken

Ken L. Sandel  
Senior Director, Sponsored Program Services  
Senior Intellectual Property Officer  
Purdue University  
610 Purdue Mall  
Hovde Hall Room 328  
West Lafayette, IN 47907  
sandel@purdue.edu  
(765) 494-1063 (office)  
(765) 426-2530 (cell)

From: Kasper, Joseph R. <JRKasper@prf.org>  
Sent: Tuesday, July 10, 2018 11:23 AM  
To: Victor Abell <vabell@lsof.comcastbiz.net>  
Cc: Sandel, Ken L. <sandel@purdue.edu>  
Subject: RE: One more question regarding GitHub release

Hi Vic,

My apologies for not following up. Mr. Sandel approves the release on GitHub under the copyright notice text currently in use.

Best,  
Joe

Joseph R. Kasper, Ph.D.  
Senior Business Development Manager & Director of Marketing  
Office of Technology Commercialization

765-588-3486  
jrkasper@prf.org  
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From: Victor Abell <vabell@lsof.comcastbiz.net>  
Sent: Monday, July 9, 2018 8:26 PM  
To: Kasper, Joseph R. <JRKasper@prf.org>  
Subject: RE: One more question regarding GitHub release

Joe,

Has there been any word from Ken about the release of lsof to GitHub?

Vic

From: Kasper, Joseph R. [mailto:JRKasper@prf.org]  
Sent: Thursday, June 28, 2018 1:15 PM  
To: Victor Abell  
Subject: RE: One more question regarding GitHub release

Hi Vic,

One more request. Ken would like a copy of the email from Gerry. If for any reason you are not comfortable sending it to me, please contact Ken directly (765-494-1063, sandel@purdue.edu).

If this last piece of information is satisfactory to Ken, I expect to get his approval.

Thanks for your cooperation throughout this process.

Best,

Joe

From: Victor Abell <vabell@lsof.comcastbiz.net>  
Sent: Thursday, June 28, 2018 7:43 AM  
To: Kasper, Joseph R. <JRKasper@prf.org>  
Subject: RE: One more question regarding GitHub release

Joe,

I sent e-mail to Gerry McCartney and in his answer he says he has no objection.

Vic

From: Kasper, Joseph R. [mailto:JRKasper@prf.org]  
Sent: Tuesday, June 26, 2018 4:03 PM  
To: Victor Abell  
Subject: RE: One more question regarding GitHub release

Hi Vic,

Thanks for the extra detail. I think it would put Kens mind at ease if you have Gerrys blessing. Let me know if youll reach out to him.

Best,  
Joe

From: Victor Abell  
<vabell@lsof.comcastbiz.net>  
Sent: Tuesday, June 26, 2018 3:57 PM  
To: Kasper, Joseph R. <JRKasper@prf.org>  
Subject: RE: One more question regarding GitHub release

Joe,

I have had no communication with ITaP about the move to GitHub. The extent of their involvement with lsof has been minimal the Visiting Scholar appointment and the maintenance of a distribution system.

I know Gerry McCartney well. Would it be helpful if I contacted him about the GitHub move?

Vic

From: Kasper, Joseph R. [mailto:JRKasper@prf.org]  
Sent: Tuesday, June 26, 2018 3:44 PM  
To: Vic Abell; Victor Abell



Subject: One more question regarding GitHub release

Hi Vic,

Ken Sandel, Senior IP Officer, just got back to me. He wants to know if the leadership of ITaP supports the contribution to Github. Please let me know. If you have any communication to this effect that you can forward to me, it would be helpful.

Best,

Joe

Joseph R. Kasper, Ph.D.  
Business Development Manager  
Purdue Research Foundation  
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\* /lsof-4-92-1-zip/lsof-4.92.1/dialects/darwin/libproc/machine.h

\* /lsof-4-92-1-zip/lsof-4.92.1/dialects/darwin/libproc/dmnt.c

\* /lsof-4-92-1-zip/lsof-4.92.1/dialects/darwin/libproc/dstore.c

\* /lsof-4-92-1-zip/lsof-4.92.1/dialects/darwin/libproc/dproto.h

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/\* Definitions for data structures and routines for the regular  
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\* /lsof-4-92-1-zip/lsof-4.92.1/dialects/hpux/pstat/dlsof.h

\* /lsof-4-92-1-zip/lsof-4.92.1/dialects/hpux/pstat/dsock.c

\* /lsof-4-92-1-zip/lsof-4.92.1/dialects/hpux/pstat/dfile.c

\* /lsof-4-92-1-zip/lsof-4.92.1/dialects/hpux/pstat/machine.h

\* /lsof-4-92-1-zip/lsof-4.92.1/dialects/hpux/pstat/dproc.c

\* /lsof-4-92-1-zip/lsof-4.92.1/dialects/hpux/pstat/dproto.h

\* /lsof-4-92-1-zip/lsof-4.92.1/dialects/hpux/pstat/dstore.c

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# of MERCHANTABILITY or FITNESS FOR A PARTICULAR PURPOSE. See the  
# GNU General Public License for more details.  
# You should have received a copy of the GNU General Public License  
# along with this program (in the main directory of the Linux-NTFS

Found in path(s):

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*
* @(#)cdefs.h 8.2 (Berkeley) 10/4/93
*/

```

Found in path(s):

```
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/osr/include/sys/cdefs.h
```

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Notes for the distribution of lsof version 3

```

*****
| The latest release of lsof is always available via anonymous ftp |
| from vic.cc.purdue.edu. Look in pub/tools/unix/lsof.          |
*****

```

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3.60, February 27, 1996

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3.68, July 17, 1996

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3.70, August 9, 1996

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3.76, September 21, 1996

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3.80, November 8, 1996

3.81, November 14, 1996

3.82, December 11, 1996

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3.84, January 13, 1997

3.85, January 17, 1997

3.86, January 30, 1997

3.87, February 11, 1997

3.88, February 17, 1997

## Dialects Supported

=====

Lsof (for LiSt Open Files) lists files opened

by processes on

selected Unix systems. It's a major revision of lsof version 2,

and has been tested on:

AIX 3.2.5, 4.1.[1234]], the IBM RISC/System 6000  
 and 4.2  
 BSDI BSD/OS 2.0, 2.0.1, Intel-based systems  
 and 2.1  
 DC/OSx 1.1 Pyramid systems  
 EP/IX 2.1.1 the CDC 4680  
 FreeBSD 1.1.5.1, 2.0, Intel-based systems  
 2.0.5, 2.1, 2.1.5,  
 2.2, and 3.0  
 HP-UX 8.x, 9.x, 10.01, HP systems (some combinations)  
 10.10, and 10.20  
 IRIX 5.2, 5.3, 6.0, 6.0.1, SGI systems  
 and 6.[1234]  
 Linux through 2.0 Intel-based systems  
 NetBSD 1.0, 1.1, and 1.2 Intel and SPARC-based systems  
 NEXTSTEP 2.1 and 3.[0123] all NEXTSTEP architectures  
 OpenBSD 1.2 and 2.0 Intel-based systems  
 OSF/1 2.0, 3.0, 3.2, and the DEC Alpha  
 4.0-BETA  
 Reliant UNIX 5.43 Pyramid systems  
 RISC/os 4.52 MIPS R2000-based systems  
 SCO OpenServer 1.1, 3.0, Intel-based systems  
 and 5.[024]  
 SCO UnixWare 2.1 and 2.1.1 Intel-based systems  
 Sequent PTX 2.1.[1569], Sequent systems  
 4.0.[23],  
 4.1.[024],  
 4.2[.1], and 4.3  
 Solaris 2.[123456], 2.5.1, Sun 4 and i86pc systems  
 and 2.6-Beta  
 SunOS 4.1.[1234] Sun 3 and 4  
 Ultrix 4.2, 4.3, 4.4, DEC RISC and VAX  
 and 4.5

(The pub/tools/unix/lsof/contrib directory on vic.cc.purdue.edu  
 contains information on other ports.)

If your favorite Unix dialect is not in the list, or if your version  
 of it is more recent than the ones listed, please contact me at  
 <abe@vic.cc.purdue.edu>.

#### How Lsof Works

=====

Using available kernel data access methods -- getproc(), getuser(),  
 kvm\_\*, nlist(), pstat(), read(), readx(), /proc -- lsof reads  
 process table entries, user areas and file pointers to reach the

underlying structures that describe files opened by processes.

Lsof interprets most file node structures -- advfsnodes, autonodes, cnodes, cdrnodes, devnodes, fifonodes, gnodes, hsnodes, inodes, mfsnodes, pcnodes, procnodes, rnodes, snodes, specnodes, s5inodes, tmpnodes. It understands NFS connections. It recognizes FIFOs, multiplexed files, Unix and Internet sockets. It knows about streams. It understands /proc file systems for some dialects. On many dialects it recognizes execution text and library references. It knows about AFS on some Unix dialects.

## Lsof Output

=====

The lsof output describes:

- \* the identification number of the process (PID) that has opened the file;
- \* the process group identification number (PGRP) of the process (optional);
- \* the process identification number of the parent process (PPID) (optional);
- \* the command the process is executing;
- \* the owner of the process;
- \* for all files in use by the process, including the executing text file and the shared libraries it is using:
- \* the file descriptor number of the file, if applicable;
- \* the file's access mode;
- \* the file's lock status;
- \* the file's device numbers;
- \* the file's inode number;
- \* the file's size or offset;
- \* the name of the file system containing the file;

- \* any available components of the file's path name;
- \* the names of the file's stream components;
- \* the file's local and remote network addresses;
- \* other file or dialect-specific values.

## Getting Started Quickly

=====

If you want to get started using lsof quickly, or see some examples of how lsof can be used, consult the 00QUICKSTART file of the lsof distribution.

The 00QUICKSTART file won't help you build or install lsof, but it will cut through the density of the lsof man page, giving you more readily an idea of what you can do with lsof.

For information on building and installing lsof, consult the 00README file of the lsof distribution.

## Limiting, Filtering, and Selecting Lsof Output

=====

Lsof accepts options to limit, filter, and select its output. These are the possible criteria:

- \* Process ID (PID) number -- to list the open files for a given process;
- \* Process Group ID (PGRP) -- to list the open files for all the processes of a given process group;
- \* User ID number or login name -- to list the open files for all the processes of a given user;
- \* Internet address -- to list the open files using a given Internet address (host name), protocol, or port (number or name); or to list all open Internet files;
- \* command name;
- \* file descriptor name or number;

- \* list all open NFS files;
- \* list all open Unix domain socket files;
- \* list all uses of a specific file;
- \* list all open files on a file system.

Selection options are normally ORed -- i.e., an open file meeting any of the criteria is listed. The selection options may be ANDed so that an open file will be listed only if it meets all the criteria.

In the absence of any selection criteria, lsof lists files open to all processes.

#### Parsing Lsof Output with Another Program

=====

The

lsof -F option directs it to produce "field" output that can easily be parsed by another program. The lsof distribution contains sample awk, perl 4, and perl 5 scripts in its scripts subdirectory that show how to post-process field output.

#### Repeat Mode

=====

Lsof can be directed to produce output, delay for a specified time, then repeat the output, cycling until stopped by an interrupt or quit signal. This mode is useful for monitoring the status of some file operation -- e.g., an ftp transfer or a tape backup operation.

Repeat mode is more efficient when combined with lsof's selection options, since they limit lsof overhead.

It's possible to use lsof's field output options to supply repeat mode output to another process for its manipulation. The scripts subdirectory of the lsof distribution has sample Perl scripts showing how to consume lsof repeat mode output from a pipe.

#### Distribution Restrictions

=====



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3. Altered versions must be plainly marked as such, and must not be misrepresented as being the original software.
4. This notice may not be removed from or altered in the lsof source files.

#### Cautions

=====

Lsof is a tool that is closely tied to the Unix operating system version. It uses header files that describe kernel structures and reads kernel structures that typically change from OS version to OS version.

DON'T TRY TO USE AN LSOF BINARY, COMPILED FOR ONE UNIX OS VERSION, ON ANOTHER.

On some Unix dialects, notably SunOS and Solaris, lsof versions may be even more restricted by architecture type. An lsof binary, compiled for SunOS 4.1.3 on a sun4c machine, for example, won't work on a sun4m machine. Although I have no evidence that they exist, the potential for similar restrictions exists in Solaris versions of lsof.

AN LSOF BINARY, COMPILED FOR ONE SOLARIS ARCHITECTURE, ISN'T GUARANTEED TO WORK ON A DIFFERENT SOLARIS ARCHITECTURE.

#### Distribution Contents

=====

The lsof distribution is checked for completeness when it is constructed and by the Inventory script when you run the Configure script. (See The Inventory Script section of the 00README file of this distribution.)

If you're worried you don't have everything, run the Inventory script. Here's an approximate picture of what you should have:

`lsof_<version>:`

```
00CREDITS  00PORTING  Customize lsof_fields.h proc.c
00DCACHE   00QUICKSTART Inventory main.c    proto.h
00DIST     00README   arg.c    misc.c    scripts/
00FAQ      AFSCConfig dialects/ node.c    store.c
00MANIFEST Configure    lsof.h    print.c    version
```

`lsof_<version>/dialects:`

```
aix/    epix/    linux/  osf/    riscos/ sun/
bsdi/   freebsd/ netbsd/ ptx/    sco/    ultrix/
common/ hpux/    next/   pyramid/sgi/    unixware/
```

`lsof_<version>/dialects/common:`

```
00Manifest dvch.frag lkud.frag prtf.frag rnam.frag
ckfa.frag fchi.frag pcdn.frag rdev.frag rnch.frag
cvfs.frag isfn.frag prfp.frag rmnt.frag rvfs.frag
```

Specific dialects sub-directories may differ slightly, depending on the needs of the dialect, but they should all contain:

`lsof_<version>/dialects/next:`

```
Makefile ddev.c dlsof.h dnode.c dproto.h dstore.c
Mksrc*   dfile.c dmnt.c dproc.c dsock.c machine.h
```

`lsof_<version>/scripts:`

```
00MANIFEST    count_pf.perl*  list_fields.awk
00README      count_pf.perl5* list_fields.perl*
big_brother.perl5 list_NULf.perl5* watch_a_file.perl*
```

Warranty

=====

Lsof

is provided as-is without any warranty of any kind, either expressed or implied, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. The entire risk as to the quality and performance of Lsof is with you. Should Lsof prove defective, you assume the cost of all necessary servicing, repair, or correction.

## Bug Reports

=====

Now that the obligatory disclaimer is out of the way, let me hasten to add that I accept lsof bug reports and try hard to respond to them. I will also consider and discuss requests for new features, ports to new dialects, or ports to new OS versions.

PLEASE DON'T SEND A BUG REPORT ABOUT LSOF TO THE UNIX DIALECT VENDOR.

At worst such a bug report will confuse the vendor; at best, the vendor will forward the bug report to me.

Please send all bug reports, requests, etc. to me via email at <abe@purdue.edu>.

## What's new in Version 3

=====

I had three goals in mind for version 3:

1. Make it faster.

Lsof 3 defers as many lookup operations -- /dev scan, mount table scan, /etc/services scan -- until they're needed.

I used prof on lsof and used its information to reduce lsof's overhead.

2. Make it easier to maintain and port to other systems, and eliminate complicated nestings of #if/#else/#endif pre-processor statements.

3. Add a few features:

- o ANDing of options;
- o Sorting of output by Process ID;
- o Searching for Unix domain sockets by name -- to a limited extent.
- o Process group ID support. (This was a late addition.)

As a result of goal 2, the organization of lsof version 3 differs greatly from version 2. The main directory contains totally common functions, a dialect subdirectory contains subdirectories of code specific to each Unix dialect that is supported. There is also a dialects/common subdirectory that contains code fragments that are used by more than one, but not all dialects.

A top-level Configure script constructs the complete set of sources for a given dialect and the Makefile at the top-level. Configure is self-documenting. When it is finished, Configure calls a second script, Customize, that assists with the modification of a few important compile-time options.

#### Version 3 Release Notes

=====

##### 3.0 May 24, 1994

This is the first official release of lsof 3.

##### 3.01 May 27, 1994

Corrected the `#ifdef` condition for `HASPWSTAYOPEN` under Sequent Dynix 3.0.12.

Fixed bug that prevented the display of current working and root directory path names under SunOS 4.1.x, even when the user area contained pointers to them.

Changed the strategy for allocating space to the local proc table in EP/IX, NEXTSTEP, Solaris, and SunOS.

Closed the distance between reading the Solaris proc structure and its companion pid structure in an effort to avoid using a stale pid structure pointer. A stale pid structure pointer sometimes causes a segmentation violation in `kvm_read()`.

Added code to the SunOS `kread()` function to filter out non-kernel addresses that might lead `kvm_read()` to a segmentation violation. The Configure script was updated to create a header file, `kernelbase.h`, with the necessary kernel memory boundary value; and to remove the header file when the `-clean` option

is specified. The Configure script now passes the target name to the Mksrc shell script. It's used by sun/Mksrc to determine the source for kernelbase.h.

### 3.02 June 2, 1994

Added #if's to of kernelbase.h for Solaris and SunOS. This eliminates a redeclaration complaint from old versions of SunOS.

Added code to process\_file() in all dialects to display "no more information" when f\_count in the file structure is zero.

### 3.03 July 8, 1994

Added support for displaying process group IDs. This includes two new options: -j to select PGRP display; and -g<list> to specify a list of PGRPs whose files are to be displayed. (-j was chosen to match a similar option in some ps(1)'s.)

Philippe-Andre Prindeville <philipp@res.enst.fr> suggested this addition.

### 3.04 July 15, 1994

Corrected handling of port name component of -i option on systems where htons() is required.

Corrected casting of UID arguments -- needed when UID is a short and the compiler wants the minimum argument size to be larger.

### 3.05 July 26, 1994

Added printing of DECnet socket information for the Ultrix 4.2 and 4.3 dialects. John Beacom <beacom@wisnud.physics.wisc.edu> kindly provided the test system. A new Configure abbreviation, ultrix42dn, must be used to activate the DECnet support.

### 3.06 September 2, 1994

The major news in this revision are the V/88 R32V3 and R40V4.2 ports for Motorola M88K systems. Chance Neale <cneale@panix.com> kindly provided test systems and Mike Feldman <feldman@charm.urbana.mcd.mot.com> provided technical assistance.

Version 3.06 contains other, minor modifications:

\* The Configure

script has been isolated from the

environment, thanks to a report of a CC=xlC problem from Johnny Tolliver <jxt@ca04.cad.ornl.gov>. Johnny also suggested a better form for the install commands in the Makefile's install rule. This change affected all the dialect Mksrc scripts.

A new HP-UX abbreviation (hpuxx25) was added for systems that have the /etc/conf/x25 include files. The old HP-UX abbreviation (hpux) no longer references /etc/conf or defines HPUX\_CCITT.

\* The command "lsof `tty`" now works most places (maybe not always for SGI IRIX, but I tried) thanks to a bug report from Casper Dik <casper@fwi.uva.nl>.

\* A mode has been added to disable forking when debugging. The V/88 R40V4.2 debugger needed that.

\* Printing of stream NAMEs was standardized (IRIX was different) and an attempt was made to avoid stream NAMEs like /dev/ttyx4->/dev/ttyx4.

\* A new documentation file, 00FAQ, accompanies the distribution. It contains frequently asked questions about lsof, and the best answers I can manage to give.

\* I have a new HP-UX test system, courtesy of Dave Curry <davy@ecn.purdue.edu> and George Goble <ghg@ecn.purdue.edu> of Purdue's Engineering Computer Network. I want to thank J. Nelson Howell <nelson@zeus.mgmt.purdue.edu> of Purdue's School of Management for his prior support of lsof development under HP-UX.

### 3.07 September 8, 1994

This revision contains a small security enhancement. Tim Ramsey <tar@ksu.ksu.edu> pointed out that lsof's setgid or setuid power might allow its user to read an alternate kernel name list or memory file via the -c and -k options that the real UID might not have authority to read. In revision 3.07 lsof uses access(2) to check the real UID's authority to read files named with -c and -k.

### 3.08 September 23, 1994

This revision contains support for Novell's UnixWare, versions 1.1,

1.1.1, and 1.1.2. Peter Lord

<plord@novell.co.uk> made this possible by providing a copy of UnixWare and supplying technical advice.

Binaries and sources for this version will be available from Novell sources. See the Novell UnixWare section of the distribution's 00README file for details.

This version adds /proc file system support to the dialects derived from SYSV R4 (except EP/IX 2.1.1): FreeBSD, IRIX 5.2, Solaris, UnixWare, and V/88 R40V4.2.

This version compiles under IRIX 4.0.5 again, correcting a problem introduced at version 3.06 in the "lsof `tty`" fix.

HP-UX now skips file systems whose mount type is "ignore". The presence of the -c option is now controlled by the HASCOPT definition in machine.h. The HASSWAPPORT option is now documented and implemented correctly. Hans Petter Christiansen <hpchr@dxcern.cern.ch> suggested these changes.

### 3.09 October 18, 1994

This revision recognizes the DEC Alpha OSF/1 V3.0, IBM AIX 4.1, and

Solaris 2.4 dialects. It has

support for the SunOS 4.1.3 PC file system and two bug fixes: an IRIX, V/88, and Solaris file argument processing bug; and a V/88 include error.

Alex Kreis <akreis@us.oracle.com> made the initial request for DEC OSF/1 V3.0 support and provided help with testing. Ron Young <ron@screamer.nevada.edu> graciously provided a test host. James Woodward <woodward@zk3.dec.com> provided invaluable clues to V3.0 kernel organization. Others who read the alpha-osf-managers mailing list made generous offers of test facilities, and I thank them, too. The decosf3 abbreviation was added to the Configure script, and the script was modified to request the name of the system configuration subdirectory of /sys where the configuration-specific header files

reside for the decosf1, decosf2, and decosf3 configuration abbreviations.

Mark Peek <mark\_peek@taligent.com> provided and tested the AIX 4.1 changes.

Casper Dik <casper@fwi.uva.nl> provided and tested the Solaris 2.4 changes.

Friedel Loinger <friedel@wise.tau.ac.il> suggested the addition of support for the SunOS 4.1.3 PC file system ("pcfs").

Andreas Stolcke <stolcke@ICS.Berkeley.EDU> supplied a fix to a file argument processing bug that causes lsof to crash when supplied the path of an NFS mounted file. The bug affects lsof versions for Motorola V/88 R40V4.2, SGI IRIX 5.2, and Solaris 2.[123].

Corrected an error in the path to include prdata.h in dlsof.h for Motorola V/88 R40V4.2.

### 3.10 October 21, 1994

This revision adds support for the cache and PC file systems to Solaris. It fixes these bugs: a problem with the display of Motorola V/88 R40V4.2 device numbers; and a failure of Readlink() to resolve symbolic links completely in all cases.

Some major internal restructuring was necessary to be able to display negative inode numbers for SunOS PC file system nodes, while displaying them as unsigned numbers for Solaris, hence all dialect versions were affected.

### 3.11 October 28, 1994

This revision adds support for Linux version 1.0.9. Tim Korb <jtk@arthur.cs.purdue.edu> kindly provided a development system in the Computer Science Department at Purdue. It is likely that the Linux revision will have to be adjusted for each installation, and it is probable that this revision will not run under later versions of Linux. See the 00FAQ and 00README files for more information on Linux tuning.



### 3.12 October 29, 1994

This revision supports Linux version 1.1.47 -- the Yggdrasil Plug-and-Play Linux Fall '94 release. Both Linux versions now obtain kernel symbol addresses from the /zSystem.map file.

November 4, 1994

Hendrik G. Seliger <hank@Blimp.automat.uni-essen.de> reports that lsof compiles and seems to work under Linux 1.1.61. He used the linux1147 Configure abbreviation. Marty Leisner <leisner@sdsp.mc.xerox.com> reports that the linux1147 Configure abbreviation produces a working lsof for Linux 1.1.64, too.

### 3.13 November 11, 1994

This revision contains Pyramid DC/OSx support, provided by Anthony Shortland <Anthony.Shortland@FMR.com>.

Marty Leisner <leisner@sdsp.mc.xerox.com> reported a segmentation violation failure in Linux lsof. In response I changed its task structure access to use /dev/kmem instead of mmap'ing kernel memory. This avoids a possible segmentation violation when bad pointers are obtained from kernel memory. I also enabled the setting of Linux INET and Unix select flags so that the -n and -U options work -- I forgot to do that when I did the Linux port.

Marty Leisner reports that the linux1147 Configure abbreviation produces a working lsof for Linux 1.1.64, too.

Francois Pindard <pinard@iro.umontreal.ca> provided a correction to the Linux install rule.

### 3.14 November 16, 1994

This revision adjusts the Configure script stanzas for DEC OSF/1, Motorola V/88, Pyramid DC/OSx, and Ultrix.

It also contains additional support for DC/OSx and Ultrix.

Bruce Beare <bjb@pyramid.com> and Robert Vernon <bob@pyramid.com.au> helped me understand Pyramid nomenclature. Robert Vernon provided DC/OSx support for the RxFS file system and added machine series auto-detection to the Configure script. Alex Podlecki

<a.podlecki@att.com> helped test the updated DC/OSx distribution.

Chris Timmons <skynyrd@tahoma.cwu.edu> provided information on RISC and VAX Ultrix 4.4 that led to correct prefixing of nlist() names. I updated the Configure script to detect Ultrix version, machine hardware type, and the presence of DECnet support.

I also updated the OSF/1 and V/88 Configure scripts to determine configuration parameters automatically.

### 3.15 November 25, 1994

Corrected DEC OSF/1 V2.0 support of the ADVFS file system.

Bernt Christandl <beb@mpe-garching.mpg.de> and Alex Kreis <akreis@us.oracle.com> helped test. No OSF/1 V1.x system with ADVFS was available for testing.

### 3.16 December 2, 1994

Fixed some device number handling bugs in DEC OSF/1 V2.0 and V3.0 support.

### 3.17 January 25, 1994

Isof now supports SGI IRIX 5.3, thanks to changes supplied by Dave Olson <olson@anchor.engr.sgi.com>; and SCO OpenDesktop or OpenServer releases 1.1 and 3.0, thanks to support from Dion Johnson <dionj@sco.com>, Bela Lubkin <belal@sco.com>, and Nathan Peterson <nathanp@sco.com>.

Dave Olson pointed out an IRIX stream handling bug in `sgi/dnode.c`. When I investigated it, I found that it had implications wider than SGI IRIX. The eventual fix provided the display of inode numbers for character devices when the inode number must be obtained from `/dev`. IRIX, Solaris, and SunOS benefit from the fix.

I added version detection to the Configure script, so there is now just one Configure abbreviation for IRIX versions 4.05, 5.2, and 5.3 -- ```irix"`. (The Configure abbreviation for the SCO dialect ```sco"`.)

Ian

Darrow <ian@sq.com> pointed out that lsof wouldn't Configure or work properly under Solaris on an i86pc. Sorting out the difficulties made clear that the HASSWAPPORT definition should be removed from every machine.h file and that ntohs() should be used in every dsock.c on every port supplied to printinaddr().

Andreas Stolcke <stolcke@ICS.Berkeley.EDU> pointed out a method that sometimes allows lsof to report on files open to a crashed or unavailable remote NFS server. This led to the addition of code, where possible, to estimate the device number of mount points that cannot be stat()'d. The alternate device number can come from /etc/mstab or /etc/mnttab, or from the dialect's version of them. On systems that use /etc/mstab or /etc/mnttab, it is sometimes possible to add the device number manually to the mount options field in the form ``dev=xxxx''. Some internal changes in the way lsof handles device numbers were necessary to prevent ones whose dev\_t typedef is a signed short from causing sign extension when promoted to integers as function arguments.

David Addison <addy@meiko.co.uk> and Robert Ehrlich <Robert.Ehrlich@inria.fr> pointed out that lsof errs when reporting device numbers and other node information for some special Sun files. I rewrote most of sun/dnode.c to correct the problem; Robert rewrote it again; and I rewrote it once more. David and Robert helped me test it under Solaris 2.[34] and SunOs 4.1.[23].

While using code from the Motorola V/88 port for the SCO port, I found and fixed some NFS bugs in the V/88 port.

3.18 January 31, 1995

I added the -b and -w options. The -b option causes lsof to avoid the functions lstat(2), readlink(2), and stat(2) that might block in the kernel -- e.g., when they reference an inaccessible NFS file system. Instead it uses alternate device numbers obtained from the mount table, where possible.

The -w option causes lsof to suppress

warning

messages -- e.g., when the -b option has been specified. The suppression of warning messages was formerly bundled into the -t option. The -t option now selects -w.

I figured out how to make alternate AIX 3.2.5 device numbers from the kernel mount structure. The new -b option therefore works under AIX 3.2.5.

With the help of Chance Neale <cneale@panix.com> I fixed bugs in the Motorola V/88 R32V3 NFS support.

I added a solariscc Configure abbreviation for those who want to use Sun's C compiler.

3.19 February 10, 1995

Robert Ehrlich <Robert.Ehrlich@inria.fr> pointed out that lsof might be able to gather more complete path name information from the kernel's name cache. Name cache access may be inhibited with the new -C option. Revision 3.19 implements name cache access for:

DEC OSF/1 [23].0  
Dynix (Purdue 3.0.12)  
EP/IX 2.1.1  
FreeBSD 1.1.5.1  
HP-UX 9.01  
Motorola V/88 R40V4.2  
NEXTSTEP 3.1

SGI IRIX 5.3

Solaris 2.[34]  
SunOS 4.1.x  
Ultrix 2.2 and 4.2

Revision 3.19 does NOT implement name cache access for:

===

AIX           The knlist() function won't  
return cache addresses --  
some IBM wisdom to "protect"  
their customers.

Linux   My only access is to 1.0.9,  
and it doesn't seem to have  
a kernel name cache.

Motorola V/88 It doesn't have a unified  
R32V3 name cache.

Novell UnixWare I don't have a test system.

Pyramid DC/OSx I don't have a test system.

SCO OpenDesktop It doesn't have a unified  
OpenServer name cache.

SGI IRIX 4.0.5H I saw no unified name cache  
in the header files before  
my 4.05H system was converted  
to 5.2.

SGI IRIX 5.2 I don't have a test system.

Another Robert Ehrlich suggestion led to the  
establishment of a device cache file feature. The  
new -D option gives control of it. This feature  
speeds lsof dramatically  
on some dialects after  
lsof has been called once and the cache has been  
built. (Calling stat(2) on several hundred or  
thousand /dev nodes can take a long time.) The  
feature can be disabled or modified in the machine.h  
header file and the dialects/\*/ddev.c source file  
when lsof is built.

3.20 February 23, 1995

Upgraded Linux socket handling for versions 1.1.75  
or greater with help from Marty Leisner  
<leisner@sdsp.mc.xerox.com> and Linus Torvalds  
<Linus.Torvalds@cs.Helsinki.FI>. There is now a  
single Configure script abbreviation for linux.

Updated for Motorola V/88 R40V4.3 with help from  
Mike Feldman feldman@charm.urbana.mcd.mot.com>  
and Chance Neale <cneale@panix.com>.

Updated for SGI IRIX 6.0 with help from Przemek  
Klosowski <przemek@rrdjazz.nist.gov> and Dave Olson  
<olson@anchor.engr.sgi.com>.

Corrected access of device cache file that needs  
to be updated so that someone other than the file  
owner can rewrite it. Deleted the chmod() failure  
warning.

Updated

Configure and the Sun Makefile to specify absolute paths to the Sun install program.

### 3.21 March 3, 1995

Removed BSDI BSD/386 support, because I no longer have a test system, and I needed to have separate sources for two of the three dialects (FreeBSD, and NetBSD) once served by the BSDI BSD/386 sources. FreeBSD sources are now in the freebsd subdirectory; NetBSD, in netbsd.

With the help of Greg Earle <earle@isolar.Tujunga.CA.US> and Paul Kranenburg <pk@cs.few.eur.nl> installed new NetBSD support for versions 1.0 and 1.0A. The NetBSD 0.9 support was removed. The 1.0A support has been tested on Intel and SPARC-based systems.

### 3.22 March 9, 1995

Fixed a bug in name cache handling that occasionally caused lsof to cause a segmentation violation on FreeBSD. Although the bug didn't do that anywhere else, recreated the binaries of all dialect versions that use the affected code from rnam.frag and rnch.frag.

### 3.23 March 24, 1995

Removed forgotten HASSWAPPORT reference from HP-UX machine.h and inserted ntohs() calls in the printinaddr() calls of dsock.c for HP-UX and NEXTSTEP.

Added support for NEXTSTEP 3.3, courtesy of Allan Nathanson <ajn@NeXT.com>

### 3.24 March 31, 1995

Changed Configure script to handle DEC OSF/1 V3.2. Removed leading zero from DEC OSF/1 and ADVFS version values. Added dialects/osf/dec\_a/3.2 header file directory, courtesy of Dave Morrison <dmorriso@us.oracle.com>, who also tested the 3.24 DEC/OSF1 V3.2 lsof.

### 3.25 April 5, 1995

Ported to RISC/os on a R2030 (R2000-based) system, provided by Zdenko Tomasic <zdenko@harvey.cam.rice.edu>.

Tightened security on the device cache file; lsof

always tries to change its ownerships to the effective IDs after creating it. This was suggested by Stefan Kelm <kelm@cert.dfn.de>.

Ported to FreeBSD 2.0, starting with work done by Kurt Jaeger <pi@complx.stgt.sub.org> on lsof revision 3.16. Ade Barkah <mbarkah@hemi.com> and William McVey <wam@cs.purdue.edu> provided test systems.

### 3.26 April 20, 1995

Ported to SCO OpenDesktop or OpenServer 5.0 (aka Everest and 3.2v5.0.0). Hugh Dickins <hughd@sco.COM>, Bela Lubkin <belal@sco.COM>, Craig B. Olofson <craig@sco.COM>, and Nathan Peterson <nathan@sco.com>, provided me an early-release version of 3.2v5.0.0 and gave technical advice.

Added length checking of the Namech buffer to the printinaddr() function.

### 3.27 May 2, 1995

Corrected typo in AIX install rule, courtesy of a report from John Colgrave <colgrave@hursley.ibm.com>.

At the suggestion of Greg Earle <earle@isolar.Tujunga.CA.US> added a function to print the name of the unknown protocol (the AF\_\* symbol), when there is no specific processing for it in dsock.c. This change affected most dialects: exceptions are DC/OSx, Linux, Motorola V/88, and UnixWare.

### 3.28 May 26, 1995

Added support for Sequent PTX 2 and PTX 4. The PTX 2.1.6 and PTX 4.0.2 test systems and technical advice were provided by Gerrit Huizenga <gerrit@sequent.com>, Peter Jordan <petej@sequent.com>, Kevin Smallwood <kcs@sequent.com>, and Mike Spitzer <mks@sequent.com>. (Thomas A. Endo) <tendo@netcom.com> and (David Putz). <PutzDW@PO1.LMB.unisys.com> tested under PTX 2.1.5. Bob Foertsch <foertsch@uiuc.edu> tested under PTX 4. Kevin Smallwood tested under 2.1.1. Others who helped include Shane Kenney <shane@sequent.com>, Stephan Rossi <rossi@mtu.edu>, Douglas R. Smith <drsmith@us.oracle.com>, and Joel White <jdwhite@netcom.com>.

Changed the local dev structure's name to l\_dev to avoid conflicts with the PTX dev structure. Added a common/rdev1.frag -- a variant of rdev.frag. It's used by EP/IX, PTX, RISC/os, and V/88.

Changed printname() to check Namech first and print it if it contains something. This eliminates some hacks in the handling of names for streams, but generates some duplicate device name look-up code in the dnode.c files of some dialects.

3.29 June 2, 1995

Added clone device support to Motorola V/88 R40V4.3.

Added a generic ``-X" option for dialect-specific use. Used it in AIX to allow use of readx(). Lsof no longer uses readx() by default, because its use can cause an AIX 3.2.x and 4.1.x kernel error to appear. Kevin Ruderman <rudi@acs.bu.edu> reported this bug to me and the possibility that lsof might trigger it.

The error, known as the Stale Segment ID bug, hangs the kernel in its dir\_search() function, thus hanging the application process that called it so tightly that the application process can neither be killed nor stopped. The bug does not directly affect lsof, but may cause the hang when the kernel is searching directories for other processes. 00FAQ and 00README describe the Stale Segment ID bug in more detail. Consult dialects/aix/machine.h for options on enabling or disabling readx() by default, or permanently enabling or disabling it with the HASXOPT and HASXOPT\_VALUE definitions.

When not using readx(), AIX lsof may not report fully on all text and loader references. Changes to the kernel getuser() function in AIX 4.1.1 appear to have eliminated the text file and loader file reference information that once led lsof to use readx(); of course, without that information, lsof can no longer report on the executing text file or shared libraries in 4.1.1.

Changed the Configure script to use a single



abbreviation, aix, for AIX. Configure now uses /usr/bin/oslevel to determine the AIX version; in the absence of /usr/bin/oslevel, Configure issues a warning and assumes the version is 3.2.0. Source code changes were made to dialects/aix/\*.ch to accommodate the new form of the \_AIXV value.

### 3.30 June 8, 1995

Added -c to the installation of the man page in the Ultrix Makefile's install rule. Thanks go to Jules van Weerden <Jules.vanWeerden@let.ruu.nl> for noticing this omission.

Made FreeBSD 2.0 changes: 1) added automatic sensing of the FreeBSD 2.0 boot file path, using the getbootfile(3) function (suggested by Ade Barkah); 2) changed kvm\_getprocs(3) function call to use KERN\_PROC\_ALL symbol from <sys/sysctl.h>, thus eliminating incorrect use of the <sys/kinfo.h> and <sys/kinfo\_proc.h> header files; and 3) removed <sys/kinfo.h> and <sys/kinfo\_proc.h> header files from the dialects/freebsd/include/2/sys subdirectory of distribution.

Tested under AIX 4.1.2.

### 3.31 June 16, 1995

Added the NOUSAGEONERR definition to allow lsof to be compiled with the displaying of usage information after option error messages disabled. Lsof is distributed without the NOUSAGEONERR definition -- i.e., usage output is displayed after option error messages.

Worked on documentation in the 00\* files and the man page, adding tables of contents, making usage more consistent, trying to insure proper dialect titles, and inserting some notes about distribution restrictions (few) and warranty (none).

Fixed Motorola V88 R32V3 bug in handling Internet files. This bug was introduced some time ago, but I have only recently been able to test under R32V3 again.

### 3.32 June 23, 1995

Added the ability to the Linux nlist() function to automatically detect that the kernel binary is COFF or ELF form. Also corrected the UID\_ARG cast from int to u\_int. These changes were suggested by Michael Shields <shields@tembel.org>. Joseph J. Nuspl Jr. <nuspl@nvwls.cc.purdue.edu> provided a test system.

Updated lsof for HP-UX 10. Richard Allen <ra@rhi.hi.is> provided a test system. The hpux stanza in the HP-UX configure script was updated to sense the HP-UX version automatically, and to sense the availability of CCITT header files in /etc/conf/x25.

### 3.33 June 28, 1994

Added options to select "field" output that can be parsed by a subsequent program. (The -f, -F, and -0 options form the selection set.) Provided sample awk and Perl scripts for parsing and displaying field output. This feature was suggested by Dan Bernstein <djb@silverton.berkeley.edu>.

Tested under PTX 4.0.3.

### 3.34 June 30, 1995

Changed display of file offset to decimal in the form "0t12345678" if it is less than 100,000,000. The offset is displayed in hexadecimal in the form "0x12abcdef" if it is larger than 99,999,999.

Changed inode field output from signed to unsigned decimal. Updated the list\_fields.{awk,perl} and list\_NULf.perl5 scripts.

Documented the truncated inode output form (leading '\*' and 5 digits) for inodes that are too large for the output field; thanks go to Leonard Sitongia <sitongia@zia.hao.ucar.edu> for pointing out that this wasn't documented.

### 3.35 July 9, 1995

Added loopback file system support to Solaris with advice from Casper Dik <casper@Holland.Sun.COM>.

Removed the NOUSAGEONERR compile option in favor of producing a shortened

usage message when option errors are detected.

Marty Leisner <leisner@sdsp.mc.xerox.com> provided code to validate the Linux system map file (/System.map or /zSystem.map). If lsof detects that the system map file doesn't match the booted kernel, it complains and quits.

Updated host name cache to include dot forms -- e.g., when the host name can't be obtained via gethostbyaddr(). This prevents subsequent lookup delays for the same address.

### 3.36 July 20, 1995

Updated kernel name cache handling to assume a default size for pointer-linked caches (DEC OSF/1, FreeBSD, NetBSD, and SGI IRIX 5.3) when the kernel's cache size variable has a value of zero. A warning is issued, but lsof proceeds to read and use the name cache.

Folded rdev1.frag into rdev.frag by supporting a HASDNAMLEN #define for those dialects whose DIRTYTYPE structure has a d\_namlen definition.

Updated Linux distribution to avoid using d\_namlen from struct dirent if the Linux version is 1.2.10 or greater. This avoidance might work on earlier version of Linux, too, but I have no way of telling.

Added support for FreeBSD 2.0.5. Ade Barkah <mbarkah@hemi.com> provided a test system.

Added WARNDEVACCESS definition to machine.h control the default issuance of device directory and subdirectory access errors.

Changed options:

- m (mount warning) option deleted
- c (core file) option changed to -m
- c option redesignated as command selector
- d (device warning) option deleted
- d option redesignated as file descriptor selector
- O (order) option changed to less-overhead option
- r option added to enable repeat mode

Added a repeat mode in which lsof will display

output, sleep for the number of seconds defined by the repeat-mode option, -r <seconds>, and then display output again, doing this repetitively until it receives an interrupt or quit signal. This option is much more efficient for monitoring a file than calling

lsof repeatedly from a shell script, since it entails only one set of lsof startup operations.

The CANDOCHILD compile-time option has been removed. The -O run-time option will do the same thing.

### 3.37 July 27, 1995

Fixed incorrect setting of low-overhead flag from -O option.

Marty Leisner reports that d\_namlen is not needed under Linux 1.2.8. Changed the #if test that sets HASDNAMLEN accordingly.

Made more changes to option processing: combined -f, -F, and -0 into -F (-0 becomes a field identifier value for -F); now allow -F, -g, -r, and -S to have an optional value; made -F? (help) and -F0 (all fields plus NUL terminator) special forms of -F; and added support for --. These option processing changes are handled with a local getopt() function (named GetOpt()) to avoid confusion).

Made yet another attempt to create "standard" install and deinstall SunOS/Solaris Makefile rules.

Corrected improper use of examine\_lproc() when in repeat mode.

### 3.38 August 3, 1995

Modified Linux and PTX to show TCP's "send next" sequence number as the offset for TCP socket files.

Added some version tests for Linux 1.3.0, provided by Roman Gollent <roman@portal.stwing.upenn.edu>.

Added some more PTX tests around code that shouldn't be active when the NFS layered product is unavailable. Mark Vasoll <vasoll@a.cs.okstate.edu> provided them.

### 3.39 August 10, 1995

Added generic support for dialect-specific elements in the lfile structure. The HASLFILEADD and SETLFILEADD macros are used in lsof.h to define the elements and in proc.c to preset them. Field identifiers `1' through `9' are allocated to dialect-specific files. The HASFIELDAP<x> strings define the -F? help text for the FieldSel[] table of store.c, and LISTLFILEAP<x> are macros, used in the print\_proc() function of proc.c, to list fields. (<x> is the field identifier.) Other private element and field processing should be done in dialect-specific modules.

Used {HAS,SET}LFILEADD, HASFIELDAP[12], and LISTLFILEAP[12] to define and list link count and inode address lfile elements under PTX. Used the -X option to control when the values are displayed.

### 3.40 August 25, 1995

Added support for Solaris 2.5-BETA, including rudimentary support for door files and extensive support for fattach'ed files with the help of Henry Katz <hkatz@panix.com>, Joseph Kowalski <jek3@jurassic.Eng.Sun.COM>, and Mike Tracy <mtrac@jurassic-45.Eng.Sun.COM>.

Changed most dialects to use slightly safer fchown() on the device cache file. Changed dvch.frag to avoid creating a device cache file that is owned by root. Cleared caches when reading of device cache file fails and removed extra NL from device cache error messages.

After receiving yet another complaint about Makefile install rules, I decided to remove all install and deinstall rules from the distribution Makefiles. The Makefiles now contain a set of comments (echo commands) that describe what the install rule might be. The lsof user is now free to construct install and deinstall rules that meet local conventions and preferences.

### 3.41 September 5, 1995

Changed Linux kernel symbol handling to avoid the stripping of leading `\_ ' characters that was

installed in revision 3.32. (Recent Linux kernels have some symbols that are the same except for the leading `\_'.)

The Linux kernel loader format is now determined by testing for "\_system\_utsname" (COFF) and "system\_utsname" (ELF) in the symbols returned by the get\_kernel\_syms() syscall. If neither or both symbols are present, a warning is issued and COFF format is assumed. If the loader format is COFF, then kernel symbols important to lsof are assumed to have a leading `\_'.

Because recent Linux releases add a parameter hashing suffix to kernel symbols, lsof removes it before comparing kernel symbol names and addresses to those in /[z]System.map.

Marty

Leisner, Keith Parks <emkxp01@mtcc.demon.co.uk>, and Michael Shields helped me with the Linux changes.

After much discussion of the security of the device cache file on the bugtraq mailing list, I adopted a suggestion from Dave Sill <de5@sws5.CTD.ORN.LGOV>. His suggestion removes the world-writable device cache file from /tmp and creates instead a mode 0600 device cache file in the home directory of the real user ID that is executing lsof. Lsof issues a warning message when it does this. (The warning can be suppressed with -w.) The HASDCACHE definition becomes a relative path. When lsof is run from root, it will create a device cache file in root's home directory, e.g., / or /root, but the file will be readable and writable only by root. This should make the device cache file much more secure.

Added support for SGI IRIX 6.1. Dave Olson provided technical support and Przemek Klosowski supplied a test system. Since Przemek's system formerly supported my testing of lsof for IRIX 6.0, its update to 6.1 means I have not tested lsof under IRIX 6.0 since revision 3.39.

Changed name list structure element initialization for V/88 to make gcc happy. Albert Chin-A-Young

<china@cig.mot.com> suggested this.

#### 3.42 September 7, 1995

Changed device cache file naming process to add a suffix formed of an underscore, followed by the first component of the host name returned by `gethostname(2)`. This allows `lsf` to create separate device cache files for each host from which it is run for the same UID when the UID's home directory is shared by the hosts via NFS.

#### 3.43 September 12, 1995

Enabled SCO searching for stream files and Release 5.0 Unix domain socket files by name.

Defined `HASDOPTPATH` for dialects that can supply a path with `-Db`, `-Dr`, and `-Du`. Defined it for all but DC/OSx, UnixWare, and V/88. Used it in the `ctrl_dcache()` function of `arg.c` to enable and disable `-Db`, `-Dr`, and `-Du`.

Used `is_readable()` in `dvch.frag` when opening the device cache file for reading.

#### 3.44 September 19, 1995

Added test for `setuid-root` state so that some security-sensitive code now disabled by `#define`'s can be dynamically disabled.

Enhanced, extended, improved, secured, and documented formation and use of the device cache file path. More options, more carefully controlled are now available. A separate documentation file, `00DCACHE`, accompanies the distribution to explain the device cache file path handling.

Where possible, `lsf` now drops `setgid` permission as soon as possible. Two exceptions are the Solaris and SunOS versions of `lsf` which need to close and re-open `kvm` access. `Setuid-root lsf` implementations must retain that permission to access files in `/proc`.

Improved the `README.lsf_<revision>` file that appears in the `lsf` wrapper tar file with help from Jon A. Tankersley <tank@amoco.com>.

Added Veritas file system support

to the HP-UX  
dialect port.

Albert Chin-A-Young tested lsof under Motorola V/88  
R40V4.1 and provided #if/#else/#endif changes.

#### 3.45 September 20, 1995

Enabled setgid permission surrender for Solaris  
and SunOS dialects.

#### 3.46 October 5, 1995

Added more conversions to HASPERSDC, based on  
suggestions from John Gardiner Myers <jgm+@CMU.EDU>.  
They make it possible to locate the personal device  
cache file in /tmp, for example. A new -D function,  
'?', reports device cache file name formation  
information.

Gained access to AIX 4.1.3, compiled lsof there, and  
found that it seems to work.

Tested lsof under FreeBSD 2.1.0-950726-SNAP. John  
Clear <jac@dragonfly.vet.purdue.edu> kindly provided  
a test system.

Added a Customize script that helps with the job  
of modifying some important (e.g., security-related)  
compile-time options. Configure calls Customize,  
but can be told not to with the -n|-nocust options.

Fixed over-sensitivity to unexpected kernel  
file  
structure pointer values in HP-UX version that led  
to premature exit. Lionel Cons <cons@dxcern.cern.ch>  
pointed out the problem.

With the help of Leif Hedstrom <leif@infoseek.com>  
identified a pair of conflicting Solaris 2.4 patches  
that prevent lsof from working. A work-around is  
described in section 00FAQ.

#### 3.47 October 16, 1995

Enabled suppression of an HP-UX pstat() warning  
message. Added big\_brother.perl5 to field output  
scripts/ subdirectory. Both changes are courtesy  
of Lionel Cons <Lionel.Cons@cern.ch>.



Added a test for automount detritus in the SCO mount table.

Added kernel name cache support to SCO dialect.  
Modified most name cache support to report full path names without the intervening `` -- " when possible.

Added an Inventory script to check the contents of the distribution, using a new file, 00MANIFEST.  
The Configure script normally calls Inventory.  
Changed the -n option to Configure to avoid calling the Customize  
and Inventory scripts and dropped  
the -nocust option. The presence of .neverCust suppresses the calling of Customize; .neverInv, Inventory. The Inventory script creates .ck00MAN when it completes, so that subsequent calls to Inventory won't check the inventory again -- although the caller is given the opportunity to have the inventory rechecked.

Added PTX 4.1.0 support, courtesy of a test system supplied by Kevin Smallwood <kcs@sequent.com>.

Picked lint for gcc in the V/88 dproc.c from hints provided by Albert Chin-A-Young <chinay@cig.mot.com>.

3.48 October 20, 1995

Improved root directory detection during name cache lookup.

Remove the Novell UnixWare and Pyramid DC/OSx ports from the distribution, because I have not been able to test them for 40 or more revisions. Their pieces may now be found on vic.cc.purdue.edu in pub/tools/unix/lsof/OLD/{binaries,dialects}.

Corrected an error in Customize that caused it to incorrectly redefine  
HASSYSDC to HASSYSDCPATH. This  
was reported by Michael Beirne <beirne@dcdrv0.fnal.gov>.

Made sure that lsof will compile when HASDCACHE is undefined. A problem with a reference to the DChelp symbol was reported by Vasco Pedro <vp@fct.unl.pt> and resolved by always defining DChelp.

Corrected handling of -c and -m options.

Corrected the reading of the SCO /etc/mnttab. Bela Lubkin <belal@sco.com> helped me understand its special multi-line format. The "nothing/nowhere" lines are continuations of the file system directory and device names when either are > 31 characters.

Corrected SCO version list in Configure help output.

Update special SCO name cache code to make it more robust.

Add support for IRIX 6.0.1 with the help of Eberhard Mater <system@grzap1.rz.go.dlr.de>.

### 3.49 October 25, 1995

Removed need for dialects/sgi/irix601hdr subdirectory, replacing it with one created by dialects/sgi/Mksrc and composed of symbolic links to dialects/sgi/irix6hdr. Eberhard Mater did the testing.

Added file system inode number to the local file structures of the DEC OSF/1, DYNIX, EP/IX, HP-UX, NeXT, PTX, RISCos, SGI, Sun, and V/88 dialects. Added code to name cache, node, and VFS functions to set the file system inode number and use it for faster recognition of files on the file system mount point.

Added kernel name cache support to Linux. This has been tested only under release 1.2.13.

### 3.50 October 31, 1995

Updated 00FAQ: reorganized and renumbered sections; added some DEC OSF/1 sections; section about the Solaris and SunOS Sun KERNELBASE.

Added an alternative readdir() function, called ReadDir(), to dialects/osf/ddev.c This function was supplied by Duncan McEwan <duncan@comp.vuw.ac.nz>, who discovered that the getdirentries() function in DEC OSF/1 versions 3.[02] returns an incorrect length for the /dev/fd directory when it is a file system mount point. Modified the Configure script to

define USELOCALREaddir for 3.[02] to enable using this local function.

Modified the Solaris/SunOS Mksrc to create a dummy (empty) kernelbase.h for Solaris 2.5 (5.5).

3.51 November 8, 1995

Modified the Configure script to declare the kernel state definitions appropriate to IRIX 6.1 on IP21 and IP26 platforms. News of the need for this came from Kate Fissell <Kate.Fissell@IUS4.IUS.CS.CMU.EDU> and Dave Olson <olson@anchor.engr.sgi.com>.

Modified the SGI IRIX dproc.c to provide more information when the kernel's idea of the size of a proc structure doesn't match sizeof(struct proc). This mismatch can occur if the wrong kernel state definitions are used to condition the header files (e.g., <sys/proc.h>) included when compiling dproc.c.

Made the -i option with no arguments equivalent to the -n option -- i.e., they both select the listing of all open Internet files.

Supplied a missing "you" in the Customize script introduction. John Jackson <jrj@cc.purdue.edu> noticed the omission.

Modified the Customize script to put long messages in here documents rather than echo statements, so that changing and reformatting them is easier. John Jackson offered this helpful suggestion.

Fixed a port number cast bug in Solaris 2.[45], courtesy of information and code supplied by Allan Black <allan@scotnet.co.uk>.

Automated the detection of Solaris 2.4 patches 101945-32 and 102303-02 that cause the installed kernel's user structure to differ from the one defined by <sys/user.h> because of a patch to <sys/auxv.h> that wasn't applied when the kernel was built. The Configure script invokes an alternate auxv.h file and warns that it is doing so.

Fixed a problem with Inventory script that shows up on systems where echo is not an sh built-in. The

bug was reported by Scott Ballew <smb@cc.purdue.edu>.

### 3.52 November 27, 1995

Added support for Linux versions 1.3.22 and above,  
courtesy of changes supplied

by Keith Parks

<emkxp01@mtcc.demon.co.uk>.

Changed -d option processing to allow specification  
of a comma-separated list of file descriptors.

Modified SCO support to allow NFS code to be optional  
at the request of Dave Gilbert

<agere!dgilbert%peapod.com@zool.interaccess.com>.

Enabled HP-UX 10.x version to display device and  
inode numbers for FIFOs. The problem was reported  
by Jeff Earickson <jaeearick@colby.edu>.

### 3.53 December 8, 1995

Enhanced NeXTSTEP FIFO reporting.

Fixed a formatting problem in the man page, reported  
by Angel Li <angel@flipper.rsmas.miami.edu>.

Added support for DEC OSF/1 4.0-BETA. Angel Li  
provided the test system.

Added a -v option to display lsof version information.  
Marty Leisner <leisner@sdsp.mc.xerox.com> suggested  
this.

Replaced touch with echo in Inventory script to avoid  
DEC OSF/1 4.0 complaint.

Tested under PTX 4.1.2.

### 3.54 December 15, 1995

Added support for IRIX 6.2-BETA. The support for  
older IRIX

versions changed considerably in the

process. Revision 3.54 has been tested under these

older IRIX versions: 5.3 and 6.1. Angel Li

<angel@flipper.rsmas.miami.edu> provided a test

system and Jim Brown <jim@guanabana.rsmas.miami.edu>

helped.

Tested under AIX 4.1.4.

Decommissioned the DYNIX port -- I no longer have access to a test system.

Added the HASXOPT\_ROOT define to allow the lsof builder to restrict the use of the dialect-specific X option (AIX and PTX currently) to processes whose real user ID is root. Updated the Customize script to provide an easy mechanism to change HASXOPT\_ROOT. AIX uses HASXOPT\_ROOT; PTX does not. This change was suggested by R. Lindsay Todd <toddr@rpi.edu>.

### 3.55 December 22, 1995

Eliminated need for modified DEC OSF/1 headers by using #undef and #define statements. Chip Stettler <STETTLERC@wlmpo1.wilm.ge.com> helped test.

Added quick start documentation file, 00QUICKSTART, containing examples and explanations of lsof use.

Verified that lsof works under the released Solaris 2.5.

### 3.56 January 2, 1996

Corrected lock reporting for Solaris 2.[345].

Corrected Linux malloc() kernel symbol handling bug, reported by Keith Parks <emkxp01@mtcc.demon.co.uk>.

Corrected AIX loader text file selection bug; it caused all process IDs to be listed when the -t option and one file system name was specified. The bug was reported by Christopher C. Evert <cevert@wail.com>.

Made sure Solaris Kb variable is zeroed before first use.

### 3.57 January 12, 1996

Updated SunOS port to obtain lock information from v\_filocks and the lock\_list struct to which it points.

Changed -H to -n. The function formerly performed by -n can be done by using -i with no address.

Updated Linux FIFO support so that the display for FIFOs

contains device number, inode number, and NAME. Johannes Kroeger <jkroeger@squirrel.owl.de> reported the lack of these items in the Linux FIFO display.

Added

RCS identification to header files, Makefiles, and common fragments.

Added BSDI BSD/OS support for 2.0, 2.0.1, and 2.1-BETA. Terry Kennedy <terry@spcvxa.spc.edu> kindly provided a 2.1-BETA test system and did the 2.0.1 testing.

Modified the Inventory script to compensate for dialects that have an expr that doesn't set its exit code when string matches fail.

Converted internal representations of file offset and size to unsigned long.

Corrected bug in NetBSD lock handling.

Corrected bug in FreeBSD file system type name handling.

Keith Parks <emkxp01@mtcc.demon.co.uk> reports lsof 3.57 compiles and runs under Linux 1.3.56.

3.58 February 7, 1996

Changed Solaris 2.3 configuration to pass the level of patch 101318 to the source code. This allows a Solaris 2.3 lock handling difference to be accommodated.

Updated 00QUICKSTART to reflect -n and -H changes made in revision 3.57. (Ooops!)

Changed Configure script to compile lsof for SCO versions

beyond 3.2v5.0.0 as it is compiled for 3.2v5.0.0. Bill Campbell <bill@celestial.com> reported he has done this successfully.

Added information to 00FAQ about a Linux kernel symbol problem (section 3.7.6) and included a <linux/random.h> patch to work around it. The patch was supplied by Keith Parks <emkxp01@mtcc.demon.co.uk>.

3.59 February 21, 1996

In response to a query from Louis Rayman

<lou@asahi.ps.quotron.com>, added special support for Solaris "sockmod" streams, used for Unix domain sockets, that allows their file system device type and inode number to be displayed. It also allows lsof to search for them by name or type (-U).

Added range handling to -d argument.

Added the display of CDFS file size to DEC OSF/1 output.

Added an include of <rpc/xdr.h> to keep gcc on HP-UX 10 happy. Blair Zajac <blair@olympia.gps.caltech.edu> suggested it.

Added Ultrix 4.5 to support list, courtesy of a notification from Gregory Neil Shapiro <gshapiro@WPI.EDU>.

Added AFS support for Solaris 2.4 at the request of Michael L. Lewis <mlewis@morgan.com> and Phillip Moore <wpm@morgan.com>. Phillip helped me locate a test host, generously provided by Heidi Hornstein <heidi@cmf.nrl.navy.mil> with support from Chaskiel Moses Grundman <cg2v+@andrew.cmu.edu> and Sushila R. Subramanian <sushi@cmf.nrl.navy.mil>. Lsof is configured for AFS with a new script, AFSCfg.

Used a SunOS 4.1.4 test system, provided by Chaskiel, to extend Solaris AFS support to cover SunOS. Used another test system, provided by Chaskiel, to extend AFS support to NEXTSTEP 3.2.

Tested lsof under AFS on yet another Chaskiel-provided system, running Linux 1.2.13 and AFS 3.3, and found that lsof needed no changes to recognize its AFS files.

Used a test system, provided by Curt Freeland <curt@grumpy.cse.nd.edu> and Terry McCoy <terry@anubis.cc.nd.edu> to extend Solaris AFS support to Solaris 2.5 with AFS 3.4-Alpha.

Added the [-A A] option for specifying the name list file that contains dynamic kernel module addresses. This is defined for the NEXTSTEP, SunOS, and Solaris implementations.

Added stty isig handling (where appropriate) to

the Customize and Inventory scripts.

Added support to Solaris for the nfs3 file system type. Its absence was reported by Patrick D. Sullivan <pds@snt.bellsouth.com>.

In response to a report from Tigran Aivazian <bs\_s641@ceres.king.ac.uk> corrected bug in Linux local nlist() function and based the default kernel loader format on a Configure test for CONFIG\_KERNEL\_ELF in /usr/src/linux/include/linux/autoconf.h.

Fixed a bug in name cache exploration for BSD-derived dialects -- e.g., FreeBSD.

Updated for NetBSD 1.1.

3.60 February 27, 1996

Improved Unix domain socket reporting for Solaris. Louis Rayman <lou@asahi.ps.quotron.com> helped test.

Added warning messages about absence of Linux CONFIG\_MODULES definition in autoconf.h, leading to lack of get\_kernel\_syms() support. Tigran Aivazian <bs\_s641@ceres.king.ac.uk> supplied the information.

3.61 March 8, 1996

Added AFS support for AIX and HP-UX and verified that the lsof Ultrix version needs no additions for AFS. Chaskiel Moses Grundman <cg2v+@andrew.cmu.edu> provided the HP-UX and Ultrix test systems. Jan Tax <jan\_tax@unc.edu> provided an AIX 4.1.4 test system. Bob Cook <bobcook@SLAC.Stanford.EDU> provided 3.2.5 and 4.1.4 test systems.

Fixed minor problems and made improvements to NEXTSTEP, Solaris, and SunOS AFS support. Changed the AFSCfg script to ask for AFS version.

During the Hp-UX AFS work, added the hpuxgcc abbreviation to the Configure script for configuring lsof to be compiled with gcc under lsof.

Fixed a NetBSD mount structure array referencing bug, reported by Peter Svensson <petersv@df.lth.se>.



Dropped support for Motorola V/88, because I no longer have access to test systems.

Added rudimentary support for the IRIX XFS file system type, pending more information.

### 3.61 March 12, 1996

Corrected misuse of the LSOFS\_DINC shell variable in the Configure script for HP-UX and Solaris. Larry Rogers <lrr@cert.org> pointed out this problem. Also removed an obsolete irix52 abbreviation from Configure.

I didn't consider this change sufficient to warrant a new version number, but just rebuilt the 3.61 distribution.

### 3.62 March 26, 1996

Updated AFS comments in 00README.

Supplied missing break statement in a N\_VXFS case clause in the HP-UX dnode.c.

Added Veritas file support to PTX, courtesy of code supplied by Laurent Montaron <lpm@sequent.com> and help from Kevin Smallwood <kcs@sequent.com>. Created two new source modules (dnode[12].c) to separate PTX header file node definitions and thus eliminate symbol conflicts. Laurent did most of the testing.

Added tests to BSDI, FreeBSD, HP-UX, IRIX, NetBSD, NEXTSTEP, PTX, Solaris and SunOS lsof versions that allow them to report on unknown file system types.

Added IRIX 6.0.1 #if/#else/#endif support in response to a report and suggested modifications from Scott Presnell <srp@zgi.com>.

With the help of Dave Olson <olson@anchor.engr.sgi.com> improved the IRIX 6.2-BETA XFS support.

### 3.62 March 27, 1996

Corrected SunOS incompatibility with last-minute addition of Solaris MVFS support. The problem was reported by Larry W. Virden <lvirden@cas.org>.

I didn't consider this change sufficient to warrant a new version number, but just rebuilt the 3.62 distribution.

### 3.63 April 11, 1996

Upgraded Solaris MVFS support. In the process, enlarged Solaris and SunOS DEVICE output column.

Changed SunOS 4.1.x Configure to make -DNOCONST Makefile definition dependent on SC version.

At the suggestion of John DiMarco <jdd@cdf.toronto.edu> suppressed two warning messages: the device cache file creation warning when -Db has been specified; and the one issued when -D? is used with a non-writable system-wide device cache file and there is no other writable path. Also at John's suggestion redid the manner in which child processes are used to avoid kernel calls that might block; the net effect of the change is that normally one child process is required, rather than one per kernel call.

Refined the NetBSD test for <nfs/nfsproto.h> with a Configure script change.

Modified Configure script to compute AIX version with ``uname -rv" when /usr/bin/oslevel can't be executed. Stephen C. Woods <scw@seas.ucla.edu> suggested this.

Disabled conflicting prototype definitions in the local netdb.h used when the SCO 3.0 netdb.h is missing. Disabled #include of <strings.h> unless the SCO version is 5.0 or above. Don Kirouac <dkirouac@minicom.com> pointed out these problems.

### 3.63 April 15, 1996

Improved Configure's SunOS 4.1.x CC test for compiler support of the const keyword and avoided Configure's ``test

-f {Customize,Inventory}" (because the Ultrix test doesn't grok -x) in response to a report from Larry Schwimmer <rosebud@cyclone.Stanford.EDU>.

I didn't consider this change sufficient to warrant a new version number, but just rebuilt the 3.63

distribution.

### 3.64 April 26, 1996

Added a negate option for entries of the -u list.

Kurt Hillig <khillig@Chem.LSA.umich.edu> suggested it.

Added a check for legal protocols in the -i option.

Adjusted the Configure and SGI MkKernOpts scripts to handle more IRIX situations per instructions from Dave Olson <olson@anchor.engr.sgi.com>.

Added support for HP-UX 10.10, courtesy of a test system provided by Mark Bixby <markb@cccd.edu>.

### 3.65 May 20, 1995

Corrected errors, reported by Arne H. Juul <arnej@pvv.unit.no>, in use of IRIX stat structure.

Added support for the IRIX 6.2 cacheefs, following a report from Peter Van Epp <vanep@sfu.ca>.

Added clone support for AIX 4.1.4 and above.

Adjusted the IRIX configuration to work properly for 64 bit IRIX 6.2 systems. Richard Chycoski <richard@sfu.ca> and Peter Van Epp <vanep@sfu.ca> provided a test system.

### 3.66 June 19, 1996

Improved the HP-UX VXFS test in the Configure script, based on a report from Robert Hall <rjh6810@misty.ca.boeing.com>.

Added SCO information to 00FAQ. Added information about lsof slowness and nameserver.

Added an untested Configure abbreviation for Solaris 2.5.1.

Ambrose Li <ambrose@www.mingpaoxpress.com> supplied a Linux change that avoids a conflict with the d\_namlen definition in versions 1.99.8 and above.

Added compiler version identification to the Configure script for AIX and Solaris cc.

Added support for FreeBSD 2.2-960612-SNAP. Ade Barkah <mbarkah@hemi.com> provided a test system.

3.67 Jul 1, 1996

Made miscellaneous documentation corrections.

Added support for gcc under AIX 4.1 and above, including an aixgcc Configure abbreviation, and a work-around

for an long long alignment problem.

Stuart D. Gathman <stuart@bmsi.com> and Waldemar Zurowski <bilbo@pwr.wroc.pl> helped me to understand the gcc problem and devise the work-around.

3.68 July 17, 1996

Malgorzata Roos <groos@rzusun.unizh.ch>: pointed out the AIX lsof didn't report the inode number for named pipes (FIFOs) and wouldn't locate them by name; `_and_` supplied a fix. (Now `_that's_` the kind of bug report I like. :-)

Update Configure script to clean out aix41\* subdirectories created by the AIX gcc work-around.

Taught IRIX lsof how to report the correct device number, inode number, and size for named NFS pipes.

Taught HP-UX 9.x lsof how to report size/offset and inode number for named NFS pipes. (HP-UX 10.x already knows.)

Taught DEC OSF/1 (errr, Digital Unix) lsof to report device and inode numbers correctly for named pipes. Because stat(2) under DEC OSF/1 V3.2 doesn't report the device number correctly for named pipes, lsof can't locate them by name, but it can do that under DEC OSF/1 V2.0.

Taught EP/IX 2.1.1 lsof to report device and inode numbers correctly for named pipes.

Taught versions of lsof for PTX 2.1.6 and 4.1.2 to report device and inode numbers correctly for named pipes.

Taught RISC/os 4.52 lsof to report device and inode

numbers correctly for named pipes.

Taught versions of lsof for Ultrix 4.2 and above to report inode numbers and file systems names correctly for named pipes (FIFOs).

Added safety check when trying to get a sockaddr\_un structure from a BSDI, FreeBSD, or NetBSD mbuf.

Improved documentation on install permissions in 00README at the suggestion of Paul Wickman <Paul.Wickman@amd.com>.

Installed support for the DTYPE\_PIPE file structure in FreeBSD 2.2. Changed the FreeBSD version symbol from \_FREEBSDV to FREEBSDV.

Added support for NetBSD 1.2.

### 3.69 July 30, 1996

Added block device name caching and reporting for all dialects.

Improved  
(I think) IRIX 6.2 64 bit configuration.

Eliminated C name space pollution by removing the leading `\_` from all dialect version symbols that had it: \_AIXV, \_BSDIV, \_OSF1V, \_ADVFSV, \_EPIXV, \_HPUXV, \_IRIXV, \_PTXV, \_RISCOSV, and \_SCOV.

Changed decosf stanza in Configure script to automatically detect the subdirectory of /sys (or /usr/sys) that contain's the configuration header files for the machine. Added a 00FAQ entry about this.

### 3.70 August 9, 1996

Set the execute bits on scripts/big\_brother.perl5.  
Changed -H in scripts/watch\_a\_file.perl to -n.  
Retained all the command name characters that are available in the proc or user struct for field output. Improved sample install rules for BSDI and HP-UX. Strengthened HP-UX CCITT test in the Configure script. Gildas Perrot <perrot@francenet.fr> suggested these changes.

Improved Solaris local TCP address reporting, based

on a bug report from John Caruso <jcaruso@csg.com>.

Improved HP-UX VFS handling,  
and corrected a bug  
in VFS handling, based on bug reports from David  
Capshaw <David.Capshaw@SEMATECH.Org>.

Added support to -i argument handling to allow port  
lists and ranges, and service name lists to be  
specified. John DuBois <spcecdt@armory.com>  
suggested this.

Dropped support for IRIX 4.0.5H. Revived support  
for IRIX 5.2, courtesy of a test system from Dan  
Trinkle <trinkle@cs.purdue.edu>.

### 3.71 August 15, 1996

Improved handling of port ranges specified with  
the -i option. Improved performance when the only  
option is -i.

### 3.72 August 28, 1996

Fixed bugs and typos in SCO mount table handling.

Added support for OpenBSD (only the i386 architecture  
type has been tested), using the NetBSD dialect  
sources. David Mazieres <dm@amsterdam.lcs.mit.edu>  
provided a test system.

Added fdsc file system support to FreeBSD, NetBSD  
and OpenBSD. Changed the way proc file system  
support is activated with additions to the Configure  
script and  
changes to the dialect machine.h files.  
Dropped the distribution of the FreeBSD <procfs/procfs.h>  
header file.

Added support for PTX 4.1.4.

### 3.73 September 5, 1996

Added information to 00FAQ for missing CCITT HP-UX  
header file x25L3.h. Pasi Kaara <ppk@atk.tpo.fi>  
provided the information.

Changed AIX header file #include pattern to prevent  
gcc's loader from complaining about multiply defined  
etherbroadcastaddr[], fddi\_broadcastaddr[], and  
ie5\_broadcastaddr[] CONST u\_char arrays from

<net/net\_globals.h>. (The AIX loader doesn't complain.) David Capshaw <David.Capshaw@SEMATECH.Org> reported this problem.

Removed the HASPWSTAYOPEN definition; it was only used for two dialects that are no longer supported.

Corrected a bug in UID cacheing that appeared during long repeat-mode (-r) operations. The bug was reported by Peter Van Epp <vanep@sfu.ca>. When in repeat mode the UID cache will be cleared when /etc/passwd changes.

Fixed a bug in FreeBSD support that causes a segmentation fault on VBAD vnodes.

Deleted ultrix22 from Configure and RHF from Ultrix source files. Dropped 2.2 from support list.

#### 3.74 September 6, 1996

Corrected a bug in FreeBSD's proc table handling, reported by David O'Brien <obrien@Nuxi.cs.ucdavis.edu>.

#### 3.75 September 9, 1996

Added FreeBSD proc table handling fix from revision 3.74 to BSDI, NetBSD, and OpenBSD dialects.

Improved Solaris VFS handling.

Added pipe handling to OpenBSD. Changed Configure script to define OPENBSDV for OpenBSD and used that definition to include the pipe support in the NetBSD sources. The Configure script defines NETBSDV for NetBSD. So far neither dialect has any #if/#else/#endif blocks that depend on version number.

Added support for AIX 4.2.

#### 3.76 September 21, 1996

Plugged a memory leak in command handling, introduced in revision 3.70. The bug was reported by Peter Van Epp <vanep@sfu.ca>.

Fixed a bug in the reporting of size for IRIX 5.3 EFS files, introduced in revision 3.69 by the name space pollution abatement. The \_IRIXV definition

was used in the IRIX 5.x private `efs_inode.h` header file to configure the inode structure for IRIX 5.3, so I changed the tests to use IRIXV.

Changed information on the AIX Stale Segment ID bug to reflect the fact that IBM now says they won't fix it. They have closed the APAR.

Disabled the AIX gcc long long alignment hack under AIX 4.2, because it doesn't work there. Installed a fatal error message in `Configure` that gcc can't be used to compile `lsof` under AIX 4.2 until a work-around can be developed.

Upgraded BSDI, FreeBSD (2.0 and above), NetBSD (1.1B and above), and OpenBSD lock reporting. David Mazieres <dm@amsterdam.lcs.mit.edu> reported the need for the upgrade.

Made similar lock reporting upgrades to (versions tested are in parentheses): AIX (4.1.4 and 4.2); DEC OSF/1 (2.0 and 3.2d); EP/IX (2.1.1); HP-UX (9.x and 10.10); IRIX (5.2, 5.3, and 6.2); Linux; NEXTSTEP (3.1); PTX (2.1.6 and 4.2); RISCos; SCO (releases 3.0 and 5.0); Solaris (2.5); SunOS (4.1.3); and Ultrix (4.2).

Updated man page and 00FAQ with more information on lock reporting.

Updated PTX `lsof` for 4.2. Upgraded HP-UX `lsof` for 10.20. Used a test system, provided by Richard Allen <ra@rhi.hi.is>, and received testing assistance from Marc Winkler <marc@healthchex.com>.

Changed handling of Internet addresses to avoid DNS lookup operations when the address has clearly not been selected. John DuBois <johnd@sco.COM> suggested this.

3.77 October 2, 1996

Changed SCO `Configure` stanza to call `nm` by its full path, thus avoiding possible confusion. The change was suggested by Jean-Pierre Radley <jpr@jpr.com>.

Added changes to allow `lsof` to be compiled by gcc under AIX 4.2 -- enabled some gcc-specific typedef's



in the AIX machine.h and disabled the Configure script's rejection of aixgcc for AIX

#### 4.2. The

typedef's were supplied by Henry Grebler  
<henryg@optimization.com.au>.

Based on information supplied by Henry and David J. Wilson <davidw@optimization.com.au>, invented a description and processing for an unknown file struct that is established by AIX 4.2 (at least) for X processes when DISPLAY=:0.0. For convenience I gave its type the DTYPE\_PIPE definition, but that may be incorrect.

Fixed some Solaris 2.[34] errors in locking code, added at 3.76, that I couldn't test. Rainer Orth <ro@TechFak.Uni-Bielefeld.DE> reported the problem and supplied the fixes.

Made Configure script supply NeXTSTEP 3.x version in Makefile so that the shadow vnode locking code, introduced in 3.76, would be disabled for NeXTSTEP 3.0. Rainer Orth discovered this problem, too.

Added reporting of UNIX domain socket inode numbers for Linux version 2.0 and above. The addition was supplied by Matthew Burt <BurtM@poole.siemens.co.uk>.

Enhanced file searching to report all instances of references to automounted file systems, even when they're direct mounts not yet realized. Enhanced Solaris 2.5 lsof to grok autofs nodes. Victoria H. Lau <vlau@msmail2.hac.com> pointed out the need for these enhancements and helped test them.

Changed AIX lock length test so it will work with gcc under AIX 4.2.

Changed PTX HAS\_VXFS symbol, indicating presence of VxFS, to HASVXFS for consistency with the HP-UX form of the symbol.

3.78 October 14, 1996

Changed strtol() call in private Linux nlist() function to strtoul(). Linux kernel addresses at 2.1.0 have their top bit set and appear to be negative to strtol(). This information was provided

by Marty Leisner <leisner@sdsp.mc.xerox.com>.  
Marty also notes that other, unknown-as-of-yet  
problems prevent lsof from working under 2.1. He  
is investigating, since I don't have access to a  
2.1 system.

Added definitions to machine.h for a private file  
struct type (HASPRIVFILETYPE  
and PRIVFILETYPE) that  
can be accommodated without changing prfp.frag,  
much as HASPIPEFN works for PIPE file struct types.

Used the new private file struct type support to  
support the AIX f\_type=0xf that DISPLAY=:0.0 causes.  
Changed its output TYPE from PIPE to SMT; displayed  
file size as buffer size less free bytes in buffer;  
enabled recognition under AIX 4.1.4. Mike Feldman  
<feldman@charm.urbana.mcd.mot.com> and others helped  
me identify this file as a Shared Memory Transport  
(SMT) socket.

Corrected a function prototype in the HP-UX dnode.c  
for HP-UX 10 and greater; gcc objected; HP's cc did  
not. Christian Krackowizer <kra1@technodat.co.at>  
reported the problem.

Made AFSConfig script more capable of locating the  
cell's root directory. Updated AFS documentation  
in 00FAQ and 00README. Both were suggested by  
Timothy Miller <tsm@cs.brown.edu>.

Installed update to big\_brother.perl5 script from  
Lionel Cons <Lionel.Cons@cern.ch>.

3.79 October  
29, 1996

Added support for IRIX 6.4, courtesy of a test  
system provided by Angel Li <angel@rrsl.rsmas.miami.edu>.  
Fixed FIFO and NFS3 bugs in IRIX 6.2 lsof in the  
process. Lsof has not been tested under IRIX 6.3,  
but the Configure script has a stanza for it.

Changed device functions to use stat() instead of  
lstat(). Used WARNDEVACCESS to suppress stat(2)  
failure messages.

Tested under OpenBSD 2.0.

3.80 November 8, 1996

Corrected comments in 00README about using the sunos413 and sunos413cc Configure abbreviations.

Made some Configure and Customize script changes, suggested by Bruce Jerrick <bruce@cse.ogi.edu>.

Added missing elements to definition of local Solaris 2.3 lock\_descriptor structure so that dnode.c will compile and work properly under it. Corrected a bug in Solaris 2.[34] lock descriptor handling.

3.81 November 14, 1996

Corrected error in the "invented" HP-UX 10.20 proc struct. The erroneous struct definition named the set-UID member as the UID member, resulting in occasional incorrect UID attributions in lsof output.

At the suggestion of Larry Schwimmer <schwim@cyclone.stanford.edu>, changed AFSSConfig to use awk to get the cell name from /usr/etc/vice/ThisCell, thus avoiding a problem when the cell name line has more than one word.

Added -DSWASH to IRIX 6.2 options propagated from the kernel build CCOPTS to lsof's Makefile. Randolph J. Herber <herber@dcdrrh.fnl.gov> did the detective work that revealed the need for this. IRIX 6.2 patch 1488 added -DSWASH and its effects.

3.82 December 11, 1996

Updated Configure script for FreeBSD 3.0 and SCO OpenServer 5.0.[24]. FreeBSD Configure script change was supplied by David E. O'Brien <obrien@NIXI.com> and SCO Configure script change was supplied by Bela Lubkin <belal@sco.COM>.

Tested lsof under FreeBSD 3.0, courtesy of a test system provided by Ade Barkah <mbarkah@hemi.com>.

Added changes to support SCO OpenServer 5.0.4 (Comet), supplied by Bela Lubkin <belal@sco.COM>.

Added support for UnixWare 2.1. D. Chris Daniels

<chrisd@dlpco.com> provided a test system and Bela Lubkin provided technical assistance.

Added support for Pyramid DC/OSx 1.1 and Reliant UNIX 5.43. Bruce Beare <bjb@pyramid.com> and Kevin Smith <kevin@pyramid.com> provided test systems and technical assistance. This dialect version must run setuid-root, since it accesses proc and user structures via the /proc file system.

Tested under PTX 2.1.9 and added support for PTX 4.2.1.

At Bela Lubkin's suggestion added a commercial to the lsof man page, -h option, and -v option output, telling where to get the latest revision. This entailed large scale rearrangement of the -h output to keep it as short as possible. It also involved shortening the -X explanation for PTX.

Made sure that address segment access errors didn't incorrectly force the listing of a process. This fix was needed by the Sun, Pyramid, and UnixWare ports.

Corrected bug in the way the local device table is sorted.

3.83 December 30, 1996

Added support for Solaris 2.6 (Beta) with help from Casper Dik <casper@holland.Sun.COM>, May Jackson <methalya.jackson@eng.sun.com>, Joseph Kowalski <jek3@Eng.Sun.COM>, and the Solaris 2.6 Beta test program.

Fixed an inode file system type processing bug in SCO OpenServ 5.0 and greater, reported by Robert Lipe <robertl@arnet.com>.

Fixed bugs in SCO kernel name cache probing, courtesy of code and suggestions from Bela Lubkin <belal@sco.COM>.

Revised kernel name list handling to remove the need for changing two files (dlsof.h and dstore.c) when altering, removing, or adding name list symbols. All dialects were affected.

Added support for SCO OpenServer event "clones."  
Robert Lipe need for their support and Bela Lubkin  
provided technical assistance in identifying them.

Added display of bound name to Solaris UNIX  
domain  
socket file handling.

Correct bug in SunOS address space ("txt" file)  
handling.

Tested under UnixWare 2.1.1.

Changed SGI IRIX lsof to use the kernel's proc  
struct size when striding through its proc table  
(IRIX versions below 6.4). The proc struct size  
difference warning is still issued, and lsof still  
uses the proc struct size and proc struct from  
<sys/proc.h> to read and process proc table  
information. Added a note to 00FAQ about this.

Deferred Internet host and port name lookups to  
print time, thus avoiding lookups for files that  
are not listed.

#### 3.84 January 13, 1997

Updated the Pyramid private configuration script,  
MkKernOpts, to propagate the R4000 definition for  
DC/OSx systems so equipped. Anthony Shortland  
<anthony.shortland@FMR.COM> pointed out the need  
for this and Kevin Smith <kevin@pyramid.com> provided  
access to a test system.

Added information to 00FAQ about UDP ports for  
which lsof can't find users, because the  
ports are  
reserved to the kernel and aren't associated with  
open files.

#### 3.85 January 17, 1987

The DEC OSF/1 kernel name cache can be processed  
as a simple table, rather than a linked list, so  
changed the interface to rnam.frag accordingly.

Added a new optional output field, parent process  
ID (PPID). The -R option (for paRent) selects it,  
and the `R' field identifier labels it. Updated  
some scripts to handle it and developed two new

scripts, idrlogin.perl and idrlogin.perl5, to use it in locating network (rlogind and telnetd) source addresses for shell processes. Added some information about the new scripts to 00QUICKSTART.

### 3.86 January 30, 1997

Add explanation of why device warning messages disappear when the device cache file is used.

Changed Linux Configure stanza to check more places for the [z]System.map file and warn if the one located differs in date from /vmlinuz. Bjorn S. Nilsson <NILSSON@nbivms.nbi.dk> suggested this for easier configuration at Linux 2.0.28.

Changed Linux Configure stanza to check for the presence of fl\_fd, fl\_file, and fl\_whence in the file\_lock structure of <linux.fs.h> and define symbols appropriately.

Changed Linux lock testing to test task structure pointer (fl\_owner) from file\_lock struct as well as (possibly) the file struct pointer (fl\_file) or file descriptor number (fl\_fd) to identify the lock owner, depending on what HAS\_FL\_\* symbols were defined by Configure's file\_lock structure examination. Added section to Linux Problems in 00FAQ about this.

Corrected 00FAQ reference in Configure's Solaris 2.4 stanza.

### 3.87 February 11, 1997

Corrected setting of VxFS device number for HP-UX and PTX.

Added VM map flag test #if/#else/#endif for recent versions of FreeBSD 3.0, supplied by Chris Timmons <skynyrd@opus.cts.cwu.edu>.

Added a #define that removes a conflict between a signal() prototype in the IRIX 6.4 <sys/systm.h> and one in its <sys/signal.h>, exposed when cachefs support is enabled. Wolfgang Hecht <hecht@zedat.fu-berlin.de> identified the need for this addition and helped test it. Refined IRIX proc struct size test, warning, and use.

Revised Linux system map file handling (yet again)  
to search for the file at execution time, rather  
than in the Configure script. Marty Leisner  
<leisner@sdsp.mc.xerox.com> suggested this.

Added VxFS support to Solaris lsof with help from  
Peter Radig <radig@DresdnerBank.de>. Philip Kizer  
<pckizer@tamu.edu> helped test.

Added support for PTX 4.3, thanks to access provided  
by Peter Jordan <petej@sequent.com>.

3.87 February 11, 1997  
supplement Updated FreeBSD kernel name list handling.

3.88 February 17, 1997  
Added documentation files -- 00.README.FIRST[\_<version>]  
and 00RELEASE.SUMMARY\_<version> -- to the distribution.

Vic Abell <abe@purdue.edu>  
Purdue University Computing Center  
February 17, 1997

Found in path(s):  
\* /lsof-4-92-1-zip/lsof-4.92.1/OLD/lsof3\_00DIST  
No license file was found, but licenses were detected in source scan.

```
/*
 * Copyright 1997 Purdue Research Foundation, West Lafayette, Indiana
 * 47907. All rights reserved.
 *
 * Written by Victor A. Abell
 *
 * This software is not subject to any license of the American Telephone
 * and Telegraph Company or the Regents of the University of California.
 *
 * Permission is granted to anyone to use this software for any purpose on
 * any computer system, and to alter it and redistribute it freely, subject
 * to the following restrictions:
 *
 * 1. Neither the authors nor Purdue University are responsible for any
 *    consequences of the use of this software.
 *
 * 2. The origin of this software must not be misrepresented, either by
 *    explicit claim or by omission. Credit to the authors and Purdue
 *    University must appear in documentation and sources.
```

- \*
  - \* 3. Altered versions must be plainly marked as such, and must not be misrepresented as being the original software.
  - \*
    - \* 4. This notice may not be removed or altered.
- \*/

Found in path(s):

```
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/linux/dfile.c
* /lsof-4-92-1-zip/lsof-4.92.1/lib/rmnt.c
* /lsof-4-92-1-zip/lsof-4.92.1/lib/rnch.c
* /lsof-4-92-1-zip/lsof-4.92.1/lib/rdev.c
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/linux/dproto.h
* /lsof-4-92-1-zip/lsof-4.92.1/lib/ptti.c
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/sun/dnode2.c
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/linux/dmnt.c
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/linux/dproc.c
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/linux/dsock.c
* /lsof-4-92-1-zip/lsof-4.92.1/lib/fino.c
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/linux/dstore.c
* /lsof-4-92-1-zip/lsof-4.92.1/lib/cvfs.c
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/linux/dnode.c
* /lsof-4-92-1-zip/lsof-4.92.1/lib/lkud.c
* /lsof-4-92-1-zip/lsof-4.92.1/lib/prfp.c
* /lsof-4-92-1-zip/lsof-4.92.1/lib/pdvn.c
* /lsof-4-92-1-zip/lsof-4.92.1/dialects/linux/dlsof.h
* /lsof-4-92-1-zip/lsof-4.92.1/lib/rnam.c
* /lsof-4-92-1-zip/lsof-4.92.1/lib/rnmh.c
*
/lsof-4-92-1-zip/lsof-4.92.1/dialects/linux/machine.h
* /lsof-4-92-1-zip/lsof-4.92.1/lib/isfn.c
* /lsof-4-92-1-zip/lsof-4.92.1/lib/dvch.c
```

No license file was found, but licenses were detected in source scan.

Notes for the distribution of lsof version 4

```
*****
| The latest release of lsof is always available via anonymous ftp |
| from lsof.itap.purdue.edu. Look in pub/tools/unix/lsof.      |
*****
```

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#### Dialects Supported

=====

Lsof (for LiSt Open Files) lists files opened by processes on selected Unix systems. Version 4 is a source reorganization of version 3, itself a major revision of version 2. Version 4 has been tested on:

Apple Darwin 9 and Mac OS X 10.[567]  
FreeBSD 10.3, 11.0 and 12.0 for AMD64-based systems  
Solaris 9

(The pub/tools/unix/lsof/contrib directory on [lsof.itap.purdue.edu](http://lsof.itap.purdue.edu) contains information on other ports.)

If your favorite Unix dialect is not in the list, or if your version of it is more recent than the ones listed, please contact me at [<abe@purdue.edu>](mailto:abe@purdue.edu).

Version 3 of lsof was tested on:

AIX 3.2.5, 4.1.[1234], and 4.2  
BSDI BSD/OS 2.0, 2.0.1, and 2.1 for x86-based systems  
DC/OSx 1.1 for Pyramid systems  
Digital UNIX (DEC OSF/1) 2.0, 3.0, 3.2, and 4.0  
EP/IX 2.1.1 for the CDC 4680  
FreeBSD 1.1.5.1, 2.0, 2.0.5, 2.1, 2.1.5 for x86-based systems  
HP-UX  
8.x, 9.x, 10.01, 10.10, and 10.20  
IRIX 5.2, 5.3, 6.0, 6.0.1, and 6.[124]

Linux through 2.0.27 for x86-based systems  
NetBSD 1.0, 1.1, and 1.2 for x86 and SPARC-based systems  
NEXTSTEP 2.1 and 3.[0123]  
OpenBSD 1.2 and 2.0 for x86-based systems  
Reliant UNIX 5.43 for Pyramid systems  
RISC/os 4.52 for MIPS R2000-based systems  
SCO OpenServer Release 1.1, 3.0, and 5.0.x for x86-based systems  
SCO UnixWare 2.1 and 2.1.1 for x86-based systems  
Sequent PTX 2.1.[1569], 4.0.[23], 4.1.[024], 4.2[.1], and 4.3  
Solaris 2.[12345], 2.5.1, and 2.6-Beta  
SunOS 4.1.x  
Ultrix 4.2, 4.3, 4.4, and 4.5

Version 3 and its predecessor, version 2, may be found at:

<ftp://lsof.itap.purdue.edu/pub/tools/unix/lsof/OLD>

#### How Lsof Works

=====

Using available kernel data access methods -- `getproc()`, `getuser()`, `kvm_*`, `nlist()`, `pstat()`, `read()`, `readx()`, `/proc` -- lsof reads process table entries, task table entries, user areas and file pointers to reach the underlying structures that describe files opened by processes.

Lsof interprets most file node structures -- `advfsnodes`, `autonodes`, `cnodes`, `cdnodes`, `devnodes`, `fifonodes`, `gnodes`, `hsnodes`, `inodes`, `mfsnodes`, `pcnodes`, `procnodes`, `rnodes`, `snodes`, `specnodes`, `s5inodes`, `tmpnodes`. It understands NFS connections. It recognizes FIFOs, multiplexed files, Unix and Internet sockets. It knows about streams. It understands `/proc` file systems for some dialects. On many dialects it recognizes execution text and library references. It knows about AFS on some Unix dialects.

#### Lsof Output

=====

The lsof output describes:

- \* the identification number of the process (PID) that has opened the file;

- \* the process group identification number (PGID) of the process (optional);
- \* the process identification number of the parent process (PPID) (optional);
- \* the command the process is executing;
- \* the owner of the process;
- \* for all files in use by the process, including the executing text file and the shared libraries it is using:
  - \* the file descriptor number of the file, if applicable;
  - \* the file's access mode;
  - \* the file's lock status;
  - \* the file's device numbers;
  - \* the file's inode number;
  - \* the file's size or offset;
  - \* the name of the file system containing the file;
  - \* any available components of the file's path name;
  - \* the names of the file's stream components;
  - \* the file's local and remote network addresses;
  - \* the TLI network (typically UDP) state of the file;
  - \* the TCP state, read queue length, and write queue length of the file;
  - \* the file's TCP window read and write lengths (Solaris only);
  - \* other file or dialect-specific values.

Getting Started Quickly

=====

If you want to get started using lsof quickly, or see some examples of how lsof can be used, consult the 00QUICKSTART file of the lsof distribution.

#### The 00QUICKSTART

file won't help you build or install lsof, but it will cut through the density of the lsof man page, giving you more readily an idea of what you can do with lsof.

For information on building and installing lsof, consult the 00README file of the lsof distribution.

#### Limiting, Filtering, and Selecting Lsof Output

=====

Lsof accepts options to limit, filter, and select its output.

These are the possible criteria:

- \* Process ID (PID) number -- to list the open files for a given process;
- \* Process Group ID (PGID) -- to list the open files for all the processes of a given process group;
- \* User ID number or login name -- to list the open files for all the processes of a given user;
- \* Internet address -- to list the open files using a given Internet address (host name), protocol, or port (number or name); or to list all open Internet files;
- \* command name;
- \* file descriptor name or number;
- \* list all open NFS files;
- \* list all open Unix domain socket files;
- \* list all uses of a specific file;
- \* list all open files on a file system.

Selection options are normally ORed -- i.e., an open file meeting any of the criteria is listed. The selection options may be ANDed so that an open file will be listed only if it meets all the

criteria.

In the absence of any selection criteria, lsof lists files open to all processes.

#### Parsing Lsof Output with Another Program

=====

The lsof -F option directs it to produce "field" output that can easily be parsed by another program. The lsof distribution contains sample awk, perl 4, and perl 5 scripts in its scripts subdirectory that show how to post-process field output.

#### Repeat Mode

=====

Lsof can be directed to produce output, delay for a specified time, then repeat the output, cycling until stopped by an interrupt or quit signal. This mode is useful for monitoring the status of some file operation -- e.g., an ftp transfer or a tape backup operation.

Repeat mode is more efficient when combined with lsof's selection options, since they limit lsof overhead.

It's possible to use lsof's field output options to supply repeat mode output to another process for its manipulation. The scripts subdirectory of the lsof distribution has sample Perl scripts showing how to consume lsof repeat mode output from a pipe.

#### Distribution Restrictions

=====

Lsof may be used and distributed freely, subject to these limitations:

1. Neither the author nor Purdue University is responsible for any consequences of the use of this software.
2. The origin of this software must not be misrepresented, either by explicit claim or by omission. Credit to the author and Purdue University must appear in documentation and sources.
3. Altered versions must be plainly marked as such, and must not be misrepresented as being the original software.

#### 4. This

notice may not be removed from or altered in the lsof source files.

#### Cautions

=====

Lsof is a tool that is closely tied to the Unix operating system version. It uses header files that describe kernel structures and reads kernel structures that typically change from OS version to OS version.

DON'T TRY TO USE AN LSOF BINARY, COMPILED FOR ONE UNIX OS VERSION, ON ANOTHER.

On some Unix dialects, notably SunOS and Solaris, lsof versions may be even more restricted by architecture type. An lsof binary, compiled for SunOS 4.1.3 on a sun4c machine, for example, won't work on a sun4m machine.

AN LSOF BINARY, COMPILED FOR ONE SOLARIS 1.X ARCHITECTURE, ISN'T GUARANTEED TO WORK ON A DIFFERENT SOLARIS 1.X ARCHITECTURE.

#### Distribution Contents

=====

The lsof distribution is checked for completeness when it is constructed and by the Inventory script when you run the Configure script. (See The Inventory Script section of the 00README file of this distribution.)

#### Lsof is

organized in these parts:

- \* The main lsof directory, containing common sources, configuration and setup scripts and three subdirectories: dialects/, lib/, and scripts/.

Lsof is compiled in the main lsof directory after configuration. The selected dialect sources are copied or linked from the specified subdirectory. (Symbolic linking is the standard method.)

Common lsof definitions may be found in lsof.h; common function prototypes, proto.h; and common storage, store.c.



- \* The dialects/ subdirectory contains subdirectories with sources specific to UNIX dialect implementations -- e.g., the dialects/sun/ subdirectory contains sources for the SunOS (Solaris 1.x) and Solaris (2.x) implementations of lsof. The dialects subdirectories also contain Makefiles and scripts for assisting dialect source configuration.

Dialect configuration definitions may be found in dlsof.h; other dialect definitions, dlsof.h; dialect prototypes, dproto.h; and dialect storage, dstore.c.

- \* The lib/ subdirectory contains sources for common lsof functions. Not all dialects use the functions -- some have their own versions of them. The lib/ functions are enabled and customized with #define's in the dialect machine.h header files.

- \* The scripts/ subdirectory contains sample scripts for processing lsof field (-F) output. The scripts are written in AWK, Perl 4, and Perl 5.

The 00PORTING file of the lsof distribution has more information on lsof components, configuration, and construction.

#### Warranty

=====

Lsof is provided as-is without any warranty of any kind, either expressed or implied, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. The entire risk as to the quality and performance of lsof is with you. Should lsof prove defective, you assume the cost of all necessary servicing, repair, or correction.

#### Bug Reports

=====

Now that the obligatory disclaimer is out of the way, let me hasten to add that I accept lsof bug reports and try hard to respond to them. I will also consider and discuss requests for new features, ports to new dialects, or ports to new OS versions.

PLEASE DON'T SEND A BUG REPORT ABOUT LSOF TO THE UNIX DIALECT VENDOR.

At worst such a bug report will confuse the vendor; at best, the vendor will forward the bug report to me.

Please send all bug reports, requests, etc. to me via email at <abe@purdue.edu>.

#### The Isof-l Mailing List

=====

Information about Isof, including notices about the availability of new revisions, may be found in mailings of the Isof-l listserv. For more information about it, including instructions on how to subscribe, read the 00LSOF-L file of the Isof distribution.

#### Version 3 Release Notes

=====

See 00DIST in the last Isof 3 revision 3.88, for its complete set of release notes. Isof revision 3.88 may be found at:

<ftp://Isof.itap.purdue.edu/pub/tools/unix/Isof/OLD>

3.0 May 24, 1994

This is the first official release of Isof 3.

...

3.88 February 17, 1997

+=====+  
| This is the last version 3 revision. |  
+=====+

Added documentation files -- 00.README.FIRST[\_<version>]  
and 00RELEASE.SUMMARY\_<version> -- to the distribution.

#### What's new in Version 4

=====

The main goal of version 4 was to eliminate the confusing common/fragment source file technique. Changing the version number also provided an opportunity to restart the numbering, which at 3.88 had risen to a large value.

The sources that appeared in the dialects/common subdirectory of version 3 in fragment files have been incorporated into the version 4 liblsof.a library as \*.c files. This results in significant changes to many source files, scripts, and Makefiles of all dialect versions. It allows elimination of some source files -- ddev.c, dfile.c, dmnt.c -- for dialects now obtaining functions from liblsof.a that formerly came from making dialect source files by combining fragment files.

The version 4 liblsof.a sources are stored in the lib/ subdirectory of the main lsof directory. The liblsof.a functions are activated and conditioned in their source files by values #define'd in the dialect dlsof.h and machine.h header files.

Dialects that provide a private version of a library function refrain from #define'ing the symbol that would activate the library function code.

#### Version 4 Release Notes

=====

4.0 February 24, 1997

```
+=====+
| This is the first lsof 4 revision. |
+=====+
```

Reorganized sources: eliminated code fragment files and created a library in their place. Modified or deleted many dialect source and header files. Changed documentation accordingly.

#### Added

a warning to sgi/Makefile and 00FAQ that advises against using the IRIX C compiler -n32 option when compiling lsof. Thanks go to Peter Ilieve <peter@memex.co.uk> for bringing this to my attention.

Dropped IRIX 5.2 in mid-stream, because my 5.2 test system was upgraded to 5.3.

4.01 March 3, 1997

Added TFS support for Pyramid dialects.

Added test to Configure and to the IRIX dnode.c

for the different cnode struct that appears in  
<cache/fs/cache/fs.h> on the 6.2 IMPACT distribution.  
Heddy Boubaker <boubaker@amfou.cenatls.cena.dgac.fr>  
alerted me to the cnode change and helped test this  
lsof adjustment.

Shut down the lsof child process before doing a -r  
sleep(). A comment from Dan Mercer <dam@mmm.com>  
prompted this.

4.02 March 21, 1997

Based on a report from Pasi Kaara <Pasi.Kaara@atk.tpo.fi>,  
disabled HP-UX CCIT support in lsof for HP-UX  
versions 10 and above. Pasi's report also led to  
changes in the HP-UX machine.h to  
support use of  
gcc to compile lsof for HP-UX 10.20 and warnings  
against using `cc -Aa` or `gcc -ansi` to compile  
lsof under HP-UX 10.x.

With help from Richard Allen <ra@hp.is> taught  
HP-UX 10.x lsof to name file systems better by  
using the virtual file system device number. Elias  
Halldor Agustsson <elias@rhi.hi.is> provided a test  
system.

Changed NEXTSTEP and UNIXWARE Makefiles to use  
safer quoting when generating version.h. The change  
was suggested by Bob Farmer <ucs\_brf@unx1.shsu.edu>.

Added SHELL=/bin/sh string to all Makefiles.

Added support for Linux 2.1.28 on a test system,  
kindly provided by Jonathan Sargent <sergent@purdue.edu>.  
Configure tests the Linux 2.1.x's C library lseek()  
function for proper handling of kernel offsets.  
If lseek() appears suspect, Configure activates  
the use of a private lseek() function. Changed  
the private nlist() function to nlist\_private()  
and taught it to use the query\_module() syscall in  
place of the  
deprecated get\_kernel\_syms() one.  
Added rudimentary AX.25 support for Pierfrancesco  
Caci <ik5pvx@infogroup.it> who helped test it.  
Updated the old get\_kernel\_syms() code to recognize  
and skip module name entries.

Prompted by Marty Leisner <leisner@sdsp.mc.xerox.com>, eased the requirement that service name lookup for the -i option be accompanied by a protocol name. The name is not needed if both TCP and UDP names yield the same port number.

Added xusers.awk script from Dan Mercer <damercher@mmm.com> to the distribution scripts/ subdirectory.

Changed Configure script to use LSOF\_VERS for all UNIX dialect version numbers and to pass LSOF\_VERS to the dialect Mksrc functions. Also added the ability for a dialect stanza to declare a different dialect Makefile source. Modified dialect Mksrc files -- e.g., linux and sun -- accordingly.

Added support for BSD/OS 3.0 with help from Jim Reid <jim@mpn.cp.philips.com>. Terry Kennedy <TERRY@spcvxa.spc.edu> kindly provided a test system. During the port corrected a bug that prevented proper handling of revoked files.

#### 4.03 April 7, 1997

At the suggestion of Dan Mercer <damercher@mmm.com>, made HP-UX building of lsof aware of differences between the HP-UX bundled and unbundled C compilers.

Added the ability for the lsof builder to define the default warning message issuance state. By default the issuance of warning messages is disabled; defining WARNINGSTATE in machine.h disables it. The Customize script was updated to handle WARNINGSTATE. Dan Mercer suggested this.

Eliminated compiler complaint about improperly cast get\_Nl\_value() argument in ncache\_load() in lib/rnch.c.

Corrected zeromem() argument error in SCO dproc.c. Sped up parent directory cache lookup slightly.

Updated for PTX 4.4, including additional VxFS (EFS) file system support.

#### 4.04 April 17, 1997

At the suggestion of Bela Lubkin <belal@sco.COM> changed device cache handling

to be more tolerant  
of a device cache file whose [cm]times are older  
than the ones on /dev or /devices. The change  
required adding information to Solaris device cache  
file clone lines, so the first time lsof 4.04 is  
run under Solaris it will complain about a bad  
cached clone device in a previous device cache  
file, then regenerate it.

Added boot file path detection for SCO OSR 5 and  
above, based on information supplied by Bela.

Fixed two bugs in DEC OSF/1 lsof -- an error in  
reporting locks and a missing continue statement  
in readdev() after a failure to open a directory.  
Jan Ole Suhr <josuhr@informatik.tu-clausthal.de>  
reported the second bug and supplied a fix.

Fixed XFS problems with IRIX 6.2 by abandoning the  
idea that SGI will distribute XFS header files and  
defining an lsof-private xfs\_inode structure. John  
Paul Morrison <John.Paul.Morrison@MultiActive.com>  
helped develop and test the 5.3 definition. John  
R. Vanderpool <fish@daacdev1.gsfc.nasa.gov>  
helped  
develop and test the 6.2 definition.

Remove obsolete comments about common/\*.frag files.

Updated Linux lsof for Linux version 2.1.35.

4.04 April 18, 1997

Supplement Regenerated the 4.04 distribution to correct a non-  
device-cache #define misplacement in the Solaris and  
SunOS dlsof.h. Alexandre Oliva <oliva@dcc.unicamp.br>  
reported the problem.

4.05 April 24, 1997

Corrected an error in 00DCACHE.

Made sure SCO /etc/ps/booted.systems is closed.

Based on an observation by Bela Lubkin <belal@sco.COM>  
that the lsof child had needless file descriptors  
open, closed all but the open pipes between the  
lsof parent and child.

Decommissioned CDC EP/IX support; I no longer have a

test system.

Based on a suggestion from Patrick Connor  
<connor@phreak.csd.sgi.com>, added -xansi to CFLAGS  
for IRIX 5.3 and 6.[234].

Also at Patrick's suggestion changed Configure to  
propagate exact SunOS 4.1.x version to the main  
and library Makefiles.

This allowed the sunos413  
and sunos413cc Configure abbreviations to be  
shortened to sunos and sunoscc.

Updated obsolete argument uses (-H changed to -n)  
in count\_pf.perl\* and watch\_a\_file.perl scripts.

Adjusted Solaris 2.6 lsof for Beta\_Update with tips  
from Casper Dik <casper@holland.Sun.COM>.

Fixed a Solaris 2.4 TCP address reporting bug.

#### 4.06 April 30, 1997

Added a step to the Makefile clean rules that does  
a make clean in the lib subdirectory; suggested by  
Casper Dik <casper@holland.Sun.COM>. (Configure's  
-clean argument already did this.)

Fixed an incorrect awk argument in the sunos\*)  
Configure stanza, reported by Alexandre Oliva  
<oliva@dcc.unicamp.br>.

Added CD9660 (aka ISO) file system support to  
FreeBSD, NetBSD, and OpenBSD with mods and help  
from Kenneth Stailey <kstailey@disclosure.com>.  
(BSDI already had CD9660 support.) While at it,  
added file descriptor system support to BSDI and  
FreeBSD.

Added /kern file system support  
to OpenBSD. The  
support wasn't extended to BSDI, FreeBSD, or NetBSD,  
because it requires Kenneth Stailey's changes to  
/sys/miscfs/kernfs/kernfs.h.

Updated IRIX 6.3 support after getting access to  
a test system, provided by John Paul Morrison  
<John.Paul.Morrison@MultiActive.com>. Improved  
the handling of IRIX 5.1 and greater FIFOs.

#### 4.07 May 12, 1997

Based on AIX problem reports from David Capshaw <David.Capshaw@SEMATECH.Org>, changed the aix\* Configure script stanza to avoid -bnolibpath for gcc (which the GNU loader doesn't grok) and AIX below 4.1.4 (where -bnolibpath hasn't been tested or is known to be unimplemented), and to refuse to use gcc for compiling lsof in AIX versions below 4.1 (because of possible structure alignment problems). Updated 00FAQ appropriately.

Added OpenBSD support for EXT2FS. This support has yet to be tested.

Tested lsof under OpenBSD 2.1.

Activated /kern file system support for NetBSD when Configure senses that /sys/miscfs/kernfs/kernfs.h defines the kern\_target structure. This support has not been tested under NetBSD, although it has been tested under OpenBSD.

Made some simple changes to the BSDI machine.h, suggested by Jeffrey C. Honig <jch@bsd.com>.

Improved handling of alternate dialect Configure abbreviations -- aix and aixgcc, hpux and hpuxgcc, solaris and solariscc, and sunos and sunoscc.

#### 4.08 May 23, 1997

Cleaned up dialect Makefile's, starting with a suggestion from Christopher Schanzle <chris@cam.nist.gov>.

Improved Configure's -clean processing.

Corrected bugs in Solaris lock reporting.

Changed NetBSD Configure stanza to put -I/usr/include before -I/sys.

#### 4.09 June 1, 1997

Adjusted for latest FreeBSD 3.0 release. This required adding a new kernel name cache module for reading BSD-form hashed kernel name cache entries, rnmh.c, to the lsof library, and adding a #define to each machine.h to select it.



Activated rnmh.c for BSDI  
2.1, BSDI 3.0, NetBSD  
1.2, and OpenBSD 2.1.

#### 4.10 June 8, 1997

Adjusted for Linux 2.1.x (x > 35) kernels with  
hashed task structure pointers. Marty Leisner  
<leisner@sdsp.mc.xerox.com> and Jonathan Sergent  
<sergent@io.com> tested the adjustment.

Replaced readdev() stat() calls with lstat() to  
reduce device table and cache entries with the same  
device number and inode values. Added code to  
remove all remaining duplicates. This fixes a  
Linux problem reported by Jonathan Sergent and  
makes device node name output predictable.

Corrected a bug in UnixWare stream file handling  
that prevented searching for the stream file by  
its associated character device name.

Added Pyramid code to determine Reliant UNIX clone  
major device number differently from that of DC/OSx.

#### 4.11 June 12, 1997

Changed Configure to sense that the PTX inp\_[fl]addr  
members of the inpcb structure of <netinet/in\_pcb.h>  
have a struct type and set HASINADDRSTR for use in  
PTX dnode.c  
and dsock.c tests.

Changed PTX version 4.1.4 tests to use 4.1.3 instead.  
Carson Wilson <carson@mcs.com> reported the need  
to do this and tested the change.

Fixed a block device table indexing bug in lib/rdev.c,  
reported by Carson Wilson. The same bug was squashed  
in pyramid/ddev.c.

Added code to the Pyramid Reliant UNIX kread()  
function to compensate for an address boundary  
error in the kernel's /dev/kmem driver.

Verified that lsof compiles and works under AIX  
4.2.1. Added an AIX test for the presence of NFS  
header files, defined HAS\_NFS and adjusted AIX  
dialect sources accordingly.

Based on a suggestion from Gaylord Holder  
<holder@phy.ucsf.EDU>, added DEC OSF/1 code to  
auto-detect the booted file, whence kernel symbol  
addresses are obtained.

#### 4.12 June 24, 1997

Corrected a device number sign extension problem  
in the reading and writing of device cache file.  
The problem was reported by Bela Lubkin <belal@sco.com>  
and he suggested  
a fix.

Fixed an SCO stream device lookup problem. The  
report and solution came from Bela Lubkin

Enhanced the Configure script to enable cross-  
configuration of lsof, based on suggestions from  
Marty Leisner <leisner@sdsp.mc.xerox.com>. A new  
documentation file, 00XCONFIG, describes the process.

Made Pyramid OBJFS support conditional on the  
presence of supporting header files. Corrected  
the Pyramid MkKernOpts script so it generates the  
necessary -D's for the Nile/Jolt architecture.  
Richard Coley <rcoley@pyra.co.uk> helped.

Added another IRIX xfs\_inode variant for 6.2, 32  
bits, no XFS rollup patch.

Tested under UnixWare 2.1.2.

#### 4.13 July 9, 1997

Taught Pyramid lsof to grok ttyfs vnodes with help  
from Richard Coley <rcoley@pyra.co.uk>. Fixed some  
minor bugs in Pyramid FIFO reporting. Eliminated  
use of the Pyramid UCB compatibility library at  
Richard's suggestion.

Eliminated reporting of "strange" inode numbers  
for SCO OSR 3.2v5.0.x HPPS  
files with help from  
Bela Lubkin <belal@sco.com>

Modified port to service name lookup to use a small  
number of getservbyport() calls before reading the  
entire map with getservent(). Changed port reporting  
to represent a zero as '\*' to be consistent with

other prt number reporting tools like netstat.  
Casper Dik <casper@holland.Sun.COM> suggested these changes -- the getserv\*() one to improve performance for large NIS service name maps.

Changed all readdev() functions to make the absence of block devices a warning instead of a fatal error after Brian Redman <ber@ms.com> reported his IRIX 6.4 system had no block devices. (It really did have block devices, but readdev()'s lstat() use caused it to miss them in a directory symbolically linked from /dev/dsk->/hw/disk.) Fixed Brian's real problem by changing the IRIX readdev() to use stat() on /dev nodes if a Configure test shows /hw is readable. Extended the potential to do the same to all readdev() functions.

For consistency and convenience changed some Configure abbreviations and dialect subdirectory names: "decosf" abbreviation and "osf" dialect subdirectory name to "du"; "netbsd" dialect subdirectory name to "n+obsd"; "next3" abbreviation and "next" dialect subdirectory name to "ns"; "sco" abbreviation and dialect subdirectory name to "osr"; "sgi" dialect subdirectory name to "irix"; and "unixware" abbreviation and dialect subdirectory name to "uw".

Added #if/#endif clauses to the AIX rmdupdev() function to avoid clone processing for AIX versions less than 4.1.4. The problem was reported by Toralf Foerster <toralf.foerster@io-warnemuende.de>, who supplied corrective code.

Added support for new style NetBSD inode with i\_ffs and i\_e2fs union members.

Improved Configure and 00FAQ information on Digital UNIX configuration subdirectory with suggestions from Brad Krebs <brad@EECS.Berkeley.EDU>.

4.14 July 22, 1997

Reorganized the Solaris handling of the inode structure header file, ufs\_inode.h, to eliminate VxFS structure definition conflicts for Solaris 2.4, based on information from Greg Earle

<earle@netbsd4me.jpl.nasa.gov>.

Cleaned up some typos and confusion in Configure's help output, based on comments from Bela Lubkin  
<belal@sco.com>

Added a 00DIALECTS file, containing UNIX dialect version numbers, that can be used by Configure and the man page.

#### 4.15 August 15, 1997

Aligned `Configure -help` output better. Removed Configure's 2.6 Beta test adjustments.

Added improved Solaris VxFS configuration and handling, based on information from Greg Earle  
<earle@netbsd4me.jpl.nasa.gov>.

Added socket state -- TCO or TPI -- for socket files at the suggestion of Ian Fitchet  
<I.D.Fitchet@ftel.co.uk>.

#### 4.16 September 25, 1997

Added reporting of TCP/TPI queue lengths and window sizes ala netstat to NAME column. Added -T option to select or de-select TCP/TPI info reporting.

(Window

sizes are only reported for Solaris.)

Fixed anomalies along the way in SIZE/OFF processing for some dialects.

Fixed service name argument processor to allow minus signs as part of the name. Consequently this disallows names with embedded minus signs from being specified as the start of a range.

Added 00FAQ entries explaining why lsof won't find a file being edited with vi, why window sizes aren't reported for all dialects, and what the "no more information" message means.

Forced Pyramid CC to be /usr/ccs/bin/cc to avoid accidental use of the BSD variant in /usr/ucb/cc.

Added support for Linux glibc2, including a Configure test; cross-Configure support (00XCONFIG); and much unfortunate and risky sleight-of-hand in lsof Linux dialect header and source files, forced upon lsof

by incompatibilities between Linux kernel and glibc2 header files.

Included in scripts/identd.perl5 a Perl 5 implementation of an identd server, using lsof, provided by Kapil Chowksey <kchowksey@hss.hns.com>.

Updated IRIX 6.4 xfs\_inode guess.

#### 4.17 October 14, 1997

Added -V option for verbose search result reporting. Verbose reports are prepared for failure to locate file names, command names, Internet addresses or files, login names, NFS files, PIDs, PGIDs, and UIDs.

Augmented Linux NFS file test to cope with kernels whose NFS code is in a loadable module. Need for the test was pointed out by Jonathan Sergent <sergent@csociety.ecn.purdue.edu>. The change required that Linux have private dmnt.c source,

Completed a Linux 2.1.57 port on a system provided by Jonathan Sergent.

#### 4.18 October 25, 1997

Eliminated memory leaks in alloc\_lfile(), lkup\_port(), and NEXTSTEP's process\_text() function.

Added recognition of OpenBSD 2.2 in Configure, supplied by Kenneth Stailey <kstailey@disclosure.com>.

Consolidated print\_file() functions to use the one in lib/prtf.c. Made it configurable and changed it to size print columns dynamically.

!!! WARNING !!!

WITH DYNAMICALLY SIZED PRINT COLUMNS LSOOF 4.18 PRODUCES OUTPUT SIGNIFICANTLY DIFFERENT FROM THAT OF PREVIOUS REVISIONS. LINES ARE GENERALLY SHORTER AND THERE IS GENERALLY LESS BLANK SPACE BETWEEN COLUMNS AND THE ITEMS IN THEM. THERE ARE NO LONGER ANY SPACES BETWEEN DEVICE NUMBER ELEMENTS, ONLY COMMAS.

!!! WARNING !!!

Added special types and print specification modifiers for file size and offset to handle UNIX dialects with 64 bit sizes and offsets. Paul Eggert <eggert@twinsun.com> reported the need for this addition.

With Paul Eggert's help picked lint from the lsof library, the main level lsof sources, and the Sun dialect sources.

Added documentation, including the file 00LSOF-L, about the lsof-l LISTSERV.

Added support for Reliant UNIX on the RM600. Bob Passarella <rmpassar@pyramid.com> supplied the changes. Kevin Smith <kevin@pyramid.com> helped arrange test systems. While incorporating Bob's changes, modified lib/rnch.c to handle kernel ncache structs whose name is accessed via a char \*, rather than in a char array.

Changed #include order of <sys/socketvar.h> for Solaris 2.x. W. Richard Stevens <rstevens@kohala.com> pointed out the need to do this.

#### 4.19 October 30, 1997

Changed Pyramid Reliant RM600 proc scan to skip SSYS (p\_flag) processes, since they don't seem to have a readable u\_cdir vnode.

Enabled Pyramid Reliant UNIX kread() work-around for DC/OSx, too, since its read(/dev/kmem) kernel driver seems to share the page boundary bug this work-around circumvents.

Changed SzOffFtm\_d and SzOffFtm\_dv (new formats at 4.18 to print size and offset) from signed to unsigned. Setting them signed at 4.18 was an oversight.

Plugged a memory leak that caused the loss of 130 bytes per repeat-mode pass. Fixed it with a simple work-around in main(). Lionel Cons <Lionel.Cons@cern.ch> reported the leak.

#### 4.20 November 11,

1997

Tested under BSDI 3.1.

Added support for Reliant UNIX Mesh IPC files with help from Billy Ho <bho@pyramid.com>.

Added support to Digital UNIX lsof that uses the libmfs tag\_to\_path() function (when it exists) to look up AdvFS path names. The idea and sample code came from Dean Brock <brock@cs.unca.edu>. Converted Dean's code into more general purpose support for private name cache lookups via the HASPRIVNMCACHE #define in the dialect machine.h file and code conditional on it in the printname() function.

Taught Digital UNIX lsof to recognize NFS3 file systems. Corrected Digital UNIX lsof DEVICE column alignment.

#### 4.21 December 1, 1997

Squashed bug, introduced at revision 4.18, that resulted in double reporting of each selected PID when terse mode (-t) was specified.

Corrected minor bug, also introduced at 4.18, that might cause an extra print\_proc() pass when one PID has been specified.

Added -R to lsof options in scripts/idrlogin.perl\*. The option should have been there -- it was supposed to be mandatory for PGID reporting -- but a bug, corrected in revision 4.18, previously made -R unnecessary.

Enabled configuring for BSDI BSD/OS 4.0 per a suggestion from Jeff Honig <jch@bsd.com>.

Enabled replacement of scoff\_t with off64\_t (scoff\_t is used to type r\_size and r\_localsize in the rnode struct) for IRIX 5.3 systems that have the NFS kernel rollup patch (1477). This compensates for SGI's failure to distribute an updated <sys/fs/rnode.h> with their patch.

Validated under Linux 2.0.3[12], Linux 2.1.64, and NetBSD 1.3.

Added FreeBSD root directory reporting, courtesy of Dan Nelson <dnelson@emsphone.com>.

4.22 December 15, 1997

Made adjustments for Linux 2.1.7[02].

Improved NAME information for Linux UNIX domain sockets.

Added option `+|-M` to control the reporting of portmapper registration information in square brackets after the TCP or UDP port or service name.

Kenneth

Stailey <kstailey@disclosure.com> suggested the feature and provided sample code from OpenBSD.

Reporting is disabled by default in the distribution and may be enabled with `+M`; if `lsof` is compiled with `HASPMAPENABLED` (e.g., from `machine.h`), reporting will be enabled by default and can be disabled with `-M`.

Changed the `-w` option to `+|-w` to match the syntax of the `+|-M` option and to eliminate any options that flip meaning when a symbol is defined at compile time. For both `+|-M` and `+|-w`, specifying ``-'` when the default state is disabled or specifying ``+'` when the default state is enabled causes no problems.

!!!WARNING The `-w` option has changed in `lsof` 4.22. WARNING!!!

Made the `+|-` prefix legal for most options, but didn't document it in the man page or help panel.

Most options that disable something -- e.g., `-b`, `-C`, `-n`, `-P` -- now disable when the prefix is ``-'`

and enable when it is ``+'`. Since the states these options disable are enabled

by default, I chose to

avoid documentation complexity and confusion by not mentioning that they can be used with the ``+'` prefix.

Condensed the help panel.

Made sure Digital UNIX Configure stanza puts normal include path (e.g., `/usr/include`) before system include paths.



Added IPX socket information reporting to Linux with help from Jonathan Sergent <sergent@purdue.edu>.

#### 4.23 January 16, 1998

Fixed conflict arising from the quondam replacement of the Sun Solaris <netdb.h> with a BIND/BSD version.

With help from Jonathan Sergent <sergent@purdue.edu> developed a /proc file system based Linux lsof.

It needs some Linux 2.1.x release to work -- I'm not sure which, but I tested under 2.1.72, 2.1.76, and 2.1.79. The Configure script selects special sources for this lsof, so the full lsof distribution now contains both /dev/kmem and /proc based sources for Linux lsof. An optional kernel mod, written by Jonathan, enhances the /proc-based lsof ability to

recognize IPX socket files. Reorganized and augmented the Linux sections in 00FAQ to explain the two types of Linux lsof.

Defined DOSTAT\_FUNCTION for dostat() in misc.c to select the function, stat() or lstat(), it will use. DOSTAT\_FUNCTION is normally undefined, defaults to lstat(), and is only defined for the /proc-based Linux lsof in its dlsof.h.

Made conditional on the presence of IRIX 6.4 XFS rollup patch #6 an XFS node change introduced in revision 4.16. Identified the patch with help from John R. Vanderpool <fish@daacdev1.gsfc.nasa.gov>.

Added NFS node compensation for NetBSD 1.3. The code and suggestion for it was supplied by Jean-Luc Richier <richier@imag.fr>.

Added diagnostic messages to the /dev/kmem-based Linux Mksrc script to report errors during the construction of the kernel name cache header file, knccache.h. Added 00FAQ information on knccache.h.

Added a new Linux test host, running 2.0.33 and Glibc, provided by Steve Logue <stevel@mail.cdsnet.net>.

Ported to PTX 4.1.3 and 4.4.2. Adjusted lib/rnch.c for 4.4.2 to allow customization of additional ncache struct element names.

4.24 January 28, 1998

Changed /proc-based Linux lsof offset test to use "/" instead of "/etc/passwd".

To assist Jim Mintha <jim@geog.ubc.ca> with the packaging of lsof for Debian Linux, added a DEBIAN\_LINUX\_LSOF #define to trigger the activation of special system map file location code in the /dev/kmem-based dproc.c.

Applied modification to dialects/bsdi/dlsof.h from Ingimar Robertson <iar@skyr.is>, enabling lsof to compile for BSDI BSD/OS 2.0.

Corrected a documentation error in 00DCACHE, pointed out by Thomas Anders <anders@hmi.de>. The error was created when the -V option was added at lsof 4.17.

Made IRIX 5.3 through 6.3 lsof aware of IRIX SCSI tape devices (e.g., /dev/tape). Dave Olson of SGI and Randolph J. Herber of FNAL provided valuable advice, and Igor Schein <ischein@air-boston.com> helped test.

Added a machine.h symbol (NEVER\_HASDCACHE) that prevents Customize from offering to change HASDCACHE. The symbol may appear anywhere in machine.h -- e.g., in a comment. Included the symbol in a comment of the HASDCACHE section of the /proc-based Linux lsof machine.h, and accompanied it with warnings against #define'ing HASDCACHE. Did the same thing for WARNDVACCESS (NEVER\_WARNDEVACCESS is the suppressant.)

4.25 February 7, 1998

Corrected an IRIX mis-cast of file offset (position). Igor Schein <ischein@air-boston.com> reported the problem. This was offered as a patch to 4.24. Picked some lint Igor pointed out.

At Igor's suggestion added an optional decimal digit size argument to the -o option. This argument specifies how many file offset decimal digits can follow "0t" before lsof switches to a "0x..." form. The argument size specification doesn't count the two characters of the "0t". A size of 0 means

unlimited.

The default is OFFDEC DIG (8), preserving compatibility with existing lsof output; it can be changed by the lsof builder. When size is specified with -o it does not force offset display; -o without a size still must be used to do that.

Added an IRIX 6.2, 32 bit system, XFS node patch, courtesy of Ulrich Bernhard <rzubu@rzu.unizh.ch>.

For my own convenience enabled Configure to use /usr/local/bin/gcc for NEXTSTEP. This allows circumvention of a gcc 2.8.0 ranlib problem on my test 3.1 `040 cube.

Added flags recommended by the RISC/os and Ultrix compilers for the updated (and longer) main.c.

Updated FreeBSD cd9660\_node.h Configure test.

4.26 February 17, 1998

Added shared process group processing for IRIX 5.3, and IRIX 6.1 and above, based on investigation of a bug report from Igor Schein <ischein@air-boston.com>. Igor helped test this addition.

Improved handling of file system name arguments. It's now done in a manner similar to fuser.

The

-f argument forces path names to be considered as simple files, rather than as file system names.

The +f flag forces them to be considered as file system names. Normally path arguments are considered file system names when they match a mounted-on directory in the system's mount table, or when they match a mounted file system's block device. Igor Schein helped test this change.

Igor also suggests that the proper compilation of the IRIX 6.4 proc structure after patch 2536 has been installed may need -DPIOMEMOPS. So lsof's MkKernOpts script was updated to propagate that option from CCOPTS in /var/sysgen/system/irix.sm, even though patch 2536 doesn't add -DPIOMEMOPS to it. Added a 00FAQ item on this patch.

Added a fatal warning message about names forced to be file system names (with +f) that have no

match in the mount table.

Improved the -V message for files and file systems for which no open files were found. Added reporting of /proc file and file system search failures.

Did some code reorganization to combine the multiple `ck_file_arg()` functions into one. Moved the new function from the library to the top level and put it in `arg.c`; moved the usage function from `arg.c` to a new top-level source file, `usage.c`, to balance top-level source file size. The new `usage.c` depends on `version.h`; `arg.c` no longer does.

Added flag recommended by the DU compiler for the updated (and longer) `main.c`.

#### 4.27 March 6, 1998

At the request of Igor Schein <ischein@air-boston.com> added a conditional repeat mode option, using the '+' prefix to the 'r' option. +r operates as does -r with the exception that it exits the first time no open files have been listed during a cycle. The exit code will be zero when any open files have been listed; one, if none were ever listed.

Ported `lsf` to HP-UX 11.0 with the help of Richard Allen. This port hasn't been tested on a 64 bit kernel; I'm sure it won't work there without more mods. It may not work on PA 2 architectures; I've only tested it under PA 1 and a separate, busy tester reported PA 2 problems that I've been unable to investigate.

In anticipation of getting access to a 64 bit HP-UX kernel and the pending start of the Solaris 2.7 Beta test (It will have 64 bit kernel addressing.), started adding support for 64 bit kernel pointers. This includes: ubiquitous use of the `KA_T` cast for kernel pointers; a format to print them, `KA_T_FMT_X`; a function to print them, `print_kptr()`; and modifications to most kernel-related functions -- e.g., `process_file()`, `process_node()`, `process_socket()`, `readvfs()` -- to process kernel addresses as `KA_T` types.

Fixed minor bug in handling path name arguments that end with a `/'.

Removed support for RISC/os; its test system is no longer available.

Made modifications to insure that lsof output doesn't contain non-printable characters. All such characters

are now printed in the printf form

"\x%02x". Several new common functions were installed in misc.c to support "safe" printing.

This second major modification in 4.27 to common and dialect code could have introduced bugs not yet detected.

4.28 March 10, 1998

Refined unprintable format to use \b, \f, \r, \n, \t, and ^\* (for CTRL) forms. Corrected omission of safestrprt() use for field output command name. These changes were offered as patches to 4.27.

Made space an unprintable character (\x20) in the COMMAND column; printable elsewhere, including the NAME column, field output, and error messages.

Made sure FD column is parseable as a single entity -- i.e., has no embedded space. Thus, if the access mode is unknown but there is a known lock mode, (a very rare case) the access mode will be printed as `-'.

Picked lint with gcc 2.8.0 under Solaris 2.6.

With the help of Dave Olson of SGI identified a proc struct element that should have been added to

<sys/proc.h> by IRIX 6.4 patch 2536. Added a work-around for it to the lsof Configure script.

Igor Schein <ischein@air-boston.com> identified that the patch caused a proc structure length complaint from lsof. Removed an obsolete 00FAQ item on the patch, installed at lsof 4.26, explaining that no solution was yet available.

Added a 00FAQ item on how BIND installs its own header files, including <netdb.h>, which may cause the rpercent struct definition to vanish. Solaris

has an automatic lsof work-around, but that hasn't been (and probably can't be) propagated to all dialects supported by lsof. The 00FAQ item recommends re-installation of the vendor header files that BIND has replaced. (Others include <rpcent.h>, <sys/bitypes.h>, and <sys/ctypes.h>.)

Made AIX AFS fixes.

#### 4.29 March 26, 1998

Corrected bug in Internet address matching. The matching formerly stopped if the foreign address matched, thus failing to check the local address for a match. That led to a possible false "Internet address not located" warning (i.e., in response to -V) about the local address, when both foreign and local addresses were specified with -i. This correction was offered as a patch to 4.28.

Changed readmnt() usage in an attempt to defer mount readlink() and stat() delays until they are necessary.

Corrected two bugs in the Digital UNIX readdev() function. Made the correction available as a patch to 4.28 and regenerated the 4.28 DU binaries.

Added a missing argument to a print-kptr() call in the HP-UX dsock.c. The missing argument causes a fatal gcc error. The problem was reported by Eyal Shaynis <eyal.shaynis@telrad.co.il>. The fix was offered as a 4.28 patch.

Adjusted for Digital UNIX 4.0D; the spec\_node structure is now defined in <sys/specdev.h>. Kris Chandrasekhar <Kris.Chandrasekhar@digital.com> identified the need for the adjustment.

Incorporated a bug fix from Brian McAllister <mcallister@mit.edu> to the DU readmnt() function. This fix was offered as a patch to 4.28.

Added "safe" printing to a SunOS clone device error message.

Corrected bug in tabling of Linux /proc-based lock

info.

Corrected bug in handling of SunOS TLI streams.  
Dan Farmer <zen@trouble.org> reported the problem.

Added a Solaris 2.6 work-around to keep the BIND  
<sys/bitypes.h> from colliding with the Solaris  
<sys/int\_types.h>.

Strengthened the Configure test for /proc-based  
Linux lsof, based on a report from Marty Leisner  
<leisner@sdsp.mc.xerox.com>.

Tested on OpenBSD 2.3.

Made AIX changes that allow use with 3.2.5. The  
changes were suggested and tested by Brett Hogden  
<hogden@rge.com>.

Added Solaris 2.6 AFS support. Disabled reporting  
of some node numbers for Solaris 2.5 and above open  
AFS files. The node number computation algorithms  
used for SunOS 4.1.x and Solaris less than 2.5 no  
longer always work under Solaris 2.5 and above.

4.30 April  
9, 1998

Corrected a pid structure member naming error for  
UnixWare < 2.1.2. The problem was reported by  
Richard van Meurs <vanmeurs.anva@atriserv.nl>. He  
supplied the correction. This was offered as a  
patch to 4.29.

Had a report from Igor Schein <ischein@air-boston.com>  
that IRIX 6.4 patch 2839 is another SGI kernel  
patch, along with 2536, that changes the size of  
the proc structure in the kernel without changing  
the proc structure in <sys/proc.h>. Upon further  
investigation found that the effect of these patches  
on the proc structure is not consistent. Therefore,  
dropped the Configure patch test for IRIX 6.4 and  
made the code in irix/dproc.c slightly more tolerant  
of proc structure size differences for IRIX 6.4.  
Igor help test the change.

Corrected Solaris >= 2.5 AFS inode number generation.  
Craig Everhart <Craig\_Everhart@transarc.com> helped  
find the cause of the problem. This was offered as

a patch to 4.29.

Refined the

Linux /dev/kmem-based glibc evasion for the timeval structure to make it work with glibc version 2.0.7. This required defining a new global symbol, TIMEVAL\_LSOF, default timeval, that the /dev/kmem-based Linux lsof can set to its private glibc timeval name, distinct from the kernel timeval name.

Added support for Alpha to the /dev/kmem-based Linux lsof. Alexandre Oliva <oliva@dcc.unicamp.br> provided a test system. Added an item to 00FAQ about lsof, the Alpha processor, and Linux.

Added a 00FAQ item about lsof year 2000 compliance. Basically it says lsof is probably compliant, because its only date or time computations are done with time\_t values, but I haven't done any specific Y2K validation. I don't have plans to do any.

Added support for UnixWare 7. Chris Daniels <chrisd@dlpco.com> provided a test system and Don Draper <dond@sco.COM> provided technical information. Added BFS and SFS file system support to lsof for UW 2.1.[12] and 7.

Updated

Solaris VxFS support for VxFS 3.2.1. Greg Earle <earle@netbsd4me.jpl.nasa.gov> reported the need for the update. Greg and Roger Klorese <rogerk@veritas.com> provided technical information. Scott McClung <mcclung@primenet.com> tested.

Changed IRIX XFS patch detection in anticipation of learning there are multiple XFS patches for IRIX 6.4 that require different versions of the lsof-invented xfs\_inode structure.

4.31 April 21, 1998

Added a VxFS #if/#endif wrap to a section of the HP-UX dnode.c that wasn't properly protected. The problem was reported by Peter Klosky <PKlosky@bdm.com>. This was offered as a patch to 4.30.

Added support for Solaris 2.7 (first Beta release). Mike Sullivan <Mike.Sullivan@Eng.Sun.COM> provided



technical advice and helped test. Charles Stephens  
<cfs@jurassic.eng.Sun.COM> also helped test.

Fixed bug in /proc-based Linux that caused it to  
access /proc/mounts excessively. Marty Leisner  
<leisner@sdsp.mc.xerox.com>  
provided a syscall  
trace that identified the bug. The fix was offered  
as a patch to 4.30.

Adjusted the IRIX 6.4 private structure definition  
for the XFS node to accommodate patch 2970. Igor  
Schein <ischein@air-boston.com> identified the  
patch and the required adjustment.

4.32 May 11, 1998

Corrected Solaris 2.7 code for reporting PCFS  
(floppy disk) node numbers. Casper Dik  
<casper@holland.sun.com> supplied the fix. The  
fix was offered as a patch to 4.31.

Corrected a bug in conditional repeat mode handling  
pointed out by Igor Schein <ischein@air-boston.com>.  
This was offered as a patch to 4.31.

Improved reporting of AIX open(/dev/memory device)  
errors.

Corrected a Solaris < 2.5 KA\_T declaration error,  
pointed out by Robert Kiessling <robert@easynet.de>.  
Changed KA\_T from a #define to a typedef for all  
dialects to prevent future problems of this kind.

Changed the sample Perl 5 script big\_brother.perl5  
to report a four digit year  
from localtime().

Added support for AIX 4.3[.1]. Bill Pemberton  
<wfp5p@tiger.itc.virginia.edu> provided a test  
system. Andrew Kephart <akephart@austin.ibm.com>  
and Tom Weaver <tvweaver@austin.ibm.com> provided  
technical assistance. Niklas Edmundsson  
<nikke@ing.umu.se> did 4.3.1 testing.

Added -qmaxmem option to CFLAGS for an AIX compilation  
with an xlc version 4.x compiler.

Adjusted Linux socket handling for changes in the

AX25 members of the sock struct. Richard Green <rtg@tir.com> pointed out the problem. Tested /dev/kmem-based lsof under Linux 2.0.34.

#### 4.33 May 22, 1998

Added generic IPv6 support to common lsof sources and specific IPv6 support to AIX sources. Andrew Kephart <akephart@austin.ibm.com> supplied the additions and helped with testing. Bill Pemberton <wfp5p@tigger.itc.virginia.edu> provided a test system. The modification affected sources for every dialect, whether it supports IPv6 or not, by changing the interfaces to the common Internet address function `ent_inaddr()`.

Added support for the NetBSD UVM virtual memory system. Paul Kranenburg <pk@cs.few.eur.nl> supplied technical details.

Bracketed HP-UX 11 use of <sys/spinlock.h> with `#if/endif _KERNEL`.

Corrected printing of PCB address in DEVICE column for IRIX.

#### 4.34 June 26, 1998

Updated 00FAQ to discuss TCP and UDP ports private to the AIX kernel and 00README to describe how ACLs can be used to give lsof permission to read the kernel memory devices. Add information to 00FAQ and 00README about other OpenBSD architectures where lsof is reported to compile and run. Added section to 00FAQ discussing how an incorrect loader path environment variable value can prevent lsof from loading correctly.

Improved Solaris namefs and doorfs support so that it is now possible to search for an open VDOOR file by the path name of its fattached file system object. Igor Schein <igor@txc.com> requested the ability to do such a search. Even with the change, lsof can't always identify path names for open VDOOR files.

Also at Igor's request, improved reporting of information on open Solaris VCHR files that share

a common vnode, and Solaris UNIX domain socket files.

Corrected print\_kptr() argument error in PTX dnode.c, reported by Mark Price <mprice@sequent.com>. Compensated for ncache element naming differences, introduced at PTX 4.4.2; Kurtis D. Rader <krader@sequent.com> reported the problem.

Changed output column title from INODE to NODE to better reflect the column's contents of node IDs for more than just inodes.

Improved Configuration and processing for Solaris AFS. Corrected AIX AFS 3.4 afs\_rwlock\_t simulation.

Corrected a cast problem with two AIX knlist() calls, thus quieting an AIX 4.2.1 compiler argument type warning. Jon Champlin <champlin@us.ibm.com> reported the problem.

Added support to most dialect versions (exception: /proc-based Linux) to warn when the identity of the kernel where lsof was compiled doesn't match the running identity. The warning can be suppressed with -w. Note: determining AIX state requires calling oslevel, a potentially slow operation. Jon Champlin <champlin@us.ibm.com> suggested this addition.

!!!! WARNING !!!!   !!!! WARNING !!!!   !!!! WARNING !!!!

Those using the lsof cross-configuration capability (see 00XCONFIG), should be aware that the kernel identity test feature introduces two new basic cross configuration environment variables, LSOF\_ARCH and LSOF\_VSTR.

!!!! WARNING !!!!   !!!! WARNING !!!!   !!!! WARNING !!!!

Identified a situation where a Solaris UNIX domain socket name is known and can be searched for by name; added the necessary code.

4.35 July 17, 1998

Made the kernel identity check an option with the HASKERNIDCK #define in machine.h. Enabled altering

of HASKERNIDCK with the Customize script. Added a clause to the help output that indicates the build-time HASKERNIDCK status.

Added more information to the NAME column for Solaris UNIX domain sockets. Made them searchable by their clone device path name. Igor Schein <igor@txc.com> requested this.

Completed the HP-UX 11 port with support for its optional 64 bit kernel. Rich Rauenzahn <rrouenza@cup.hp.com> provided a test system. Corrected errors with HP-UX 11 lock reporting and private kernel structure and type definitions. Added support for HP-UX NFS3 files.

Limited mount table warnings -- e.g., when -b is used -- to one set per mount point.

Fixed some mount table scanning and usage bugs, including one in Solaris, reported by Kjetil Torggrim Homme <kjetilho@ifi.uio.no>.

#### 4.36 August 4, 1998

Made corrections and additions to IPv6 support and to AF\_ROUTE socket handling, supplied by Jean-Luc Richier <Jean-Luc.Richier@imag.fr>. Jean-Luc's additions provide IPv6 support for the Inria IPv6 implementations on FreeBSD and NetBSD.

Fixed two Solaris 2.5, 2.5.1, 2.6 and 2.7 TCP and UDP host name or IP address reporting bugs, reported by James Mathiesen <James-Mathiesen@deshaw.com>. This fix was offered as a patch to 4.35.

Updated the Customize script to cause ENTER to use all defaults. Amir J. Katz <amir@ndsoft.com> suggested this and helped test the changes.

Updated Solaris ICMP and IP stream handling, based on a report from Igor Schein <igor@txc.com>.

Fixed a bug in the Digital UNIX mount table handling, reported by Bob Ward <bward@thehartford.com>. While working on the bug, found and updated some obsolete AdvFS code. This fix was offered as a

patch to 4.35.

#### 4.37 September 15, 1998

Deactivated SGI IRIX support and archived revision 4.36 sources and binaries in pub/tools/unix/lsof/OLD.

Improved performance of FD searching. This was offered as a patch to 4.36.

Amir J. Katz <amir@ndsoft.com> pointed out that ranlib isn't needed for AIX or Solaris.

Made

appropriate Configure script changes.

Fixed a file offset reporting bug for HP-UX VCHR and VBLK device nodes located on a VxFS root. Doug Siebert <douglas-siebert@iowa.edu> reported the bug. The fix was offered as a patch to 4.36.

Resolved an HP-UX root device name reporting bug, partly caused by an out-dated local copy of the <sys/mount.h> mount structure, by generating a local header file with the structure that can be compiled without needing \_KERNEL defined. Doug Siebert also reported this bug.

Changed some dialect source code -- Digital UNIX, Solaris, SunOS, and UnixWare -- to make more consistent with ps the user ID lsof reports in the USER column. Added a 00FAQ entry about it. Igor Schein <igor@txc.com> reported the Solaris and SunOS lsof inconsistencies with what ps(1) reports.

Ported lsof to Pyramid ReliantUNIX 5.44.

Added brackets as comments to case, do, done, else, endif, esac, if, and while statements in Configure to assist in navigating its clauses.

Added more Linux 2.0.x glibc work-arounds.

Added support for UnixWare 7.0.1.

Ralph Forsythe <ralph@contact-paging.com> provided a new FreeBSD test system.

#### 4.38 November 25, 1998

Added support for recent FreeBSD 3.0 distributions.  
A 3.0 test system was provided by David O'Brien  
<obrien@Nuxi.com>. This was offered as a patch  
to 4.37.

Updated the scripts/ldrlogin.perl\* files to look  
for sshd processes in addition to rlogind and  
telnetd ones.

Added support for DU 5.0 Beta. Berkley Shands  
<berkley@cs.wustl.edu> provided a test system.

Added support for OpenBSD 2.4 with changes supplied  
by Kenneth Stailey <kstailey@disclosure.com>.

Changed the Solaris 2.7 tests and documentation to  
Solaris 7.

Made some changes to the header files for NEXTSTEP  
3.3 and added support for OPENSTEP 4.x with help  
from Michael A. Hovan III <mhovan@BLaCKSMITH.com>  
and Carl Lindberg <Carl\_Lindberg@BLaCKSMITH.com>.

The combined

dialect subdirectory is named n+os.

One of Carl's changes propagates RC\_CFLAGS to the  
library Makefile. Timothy J. Luoma <luomat@peak.org>  
helped test under NEXTSTEP 3.3 and OPENSTEP 4.2.

Made UW 7.x version sensitive to the presence of  
ptf7038. Added peer PCB address to Unix domain  
socket Name column, even when a path name has been  
located. Information for these changes was supplied  
by Francis Le Bourse <flebourse@intelcom.fr>. Lee  
Penn <lee@dlpco.com> provided a test system.

Tested lsof under OSR 5.0.5 on a test system also  
provided by Lee Penn.

Made path name argument processing more tolerant  
of errors per a suggestion from Julian Gordon  
<julian@cadence.com>.

Acquired a new UnixWare 2.x test system, generously  
provided by Computer Classroom, Inc. -- Matthew  
Thurmaier <matt@compclass.com>, Ken Laing  
<ken@compclass.com>, and Andrew Merrill  
<andrew@compclass.com>. Updated Configure to accept  
a UnixWare version of 2.1.3.

Updated kmem-based  
lsof for Linux 2.0.36.

Updated NetBSD sources for a change in a UVM virtual  
mapping header file.

Corrected a cache allocation bug in Sun format  
kernel name cache handling. The bug only shows up  
when the kernel name cache is inaccessible.

#### 4.39 December 29, 1998

Corrected problems with large device number handling  
for 64 bit Solaris 7. The problems were reported  
by Steve Bellenot <bellenot@math.fsu.edu>. Steve  
helped test the fixes. The fixes were offered as  
two patches to lsof 4.38.

Improved FreeBSD Configure operations for header  
files that must be obtained from the kernel source  
tree, based on a suggestion from David O'Brien  
<obrien@NUXI.com>.

For Bela Lubkin <filbo@deepthought.armory.com> made  
optional with +f[cfn] the display of file structure  
address, shared use count, and node structure  
address. /proc-based Linux doesn't implement this  
feature, because it doesn't read kernel structures  
from kernel memory. Modified the PTX -X option  
to  
take advantage of the new file structure display  
option. Added shared.perl5 to the scripts/  
subdirectory to provide an example of how +f[fn]  
might be used to track shared file descriptors and  
files.

Added more /dev/kmem-based Linux glibc evasions,  
provided by Jeff Johnson <jbj@redhat.com> and Maciej  
Lesniewski <nimir@kis.p.lodz.pl>. Jeff helped test  
them on various Linux architectures.

Tested on AIX 4.3.2; no changes were required.  
Doug Crabill <dgc@purdue.edu> provided a test  
system.

Fixed -c option to detect missing command name when  
following option begins with `+'.

4.40 January 25, 1999

Added support for using the CDS compiler for Reliant Unix 5.44 and above. Made Reliant Unix MIPC support optional, dependent on the presence of <sys/mipc.h>.

Based on a report from Michael Schmitz <MSchmitz@lbl.gov> that /dev/kmem-based lsof misbehaves on a Linux 2.0.x m68k kernel without module support, made the absence of query\_module() or get\_kernel\_syms() Linux kernel support a fatal error. Updated relevant sections of 00FAQ to reflect the change.

Added the ability to force the Linux Configure stanza to use the /proc or /dev/kmem source base via a LINUX\_BASE environment variable specification. This is a cross-configuration assist.

Added "+D <dir>" and "+d <dir>" options for directory searching. +D searches the entire tree, starting at <dir>, including <dir>, its contents, and its subdirectory branches; +d searches only <dir> and its contents, but not its subdirectory branches. Improved lsof's searching of the specified name list to compensate for anticipated long lists from +d and +D.

Made an egrep in the Solaris Configure stanza usable by the standard and XPG4 egrep's. Kenneth Stailey <kstailey@disclosure.com> pointed out the improvement.

Fixed bugs in /dev/kmem-based Linux and UnixWare Unix domain socket name searching.

Changed a Linux Alpha #include to be conditional on the presence of its named header file, so that lsof will compile on Red Hat 5.1 and 5.2 (Linux kernel 2.0.35) where the header file is absent. The problem was reported by Alexandre Oliva <oliva@dcc.unicamp.br>.

Fixed an AIX 4.3+ bug in procinfo struct space allocation, reported by Jeff Stewart <jws@purdue.edu>. This was offered as a patch to 4.39.

Added an lstatsafely() function to offer the same isolation for lstat() calls that statsafely() offers



for stat() calls. This made DOSTAT\_FUNCTION no longer necessary, so deleted it.

With help from Laurent P. Montaron <lpm@sequent.com> ported lsof to PTX 4.4.4. Laurent did a monumental job of identifying TCP/IP changes by their TCP version, rather than by their PTX (With mix 'n match PTX and TCP/IP versions, the PTX version often has no bearing on the TCP/IP version.), and changed the Configure script and pre-processor #if/#else/#endif blocks to match. He also updated Unix domain socket handling for PTX TCP/IP versions 4.5 and above.

Updated CLIENT handle acquisition of fill\_portmap() in print.c to use the more modern RPC function clnt\_create() in place of clnttcp\_create() where possible. PTX 4.4.4 requires clnt\_create().

4.41 February 27, 1999

Added FreeBSD 3.1 and 4.0 support with help from Sheldon Hearn <axl@iafrica.com>, David O'Brien <obrien@NUXI.com>, and John Polstra <jdp@polstra.com>.

Corrected bungled AIX 4.3+ patch that went into lsof 4.40.

Reorganized the Configure script to improve Makefile construction. A specific impetus for this was to allow FreeBSD system-wide make flags to be propagated to the lsof Makefiles, but other goals were to make sure that the DEBUG= make entry can over-ride standard CFLAGS values, and to better manage the identification of compilers and their versions. Two compiler-related values may now be supplied in environment variables: 1) the compiler path in LSOF\_CC; and 2) the compiler version in LSOF\_CCV. 00XCONFIG documents them.

Added support for Pyramid Reliant Unix bsdfs, msckfs, and sockfs file systems.

Added an optional LSOF\_CINFO string to Configure, producing a CINFO string in selected Makefiles, producing a #define LSOF\_CINFO in selected version.h header files. The purpose of this is to allow

Configure the option to propagate information to the lsof -v output. It is now used for Linux to identify the code base, and for HP-UX 10.30 and 11.0 and Solaris 7 to identify the kernel bit size.

Added system information to NEXTSTEP and OPENSTEP -v output, from the second line of hostinfo's output.

Fixed a login name buffer overflow problem in the processing of -u option values. This was offered as a patch to 4.40. !!!THIS IS A SERIOUS STACK OVERFLOW BUG; A LINUX EXPLOIT EXISTS FOR IT THAT OPENS A BASH SHELL WITH LSOFS AUTHORITY -- E.G, SETGID(KMEM) POWER!!!

Improved the Solaris mount table filter so the volume manager's fake mount point, "/vol", is ignored and doesn't supplant "/" in NAME column path assemblies. Igor Schein <igor@txc.com> reported this bug and provided important help in finding it. This was offered as a patch to 4.40.

Changed the Linux /dev/kmem-based lock ownership test to answer a problem reported by Tom Christiansen <tchrist@jherreg.perl.com>. This was offered as a patch to 4.40.

Installed an HP-UX 11 patch, suggested by Kevin Vajk <kvajk@cup.hp.com>, that adjusts a private lsof kernel header file, derived via Q4, to correspond to an HP-UX patch bundle.

Made NetBSD 1.3I sockproto structure adjustment.

4.42 March 30, 1999

Fixed a typo in the HP-UX dfile.c that caused +fF and +fN output controls to swap effect.

Enabled for OpenBSD 2.5 per notice from Kenneth Stailey <kstailey@kstailey.tzo.com>

Made more VM accommodations for FreeBSD 4.0.

Improved file system search reporting to include path name components when they're available,

instead  
of mindlessly reporting the file system name in  
the NAME column. Guy Dallaire <gdallair@geocities.com>  
brought the need for this change to my attention.

Updated Solaris 2.6 VxFS for Veritas Oracle Database  
Edition 2.0, VxFS version 3.3, and VxVm version  
2.5.4, based on a report from Chris Kordish  
<chris.kordish@East.Sun.COM>. Chris kindly provided  
a test system.

Improved HP-UX ipc\_s patch detection in Configure,  
response in ../dialects/hpux/hpux11/ipc\_s.h, and  
documentation in 00FAQ, Kevin Vajk <kvajk@cup.hp.com>  
helped test.

Added to Customize the option to suppress HASKERNIDCK  
selection for specified dialects. Suppressed it  
for /proc-based Linux lsof, and removed its test  
and code from there. Tin Le <tin@netimages.com>  
alerted me to the need for this update.

Ported to official Digital UNIX 5.0 release.

Changed DU lsof to use the knlist(3) function when  
no kernel file has been specified with -k. This  
change was suggested  
by Erich Wimmer  
<Erich.Wimmer@digital.com>.

Updated Configure for latest NetBSD (1.3I?) with  
UVM support the default.

4.43 May 11, 1999

Corrected a typo in the Solaris gcc discussion in  
00FAQ. Made changes to the Solaris 2.5[.1] private  
tcp\_s structure. Both changes were done in response  
to reports from Igor Schein <igor@txc.com>, who  
tested the Solaris 2.5 change.

Made more IPv6 adjustments to lsof for Tru64 UNIX  
(Digital UNIX) 5.0, based on information obtained  
from Compaq by Berkley Shands <berkley@cs.wustl.edu>.

Corrected HP-UX error message about HP-UX 11 q4 usage.  
Amir Katz <amir@ndsoft.com> reported the correction.

Fixed a Glibc 2.1 conflict in /proc-based Linux lsof.

Fixed a man page typo reported by Vlad Harchev  
<hvv@hippo.ru>.

Changed some Solaris 2.7 references to Solaris 7  
in Configure and 00XPORTING.

Added a Solaris example to the echo statements that  
are the install rule in the SunOS/Solaris Makefile.

Added a field to  
the file structure output --  
FILE-FLAG (file structure open flags, f\_flag[s],  
and process file flags, typically u\_pofile) --  
enabled with +f[gG]. Its field output character  
is 'G'.

Figured out another piece of the HP-UX 11 patched  
ipc\_s structure puzzle with the help of Keith Kalet  
<KEITH\_KALET@HP-USA-om41.om.hp.com>.

Fixed a PTX real vnode to real inode interpretation  
bug.

Added link count to lsof output. Eric Dumazet  
<dumazet@risgw.ris.fr> requested and helped test  
it. The new +L option enables and filters it.  
Its field output character is 'k'.

Updated Configure script to recognize NetBSD 1.4.

Updated AFSCConfig to handle default answers to  
questions.

Incorporated patch from Jonathan Sargent <sergent@io.com>  
that enables /proc-based Linux lsof to run on both  
32 and 64 bit kernels.

Updated Configure script with a patch from David  
O'Brien <obrien@NUXI.com> that recognizes FreeBSD 3.2.

#### 4.44 June 24, 1999

Corrected use of nlink member  
of hsnode for SunOS

4.1.x High Sierra File System files. John Dzuber  
<zube@tlaloc.stat.colostate.edu> reported the  
problem and helped test the fix. Also fixed a  
SunOS segmentation fault bug. These fixes were

offered as a patch to 4.43.

Improved handling of /proc-based Linux UNIX PCB address.

Fixed a NEXTSTEP and OPENSTEP bug that made repeat option (-r) processing malfunction. This fix was offered as a patch to 4.43.

Fixed Configure so it doesn't use -O in the Cflags for the bundled HP-UX C compiler. Jim Ankenbrandt <jankenbrandt@penton.com> reported the problem.

Corrected output ordering of parent PID and process group ID when both -R and -g are specified.

Enhanced the pdev.c and pdvn.c library modules for wider use. These dialect versions use the new library modules: DEC OSF/1, Digital UNIX, and Tru64 UNIX; Pyramid DC/OSx and Reliant UNIX; SCO OSR and UnixWare; and Sequent PTX.

Added basic clone device support to /dev/kmem-based HP-UX lsof for HP-UX 10.30 and higher.

Added raw socket support to /proc-based Linux lsof.

Changed NODE-ADDR column title to NODE-ID in anticipation of using more general identification information in the column.

Ported to UnixWare 7.1, using a test system kindly provided by Matt Thurmaier <matt@compclass.com> and Don Draper <dond@sco.com>.

Updated for NetBSD 1.4C VM changes, and a new current and root working directory structure.

Made minor adjustment for latest Tru64 UNIX 5.0 Beta release.

#### 4.45 July 30, 1999

Fixed quoting problem in DEC OSF/1, Digital Unix, and Tru64 UNIX Makefile's install rule. The problem was reported by Berkley Shands <berkley@cs.wustl.edu>.

Fixed bug in Tru64 UNIX 4 lsof that caused FDs to be skipped. These fixes were offered in a patch

to 4.44.

Fixed a repeat-mode /proc-based Linux lsof bug, reported by Sami Farin <sfarin@ratol.fi>. This was offered as a patch to 4.44.

Picked lint, some reported by Sami Farin.

Corrected a 00DCACHE documentation error in a sample shell script. The problem was reported by Chad R. Larson <chad@larsons.org>. Changed commented-out entries in machine.h files so they require more thought and work when the comments are removed, based on a remark by Chad.

Compensated for the practice of Solaris 7 and above to record the dev= value in /etc/mnttab in 32 bit mode, even on 64 bit systems. This was offered as a patch to 4.44.

Added a C library test for /proc-based Linux lsof, so that the #include files can be adjusted for a non-Glibc environment. The need for this was reported by Andrew Hill <andrewh@tirin.openworld.co.uk>. This was offered as a patch to 4.44.

Added support for Auspex LFS 1.8.1 and 1.9.2 to SunOS 4.1.4 lsof. The support was requested by Quentin Fennessy <quentin@dvorak.amd.com>, who provided information and did testing.

Enabled IPv6 support code for NetBSD and OpenBSD, conditional on Configure script tests. Wolfgang Rupprecht <wolfgang@wsrcc.com> supplied the NetBSD code and tested it. The OpenBSD code I constructed has been compiled but not tested.

Updated the identd Perl 5 script, based on a report from Wendy Lin <af5@taiyang.cc.purdue.edu> that the space in its response line in front of the user name violates RFC 1413.

Added IPv6 support to /proc-based Linux lsof. Jonathan Sergeant <sergent@ETLA.NET> and Andrew Thomas Sydelko <sydelko@ecn.purdue.edu> kindly provided a test system.

Updated man page description of AIX multiplexed files to indicate that they might be /dev/ptc or /dev/pts, depending on the AIX version. The correction was suggested by Onno van der Linden <onno@simplex.nl>.

Sylvain Robitaille <syl@alcor.concordia.ca> reports lsof passes his Y2K tests.

#### 4.46 October 23, 1999

Corrected /proc-based Linux lsof to detect that an IPv6 address is a mapped IPv4 address. The problem was reported and analyzed by Arkadiusz Miskiewicz <misiek@misiek.eu.org>, who also tested the fix.

Added a libc5 library /dev/kmem-based Linux lsof circumvention, supplied by Jason Lingohr <lingman@lucid.net.au>.

Corrected a bug in -t (terse) AIX output, reported by Wendy Lin <af5@taiyang.cc.purdue.edu>. I introduced the bug at revision 4.43 when adding FILE\_FLAG reporting. This was offered as a patch to 4.45.

Added a work-around for a problem in the OpenBSD 2.3 <sys/pipe.h> header file. Volker Borchert <bt@tekon.de> provided and tested it.

Improved description of cross-building lsof for a 64 bit Solaris 7 system on a 32 bit system with suggestions from Phillip Edwards <Philip.Edwards@sn.wpafb.af.mil>.

Fixed a gawk POSIX-mode pattern error in the Linux /dev/kmem-based Mksrc script, based on a tip from Ambrose C. Li <acli@mingpaoxpress.com>.

Fixed a bug in the Tru64 UNIX IPv6 handling, courtesy of a report from Casper Dik <casper@holland.sun.com>.

Enabled support for OpenBSD 2.6.

Enabled support for BSDI BSD/OS 4.1, based on a report from Jeffrey C Honig <jch@bsd.com> that

only a Configure script change is necessary.

Enabled Configure script to use gcc for building lsof for a 64 bit Solaris 7 and 8 kernels, if the gcc version is 2.95 or above.

Improved -i option handling for systems with IPv6 support so that it will search for a host name in both IPv4 and IPv6 families, when that is possible. As a companion modification, changed -V processing to report a single error when a multiple host name match is requested. Casper Dik <casper@holland.Sun.COM> helped test.

Fixed a DEC OSF/1, Digital UNIX, Tru64 UNIX repeat mode bug, reported by Mayer Ilovitz <mayer@cooper.edu>. Mayer helped test the fix. The fix was offered as a patch to 4.45.

Changed Solaris socket file recognition scheme, so it is (nearly) the same through Solaris 8, where the previous clone device scheme no longer works.

With significant assistance from Casper Dik, added support for Solaris 8 Beta and Beta refresh. The IPv6 support in Solaris 8 is still in some flux, so there are temporary compensations for the differences between Beta IPv6 support and Beta refresh IPv6 support. Casper and I hope those differences disappear by FCS.

Improved the delivery of information on Solaris 2.5.1, 2.6, 7, and 8 door files.

Fixed a repeat mode bug that surfaces when /etc/passwd changes between cycles. The bug report and diagnostic help were supplied by Igor Schein <igor@txc.com>. The fix was offered as a patch to 4.45.

Added support for INRIA IPv6 to NetBSD. Jean-Luc Richier <Jean-Luc.Richier@imag.fr> provided patches and a test system on which to verify them.

Added support for AIX 4.3.3. Jeff W. Stewart <jws@anaconda.cc.purdue.edu> provided a test system.

Made adjustments for FreeBSD 4.0-current.



Improved reporting of information for AIX sockets that lack protocol control blocks.

4.47 November  
29, 1999

Based on a query from Jean-Pierre Radley <jpr@jpr.com>, changed the lsof top-level Makefile to propagate CFGF to the library Makefile. (DEBUG was already being propagated.) Added osrgcc and scogcc Configure abbreviations (to use gcc) for Jean-Pierre.

In response to a query from Igor Schein <igor@txc.com>, improved the Configure script test for Solaris 7 and 8 that decides if the compiler can produce 64 bit executables.

Made an ugly hack, based on making a private rnode structure definition from q4 output, to compensate for HP-UX 10.20 and lower recent NFS3 patches. HP didn't supply an updated <nfs/rnode.h> with the patches. The problem was reported by Will Partain <partain@mekb2.sps.mot.com>. Elias Halldor Agustsson <elias@hi.is> helped identify the patches as PHNE\_18173, PHNE\_19426, PHNE\_19937, and PHNE\_20091, and provided a test system.

Switched BSDI test system from 2.1 and 3.1 to 4.0.1, courtesy of Terry Kennedy <terry@tmk.com>.

Added  
some more dev\_t hacks for Alpha FreeBSD 4.0.

Added support for IPv6 on BSD 4.x. The support hasn't yet been tested, just compiled.

Added support for the mnt file system (mntfs or /etc/mnttab) on Solaris 8. Tested on Solaris 8 BETA-Refresh.

Made selection of optional fields (e.g., PPID with -FR) in a field output specification select the optional field, too, so that the option selector for the field (e.g., -R) isn't also required. This change was made in response to an inquiry from John DuBois <spcedt@armory.com>. This may require some revision to scripts that parse all field output; two scripts in the lsof distribution's scripts/

subdirectory had to be updated.

Corrected handling of Linux IPv4 addresses mapped in IPv6 addresses.

Tested under OpenBSD 2.6.

#### 4.48 January 14, 2000

Modified -i argument processing of colon-separated IPv6 addresses to recognize an IPv4 address mapped in an IPv6 address and handle it as an IPv4 address.

This was offered as a patch to 4.47.

Added a defined symbol (NOWARNBLKDEV) to control (inhibit) the issuance of a warning when no block devices are found. This was done anticipating its need in FreeBSD 4.x, but that dialect version no longer has any block devices, so HASBLKDEV was disabled for it instead. NOWARNBLKDEV was left in place for possible use in the future.

Enabled KAME IPv6 Configure support for FreeBSD when <netinet6/in6.h> is found.

Disabled use of gcc to compile lsof for 64 bit HP-UX 11.

Updated Configure to recognized FreeBSD 3.4.

Based on suggestions from Bernt Christandl <beb@MPA-Garching.MPG.DE> improved AFS configuration for AIX and Solaris, and updated AIX AFS 3.5 support. Johannes Tax <tax@bluedog.oit.unc.edu>, Hung T. Pham <hung\_pham@unc.edu>, and Curt Freeland <curt@grumpy.cse.nd.edu> provided test systems.

Updated lsof's private rnode definition for AIX 4.3.3, since IBM still doesn't ship the <oncpus/nfs/rnode.h> header file and the rnode structure definition in <nfs/rnode.h> doesn't match what the kernel uses. This was offered as a patch to 4.47.

Weakened the test in the Linux /proc-based lsof of the field count of data lines in /proc/net/{tcp,udp}. It appears that recent 2.3.x Linux kernels have

added untitled fields to these files. The bug report came from Gabor Liptak <gaborliptak@usa.net>.

Adjusted for a FreeBSD 4.0 change in the definition of `[_]KERNEL`. David O'Brien <obrien@NUXI.com> reported the problem and provided a test system.

Removed the HASPPID bracket from Fppid (the -R option state variable) so that the field select table will compile even when HASPPID is not defined. This problem was introduced at revision 4.47 with code that causes some field output characters to set option states. The problem was reported by David Bacon <bacon@birch.eecs.lehigh.edu>.

4.49 April 3, 2000

Made clearer in man page that "Lxx" FDs are AIX

loader table references. Also updated the 00FAQ discussion of the Stale Segment ID bug to include AIX 4.3.x.

Modified support for NetBSD 1.4Q to include the <sys/buf.h> header file to cope with an MFS change.

Added support for OpenBSD UVM virtual memory.

Added support for AIX systems with > 2GB of memory. Chris Sylvain <csylvain@itg.ummcc.umd.edu> reported the problem and provided the solution. Chris also supplied some minor code cleanup. This was offered as a patch to 4.48.

Based on new information from Igor Schein <igor@txc.com> made additional compensation in Configure script for 64 bit Solaris 7 and 8 gcc.

Added some 00FAQ info on the effect ordering of the +fg and -FG options has on output format.

Improved NetBSD IPv6 configuration, based on a suggestion from Thomas Klausner <wiz@danbala.ifoer.tuwien.ac.at>. Added code to convert IPv4-mapped-in-IPv6 addresses to IPv4 addresses.

Updated the information in 00FAQ and the

## HP-UX 11

binary directory README files on the HP-UX 11 ipis\_s patch with new information supplied by Eric McWhorter <emcwhorter@xsis.xerox.com>.

Added documentation on changes to HASFSTYPE and HASNCACHE, and the new HASPRIVPRIPP.

Adjusted Configure for FreeBSD 5.0. Made additional, necessary changes to Configure and the BSDI sources to eliminate load errors.

Added KAME IPv6 support to FreeBSD at the request of Ollivier Robert <roberto@eurocontrol.fr>, who provided a test system.

Corrected the script that generates the CHECKSUMS files for binaries to correctly name the detached PGP certificate. The documentation bug was reported by Michael Hennecke <hennecke@rz.uni-karlsruhe.de>.

## 4.50 June 29, 2000

Added a NetBSD alpha test host, courtesy of Ray Phillips <r.phillips@mailbox.uq.edu.au>. An lsof 4.49 binary, built on Ray's 1.4.1 system was made available prior to the 3.50 release.

Upgraded the system map file tests in /dev/kmem-based Linux

lsof, making the use of DEBIAN\_LINUX\_LSOFF unnecessary. Tested the changes on a system made available by Vincent Kujala <kujala@geog.ubc.ca> and Jim Mintha <jim@ic.uva.nl>.

Forced AIX to use the large-file-enabled versions of lstat (lstat64) and stat (stat64) if <sys/stat.h> contains stat64. This should allow lsof to stat() AIX files > 2GB even when the builder has not defined the "large file enabled programming environment." Configure tests <sys/stat.h> and puts -DHASSTAT64 in the Makefile's CFLAGS to make this happen. Fernando A.B. Whitaker <whitaker@cenapad.unicamp.br> reported the problem. This was offered as a patch to 4.48.

Enabled Configure script to handle OpenBSD 2.7. Angelos D. Keromytis <angelos@dsl.cis.upenn.edu> reported the availability of OpenBSD 2.7 and supplied

the Configure script patch.

Improved handling of DOOR and fattach()'d files in Solaris.

Changed message about missing kernel symbol file from "not yet determined" to "none found".

Updated FreeBSD, NetBSD, NEXTSTEP, OpenBSD, and OPENSTEP support to report "no PCB" and the values of the SO\_CANTSENDMORE and SO\_CANTRCVMORE state flags when a socket structure has no inpcb pointer. This modification was made to AIX lsof at revision 4.46. Added an entry to 00FAQ about sockets that have no inpcb pointer.

Upgraded support for FreeBSD 5.0-CURRENT. Ben Smithurst <ben@scientia.demon.co.uk> supplied patches and did testing. David O'Brien <obrien@NUXI.com> supplied a test system. The update included dropping the Fctty part of file descriptor file system support, conditional on a Configure script test. I propagated those changes to BSDI, NetBSD, and OpenBSD in anticipation of their having the modification in the future. David also arranged with Michael Haro <mharo@area51.fremont.ca.us> for a FreeBSD 3.4 test system.

In response to an lsof 3.72 bug report from Jim Mewes <jim@corp.phone.com>, added more kernel address filtering to the lsof function, kread(), that reads Solaris kernel data.

In response to a report from Marc Duponcheel <marc@offline.be>, added tests to the /proc-based Linux lsof to ignore file systems of types "autofs" and "pipfs".

Based on a report and information supplied by Casper Dik <casper@holland.Sun.COM>, updated the ncache\_load() function in lib/rnch.c with new code that deals with a post Solaris 8 change in kernel name cache (DNLC) handling. Casper tested the update, which should be invisible to Solaris versions without the new DNLC code.

Added support for Solaris VxFS QIO files, based on a report from Kieran Broadfoot <kieran.broadfoot@gs.com>. Kieran help test the support.

Added support for PTX 4.4.6 and 4.5[.1] with help from the usual cast of good people at Sequent.

Added support for 64 bit file sizes and offsets on BSDI, FreeBSD, NetBSD, and OpenBSD, based on a report from Dan Nelson <dnelson@emsphone.com>. Dan supplied a patch and did FreeBSD testing.

Added Configure script recognition of NetBSD 1.5, based on a report from Andrew Brown <atatat@atatdot.net>. Thomas Klausner <wiz@danbala.ifoer.tuwien.ac.at> updated the NetBSD port package to use a pre-release of this addition.

At the last minute saw a notice via deja.com's UseNet search service that FreeBSD 3.5 had been released and lsof didn't grok it. Added recognition of 3.5 to lsof's Configure script, but didn't have the opportunity to test lsof on 3.5.

4.51 August 21, 2000

Added Configure script support for the upcoming Solaris 9 release based on suggestions from Casper Dik <Casper.Dik@holland.sun.com>.

Changed sample Perl scripts to assume that /usr/local/bin/perl is Perl 5 and Perl 4 may be found in /usr/local/bin/perl4.

Updated Configure to recognize FreeBSD 4.1 and made a FreeBSD pre-release distribution available.

Bela Lubkin <belal@sco.COM> tested lsof on the upcoming SCO OSR 5.0.6 release and reports that lsof appears to work properly.

Updated the AIX compiler test in Configure to recognize its version 5.

Updated AIX 4.3.3 support with automatic recognition of the proper rnode structure, based on machine bit width. Also added code to detect when processing

the -X option that lsof has been compiled with the "other" AIX 4.3.3 user structure and to apply compensations. When a compensation method works, it's applied during subsequent -X processing; when none works, further -X processing is disabled.

Added Tru64 UNIX 5.1 support. Updated Tru64 UNIX library text file support to recognize new kernel support for AdvFS library files. Berkley Shands <berkley@cs.wustl.edu> and Klaus Saggerer USG [saggerer@zk3.dec.com> helped put me in contact with Chang Song <song@zk3.dec.com>, the developer of 5.1's new kernel name cache and he helped me develop new code in lsof to access it.

Corrected reporting of PTX fattach()'d address.

Changed  
Configure and dlsof.h for NetBSD and OpenBSD to use /usr/include/uvm header files when available. Andrew Brown <atatat@atatdot.net>, Thomas Klausner <wiz@danbala.ifoer.tuwien.ac.at>, and Wolfgang Rupperecht <wolfgang@wsrcc.com> pointed out the need to do this for NetBSD. Andrew provided access to a NetBSD 1.5 system for verifying the changes.

Installed snprintf() support, including a private version in the lsof library for those UNIX dialects without the function. Changed all sources to use it instead of sprintf() and strcpy().

Fixed a memory leak in the readvfs() functions of BSDI, DEC/OSF1, Digital UNIX, FreeBSD, NetBSD, OpenBSD, and Tru64 UNIX.

Tested on Linux 2.4.

Modified the Pyramid MkKernOpts script to compensate for `uname -s` configuration alternatives. Robert Dahlem <Robert.Dahlem@ffm2.siemens.de> supplied the modification.

Obtained access to an FCS Solaris 8 64 bit system and built lsof on it, using Sun Workshop C 5.0 and gcc 2.96 20000814 (experimental). Both compilers produce a working lsof.

4.52 November 8, 2000

Completed work on an HP-UX 11.11 port that uses a pstat(2) interface provided by HP. To distinguish it from its predecessors for HP-UX, this lsof version is called PSTAT-based and the predecessor versions are now called /dev/kmem-based. I am indebted to the far-sightedness and support of these good people at HP for making PSTAT-based lsof possible: Carl Davidson, Louis Huemiller, Rich Rauenzahn, and Sailu Yallapragada. The PSTAT-based sources are in lsof\_4.52/dialects/hpux/pstat, the /dev/kmem-based ones in lsof\_4.52/dialects/hpux/kmem.

Ported to IBM Monterey for Merced|Itanium, aka AIX 5L. It configures via the Configure script's "aix" abbreviation and has been tested on AIX 5L Beta 3. Jay Beck, Steve Dibbell, Loc Le, Nasser Momtaheni, and Malcom Zung of IBM provided generous support. Since AIX 5L is still in Beta testing, this port can't be considered complete.

Added Configure support for OpenBSD 2.8. David Mazieres <dm@cs.nyu.edu> provided a test system.

Based on a report from Marc Christensen <marc@mecworks.com> added sockfs to the mount scan exemption list for /proc-based Linux lsof.

Added large file, CDFS, and DOSFS for UnixWare 7.x. Added UnixWare device memory mapping support. All UnixWare changes were supplied by Eric Dumazet <edumazet@cosmosbay.com> Eric also supplied some miscellaneous bug fixes.

Deferred name cache loading until printname() needs to use the name cache.

Terminated Pyramid, SunOS 4.1.x, and Ultrix support, because test systems are no longer available. Final Pyramid and Ultrix source code distributions for lsof revision 4.51 may be found on lsof.itap.purdue.edu in pub/tools/unix/lsof/OLD/src. The no longer supported SunOS 4.1.x source code is still distributed with the Solaris source code.

Added code to set Solaris node address to real vnode



address,  
when applicable.

John Speno <speno@lopan.isc-net.upenn.edu> provided information that enabled me to update the Tru64 AdvFS (MSFS) node definition for AdvFS version 5.

Added Tru64 5.x CFS support with help from Kris Chandrasekhar <Kris.Chandrasekhar@compaq.com>, Diane Lebel <lebel@zk3.dec.com>, and John Speno. The support only provides information about cached file attributes.

Installed a Configure patch for HP-UX 11 supplied by Kenneth Stailey <kstailey@disclosure.com> that adds another command to q4 input.

Tested on FreeBSD 4.2.

Will Day <willday@rom.oit.gatech.edu> and Frank Winkler <frank.winkler@germany.sun.com> graciously supplied Solaris 8 binaries.

Added Solaris 9 text file support, supplied by Casper Dik <Casper.Dik@holland.sun.com>.

#### 4.53 December 6, 2000

Added the AIX 5L j2\_lock.h to the distribution with a Configure script step to use it when it's missing from /usr/include/j2.

Removed SunOS 4.1.x support.

Removed Linux  
2.0.x /dev/kmem support.

Fixed VBLK and VCHR special device file reporting to handle /dev information more accurately.

Added a Apple Darwin / Mac OS X 1.2 port, provided by Allan Nathanson <ajn@apple.com>. Allan also arranged for a test system so I can maintain this port. An additional test system was provided by Dale Talcott.

Dropped claims of support for all UnixWare versions except 7.1.0, since that is the only version on which I can test lsof. Even though lsof 4.53 is

deprecated for UnixWare 2.1.3, installed a patch for it with testing done by A. Channing Clark <clark.channing@heb.com>.

Dropped claims of support for all SCO OpenServer versions except 5.0.5, since that is the only version on which I can test lsof.

4.54 January 19, 2001

Added compensation for a change that made the FreeBSD mount structure invisible. I can only test back to 3.2 and the compensation works there, so it's been #ifdef'd for 3.2 and above. David O'Brien <obrien@FreeBSD.org> provided the necessary clue.

Based on a report from Valdis Kletnieks <Valdis.Kletnieks@vt.edu>, changed all IPv6 support to report a TYPE of IPv6 for sockets with IPv4 addresses mapped in IPv6 addresses. The previous lsof behavior was to report their TYPE as IPv4.

Restored the Linux Glibc test to Configure, removed at revision 4.53, based on a report from John Dzubera <zube@cs.colostate.edu>, that RedHat Linux 6.0 still needs the test.

Made setting of link count for Solaris more selective.

Limited Readlink() recursion to MAXSYMLINKS. The bug was reported by Jan Dvorak <johnydog@go.cz>.

Dropped the \*claim\* that lsof runs on Solaris 2.5.1. It may well do so, but I no longer have access to a test system.

Fixed an #endif comment typo, reported by Igor Schein.

Fixed a typo in a cast for a Tru64 UNIX 5.1 function and updated Configure for Tru64 UNIX 5.0 and 5.1 with information from Jesse Perry <jesse.perry@compaq.com>.

Corrected non-fatal typos in the AdvFS support in dnode.c for Tru64 UNIX.

Added msdos file system support for NetBSD and OpenBSD. Andrew Brown <atatat@atatdot.net> requested and helped

test it.

#### 4.55 February 15, 2001

Based on a report from Bernd Eckenfels <eck@lina.inka.de> added support in lsof for files in /proc/<PID>/maps that have been deleted.

Changed PGRP output title to PGID, conforming to the most common current abbreviation for Process Group ID (PGID). While some systems continue to use \*pgrp for internal kernel variable names, most systems that support the display of PGID via ps(1) now title it PGID. The lsof -g and -G options operations are unchanged in function; only titles and descriptions have changed. Also changed internal variable names from \*PGRP and \*pgrp to \*PGID and \*pgid where possible.

Dropped the \*claim\* that lsof runs on HP-UX 9.x. It may well do so, but I no longer have access to a test system.

In response to a suggestion from Jeff Howie <jeff.howie@federated.ca> added support for command name selection by regular expression. A new form of the -c option value is used to identify and specify a regular expression.

Restore the \*claim\* that lsof works on UnixWare 7.0, since I re-acquired a test system.

#### 4.56 May 3, 2001

Corrected some problems Amir Katz <Amir\_Katz@bmc.com> found with Insure++, one in lib/dvch.c, the rest in Solaris sources. Amir's report also helped me find an error in an snpf() call that caused (the unsupported) Solaris 2.5.1 lsof to crash. Wally Winzer, Jr. <wally.winzer@ChampUSA.COM> helped test.

Added support for UnixWare 7.1.1 and above in-kernel UNIX sockets. John Hughes <john@Calva.COM> kindly provided code and access to a test system. John also provided a test system and advice for adding UnixWare 7.1.1 NonStop Cluster and CFS support. More help with that effort came from Kurt Gollhardt (SCO), Barbara Howe (SCO), Bela Lubkin

(SCO), and  
Dewan Rashid <Dewan.Rashid@ir.com>.

Archived a set of compilation hints (patches) from  
Bill Melvin <Bill.Melvin@esc.edu> that make it  
possible to compile the old, unsupported lsof 3.08  
sources on UnixWare 1.x without NFS or CDFS support.

Installed support supplied by Allan Nathanson  
<ajn@apple.com> for the Darwin "Gold Master" release,  
Mac OS X 10.0 (aka Darwin 1.3 in its public source  
version). Added Allan's CVS repository suggestions  
to the script that gets additional header files  
from an open source repository.

Tested an HP-UX 11.11 kernel patch from Sailu  
Yallapragada that enables reporting of TCP/IP  
information for telnetd processes that use the  
telnet multiplexor. I don't yet know the kernel  
patch ID.

Made the Solaris inclusion of <inet/mi.h> conditional  
on the Solaris version. (It's apparently not needed  
at 2.6 and above.) Bill Watson <bill.watson@uk.sun.com>  
brought this to my attention.

Added alternate Linux 2.4.x  
lock extent test, supplied  
by Jim Mintha <jim@ic.uva.nl>.

Rearranged the lines and pre-processor tests in  
regex.h, lib/regex.c, and lib/snpf.c so that undef  
can be used to eliminate copyright and GPL statements  
when the files aren't being used for a particular  
dialect. (USE\_LIB\_\* definitions in a dialect's  
machine.h header file determine if one or more of  
those three files are to be used.)

Added preliminary support for Solaris 8 with VxFS  
3.4. This support will be refined as I get  
information from Veritas about how they will  
distribute the kernel header files lsof needs.  
Those header files were omitted from the standard  
VxFS 3.4 distribution. Technical assistance and  
testing were provided by Calle Dybedahl <cdy@algonet.se>,  
Gary Millen <gary.millen@veritas.com>, Rainer Orth  
<ro@TechFak.Uni-Bielefeld.DE>, Peter C. Vernam  
<pvernam@draper.com>, and Donna Yobs

<Donna.Yobs@veritas.com>

Tested on FreeBSD 4.3-STABLE.

Dropped the \*claim\* that

lsof works on UNIX dialects

where I no longer have test systems: BSDI 2.1,  
3.[01] and 4.0; DEC OSF/1, Digital UNIX and True  
64 UNIX 2.0 and 3.2; FreeBSD 2.1.[67], 2.2[.x],  
3.[012345] and 4.[01]; HP-UX 10.20; NetBSD 1.[234];  
SCO OpenServer 5.0.5; and SCO UnixWare 7.0

Tested on Solaris 9 BETA, s81\_36.

4.57 July 19, 2001

Help (-h) and version (-v) output now have URLs  
for the newly created and timeliest lsof FAQ  
(00FAQ in the lsof distribution) at:

<ftp://lsof.itap.purdue.edu/pub/tools/unix/lsof/FAQ>

and the man page for the current lsof distribution  
at:

[ftp://lsof.itap.purdue.edu/pub/tools/unix/lsof/lsof\\_man](ftp://lsof.itap.purdue.edu/pub/tools/unix/lsof/lsof_man)

Based on a report from Steve Laubscher

<slaubs@woodward.com>, modified dlsof.h for PTX  
4.6[.1] to avoid a temporary dnld\_t definition  
needed at PTX 4.5.1.

Corrected test for old Linux kernels in Configure.

Henri Karrenbeld <ishtar@cal044202.student.utwente.nl>  
brought the error to my attention. Limited Linux  
claims to 2.1.72 and  
above in the documentation.

Improved HP-UX 11 Configure stanza and stream socket  
handling.

Constructed a work-around for the HP-UX 11 optional  
OnlineJFS package. The work-around sadly requires  
lsof to have a private version of the vx\_inode  
structure, since the OnlineJFS package doesn't  
update <sys/fs/vx\_inode.h>. Troyan Krastev  
<Troyan.Krastev@ricoh-usa.com> brought the bug to  
my attention and Michael Bracewell  
<michael@ra.TSS.PeachNet.EDU> provided a test system

where I developed the work-around.

Added locale support to lsof's isprint() test,  
based on a suggestion from Dan Mercer <damer@mmm.com>.  
Lsof will use setlocale(), when that function and  
its supporting <locale.h> header file are available.

Added OpenBSD 2.9 support.

Based on a report from Aaron Rhodes <arhodes@psionic.com>  
and with testing help from Aaron, made the lsof  
4.56 revision compile and work on OpenBSD 2.6.  
While that OpenBSD version is no longer supported,  
Aaron's report  
exposed a Configure script bug  
affecting OpenBSD versions lsof does support.

Updated for FreeBSD 5.0-CURRENT. Szilveszter Adam  
<sziszi@petra.hos.u-szeged.hu> help test. The lsof  
FreeBSD ports packager, David O'Brien <obrien@FreeBSD.org>,  
assisted.

Tested on AIX 5.1. Loc Le and Nasser Momtaheni of  
IBM provided test systems.

4.58 September 13, 2001

Added options to safestrprt() and safestrprtn() to  
surround the string with "" and to suppress the  
printing of an ending '\n'. Use of these functions  
in device cache file error message reporting answers  
a suggestion for better error reporting from John  
Jackson <jrj@purdue.edu>.

Fixed a Solaris 2.6 and above problem related to  
searching for "large" (O\_LARGEFILE) files by name;  
lsof was using the wrong version of [l]stat(2).  
The bug was reported by Daniel Trinkle  
<trinkle@cs.purdue.edu>.

Added AIX 4.1.4 and above XTI socket support.

Added OS/2 Xenix Shared Data and Semaphore file type  
support  
with modifications supplied by Bela Lubkin.

Updated OPENSTEP support with modifications from Carl  
E. Lindberg <lindberg@clindberg.org>. The changes  
enable the correct reporting of executable and

library open files ("txt" type).

Limited claims of OpenServer support to the versions where I currently test, 5.0.4 and 5.0.6. (Lsof probably works on 5.0.5.)

Enabled processing of -C option for PSTAT-based HP-UX lsof.

Enabled and tested on FreeBSD 4.4.

Corrected a file system test example in 00QUICKSTART, based on a report from Jun Biao WANG <wangjunb@cn.ibm.com>.

Made available for re-distribution a user-contributed port of lsof 4.51 to Reliant UNIX 5.45. Thomas Mauterer <Thomas.Mauterer@philosys.de> contributed the port.

4.59 October 20, 2001

With the closing of the Sequent Synergy Links Lab by IBM, terminated lsof support for PTX. The last tested PTX lsof revision, 4.58, is available on lsof.itap.purdue.edu in .../lsof/OLD/src.

Adjusted for FreeBSD 5.0-CURRENT NFS header file changes, based on a report from Jos Backus <josb@cncdsl.com>.

Corrected a bug in the way Linux lsof identifies the owner of a process. Lionel Cons <lionel.cons@cern.ch> reported the problem and tested the fix. Added code to avoid stat(2) calls on regular Linux files whenever possible. Lionel reported the need to do this (AFS files) and tested the new code.

Added new output field for raw device number in hex. The field is identified with 'r'. This field is NOT selected when -F or -F0 is specified so that its appearance won't disturb existing scripts that process field output.

Added support for OpenUNIX 8. A test system was provided by Larry Rosenman <ler@lerctr.org>. Matthew Thurmaier <matt@compclass.com> and many people from Caldera provided technical assistance.

Added an additional UVM test to the NetBSD Configure stanza. Andrew Brown <atatat@atatdot.net> supplied the test; it recognizes NetBSD 1.5Y UVM changes to the vnode structure recently committed by Chuck Silvers.

Applied Configure and get-xnu-headers.sh script changes supplied by Allan Nathanson <ajn@apple.com> for Darwin 1.4.

Added for Bela Lubkin <belal@mammoth.ca.caldera.com> OSR-specific environment variables to supply values to the Configure script. The variables are described in 00XCONFIG.

Added an IP version selector to the -i option parameters.

#### 4.60 November 9, 2001

Added special handling to and corrected bugs in the matching of IPv4 in IPv6 addresses to -i6:<...> selectors.

Made 00FAQ corrections and updates, based on discussions with Igor Schein <igor@txc.com>.

Modified Configure script to detect a 64 bit capable gcc compiler and permit it to be used to build 64 bit (PA-RISC 2) lsof for HP-UX 11.00. Tested with HP's gcc package, which Rich Rauenzahn of HP kindly installed on a test system at HP. Stefan Marquardt <stefan.marquardt@hagebau.de> helped test.

Made lsof's method of killing its child process more robust, based on a suggestion from Bela Lubkin <belal@caldera.com>.

Modified all dialect Makefile segments to accept select -v #define's from the environment -- a builder's comment, host, logname, system information and user name. This was done for Bela Lubkin, so he can "tune" the -v output when he packages lsof in the upcoming Caldera OSR 5.0.7 release.

Changed Perl scripts in scripts/ to put the lsof path consistently in \$LSOF. Also added a fix from



Bela Lubkin to scripts/big\_brother.perl5 that allows it to tolerate SCO OSR "ago" clauses in open UDP file information. Strengthened emphasis in scripts/00README that the scripts are examples that shouldn't be expected to run on all UNIX dialects without modification.

At Bela Lubkin's suggestion changed the device cache file format examples in 00DCACHE and 00FAQ to avoid "%U%". That's an SCCS escape sequence.

Added support for OpenBSD 3.0.

Added +DAportable to CFLAGS for 32 bit HP-UX 11. Amir Katz <Amir\_Katz@bmc.com> suggested the addition.

4.61 January 22, 2002

Updated field output example Perl scripts in the scripts/ subdirectory to discover the lsof path, starting at .. and proceeding through the PATH environment variable's directories.

Added minor OSR Configure script fixes, provided by Bela Lubkin <belal@caldera.com>.

In response to a report from Joshua Wright <Joshua.Wright@jwu.edu> modified NetBSD and OpenBSD Configure stanzas and sources so that lsof can be built when there is no system source tree (e.g., /usr/src/sys).

In response to a report from Peter Valchev <pvalchev@openbsd.org> improved the UVM test in the OpenBSD Configure stanza.

Updated Configure script to recognize FreeBSD 4.5. Updated for FreeBSD 5.0 procfs and pseudofs changes.

Updated HP-UX stanza to see if the compiler named in the LSOF\_CC environment variable is the bundled compiler. If it is, "-O" is omitted from the compiler flags.

Updated Digital UNIX 4.x and Tru64 UNIX error message related to kernel name list failures. Added an FAQ section about how a kloadsrv daemon failure can cause

knlist(3) to fail. The condition was reported by  
Douglas B. Jones <douglas@gpc.peachnet.edu>

Based on a report from Mark W. Eichin <eichin@thok.org>  
made Linux lsof capable of handling and reporting  
file sizes greater than 32 bits.

Tested on Solaris 9 BETA-Refresh.

Corrected a bug in the matching of IPv4 addresses,  
mapped in IPv6 addresses, to an IPv4 parameter to  
an -i option.

Ported to 64 bit Power AIX 5.1 kernel with advice  
from David Clissold <cliss@austin.ibm.com> and Marc  
Stephenson <marc@austin.ibm.com>, and on a test  
system provided by Loc Le <lple@us.ibm.com>.

#### 4.62 March 7, 2002

Updated 00README to reflect the usefulness of gcc  
for building AIX lsof. Documented a report from  
Brian L. Gentry <BGentry@nationsrent.com> of success  
on

AIX 4.3.3. I documented my success on 32 bit  
Power AIX 5.1 and my lack of success on ia64 AIX  
5.1 and 64 bit Power AIX 5.1.

Improved UnixWare >=7.1.1 reporting of UNIX socket  
NAME field information for NonStop Cluster systems  
with a patch provided by John Hughes <john@Calva.COM>.  
Offered John's improvement as a patch to lsof 4.61.

Corrected bugs in handling of open files on block  
devices by OSR lsof. The bugs were reported by  
Bela Lubkin <filbo@deepthought.armory.com>.

Fixed bug in writing >32 bit device numbers for  
block devices to the device cache file.

Added support for reporting block special nodes  
not in /dev (or /devices). That required "like  
device special" be changed to "like block special"  
and "like character special". (00FAQ was updated.)

Based on a report from Peter Valchev <pvalchev@openbsd.org>  
improved the definition of the source for NetBSD  
and OpenBSD kernel symbols (the nlist() source  
file). NetBSD now defaults to

getbootfile(3) if it is available, /netbsd otherwise. OpenBSD now defaults to /dev/ksyms if it is available, /bsd otherwise.

Made possible compilation under BSD/OS (BSDI) 5.0 with changes to Configure, dialects/bsdi/dlsof, dialects/bsdi/dproc.c and lib/rnmh.c. The changes were suggested by Steven Hinkle <hinkle@bsdi.com>. Note that these changes do not substantiate a claim that lsof works on BSDI 5.0, because I haven't tested it there.

Updated OpenUNIX private <sys/fs/memfs\_mnode.h>, based on a report from Larry Rosenman <ler@lerctr.org> that it had been updated by Caldera patch OU800PK3. Unfortunately the patch only corrects some of the problems with the header file, so it is still necessary to distribute a private patched version of it with the lsof sources.

Applied a man page correction reported by Frederic Delanoy <max\_ok@yahoo.com>.

Corrected cast bugs related to using the HP-UX bundled C compiler on HP-UX 11.11.

#### 4.63 April 23, 2002

Added

HPUX\_BOOTFILE environment variable for use by the Configure script in determining HP-UX kernel configuration information -- e.g., the state of the ipis\_s structure in the HP-UX 11 kernel. The change was suggested by Marc Bejarano <beej@alum.mit.edu>. Marc also suggested some changes to the HP-UX section in 00FAQ that discusses Configure's use of q4 for HP-UX 11.

Fixed a bug in the Solaris lsof file system matching code. It was not reporting that VCHR files in /devices were in / when /devices was in /, too.

Corrected bugs in device number, file size, file offset, and raw device number field output generation.

Added recognition of OpenBSD 3.1 to the Configure script with a suggestion from Peter Valchev <pvalchev@sightly.net>. Note that this change does

not constitute a claim that lsof works on OpenBSD 3.1, because I haven't tested it there.

Built an automated test suite. (See 00TEST and the tests/ sub-directory of the lsof main directory).

Bela

Lubkin requested it. Dale Talcott, John Hughes, and Larry Rosenman helped me validate it on their systems.

During the development of the test suite I discovered the following lsof bugs or missing features, and corrected or supplied them.

- \* Corrected the reporting of locks for:

- o Digital UNIX 4.0d and Tru64 Unix 5.[01];
- o HP-UX 10.30 and 11.00;
- o OpenUNIX 8;
- o UnixWare 7.1.1.

- \* Enabled HP-UX 10.30 and 11.00 to report open NFS file link counts.

- \* Corrected the reporting of UNIX domain socket names for Apple Darwin, FreeBSD 4.5 and above, NetBSD 1.4.1 and above, and for OpenBSD 3.0 and above.

- \* Enabled HP-UX 11.11 to stat(2) large files.

- \* Fixed handling of combination 32 and 64 bit device numbers in AIX 64 bit architectures.

Updated the AIX 4.3.3 NFS mode recognition code, first installed at revision 4.51. It looks like some IBM update has restored a single mode structure independent of the machine bit width.

Updated the NetBSD and OpenBSD sources so NetBSD can process DTYPE\_PIPE files, as OpenBSD was already able to do.

Updated Darwin get-xnu-headers.sh script to reflect information about a recent reorganization of the Darwin CVS hierarchy, supplied by Allan Nathanson <ajn@apple.com>.

Added defense against the standard I/O descriptor attack.

4.64 June 26, 2002

Corrected some FreeBSD pre-processor directives.

David O'Brien <obrien@NUXI.com> pointed them out.

Updated lsof's main() function to: 1) close all open file descriptors above 2 before starting; and 2) to set a non-interfering umask. Moved GET\_MAX\_FD test from misc.c to proto.h, so that main() could use it. Added multiple-include protection to proto.h.

Moved FAQ's test suite Q's & A's to a more appropriate section. Added a Q&A on HASSECURITY option and its affect on searching for open files. (That was already in the man page.)

Updated hpux/kmem/dnode.c for HP-UX < 11 compilation with information from John Dzuber <Zube@CS.ColoState.EDU>. While lsof doesn't support HP-UX < 11 any more, I try to avoid disabling it there when possible, and a locking fix for HP-UX >= 11 in lsof 4.63 inadvertently disabled compilation of lsof for HP-UX < 11. Fixed long-standing bug in HP-UX 10.20 lock reporting.

Removed language from the test suite programs that requires an ANSI-C compiler. This allowed the test suite to be validated with cc and gcc on the unsupported HP-UX 10.20.

At the suggestion of Manuel Bouyer <bouyer@antioche.eu.org> switched NetBSD and OpenBSD lsof from using nlist() to using kvm\_nlist(). Made the same change for BSDI, Darwin, and FreeBSD.

Validated test suite on OPENSTEP 4.2.

In response to a suggestion from Jeff Stoner <jstoner@blackboard.com> enhanced support for the FD list of the -d option to allow it to be either an exclusion or inclusion list, using the '^' prefix to denote exclusions.

Made

adjustments for FreeBSD 4.6 and 5.0-CURRENT.

Fixed a FreeBSD /etc/make.conf CFLAGS extraction bug, reported by Kris Kennaway <kris@obsecurity.org>, and new a bug in the fix, reported by Eric Cronin <ecronin@eecs.umich.edu>

Added nullfs support for FreeBSD, NetBSD, and OpenBSD at the request of Andrew Brown <atatat@atatdot.net>.

Modified all readmnt() functions to ignore mounted-on directory names that don't begin with '/'.

Tested on NetBSD 1.6A and OpenBSD 3.1.

Upgraded to Solaris 9 FCS with two changes to the BETA-Refresh support: 1) an adjustment to dnode.c for a change in the so\_so (sonode) structure; and 2) addition of Solaris 9 FCS specific DNLC code. David Comay <David.Comay@Eng.Sun.COM> sent me the dnode.c change and Casper Dik <Casper.Dik@sun.com> helped with the new DNLC support code.

Applied OpenUNIX changes that permit lsof to compile and run on the upcoming 8.0.1 release. The changes were supplied by Robert Lipe <robertl@caldera.com>. Larry Rosenman <ler@lerctr.org> provided a test system.

Added Solaris fd file system support.

4.65 October 10, 2002

Adjusted for change in FreeBSD 5.0-CURRENT inode structure, reported by David O'Brien <obrien@Nuxi.com>. Adjusted for changes in FreeBSD 5.0-CURRENT <sys/vnode.h>. One change was reported by Anders Nordby <anders@FreeBSD.org>. Adjusted for FreeBSD 5.0-CURRENT on sparc64 architecture.

Enhanced the error reporting of Solaris lsof when it detects a kvm\_open() failure, and added a 00FAQ entry on the cause, based on a report from Peter J. Bertoincini <pjb@anl.gov>.

Enabled compiling of lsof for NetBSD 1.5 with the NULL file system, using a patch from Andrew Brown <atatat@atatdot.net>.

Removed a hack in the LTbigf test program that was once needed when it was compiled on Solaris 9 BETA-Refresh with gcc. The hack isn't needed on Solaris 9 FCS. Janet Hempstead <jan@library.carleton.ca> brought the need for this change to my attention.

Applied a patch, supplied by Andrew Brown <atatat@atatdot.net>, that updates lsof for NetBSD version 1.6F. Corrected handling of the NetBSD nullfs.

Updated to BSDI BSD/OS 4.3 on a test system kindly provided by Terry Kennedy <terry@tmk.com>.

Updated to FreeBSD 4.7.

Updated to Apple Darwin 1.5, 5.x and 6.x with patches supplied by Allan Nathanson <ajn@apple.com>. The patches include IPv6 support.

Updated Configure to use the -bnolibpath loader option when building lsof on a PowerPC, running AIX 5 or greater. Valdis Kletnieks <Valdis.Kletnieks@vt.edu> informed me this was needed. Lsof for AIX 5.x was initially developed on the IA64, where -bnolibpath can't be used and I didn't think to restore it to PowerPC loads when AIX 5.x became available for that architecture.

Updated to UnixWare 7.1.3 on a test system provided by Larry Rosenman <ler@lerctr.org>. Removed claims that lsof works on OpenUNIX 8.0.1, because UnixWare 7.1.3 is the release name of OpenUNIX 8.0.1.

Based on a comment that his e-mail address was wrong in the lsof distribution from Kenneth Stailey <kstailey@disclosure.com>, removed all e-mail addresses from lsof documentation files except this one, 00DIST. The addresses in 00DIST are used to send revision release notices to those who contributed to a revision, but the addresses in this file for previous revisions and in other documentation files sometimes grow stale and are never validated.

4.66 December 22, 2002

Acquired Solaris 7 and 8 test systems, courtesy of

John Dzuber <Zube@CS.ColoState.EDU>. Updated 00TEST and tests/TestDB accordingly.

Clarified FreeBSD 5.0 architecture claims at the suggestion of David O'Brien <obrien@NUXI.com>. Also implemented David's suggestion to change Intel to x86.

Installed changes to DNLC handling in OSR lsof in preparation for handling changes in the OSR 5.0.7 DNLC cache. Information about the changes and patches to handle them were supplied by Bela Lubkin <filbo@deepthought.armory.com>.

Upgraded True 64 UNIX support to the 5.1B release on a test system provided by Berkley Shands <berkley@cse.wustl.edu> Had to use relaxed ANSI compilation because of an error in a system header file and other lsof source usages.

Implemented the HASNOSOCKSECURITY compile-time option. When it and HASSECURITY are defined, lsof will be built to list only the user's open files, but will also list anyone else's open socket files, provided the "-i" option selects their listing. Updated the Customize script to ask about setting HASNOSOCKSECURITY. Left it undefined in all dialect machine.h header files. This change was requested by Kenneth Stailey <kstailey@speakeasy.net> for use with ntop.

Added support for OpenBSD 3.2 and its kernel trace file.

Improved lsof help (-h) and version (-v) information reporting.

Fixed a FreeBSD 4.7 and above off-by-two UNIX domain socket path termination bug, reported by Ken Stailey <kstailey@speakeasy.net>

4.67 March 27, 2003

Began the transition of the lsof ftp server host name from vic.cc.purdue.edu to lsof.itap.purdue.edu. That reflects Purdue organizational changes. This first step makes the new name an alias to the old



one. The old name, vic.cc.purdue.edu, will remain usable for an extended period.

Corrected a revision number reference in section 17.17 of 00FAQ on the appearance of Solaris negative DNLC caching handing.

Updated 00FAQ discussion of compilers for 64 bit Solaris.

Validated test suite for 64 bit Solaris 8 and gcc.

At the request of Alek O. Komarnitsky <alek@komar.org> added the "+c <width>" option to enable optional changing of the COMMAND column output maximum width from the default to <width>. The default maximum width remains CMDL, as defined in lsof.h.

Fixed three AIX kernel bit size detection bugs, one in the AIX Configure script stanza, the second and third in the AIX dproc.c get\_kernel\_access() function. The bugs were reported by Pierre-Yves Fontaniere <pyf@cc.in2p3.fr>, who tested the fixes.

Added kernel event queue file support for FreeBSD, NetBSD and OpenBSD. Andrew Brown <atatat@atatdot.net> supplied the code.

Updated to AIX 5.2 on a test system provided by Dale Talcott <dtalcott@purdue.edu>. Had to build work-arounds for two missing AIX 5.2 header files, <j2/j2\_snapshot> and <proc/proc\_public.h>. Corrected an off-by-one UNIX socket addressing bug. Taught AIX lsof to handle both jfs and jfs2 files at the same time. Adjusted for an IBM mistake in the sizing of the fdsinfo structure in <procinfo.h> Toshiya Nakamura <TOSHIYAN@jp.ibm.com> helped test,

Updated to FreeBSD 4.8. Corrected another bug in FreeBSD UNIX domain socket name handling.

Corrected gcc build problems on HP-UX 11i, reported by Yuliy Minchev <yuliy@mobiltel.bg>.

Updated BSDI BSD/OS support to 4.3.1.

Augmented

a lock ID test on NetBSD to check if the ID is an LWP pointer.

4.68 June 18, 2003

Enhanced Configure script's cleanup operations.

Added support for OpenBSD 3.3, based on a report from Peter Valchev <pvalchev@sightly.net>.

Improved the description of the detached PGP signature certificate file in the main lsof README file, based on a suggestion from Diana Stockdale <diana@mpl.ucsd.edu>.

Installed a work-around for FreeBSD 5.0-CURRENT on Alpha to avoid a compiler register use complaint.

Corrected a 'c' option error message. Gnele <blaadeleng@yahoo.com> reported the problem.

Upgraded EXT2FS and UFS support for NetBSD and OpenBSD to handle new inode information, and the fast UFS1 and UFS2 file systems.

With the help of Andrew Brown <atatat@atadot.net> determined the NetBSD snapshot (1.6F) at which <sys/mount.h> could be included under \_KERNEL, thus eliminating the lsof netexport.h hack. The same change applies to OpenBSD versions 3.3 and above.

Applied a patch from Armin Gruner <ag@muc.de> that corrects the use of the HASPROCFS definition in the FreeBSD dialect sources.

Corrected spelling errors in 00FAQ and in the generated 00.README.FIRST\_<version> file of the distribution archive. John Jackson <jrj@purdue.edu> and Ray Phillips <r.phillips@jkmrc.uq.edu.au> spotted and reported the errors.

Corrected a spelling error in a comment and incorrect use of an alarm function in the LTsock test program.

At the suggestion of Stuart Anderson <sba@srl.caltech.edu> added preliminary (and incomplete) SAM-FS file system support to Solaris lsof. Completion awaits availability of SAM-FS internals.

Fixed a Solaris device name printing bug, reported by Ric Anderson <ric@tick.Telcom.Arizona.EDU>, only visible when HASDCACHE is not defined. Ric helped test the fix.

Fixed an AIX kernel bit size handling bug related to the NFS node (rnode) structure.

Corrected a print\_kptr() function call error in the AIX AFS code, reported by David Steiner <david.r.steiner@Dartmouth.EDU>. Upon further reflection and because I no longer have appropriate AIX AFS test systems, disabled AIX AFS support in the Configure script for AIX versions above 4.3.3.0 or AIX AFS versions above 3.5.

Added support for FreeBSD 5.1.

With advice from Allan Nathanson <ajn@apple.com> adjusted the Darwin get-xnu-headers.sh script to access the kernel header files needed by lsof from a new form of the Apple open source repository.

Installed Linux and lsof library bug fixes and improvements, supplied by Marian Jancar <mjancar@suse.cz>. One Linux improvement handles mount strings that have octal escapes in them, eg., \040 for embedded blanks. Marian tested the changes.

4.69 October 16, 2003

Received and applied an OpenBSD patch from Peter Valchev <pvalchev@sightly.net> that replaces a ctob() call with a sysconf() call. Peter claims sysconf() is needed for OpenBSD on SPARC. (It is not needed for NetBSD on SPARC.)

With the upgrade of my only Solaris 7 test system to, Solaris 8, dropped the \*claim\* that lsof works on Solaris 7. That doesn't mean it won't work there, so those who want lsof for Solaris 7 probably should be able to build it there and it probably will work there.

Revised lsof's DNLC handling for BSD derivatives, including: BSDi; Darwin, DEC OSF/1, Digital UNIX and Tru64 UNIX; FreeBSD; NetBSD; and OpenBSD. The latest NetBSD distribution's dropping of the vnode

capability ID (v\_id) required the revision.

Adjusted to the latest FreeBSD 5.1-CURRENT.

Added NetBSD support for using kvm\_getproc2().

Added a patch from Andrew Brown <atatat@atatdot.net> to handle NetBSD enum conflicts and changes in the <miscfs/kernfs/kernfs.h> and <miscfs/procfs/procfs.h> header files.

Added a "#define \_KERNEL" to the AIX dnode2.c source file for compatibility with a new <j2/j2\_inode.h> AIX 5.2 header file version. The addition was supplied by Dick Dunbar <Dick.Dunbar@Siebel.com> and was offered as a patch to lsof 4.68/

Added support for a second type of Solaris SAMFS. Stuart Anderson <sba@srl.caltech.edu> provided the support. SAMFS support in lsof SOLARIS remains scanty, because Sun won't release any details on its kernel structures.

Dropped the \*claim\* that lsof works on AIX 4.3.3, because I was unable to test it there. That doesn't mean it won't work there, so those who want lsof for AIX 4.3.3 probably should be able to build it there and it probably will work there.

Updated for Solaris 10 on test systems provided by Mike Miscevic <miscevic@hotpop.com>. Casper Dik <casper@holland.sun.com> provided significant help. During the Solaris 10 port found and fixed an lsofs handling bug that prevented reporting of open lsofs file lock status.

Updated the DNLC test, LTdnlc, to provide a possible explanation about file systems on which the test might fail.

Modified the procedure for obtaining missing Darwin XNU kernel header files. The new one requires more manual intervention, but is the best that can be done with the way Apple open sources are now organized. 00FAQ explains the new procedures for those not used to downloading Apple open source

files.

Added support for Apple Darwin 7.0 (Mac OS X 10.3) with patches supplied by Allan Nathanson <ajn@apple.com>. Dropped the *\*claim\** that lsof builds and works on Apple Darwin below 6.0.

Validated lsof on FreeBSD 4.9, using a test system provided by Ben Lewis <bl@purdue.edu>.

Validated lsof on FreeBSD 5.1-CURRENT for Amd64. David O'Brien <obrien@FreeBSD.org> provided a test system.

Changed the NetBSD Configure stanza to do header file searches in /usr/include by default. The LSOFF\_INCLUDE and NETBSD\_SYS environment variables may still be used to specify other search paths. Discussions with Andrew Brown and Wolfgang S. Rupprecht <wolfgang@wsrcc.com> led to the change.

4.70 January 16, 2004

Improved shell-portability of the linux stanza of the Configure script with a patch from Paul Jarc <prj@po.cwru.edu>.

Added a "silent" rule to tests/Makefile for Paul. Updated, extended and clarified the test suite documentation in 00FAQ and 00TEST.

Fixed Solaris 10 dlsof.h typo, reported by Mike Miscevic <miscevic@hotpop.com>. The typo prevents lsof from loading cleanly in Solaris 10 builds past 40.

Fixed a Solaris HSFS node number reporting bug and added a structure definition work-around for Solaris 10.

Converted PGP signing to GPG. My previous PGP key can be used, but the gpg "--allow-non-selfsigned-uid" option may have to be used when it is imported into a GPG key ring.

Added bz2 compression.

Updated for OpenBSD 3.4.

Added a work-around for a missing header file in the  
s10\_44 Solaris 10 build.

Added support for FreeBSD 5.2-BETA and 5.2-CURRENT.

Updated Linux AX25  
support with modifications supplied  
by Lutz Poetschulat <dl9cu@db0zwi.de>.

Added raw IPv6 support to Linux lsof.

Improved handling of parameters after "-i@".

Improved file name test in LTdnlc.c.

Added loop count controls to the reading of Solaris  
lock chains. The change was implemented as a result of  
a report from Steve Gonczi <steve@relicore.com>.

Based on a report from John Jackson <jrj@purdue.edu>,  
enabled a Solaris 10 <sys/lgrp.h> work-around for  
Solaris 9, too. (Patch 112233 installs an lgrp.h on  
Solaris 9 that needs the work-around.)

With help from Andrew Brown <atatat@atatdot.net> and  
John Heasley <heas@netbsd.org> added log-structured  
file system (LFS) support for NetBSD and OpenBSD.

Added AMD64 to the list of FreeBSD 5.x-CURRENT  
supported architectures. FreeBSD.org provides a test  
system, courtesy of (I believe) David O'Brien  
<obrien@FreeBSD.org>.

Added a cast to lseek() in the HP-UX /dev/kmem-based  
kread() function to make  
it work properly with the  
bundled HP C compiler.

#### 4.71 March 11, 2004

Added text file support to Apple Darwin lsof and  
enabled the lsof executable portion of the LTbasic  
test. Added support for Darwin kernel queue, POSIX  
semaphore and POSIX shared memory files. Tested on  
Darwin 7.2 (aka Mac OS 10.3.2).

Added process\_kqueue() function prototypes for FreeBSD,  
NetBSD and OpenBSD.

Picked some lint in AIX sources, lib/rnmh.c and tests/LTsock.c.

Added "-x [fl]" cross-over option, which enables +d and +D processing to cross over symbolic links and/or file system mount points. Discussion with Johan Lindquist <johan@smilfinken.net> and Eric Williams (aka The Ghost In The Machine) <ewill3@earthlink.net> on Linux news groups revealed the need for the option.

Updated support for UnixWare 7.1.4.

Added support for the optional reporting of socket options, socket states and TCP flags for most currently supported dialects. John Smith <lbalbalba@hotmail.com> and Tristan Nefzger <tn@bhtrader.com> requested the information. The dialects and their versions for which this feature has become available include:

- AIX 4.3.2 and 5.[12]
- Apple Darwin 7.2
- BSDI BSD/OS 4.3.1
- Digital UNIX and Tru64 UNIX 4.0
- FreeBSD 4.9 and 5.2
- HP-UX 11 and 11.11 (aka 11i)
- NetBSD 1.6ZH
- OpenBSD 3.4
- OPENSTEP 4.2
- OpenUNIX 8
- SCO OpenServer Release 5.0.6
- Solaris 2.6, 8, 9 and 10
- UnixWare 7.1.[134]

Modified the Configure stanza for HP-UX 11 with better q4 detection. Steve Bonds <3vhmxxm02@sneakemail.com> supplied the modification.

Applied a patch from Mike Miscevic <miscevic@hotpop.com> to enable lsof to compile with the zone support in the Solaris 10 s10\_b51 release. Added information on lsof zone behavior to 00FAQ.

Added a "-z [z]" option to Solaris 10 lsof. It enables the listing of zone name and can also be used to select the listing of processes and their files from specified zones.

4.72 July 13, 2004

Corrected Solaris 10 ZONE column title display bug with a patch from Joep Vesseur <Joep.Vesseur@Sun.COM>. Joep's fix was offered as a patch to 4.71.

Based on a report from Jean-Pierre Radley <jpr@jpr.com> about an unexpected GNU uname Configure interaction on OSR, and working from information received from Bela Lubkin, changed the OSR Configure stanza to use /bin/uname instead of uname. Added an FAQ entry about Configure version detection problems.

Added the +m and "+m m" options in response to a dialog with Robert T. Brown <rbrown@netmentor.com>. The options allow the creation of a mount table supplement file which can be used on selected dialects to get device numbers when stat(2) and lstat(2) can't deliver them. (That's generally the result of an inaccessible NFS server.) Currently the new options are supported only on Linux.

Made cpumask\_t typedef \_KERNEL compensation for FreeBSD 5.2-CURRENT.

Refined it for 5.2.1-RELEASE with testing help from Scott Ellentuch <tuc@ttsg.com>.

Added support for FreeBSD 4.10. Larry Rosenman <ler@lerctr.org> kindly provided a test system.

Added support for NetBSD 2.0 with patches supplied by Andrew Brown <atatat@atatdot.net>. Andrew also provided two test systems.

Made handling of Linux maps file more robust, based on a report from Jan Blunck <J.Blunck@tu-harburg.de>. As a side benefit, made handling of generated stat(2) information more flexible.

As a result of a discussion with Jason Fortezzo <fortezza@mechanicalism.net>, adjusted lsof for Solaris to obtain the maximum user name length from ut\_name of the utmpx structure, if <utmpx.h> exists.

Tested under OpenBSD 3.5.

Updated 00README information about using gcc (via the Configure aixgcc abbreviation) to compile lsof on



AIX. Ann Janssen <ajanssen@nebook.com> made me aware the information was out of date.

Added an AIX SIGDANGER handler and some 00FAQ sections on lsof memory usage after a discussion with Tom Qin <tom.qin@citigroup.com> about lsof memory usage.

Added scripts/sort\_res.perl5, contributed by Fabian Frederick <fabian.frederick@gmx.fr>. The script displays lsof output sorted by size and path name.

Improved handling of files on Linux NFS mount points that use the root\_squash option, based on discussions with Paul Szabo <psz@maths.usyd.edu.au>.

Updated FreeBSD 5.2-CURRENT support, based on a problem report from Filippo Natali <filippo@widestore.net>.

Corrected improper FreeBSD 5.x-CURRENT #if condition, reported by Kim Culhan <kimc@kim.net>.

Added a Configure script work-around for AIX 5.2 lsof with JFS2, compiled by gcc >= 3.3. The work-around was supplied by Florian M. Weps <fmw@hactrn.ch>.

#### 4.73 October 21, 2004

Added an `__XPG4_CHAR_CLASS__` #define before #include'ing <ctype.h> on Solaris to restore lsof's ability to display special characters such as acute-e.

Added wide-character (e.g., UTF-8) support where possible, prompted by a request from Kyungjoon Lee <kjoonlee@gmail.com>. Some older dialects -- e.g., NetBSD 1.4.1 -- don't support wide characters, so the wide character support is enabled by definitions in each dialect's machine.h. Dialects with wide-character support are listed in 00FAQ.

Make a FreeBSD 5.2-CURRENT adjustment for <sys/pipe.h>, supplied by Sergey A. Osokin <osa@FreeBSD.ORG>.

Implemented a Linux feature request made by Jakub Jelinek <jakub@redhat.com> that enhances lsof's ability to locate UNIX domain sockets whose paths are named as arguments. Jakub supplied suggested code.

Dropped \*claims\* that lsof works on AIX below 5.1, SCO  
Dropped \*claims\* that lsof works on AIX below 5.1, SCO  
Openserver 5.0.4, Tru64 UNIX 5.0, and UnixWare below  
7.1.4. Lsof will probably build and work on those UNIX  
dialect versions, but I no longer have any way to test  
lsof on them.

Added support  
for FreeBSD 5.3 and 6.0. The FreeBSD  
5.3 support hasn't been tested.

Added FD test code that will allow dialect versions to  
test FD option selections. Used the new code in the  
PSTAT-based HP-UX lsof to enable it to avoid scanning  
the mount table when its information is not needed.  
The addition was made in response to a query from  
Harvey Garner <Harvey.Garner@championusa.com> about  
lsof performance in a busy NFS environment.

Upgraded lsof's AIX support level to AIX 5.3, based on  
a report from Dick Dunbar <Dick.Dunbar@Siebel.com>. (I  
have not tested lsof under AIX 5.3.) Based on Dick's  
recommendation and local testing changed the C for AIX  
version 6 and higher -qmaxmem option value to -1.

Made LSOFF\_AR environment variable more useful and  
documented it in 00XCONFIG.

Corrected the use of sum(1) to generate signatures for  
the lsof distribution and binaries to match the  
documentation that claims it is sum -r output. Jin  
Guojun <jin@george.lbl.gov>  
noticed and reported the  
problem.

Tested under OpenBSD 3.6.

Added checksum and GPG certificate files for the bz2,  
gz and Z lsof distribution archives. The new files  
reside with the distribution archives and supplement  
the signature information already inside the archives.

Validated on Solaris 10, i8xpc, build s10\_63.

4.74 January 17, 2005

Fixed a Solaris segment fault bug on systems that lack  
a /dev/allkmem device. Offered the fix as a patch to  
lsof 4.73. The bug was reported by Donald Zoch

<donald.zoch@amd.com>.

Updated lsof for FreeBSD 6.0 and higher for a change in <sys/vnode.h>, based on a report from Sergey A. Osokin <osa@FreeBSD.ORG>. Made the update available in a 4.74 'A' edition pre-release.

Filed an HP bug report about missing pstat(2) CWD info for LOFS on HP-UX 11.11 and higher. The missing CWD info was noticed by Ermin Borovac <e.borovac@bom.gov.au>. Added info to 00FAQ about the problem, which can cause the lsof test suite's LTbasic test to fail.

Updated the q4-generated tcp\_s.h in the lsof distribution and added socket option support for HP-UX 11.00. Erwin Reyns <ereyns@europarl.eu.int> helped test.

Updated for Solaris 10, build s10\_69, with a patch supplied by Mike Miscevic <miscevic@hotpop.com>.

Added v\_path support to Solaris 10 lsof. That relieves it of having to read and decode the kernel DNLC, and delivers full paths more reliably.

Added specialized NFS4 support to Solaris 10 lsof.

Applied Solaris 10 patches to lsof supplied by Casper Dik <casper@holland.sun.com>.

Updated lsof for NetBSD 2.99.10 and tested it on a system provided by Andrew Brown <atatat@atatdot.net>.

Added support for the FreeBSD 6.0-CURRENT f\_vnode pointer in the file structure.

Added BSDI, FreeBSD, NetBSD and OpenBSD support for the \*effnlink member of the inode structure. This makes the lsof LTnlink test run faster on all modified dialects and correctly on OpenBSD.

Added  
ptyfs support for NetBSD, using modifications provided by Andrew Brown.

Changed the netbsd Configure stanza to look by default for system header files in both /usr/include and

/usr/src. (The NETBSD\_SYS environment variable can still be used to select an alternate for /usr/src.)

Corrects two FreeBSD 4.10 RPC/XDR type definitions.

Added an FAQ Q&A about setuid and setgid restrictions in HP-UX 11.11. The information in the answer was supplied by Frank Sanders <frank.sanders@siemens.com>.

Added abbreviations for AXI FCIO and FSNAPSHOT file flags. Holger VanKoll <Holger.VanKoll@swisscom.com> reported the missing FCIO.

Adjusted lsof's private AIX 64 bit rnode structure for 64 bit AIX 5.2 systems. (IBM doesn't distribute a correct <nfs/rnode.h> for it.)

Corrected a Linux socket inode printing bug reported by Igor Schein <igor@txc.com>.

Updated for FreeBSD 4.11. The support compiles but hasn't been tested.

Back-ported a FreeBSD 6.0-CURRENT fix to FreeBSD 5.3-RELEASE-p1. That was done to solve a compilation problem reported by Radko Keves <rado@daemon.sk>.

4.75 May 16, 2005

Dropped the \*claim\* that lsof works on DEC OSF/1 and Digital UNIX, since my last 4.0 test system has been removed. The last tested distribution of lsof on DEC OSF/1 and Digital UNIX was revision 4.74. It has been archived on lsof.itap.purdue.edu in pub/tools/unix/lsof/OLD/src.

Added negation forms to the values in the -g (PGID) and -p (PID) lists. Negated PGID and PID values, like negated UID or login name values, are applied without ORing or ANDing and take effect before any other selection criteria are applied.

At the request of Marcin Gozdzalik <gozdzal@gmail.com> added a -X option for Linux. The option inhibits the reading of the /proc/net/tcp\* and /proc/net/udp\* files.

Based on a report from David Gutierrez <davegu1@hotmail.com> changed DEC OSF/1 process table

allocation to request memory in smaller increments.

Based on a report from jayjwa <jayjwa@atr2.ath.cx> updated the Customize script to use "tail -n 1" where possible.

Enabled support for FreeBSD 5.4.

Improved the BSDI, FreeBSD, NetBSD, OpenBSD and Solaris kvm\_open() and kvm\_openfiles() error messages.

Enabled support for NetBSD 2.99.12.

Improved HP-UX Configure stanza with help from Piet Starreveld <pstarrev@csc.com>. Picked some lint Piet found.

Enabled IPv6 support for HP-UX > 11. Piet Starreveld helped test it on 11.23, among others.

Updated for HP-UX 11.23 on the ia64 architecture.

Updated to latest FreeBSD 6.0-CURRENT, using a test system provided by Andrzej Tobola <ato@iem.pw.edu.pl>.

Added support for SCO OSR 6.0.0 and UnixWare 7.1.4 with help from Richard at SCO.

Corrected a Linux bug in NFS handling, reported by Karel Zak <kzak@redhat.com>. Karel supplied a patch.

Improved the code for accessing an AIX 3.2 and higher sockaddr\_un structure, thus eliminating a segmentation fault possibility.

Updated for AIX 5.3.

Added preliminary (DEBUG) support for the AIX SANFS file system.

Fixed a bug in the Solaris 10 processing of the vnode's v\_path pointer with code supplied by Edward Jajko <ejajko@portal.com>. The fix was offered as a patch to 4.74.

Dropped support for OpenUNIX 8, since a test system is

no longer available. Archived an OpenUNIX-only distribution of the last revision (4.74) tested on OpenUNIX in pub/tools/unix/lsof/OLD/src.

Tested under Openbsd 3.7.

Tested under Darwin 7.7.0.

Enabled building on amd64 Solaris 10 with hints from Marc Aurele La France <tsi@ualberta.ca>. Marc provided a test system.

Supplied a missing quote in the FreeBSD Configure stanza. Carl Cook <Info@quantum-sci.com> reported the problem.

Removed "-O" option from tests/Makefile so that the HP-UX bundled compiler won't complain.

4.76 August 30, 2005

Corrected an example and spelling errors in man page.

Updated  
for Apple Darwin 8.x with changes supplied by Allan Nathanson <ajn@apple.com>. Allan also provided a test system.

Completed documentation of CLRLFILEADD in all machine.h files.

At the request of Chris Markle <cmarkle@sendmail.com> added partial listen queue length to socket options displayed when -Tf is specified. Partial queue length is not reported for all dialects. (00FAQ lists the ones where it is reported.)

Updated for FreeBSD 7.0 with information supplied by Andrzej Tobola <ato@iem.pw.edu.pl>.

Updated Solaris VxFS support for VxFS versions 4 and above with technical advice from Craig Harmer <craig\_harmer@symantec.com>, Gary Millen <gary\_millen@symantec.com> and Chuck Silvers <charles\_silvers@symantec.com>. Testing help was provided by Michael Antlitz <mantlitz@prophasys.com>, Steve Ginsberg <steve@dhapdigital.com> and Kenneth Stailey <kstailey@yahoo.com>.

Fixed a Solaris address space map processing bug.  
Janardhan Molumuri <mjanardhan@gmail.com>  
reported the  
bug and help me identify it. Made the fix available as  
a patch to 4.75.

Added support for Solaris 10 port and CTFS files. The  
CTFS support is incomplete, because I don't know how  
to get inode number, size and link count. (There's  
a new 00FAQ entry about that.)

Investigated a report from Christopher J Warweg  
<warwegc@GAO.GOV> that the CHECKSUMS for the lsof 4.75  
binary for 64 bit Solaris 8 was incorrect. It was my  
packaging error. I rebuilt and repackaged the binary.

Enabled support for Linux map file names with embedded  
spaces.

#### 4.77 April 10, 2006

Added -X option support for Solaris 10 and above. When  
-X is specified lsof will report cached v\_node path  
names for unlinked files, followed by "(deleted)".  
Improved cached vnode path name handling by adding  
"()" to the end of path names of questionable accuracy.  
Updated 00FAQ to reflect these changes.

Updated for FreeBSD 7.0-CURRENT.

Fixed name addition  
spacing bug, reported by Stuart  
Anderson <anderson@ligo.caltech.edu>. Also updated  
Solaris 10 SAMFS support at Stuart's request.

Added missing "break;" and another HASSTATVFS test to  
the NetBSD and OpenBSD dnode.c. Bill Behr  
<bbehrr@networkstoragecorp.com> reported those needs.

Fixed an HP-UX 11 file descriptor "chunk" size problem,  
reported by Per Allansson <per@appgate.com>. Per helped  
devise the fix and tested it. This fix was offered as  
a patch to lsof 4.76.

Updated for FreeBSD 6.0-STABLE and FreeBSD  
6.1-PRERELEASE.

Updated scripts/sort\_res.perl5 with changes supplied by  
Frederick Fabian <fabian.frederick@skynet.be>, the

author of the script.

Corrected +/-M man page documentation error, reported by Roger Cornelius <rac@tenzing.org>.

Improved FreeBSD user device random seed generation in response to a problem report from Danny Braniss <danny@cs.huji.ac.il>.

Eliminated three syntax error bugs and other compiler complaints from the PSTAT-based lsof. H. Merijn Brand <h.m.brand@xs4all.nl> reported the problems and tested the fixes.

Eliminated compiler complaints in the test suite.

Investigated problems with the building of lsof on PA-RISC HP-UX 11.23, based on a report from John Orndorff <John.Orndorff@sungard.com>. Found that neither the HP bundled C compiler nor gcc would build lsof, but the the HP unbundled ANSI C compiler would. Concluded that HP bundled C compiler can't handle <gssapi/gssapi.h>. Devised a work-around to gcc's omission of the rpcent structure definition of <netdb.h> that allows it to compile lsof's print.c, but the resulting binary doesn't run reliably. Documented the situation in 00FAQ.

Changed reporting of unknown file types. The number of an unknown type is now reported as four octets. The change was made in response to a Linux lsof bug report from Karel Zak <kzak@redhat.com>.

Dropped the \*claim\* that lsof works on BSDI BSD/OS since my last test system has been removed. The last tested distribution of lsof for BSDI BSD/OS was revision 4.76. It has been archived on lsof.itap.purdue.edu in pub/tools/unix/lsof/OLD/src.

As a result of discussing the lsof source tar's MD5 checksum with Andrew Bell <andrew.bell.ia@gmail.com>, changed the description of a suitable MD5 tool in the lsof distribution's documentation to name the openssl "dgst" command.

Enabled compilation on Solaris 10 1/06 with a fix sent



by Jason Fortezzo <fortezza@mechanicalism.net>. Made the fix available as a patch to 4.76.

Adjusted to FreeBSD 5.5-PRERELEASE.

Corrected a bug in the lsof library's process\_file() function to enable the locating of AIX XTI sockets by their TCP/IP address values. The bug was reported by Michel Dubois <Dubois@sears.ca>.

Based on a bug report from Karel Zak <kzak@redhat.com> added command name length checking to as many dialects as possible (Linux for Karel) for the "-c c" option.

Updated  
for OpenBSD 3.[89]. Tested the 3.9 update on a system provided by David Mazieres. I have not tested on OpenBSD 3.8, but David reports lsof 4.76 worked there.

Ended regression testing of lsof on 32 bit Solaris 8 with the ending of access to a test system. Lsof continues to be tested on 64 bit Solaris 8.

4.78 April 24, 2007

Added more information to the lsof FAQ about missing link counts and sizes on Linux files.

Simplified Linux stat() and lstat() usage.

Relocated #define's that prevent OpenBSD compilation on systems without a /proc file system. Pieter Bowman <bowman@math.utah.edu> reported the problem.

Added code to avoid processing Linux /proc/<PID>/maps file entries with zero device and node numbers. Some such entries now have names associated with them that are not path names -- e.g., "[heap]", "[stack]" or "[vdso]". Scott Worley <sworley@chkno.net> reported lsof's mishandling of such entries.

Added SELinux security context support, provided by James Antill <james.antill@redhat.com>. I have not tested this, but James and Karel Zak <kzak@redhat.com> have.

Added the #include of <sys/types.h> to Solaris lsof to

enabled compilation on Solaris 10 6/06. Peter Harvey  
Peter.Harvey@Sun.COM diagnosed the problem and supplied  
a patch.

Added better support for JFS2 on AIX 5.2 and 5.3, based  
on bug reports and help from Thomas Braunbeck  
<BRAUNBEC@de.ibm.com> and Tom Whitty <TWHITTY@cerner.com>.

Documented that lsof supports AIX 5.3 only up through  
maintenance level 1 (ML1).

Enabled Solaris lsof to locate the AFS vnode operation  
address for OpenAFS 1.4.1. The fix was supplied by  
Robert Jelinek <Robert.Jelinek@MorganStanley.com>.

Enabled support for Solaris 10 ZFS. If the necessary  
ZFS header files aren't found, lsof offers the option  
to drop ZFS support, to use internal, possibly  
inaccurate structure definitions, or to supply a path  
to the missing header files. Horst Scheuermann  
<Horst.Scheuermann@uni-trier.de>  
provided a development  
system and helped test the support.

Corrected a typo in the man page, reported by Eric S.  
Raymond <esr@thyrsus.com>.

Changed the spelling of macroes to macros in lsof  
source and documentations files, based on a suggestion  
from Josh Soref <timeless@gmail.com> and verification  
with the OED.

The following dialects are no longer supported: 32 bit  
AIX 5.2, HP-UX 11, OpenStep 4.2, Solaris 2.6, Solaris  
8, True Unix 64 and UnixWare 7.1.4. Lsof may work on  
them, but I no longer have test systems for them.  
Support for OpenBSD ends at its version 3.9 for lack of  
interest in the port.

4.79 April 15, 2008

\*\*\*\*\* IMPORTANT NOTE \*\*\*\*\*

\*

\*

\* Lsof support has been reduced to the following \*

\* dialects: AIX, FreeBSD, Linux and Solaris, and \*

\* only in selected versions of those dialects. \*

\* The selected versions are listed in

```

this file *
* and in other lsof documentation.      *
*                                     *
* I have made this move because of retirement *
* and because I no longer have many test systems *
* available to me.                      *
*                                     *
* Vic Abell                             *
*                                     *
*****

```

Fixed a Solaris VXFS permission problem when accessing the VXFS inode offsets. The bug was reported by Gregory A. Ivanov <ivga@mts.ru>. Gregory tested the fix.

Moved an #include <string.h> later in FreeBSD dlsof.h to enable compilation on recent FreeBSD releases. The change was supplied by Roy Marples <uberlord@gentoo.org>.

Improved Linux /proc file stream reading speed by applying an expanded version of a patch from Eric Dumazet <dada1@cosmosbay.com> that allocates a page size buffer to each stream. Improved TCP, TCP6, UDP and UDP6 hashing by determining the hash bucket count from the /proc/net sockstat and sockstat6 files. The improvement was suggested by Eric and he provided sample code. Eric also tested both improvements.

Modified Configure script to build lsof on FreeBSD 6.2. Tested it on a system provided by Larry Rosenman <ler@lerctr.org>.

Fixed a Linux maps file processing bug that prevented path names from having an embedded colon. James Lingard <jchl@arastra.com> reported the bug and helped with its fix.

Based on reports from Eric Dumazet and Samuel Thibault <samuel.thibault@ens-lyon.org> added support for the Linux 2.6.22 kernel's /proc/<PID>/fdinfo files -- i.e., file offset and flags. Samuel Thibault provided a test system.

Fixed a Linux UNIX socket memory leak, reported by Philip Shin <pshin@xceedium.com>. Phillip supplied the fix.

With generous assistance from HP added support for an HP-UX

11.23

patch that makes TLI/XTI socket address information available.

Fixed a header file problem for FreeBSD 6.2 on the Alpha architecture. The problem was reported by Pekka Honkanen <phonkane@cc.hut.fi>. Pekka tested the fix.

Based on a report and using suggested fixes from Karel Zak <kzak@redhat.com>, made these changes to Linux lsof: corrected a getpidcon() error message; insured that inode numbers are handled correctly for their unsigned long long type; and improved SELinux handling. At the request of Alon Bar-Lev <alonbl@gentoo.org> added the LINUX\_HASSELINUX environment variable to enable or inhibit SELinux support unconditionally.

Updated Configure for FreeBSD 8.0-CURRENT and tested lsof on AMD64 there.

Added a patch provided by Oles Hnatkevych <don\_oles@able.com.ua> for FreeBSD systems where the root file system is on a CD9660 device.

Added compensation for the disappearance of FMARK and FDEFER from the FreeBSD 8.0-CURRENT <sys/file.h>.

Updated

FreeBSD lsof with ZFS support. Larry Rosenman <ler@lerctr.org>, Erwin Lansing <erwin@FreeBSD.org>, Wesley Shields <wxs@atarininja.org> and Dmitry Morozovsky <marck@rinet.ru> provided test systems.

Fixed a socket file identification problem reported by Pavol Rusnak <stick@gk2.sk>. Pavol also reported the cause of the problem.

Added the ability to format the repeat mode marker line with strftime(3), where the dialect supports the localtime(3) and strftime(3) C library functions. The addition was suggested by Mike Depot <mdepot@comcast.net>, who also tested it. The addition required creating a new main lsof source module, util.c, that contains functions whose compilation conflicts with the general header file tree defined by lsof.h and dlsof.h.

Based on reports from Andrei V. Lavreniyuk

<andy.lavr@reactor-xg.kiev.ua> and Pav Lucistnik  
<pav@FreeBSD.org> updated the FreeBSD 7.0 and above  
file lock handling to use new locking structures.

The  
update requires a terrible hack to get a definition for  
the lock owner structure from a kernel source module  
into a local lsof header file.

#### 4.80 May 12, 2008

Updated for a FreeBSD 7.0 and above byte level locking  
change. The problem was reported by Conrad J. Sabatier  
<conrads@cox.net>, who helped test the update. Wesley  
Shields <wxs@FreeBSD.org> provided an 8.0-CURRENT test  
system.

Propagated the FreeBSD 7.0 and above locking changes to  
FreeBSD 6.x, based on a report from Edwin Groothuis  
<edwin@FreeBSD.org>.

Added warnings for unsupported dialects or versions.

Added Linux support for the UDPLITE protocol. Eric  
Dumazet <dada1@cosmosbay.com> supplied a patch.

Added a missing quote to the Configure script's  
FreeBSD stanza.

Added a usage.o rule to the HP-UX PSTAT-based  
Makefile. I mistakenly deleted the rule at revision  
4.79. The missing rule was reported by Kawaljeet Kaur  
<kawaljeet.malviya@gmail.com> who tested the corrected  
Makefile.

#### 4.81 October 21, 2008

Updated the Darwin libproc sources with changes from  
Allan Nathanson <ajn@apple.com>. Tested them on a iMac  
mini, provided by Apple Inc.

Changed dummy declarations in library source files to  
eliminate complaints about unused variables and empty  
object files. This change may not work on dialects I  
can no longer test; it has been tested on some versions  
of AIX, Darwin, FreeBSD, Linux and Solaris.

At the request of Hal Brooks <hal@uga.edu> added support  
for Linux /proc/net/packet files. Hal tested it.

Added socket file only performance enhancements to Linux and PSTAT-based HP-UX lsof.

Added htonl call around improper usage of INADDR\_LOOPBACK; report from an Apple engineer forwarded by Allan Nathanson <ajn@apple.com>.

Adjusted for FreeBSD-8.0 change in device number handling. The adjustment should work for FreeBSD 5 and above, should the 8.0 change be propagated downward. The problem was reported by Pav Lucistnik <pav@FreeBSD.org>. An updated test system was provided by Erwin Lansing <erwin@FreeBSD.org>.

Reduced AIX support to version 5.3, since test systems with older versions are no longer available to me.

At the request of Marjo F. Mercado <mmercado@xceedium.com> and Phil Shin <pshin@xceedium.com> applied some speed improvements to lsof, particularly when the files of interest are /Internet files -- i.e., selected with lsof's "-i" option. Added a two new options to assist the improvements: 1) "-c^<command>" to tell lsof to exclude the named command(s); and 2) "-stcp|ud>:[^]state" to tell lsof to include in its reporting or exclude (^) from its reporting Internet files in the named states (e.g., LISTEN, ^CLOSE\_WAIT, IDLE, etc.) For the most part these changes apply only to AIX, Darwin, FreeBSD, PSTAT-based HP-UX, Linux and Solaris, since those are the only places I could test them. They are controlled by the HASTCPUDPSTATE definition in each dialect's machine.h header file. Marjo and Phil provided HP-UX 11.23 and 11.31 test systems.

Fixed a stat(2) problem on HP-UX 11.31 while testing the speed improvements.

Adjusted for kernel header file changes in FreeBSD 8.0-CURRENT. Larry Rosenman <ler@lerctr.org> provided a test system.

Added a warning for Solaris systems where VxFS node info can't be obtained from the VxFS utility library. The warning was requested by Tom Matthews <Tom.MATTHEWS@rbs.com>.

Corrected mishandling of file system path name arguments that have trailing slashes, except, of course, the root file system, "/". Allan Nathanson <ajn@apple.com> reported

the bug.

4.82 March 25, 2009

Corrected an over-zealous exclusion test that caused lsof to report nothing when it was given no arguments and built with HASSECURITY and HASNOSOCKSECURITY enabled. Joshua Kinard <kumba@gentoo.org> reported the bug and supplied information for reproducing it.

Based on a report from Dan Trinkle <trinkle@cs.purdue.edu> corrected use of <sys/utsname.h> for 32 bit Solaris 10 and above compilations. Simultaneously eliminated a casting complaint in arg.c and updated Configure to use the appropriate 64 bit compilation option (-xarch=v9 or -m64) with the Solaris Sun C compiler.

Updated for FreeBSD 7.1-PRERELEASE with information supplied by Larry Rosenman <ler@lerctr.org>.

Updated the Darwin libproc sources with changes from Allan Nathanson <ajn@apple.com>. Tested them on a iMac mini, provided by Apple Inc. Allan also provided man page corrections.

Updated the FreeBSD Makefile to use the \${MAKE} variable for ZFS dnodet2.c module compilation, based on a suggestion from Alexis Ballier <aballier@gentoo.org>.

Improved the Solaris VxFS library location test, based on a suggestion from Jason Fortezzo <fortezza@mechanicalism.net>. Jason tested the change.

Updated Solaris 10 ZFS support for ZFS version 4 and ZFS pool version 10, using a test system kindly provided by Vladislav Nespor <vladislav.nespor@id.ethz.ch>. Renata Maria Dart <renata@slac.stanford.edu> tested on ZFS version 4, verifying that the update works there, too. (ZFS pool version 10 is apparently the ZFS version shipped with the 10/08 update to Solaris. The original ZFS support targeted ZFS version 3.)

I still consider ZFS support in Solaris lsof a hack, because it depends on a znode structure definition that I developed using dbx. Sun is remiss in not distributing the ZFS header files used to build the distributed kernel.

Because of the znode structure definition hack, I can't guarantee that lsof ZFS support will work for any other versions of ZFS.

Solaris 10: adjusted to a change in the way devices are stored in the kernel; fixed a problem in zone handling; and added rudimentary sharedfs support. Carson Gaspar <carson@taltos.org> reported the device number problem, provided a test system, and tested the changes. Peter Vines <psv2b@eservices.virginia.edu> reported the zone handling problem and tested the fix.

Adapted to FreeBSD 8.0-CURRENT changes in device number computation. Problem was reported by Erwin Lansing <erwin@FreeBSD.org>. Larry Rosenman <ler@lerctr.org> provided a test system.

Corrected Solaris Configure test for appropriate VxFS library when using gcc to compile lsof.

Updated for loss of KAME IPv6 FreeBSD accommodations.

Adapted to FreeBSD 7.2. Made Configure script recognized FreeBSD 6.3.

4.83 January 18, 2010

Converted Solaris 10 and above ZFS support to use the CTF debugger library, libctf. Code was supplied by Robert Byrnes <Robert.Byrnes@deshaw.com>.

Corrected a typo in the testing of the LINUX\_HASSELINUX environment variable in the Configure script. The error was reported by Mike Frysinger <vapier@gentoo.org>. At Mike's request made Configure script accept LSOF\_RANLIB (ranlib command), LSOF\_CFGF (additional configuration flags) and LSOF\_CFGL (additional library specifications) from the environment.

Enabled compilation of Solaris 10 lsof after a recent Sun patch which changed the PC file system's structure. Peter Vernam <pvernam@draper.com> reported the problem and helped with the fix.

Made the sort of configuration CFLAGS in the CkTestDB script impervious to locale settings.



Ported to Solaris 11, using a test system kindly provided  
by David Day <dday76@gmail.com>.

Adjusted to the disappearance of <nfs/rpcv2.h> in FreeBSD  
8.0-BETA1.

Changed Solaris node type lookup to a hashed method and  
added some ability for it to handle duplicate vnodeop names  
in /dev/ksyms.

Updated for FreeBSD 9.0-CURRENT. Andrzej Tobola  
<ato@iem.pw.edu.pl> provided a test system. Extends the  
fix to FreeBSD 6.0 and above via a Configure test and a  
compile-time definition. The need for the extension was  
reported by Erik Trulsson <ertr1013@student.uu.se>>

Made corrections to FAQ typographical  
errors, suggested  
by Josh Soref <timeless@gmail.com>.

Added \_\_UCLIBC\_\_ test to Linux dlsof.h so lsof would compile  
on an Intel ARM XScale processor. The addition was provided  
by Doug Kehn <rdkehn@yahoo.com>.

Added test for <utmpx.h> to FreeBSD configuration. Improved  
its use in lsof.h. The changes were supplied by Martin Wilke  
<miwi@FreeBSD.org>.

4.84 July 29, 2010

Fixed a man page nroff command error with a correction  
supplied by Josh Soref <timeless@gmail.com>.

Made Configure script recognize FreeBSD 7.3. Larry Rosenman  
<ler@lerctr.org> provided a test system.

Improved task support, initially for Linux only, with help  
provided by Jerome Marchand <jmarchan@redhat.com> and  
Miklos Szeredi <mszeredi@suse.cz>. The support includes a  
new compile-time definition, HASTASKS, and a new run time  
option, "-K" to select task reporting.

While adding help output support for "-K", reorganized the  
printing of help columns to make it much easier to  
add a new  
option description.

Updated the Solaris PC file system structure patch in  
revision 4.83 so it will compile with gcc.

Disabled the Solaris lgrp\_root work-around in the Solaris machine.h so it won't cause compilation problems on Solaris 11. It no longer causes compilation problems on my Solaris 9 and 10 test systems, but some older Solaris 9 and 10 versions may still need it, so the work-around was left in the Sun machine.h and a FAQ entry was created about it.

Updated for Solaris 11 b134, using a test system kindly provided by Carson Gaspar <carson@taltos.org>. Made provisions for the next ZFS version. Added info about the failure of the LTnlink test on ZFS file systems.

Corrected typo in Configure script, reported by Dmitry Berezin <dmitryb@oit.rutgers.edu>.

4.85 September 27, 2011

John Dzuberka <Zube@CS.ColoState.EDU> kindly provided a patched Solaris 9 test system with the lgrp\_root conflict and I was able to devise an automatic work-around for the conflict. The special note in ../dialects/sun/machine.h was removed and the 17.28.1 FAQ entry was modified to reflect the update.

Added a Solaris 11 work-around for a typedef problem with <sys/mutex.h>. Carson Gaspar <carson@taltos.org> reported the problem and supplied the work-around.

Added support for FreeBSD 7.4 and 8.2; tested on systems provided by Larry Rosenman <ler@lerctr.org>.

Added support for 32 bit Solaris 11 lsof with mods supplied by Jan Wortelboer <J.H.P.Wortelboer@uva.nl>.

Added Solaris 11 support for using an alternate genunix location. Bill Goodridge <bill@its.brooklyn.cuny.edu> reported the alternate location.

Added further Linux cross configuration support to lsof's Configure script. The additional support was supplied by Grant Erickson <erick205@umn.edu>. See the descriptions of the LINUX\_\* environment variables in 00XCONFIG for more information. Tested lsof on Linux kernel 2.6.32 and picked some lint that surfaced during the test.

Added fixes and changes for Apple Mac OS X 10.6, provided by Allan Nathanson <ajn@apple.com>. Allan also provided a test

system.

Tested on FreeBSD 6.4 i386, using a test system provided by Terry Kennedy <TERRY@tmk.com>. Updated for recent FreeBSD ZFS changes on an 8.2 amd64 test system also provided by Terry.

Changed documentation to indicate FreeBSD 7.x is no longer supported, since I no longer have a test system.

Made some changes to the lsof man page, suggested by Navid <evi1m4chine@googlemail.com>.

Added compensation for Solaris 10 systems that have patch 144488-10. The patch requires that the new header file <sys/socket\_proto.h> be included while \_KERNEL is defined. Brett Bartick <Brett.bartick@nomura.com> reported the problem first, followed by Stuart Anderson <anderson@ligo.caltech.edu>. Michael Hocke <michael.hocke@nyu.edu> suggested a work-around which I refined to limit it to the specific Solaris 10 instance and then tested on a system provided by Charles Stephens <cfs@cowlabs.com>

Added the +|-e option for Linux. It exempts file systems named by path from function calls that might block in the kernel -- i.e., stat(2) and lstat(2), and when the +e form is used, readlink (2). The new packager of lsof for the Linux Fedora and RHEL distributions, Peter Schiffer <pschiffe@redhat.com>, asked for the feature so it could be used with Clearcase file systems, whose implementation can block stat(2) calls. I consider this feature very risky and easy to misuse -- e.g., specifying the file system as '/' would exempt all file systems. I don't intend to propagate this option to any other UNIX dialect that lsof currently supports.

Made FreeBSD 9 adjustment.

Fixed a Linux bug that prevented the display of paths for abstract UNIX sockets. Masatake Yamato <yamato@redhat.com> reported the bug and supplied a patch.

Added compensation for the removal of RPC header files from Glibc 2.14 for Linux. Marek Behun <kabel@blackhole.sk> reported the problem and supplied a patch.

Added support for Linux Netlink protocol. Masatake Yamato

requested the support and supplied a patch. Peter Schiffer <pschiffe@redhat.com> provided a test system.

Corrected Linux UDP6-lite path. The error was reported by Masatake Yamato and he also supplied a patch.

#### 4.86 April 10, 2012

Lsof for AIX is no longer supported on any versions of that operating system.

Added information about the clang compiler for FreeBSD to the FAQ.

Corrected an arg.c bug in the accumulation of +|-e option values, reported by Peter Schiffer <pschiffe@redhat.com>. This correction was supplied as a patch to revision 4.85.

Enabled FreeBSD 10 support and tested it there on a system provided by Larry Rosenman <ler@lerctr.org>.

Updated for latest Solaris 11 with patches supplied by Carson Gaspar <carson@taltos.org>. Carson supplied a test system.

Adjusted Linux file system search method to compensate for NFS mounts that have duplicate device numbers. The problem was reported by Peter Schiffer <pschiffe@redhat.com>, who provided a test system.

At the request of Peter Schiffer <pschiffe@redhat.com>, added support for Linux SCTP socket files. Peter provided a test system. Applied a warning patch supplied by Peter.

Added support for Mac OS X 10.7 (Lion), provided by Allan Nathanson <ajn@apple.com>. Allan also supplied a test system.

Enabled FreeBSD 8.3 support and tested it there on a system provided by Larry Rosenman <ler@lerctr.org>.

Corrected the FAQ information on ZFS with Solaris 10 after Steven Blackmon <stblackm@cisco.com> and Prasad Jampala <jampalp@cisco.com> pointed out that it was incorrect -- i.e., outdated by the libctf changes at revision 4.83.

Added code to handle a Linux NFS-mounted root. Jia He <hejianet@linux.vnet.ibm.com> reported the need for this.

4.87 January 2,  
2013

Added an entry to 00FAQ about lsof behavior when the HASSECURITY and HASNOSOCKSECURITY options are defined. Carson Gaspar <carson@taltos.org> pointed out the need for this clarification.

Added a work-around for a missing definition of mach\_port\_t in Darwin 9 (Mac OS/X 10.5.8). The work-around was supplied by Jim Reid <jim@rfc1035.com>.

Added support for Linux anon\_inodefs, provided by Masatake YAMATO <yamato@redhat.com>.

Documented a Solaris 9 and 10 portmap reporting problem (+M) in 00FAQ. The problem was reported by Clint Roberts <Clint.Roberts@tti.us.com>. I have no solution to the problem, but discuss a possible work-around in the answer to this 00FAQ question: "Why doesn't lsof report portmap registrations for some Solaris versions?"

Added FreeBSD support for the oldnfs and newnfs file system types. Daniel Braniss <danny@cs.huji.ac.il> reported the need for the addition.

Added ICMP socket support for Linux with code provided by Masatake YAMATO <yamato@redhat.com>.

Corrected the reporting of process group ID for libproc versions of Mac OS X with a patch from Jeff Trawick <trawick@gmail.com>. The patch has not been applied to Darwin kmem versions, because of little call for them and inadequate test system access. The patch has been tested on Mac OS X 10.8 (Mountain Lion), courtesy of a test system provided by Allan Nathanson <ajn@apple.com>.

Added thread support to those FreeBSD versions that have ki\_numthreads in their kinfo\_proc structure. This also activates the -K option for those FreeBSD versions. Jeff Trawick reported problems with FreeBSD lsof when threads are present and this addition solves those problems.

Made changes to 00FAQ and the distribution, suggested by Warren Young <warren@etr-usa.com>. The 00FAQ changes center on sections that discuss the -s option. The changes to the distribution include a ChangeLog file that is either

a pointer to or a copy of 00DIST,  
the distribution notes.

Added support to FreeBSD for using the clang compiler.

Added Linux support for using the getxattr() call to obtain socket protocol identification when it is can't be obtained from the /proc/net files that lsof examines. Masatake YAMATO <yamato@redhat.com> developed the kernel patch to getxattr() and supplied the lsof patch.

4.88 October 13, 2014

Reduced to 50 the number of open file descriptors lsof attempts to close while trying to protect itself from a file descriptor exec() attack. This limits the overhead lsof incurs on systems that have large file descriptor limits, yet provides sufficient open descriptors for the library functions lsof calls.

Updated for changes in FreeBSD 10 with advice from Eygene Ryabinkin <rea@freebsd.org>. Taught Configure to recognize FreeBSD 8.4.

Herein am noting that lsof for Solaris 10 or 11 is no longer supported. I no longer have test systems. Some support is still available from Casper Dik <Casper.Dik@oracle.com> and a Solaris 11 patch he provided is included in this revision.

Initialized local variables in the Linux process\_id() function. Jia He <jiakernel@gmail.com> reported the problem.

Added support for FreeBSD 11.

Updated FreeBSD ZFS Configure stanza to supply a dummy opt\_kdtrace.h when needed.

Added tmpfs file system support for FreeBSD.

Since a test system is no longer available, dropped the claim of FreeBSD 4.9 support.

Added the +|-E options for Linux. -E displays endpoint info; +E displays endpoint info and endpoint files. Masatake YAMATO <yamato@redhat.com> requested this support and suggested code to implement it.

Fixed a Linux bug handling processes whose command includes a

non-printing character, particularly a NEWLINE character, and clarified printing of single '\\' characters in command and file names. Stephane Chazelas <stephane.chazelas@gmail.com> reported the problem.

Added support for  
Linux RDMA and CRYPTO protocol names and UNIX  
socket type with code from Masatake YAMATO <yamato@redhat.com>.

Fixed field output to insure that the field descriptor field is always selected, since it identifies the file set. The bug was reported by Gary Plewa <gary.m.plewa-1@lowes.com>.

4.89 July 7, 2015

Applied correction from Casper Dik <Casper.Dik@oracle.com> to his patch for Solaris 11 that I applied incorrectly in revision 4.88.

Updated for latest version of FreeBSD 11.0-CURRENT.

Compensated for a missing FreeBSD 10.0 typedef of bool on the i386 architecture. Allen Hewes <rallenh@hotmail.com> provided a test system. Andrey Chernov <ache@freebsd.org> provided useful advice.

Improved tests/Add2TestDB script with a patch from Peter Schiffer <pschiffe@redhat.com>. Added patches from Peter to eliminate Linux gcc warnings. Updated Lsof.8 with improvements supplied by Bjarni Ingi Gislason <bjarniig@rhi.hi.is>.

Changed FreeBSD global CFLAGS extraction  
per Terry Kennedy  
<TERRY@tmk.com>. Also made sure -DNEEDS\_BOOL\_TYPEDEF is  
#define'd when the resulting CFLAGS doesn't contain it. Terry  
reported that need.

Improved Linux test for tcp.h in response to a report from  
Cato Auestad <cato@cato.ninja>. Cato did the testing.

Fixed Linux UNIX socket search by name bug reported by  
Stephane Chazelas <stephane.chazelas@gmail.com>.

Added Linux display of UNIX socket endpoint information with  
code provided by Masatake YAMATO <yamato@redhat.com>. Peter  
Schiffer <pschiffe@redhat.com> provided a test system.

Insured that type definitions from <vm/vm.h> were again made  
visible to lsof on FreeBSD 11 after a system header file change

hid them.

4.90 February 14, 2018

```
!!!NOTE!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
!
! It is likely that this is the last lsof revision I !
! will issue, unless serious bugs are detected, Stay !
!
! tuned to lsof-l for information about future support !
! of lsof. !
!
! I thank all the many contributors to lsof over the !
! many years (20+?) I have been distributing lsof !
! versions 1, 2, 3 and 4. !
!
! Vic Abell <abe@purdue.edu> !
!
!!!NOTE!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!
```

Taught the Configure script to create a dummy opt\_random.h for FreeBSD systems whose <sys/random.h> includes it.

Added support for the FreeBSD ZFUSE file system.

Corrected the quoting in a Darwin putchar() statement in the dfile.c source file. Andrew Janke <floss@apjanke.net> reported my error.

Added support for the FreeBSD DTYPE\_PTS file descriptor and for unknown descriptors that reference the kernel's badfileops operation switch. Enabled FreeBSD 12.0 support. Tested the changes on systems provided by Larry Rosenman <ler@lerctr.org>.

Enhanced -K option with the form "-K i" to direct lsof to (i)gnore tasks. A query from Rachel Kroll <rkroll@fb.com> suggested this option. Linux task reports now include both process and task command names, making lsof's "-c <name>" option work correctly.

Added a patch to prevent NFS blocking in Linux supplied by Kristyna Streitova <kstreitova@suse.com>.

Installed a FreeBSD patch that prevents examining a TCP state structure during a race condition. The patch was supplied by Bryan Drewery <bdrewery@FreeBSD.org>.



Updated FreeBSD for new UFS inode structure that lacks an `i_dev` member in the most recent 12.0-CURRENT. Larry Rosenman <ler@lerctr.org> reported the problem and provided a test system.

Added `"#define KLD_MODULE"` to `dlsof.h` and `dnode2.c` to prevent <machine/cpuconf.h>

from generating an "ARM\_NARCH is 0" error.

This is needed so `lsf` can access kernel structures. Larry Rosenman supplied the addition.

Added recognition of the FreeBSD 11 file system name "nullfs". Jamie Landeg-Jones <jamie@catflap.org> supplied the fix.

Added a patch from Larry Rosenman <ler@lerctr.org> that is needed on FreeBSD 12 so the `lsf` compilation can obtain the `inpcb` and `tcpcb` structures from their respective header files.

Updated FreeBSD `dmnt.c` for the `ino64` changes.

Inserted a patch for Solaris 12.x to avoid compilation errors from <sys/aio\_req.h>, based on information provided by Jorn Clausen <jorn.clausen@uni-bielefeld.de>. Jorn tested the patch.

Added performance enhancement that uses the FreeBSD `closefrom()` and `dup2()` C library functions when available. The enhancement was supplied by Conrad Meyer <cem@freebsd.org>.

Corrected FreeBSD `lsf`'s gathering of ZFS file device numbers.

Updated `lsf` test library for FreeBSD.

Updated socket options information collection from the socket structure per changes supplied by Gleb Smirnov <glebius@FreeBSD.org>.

Added patch to `dlsof.h` that avoids a `_KERNEL` conflict with `bzero`. Mateusz Guzik <mjguzik@gmail.com> supplied the patch.

Corrected test library to handle 64 bit FreeBSD device numbers.

Added `#defines` for FreeBSD 12, `src r324225`, from Gleb Smirnov <glebius@FreeBSD.org>.

Incorporated Linux pseudoterminal endpoint processing (+|-E) provided by Masatake YAMATO <yamato@redhat.com> with access to

test systems provided by Peter Schiffer <pschiffe@redhat.com>.

Corrected Linux command extraction for commands that include parentheses -- e.g., "(sd-pam)".

4.91 March 26, 2018

A bug has been reported in the PTY endpoint processing of Linux lsof 4.90 by Peter Wu <peter@lekensteyn.nl>, making it necessary for me to release another revision of lsof.

This revision applies two fixes that correct the Linux PTY endpoint processing bug. Masatake YAMATO <yamato@redhat.com> supplied the fixes.

4.92 July 14, 2018

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Fixes Configure script section that creates the FreeBSD lockf\_owner.h header file; fixes <string.h> conflicts with FreeBSD kernel header files. Mateusz Gusik supplied part of the fix.

Released lsof to GitHub with Purdue releases documented in support/GitHub-release.

Vic Abell <abe@purdue.edu>  
July 14, 2018

4.92.1 May 6, 2019

!!!NOTE!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!  
!  
! The maintainership is switched from Vic to lsof-org !  
! at GitHub team officially. !  
! We thank Vic for working on lsof over the years. !  
!  
! lsof-org at GitHub team (<https://github.com/lsof-org>) !  
!!!NOTE!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!

This is just for testing "Release" feature of GitHub.  
Many documentations are not updated yet.  
URLs in -v output and -h output are updated.

Masatake YAMATO <yamato@redhat.com>, a member of lsof-org

May 6, 2019

Found in path(s):

\* /lsof-4-92-1-zip/lsof-4.92.1/00DIST

# 1.363 libjitterentropy 3.4.0

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```
* /protobuf-java-2-2-0-sources-1-jar/com/google/protobuf/RpcUtil.java  
* /protobuf-java-2-2-0-sources-1-jar/com/google/protobuf/RpcCallback.java  
* /protobuf-java-2-2-0-sources-1-jar/com/google/protobuf/AbstractMessage.java  
* /protobuf-java-2-2-0-sources-1-jar/com/google/protobuf/ProtocolMessageEnum.java  
*  
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* /protobuf-java-2-2-0-sources-1-jar/com/google/protobuf/GeneratedMessage.java  
*  
/protobuf-java-2-2-0-sources-1-jar/com/google/protobuf/UninitializedMessageException.java  
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* /protobuf-java-2-2-0-sources-1-jar/com/google/protobuf/FieldSet.java  
* /protobuf-java-2-2-0-sources-1-jar/com/google/protobuf/BlockingService.java  
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* /protobuf-java-2-2-0-sources-1-jar/com/google/protobuf/ServiceException.java  
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```

- \* /protobuf-java-2-2-0-sources-1-jar/com/google/protobuf/MessageLite.java
- \* /protobuf-java-2-2-0-sources-1-jar/com/google/protobuf/Message.java
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- \* /protobuf-java-2-2-0-sources-1-jar/com/google/protobuf/UnknownFieldSet.java

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## 1.368 libiconv 1.14.11

### 1.368.1 Available under license :

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Version 2, June 1991

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[This is the first released version of the library GPL. It is numbered 2 because it goes with version 2 of the ordinary GPL.]

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Because  
of this blurred distinction, using the ordinary General  
Public License for libraries did not effectively promote software  
sharing, because most developers did not use the libraries. We  
concluded that weaker conditions might promote sharing better.

However, unrestricted linking of non-free programs would deprive the users of those programs of all benefit from the free status of the libraries themselves. This Library General Public License is intended to permit developers of non-free programs to use free libraries, while preserving your freedom as a user of such programs to change the free libraries that are incorporated in them. (We have not seen how to achieve this as regards changes in header files, but we have achieved it as regards changes in the actual functions of the Library.) The hope is that this will lead to faster development of free libraries.

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between a  
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This option is useful when you wish to copy part of the code of the

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library `Frob' (a library for tweaking knobs) written by James Random Hacker.

<signature of Ty Coon>, 1 April 1990

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Version 3, 29 June 2007

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The

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# 1.375 slf4j-impl 1.7.5

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Found in path(s):

\* /slf4j-log4j12-1-7-5-sources-jar-zip/slf4j-log4j12-1-7-5-sources-jar/org/slf4j/impl/Log4jLoggerFactory.java  
\* /slf4j-log4j12-1-7-5-sources-jar-zip/slf4j-log4j12-1-7-5-sources-jar/org/slf4j/impl/StaticLoggerBinder.java  
\* /slf4j-log4j12-1-7-5-sources-jar-zip/slf4j-log4j12-1-7-5-sources-jar/org/slf4j/impl/Log4jLoggerAdapter.java  
\* /slf4j-log4j12-1-7-5-sources-jar-zip/slf4j-log4j12-1-7-5-sources-jar/org/slf4j/impl/Log4jMDCAdapter.java  
\* /slf4j-log4j12-1-7-5-sources-jar-zip/slf4j-log4j12-1-7-5-sources-jar/org/slf4j/impl/StaticMarkerBinder.java  
\* /slf4j-log4j12-1-7-5-sources-jar-zip/slf4j-log4j12-1-7-5-sources-jar/org/slf4j/impl/StaticMDCBinder.java

## 1.376 timezone\_checker 1.0.0-000

### 1.376.1 Available under license :

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Found in path(s):

\* /timezone-checker-tar/b79c0f3c928a609ac1b0968cfb9573ce.py

## 1.377 savi\_api 0.0.0

### 1.377.1 Available under license :

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/libsavi-so-3-2-07-358-zip/libsavi.so.3.2.07.358.1: binary file matches

Found in path(s):

\* /bin/grep



# 1.378 bsddb3 4.4.2

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\* /bsddb3-4-4-2-zip/bsddb3-4.4.2/bsddb/dbobj.py

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\* /bsddb3-4-4-2-zip/bsddb3-4.4.2/bsddb/dbtables.py

\* /bsddb3-4-4-2-zip/bsddb3-4.4.2/bsddb/test/test\_dbtables.py

\* /bsddb3-4-4-2-zip/bsddb3-4.4.2/bsddb/dbutils.py

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/bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/images/ps.gif: binary file matches

Found in path(s):

\* /bin/grep

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Metadata-Version: 1.0

Name: bsddb3

Version: 4.4.2

Summary: Python interface for BerkeleyDB 3.2 thru 4.4

Home-page: <http://pybsddb.sf.net/>

Author: Robin Dunn, Gregory P. Smith, Andrew Kuchling, Barry Warsaw

Author-email: [pybsddb-users@lists.sourceforge.net](mailto:pybsddb-users@lists.sourceforge.net)

License: UNKNOWN

Description: This module provides a nearly complete wrapping  
of the Sleepycat C API for the Database  
Environment, Database, Cursor, and Transaction  
objects, and each of these is exposed as a Python  
type in the bsddb3.db module. The database objects

can use various access methods: btree, hash, recno, and queue. For the first time all of these are fully supported in the Python wrappers. Please see the documents in the docs directory of the source distribution or at the website for more details on the types and methods provided.

Platform: UNKNOWN

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\* /bsddb3-4-4-2-zip/bsddb3-4.4.2/extsrc/\_bsddb.c

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Found in path(s):

- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/lock\_id.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/env\_set\_lk\_max.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/set\_func\_map.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/arch/bigpic.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/db\_truncate.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/dumpload/utility.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/utility/db\_printlog.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/txn\_commit.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/set\_func\_open.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/intro/need.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.2/disk.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/xa/xa\_intro.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/db\_verify.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.1/config.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/dbc\_put.html
- \*
- /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/txn/other.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/db\_del.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/env\_set\_data\_dir.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/am/truncate.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/program/appsignals.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/db\_set\_re\_source.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/env/region.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.0/value\_set.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/program/scope.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/transapp/throughput.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/lock/page.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/rpc/server.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/memp\_trickle.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/transapp/term.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/db\_key\_range.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/lock\_put.html
- \*
- /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/am\_conf/re\_source.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.0/rmw.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.0/java.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/utility/berkeley\_db\_svc.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/am\_conf/bt\_minkey.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/am\_misc/faq.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/arch/progmodel.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/transapp/read.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/am/verify.html

- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.2/incomplete.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.3/rpc.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/db\_set\_flags.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/env\_set\_tx\_max.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/lock\_detect.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/intro/terrain.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/set\_func\_rename.html
- \*
- /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/db\_stat.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.0/close.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/lock/stdmode.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.3/conflict.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/build\_unix/intro.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/am\_misc/perm.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/intro/distrib.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/set\_func\_sleep.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/transapp/faq.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/tcl/using.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/env\_remove.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.3/memp\_fget.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/env/error.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/transapp/reclimit.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.1/set\_feedback.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/set\_func\_unlink.html
- \*
- /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/transapp/archival.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.3/bigfile.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/log/intro.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/lock/twoopl.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/log\_compare.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.0/db.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/build\_vxworks/notes.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/db\_sync.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/simple\_tut/open.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/simple\_tut/intro.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/env\_set\_lk\_detect.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/log\_unregister.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/build\_unix/ultrix.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/db\_associate.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/db\_set\_errpfx.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/am/curclose.html
- \*
- /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/txn/nested.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/xa/intro.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/lock/config.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/transapp/inc.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.2/intro.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/am\_conf/bt\_compare.html

- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/transapp/app.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.1/disk.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/hsearch.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.2.0/system.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/env\_close.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/lock\_vec.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/db\_open.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/db\_get.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/simple\_tut/close.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/dbt.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/txn/limits.html
- \*
- /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/am/opensub.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/program/copy.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.0/xa.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/tcl/intro.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/program/version.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/db\_set\_feedback.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/env/intro.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/transapp/checkpoint.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/txn\_checkpoint.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.2/handle.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.1/tmp.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/db\_set\_errcall.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.1/set\_paniccall.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/tcl/error.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/tcl/faq.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.0/toc.html
- \*
- /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/set\_func\_unmap.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/env\_set\_rec\_init.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/log\_put.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/env\_set\_lg\_bsize.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/env/create.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/db\_set\_paniccall.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/intro/where.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.1/toc.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/dumpload/format.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/am/stat.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.2/notfound.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/memp\_register.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.0/txn\_begin.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/am/join.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/c\_index.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/transapp/env\_open.html
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- /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/am\_conf/extentsize.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/log\_stat.html

- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/db\_upgrade.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.2.0/toc.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/transapp/logfile.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/env\_set\_paniccall.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/build\_win/notes.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/transapp/routine.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/env\_set\_errcall.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/transapp/why.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/distrib/layout.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/set\_func\_read.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/txn\_prepare.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/utility/db\_stat.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.3/toc.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.2/set\_flags.html
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- /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/transapp/cursor.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.0/eaccess.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/db\_remove.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/db\_set\_append\_recno.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.3/disk.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/build\_unix/osf1.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/memp\_fsync.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/program/runtime.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/env\_err.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/env\_set\_lk\_conflicts.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/env\_set\_tas\_spins.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/install/multiple.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/rpc/client.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/db\_lsn.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.0/envopen.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.0/txn\_commit.html
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- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.3/alloc.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/env\_set\_feedback.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/rpc/intro.html
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- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.2/tx\_recover.html
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- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/txn/config.html
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- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/env\_set\_tx\_timestamp.html
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 \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/build\_win/intro.html  
 \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/db\_close.html  
 \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.1/btstat.html  
 \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/am/curput.html  
 \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.1/set\_tx\_recover.html  
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 \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/java/faq.html  
 \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/build\_win/faq.html  
 \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.0/lock\_stat.html  
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 \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/am\_misc/partial.html  
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 \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/simple\_tut/errors.html  
 \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/xa/config.html  
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 \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/lock/intro.html  
 \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/am/delete.html  
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 \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/mp/intro.html  
 \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/simple\_tut/put.html  
 \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/db\_put.html  
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 \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/build\_vxworks/faq.html  
 \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/log\_get.html  
 \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/intro/do.html  
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- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/intro/products.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/lock/dead.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/db\_set\_bt\_prefix.html
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- /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.1/tcl.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/set\_func\_iinfo.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/simple\_tut/handles.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.0/func.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/env\_set\_rpc\_server.html
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- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/env\_strerror.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/test/run.html
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- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/set\_func\_fsync.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/intro/what.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/dbm.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/utility/db\_dump.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/utility/db\_checkpoint.html
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- /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/txn/intro.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.0/cxx.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/transapp/recovery.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/am/sync.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.0/stat.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/env\_set\_errpfx.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/build\_unix/freebsd.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/set\_func\_seek.html
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- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/am/upgrade.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/utility/db\_verify.html
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- /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/xa/build.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/transapp/nested.html
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- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/xa/xa\_config.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/dbc\_dup.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/env\_set\_tmp\_dir.html
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- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.2.0/intro.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/db\_join.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/env\_set\_tx\_recover.html
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- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/env\_set\_mutexlocks.html
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- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/log/limits.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/set\_func\_dirfree.html
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- /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.1/put.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/am\_conf/malloc.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/program/extending.html
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- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/am\_conf/renumber.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/upgrade.3.1/dup.html
- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/txn\_abort.html
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- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/utility/db\_archive.html
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- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/utility/db\_recover.html
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- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/build\_unix/install.html
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- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/env/open.html
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- /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/am/cursor.html
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- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/api\_c/db\_err.html

- \* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/am\_misc/dbsizes.html
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<title>Challenges in Embedded Database System Administration</title>

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<h1>Challenges in Embedded Database System Administration</h1>

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<p>

Database configuration and maintenance have historically been complex tasks,  
often

requiring expert knowledge of database design and application

behavior.

In an embedded environment, it is not feasible to require such expertise and ongoing database maintenance.

This paper discusses the database administration challenges posed by embedded systems and describes how the Berkeley DB architecture addresses these challenges.

## 1. Introduction

Embedded systems provide a combination of opportunities and challenges in application and system configuration and management.

As an embedded system is most often dedicated to a single application or small set of tasks, the operating conditions of the system are typically better understood than those of general purpose computing environments.

Similarly, as embedded systems are dedicated to a small set of tasks, one would expect that the software to manage them should be small and simple.

On the other hand, once an embedded system is deployed, it must continue to function without interruption and without administrator intervention.

Database administration consists of two components, initial configuration and ongoing maintenance.

Initial configuration consists of database design, manifestation, and tuning.

The instantiation of the design includes decomposing the design into tables, relations, or objects and designating proper indices and their implementations (e.g., Btrees, hash tables, etc.).

Tuning a design requires selecting a location for the log and data files, selecting appropriate database page sizes, specifying the size of in-memory caches, and specifying the limits of multi-threading and concurrency.

As embedded systems define a specific environment and set of tasks, requiring expertise during the initial system configuration process is acceptable, and we focus our efforts on the ongoing maintenance of the system.

In this way, our emphasis differs from other projects such as Microsoft's AutoAdmin project [\[3\]](#), and the "no-knobs" administration that is identified as an area of important future research by the Asilomar authors [\[1\]](#).

In this paper, we focus on what the authors of the Asilomar report call "gizmo" databases [\[1\]](#), databases that reside in devices such as smart cards, toasters, or telephones.

The key characteristics of such databases are that their functionality is completely transparent to users, no one ever performs explicit database operations or database maintenance, the database may crash at any time and must recover instantly, the device may undergo a hard reset at any time, requiring that the database return to its initial state, and the semantic integrity of the database must be maintained at all times.

In Section 2, we provide more detail on the sorts of tasks typically performed by database administrators (DBAs) that must be automated in an embedded system.

<p>

The rest of this paper is structured as follows.

In Section 2, we outline the requirements for embedded database support.

In Section 3, we discuss how Berkeley DB is conducive to the hands-off management required in embedded systems.

In Section 4, we discuss novel features that enhance Berkeley

DB's suitability for the embedded applications.

In Section 5, we discuss issues of footprint size.

In Section 6 we discuss related work, and we conclude in Section 7.

## <h2>2. Embedded Database Requirements</h2>

Historically, much of the commercial database industry has been driven by the requirements of high performance online transaction processing

(OLTP), complex query processing, and the industry standard benchmarks that have emerged (e.g., TPC-C [\[9\]](#TPCC), TPC-D [\[10\]](#TPCD)) to allow for system comparisons.

As embedded systems typically perform fairly simple queries, such metrics are not nearly as relevant for embedded database systems as are ease of maintenance, robustness, and small footprint. Of these three requirements, robustness and ease of maintenance are the key issues.

Users must trust the data stored in their devices and must not need to manually perform anything resembling system administration in order to get their unit to work properly.

Fortunately, ease of use and robustness are important side effects of simplicity and good design.

These, in turn, lead to a small size, providing the third requirement of an embedded system.

### <h3>2.1 The User Perspective</h3>

<p>

In the embedded database arena, it is the ongoing maintenance tasks

that must be automated, not necessarily the initial system configuration.

There

are five tasks

that are traditionally performed by DBAs,

but must be performed automatically

in embedded database systems.

These tasks are

log archival and reclamation,

backup,

data compaction/reorganization,

automatic and rapid recovery, and

reinitialization from scratch.

<P>

Log archival and backup are tightly coupled.

Database backups are part of any

large database installation, and log archival is analogous to incremental backup.

It is not clear what the implications of backup and archival are in an embedded system.

Consumers do not back up their VCRs or refrigerators, yet they do (or should) back up their personal computers or personal digital assistants.

For the remainder of this paper, we assume that backups, in some form, are required for gizmo databases (imagine having to reprogram, manually, the television viewing access pattern learned by some set-top television systems today).

Furthermore, we require that those backups are nearly instantaneous or completely

transparent,

as users should not be aware that their gizmos are being backed up and should not have to explicitly initiate such backups.

<p>

Data compaction or reorganization has traditionally required periodic dumping and restoration of

database tables and the recreation of indices.

In an embedded system, such reorganization must happen automatically.

<p>

Recovery issues are similar in embedded and traditional environments with a few exceptions.

While a few seconds or even a minute recovery is acceptable for a large server installation, no one is willing to wait for their telephone or television to reboot.

As with archival, recovery must be nearly instantaneous in an embedded product.

Secondly, it is often the case that a system will be completely reinitialized, rather than simply rebooted.

In this case, the embedded database must be restored to its initial state, freeing all its resources.

This is not typically a requirement of large server systems.



## <h3>2.2 The Developer Perspective</h3>

<p>

In

addition to the maintenance-free operation required of the embedded systems, there are a number of requirements that fall out of the constrained resources typically found in the "gizmos" using gizmo databases. These requirements are:

- small footprint,
- short code-path,
- programmatic interface for tight application coupling and to avoid the overhead (in both time and size) of interfaces such as SQL and ODBC,
- application configurability and flexibility,
- support for complete memory-resident operation (e.g., these systems must run on gizmos without file systems), and
- support for multi-threading.

<p>

A small footprint and short code-path are self-explanatory, however what is not as obvious is that the programmatic interface requirement is the logical result of them.

Traditional interfaces such as ODBC and SQL add significant size overhead and frequently add multiple context/thread switches per operation, not to mention several IPC calls.

An embedded product is less likely to require the complex

query processing that SQL enables.

Instead, in the embedded space, the ability for an application to configure the database for the specific tasks in question is more important than a general query interface.

<p>

As some systems do not provide storage other than RAM and ROM, it is essential that an embedded database work seamlessly in memory-only environments.

Similarly, many of today's embedded operating systems provide a single address space architecture, so a simple, multi-threaded capability is essential for application requiring any concurrency.

<p>

In general, embedded applications run on gizmos whose native operating system support varies tremendously.

For example, the embedded OS may or may not support user-level processing or multi-threading.

Even if it does, a particular embedded application may or may not need it.

Not all applications need more than one thread of control.

An embedded database must provide mechanisms to developers without deciding policy.

For

example, the threading model in an application is a matter of policy, and depends not on the database software, but on the hardware, operating system, and the application's feature set. Therefore, the data manager must provide for the use of multi-threading, but not require it.

### <h2>3. Berkeley DB: A Database for Embedded Systems</h2>

Berkeley DB is the result of implementing database functionality using the UNIX tool-based philosophy.

The current Berkeley DB package, as distributed by Sleepycat Software, is a descendant of the hash and btree access methods distributed with 4.4BSD and its descendents.

The original package (referred to as DB-1.85), while intended as a public domain replacement for dbm and its followers (e.g., ndbm, gdbm, etc), rapidly became widely used as an efficient, easy-to-use data store.

It was incorporated into a number of Open Source packages including Perl, Sendmail, Kerberos, and the GNU C-library.

<p>

Versions 2.X and higher are distributed by Sleepycat Software and

add functionality for concurrency, logging, transactions, and recovery.

Each piece of additional functionality is implemented as an independent module, which means that the subsystems can be used outside the context of Berkeley DB. For example, the locking subsystem can easily be used to implement locking for a non-DB application and the shared memory buffer pool can be used for any application caching data in main memory.

This subsystem design allows a designer to pick and choose the functionality necessary for the application, minimizing memory footprint and maximizing performance.

This addresses the small footprint and short code-path criteria mentioned in the previous section.

<p>

As Berkeley DB grew out of a replacement for dbm, its primary implementation language has always been C and its interface has been programmatic. The C interface is the native interface, unlike many database systems where the programmatic API is simply a layer on top of an already-costly query interface (e.g. embedded SQL).

Berkeley DB's heritage is also apparent in its data model; it has none.

The database stores unstructured key/data pairs, specified as variable length byte strings.

This leaves schema design and representation issues the responsibility

of the application, which is ideal for an embedded environment. Applications retain full control over specification of their data types, representation, index values, and index relationships. In other words, Berkeley DB provides a robust, high-performance, keyed storage system, not a particular database management system. We have designed for simplicity and performance, trading off complex, general purpose support that is better encapsulated in applications.

<p>

Another element of Berkeley DB's programmatic interface is its customizability; applications can specify Btree comparison and prefix compression functions, hash functions, error routines, and recovery models.

This means that embedded applications can tailor the underlying database

to best suit their data demands.

Similarly, the utilities traditionally bundled with a database manager (e.g., recovery, dump/restore, archive) are implemented as tiny wrapper programs around library routines. This means that it is not necessary to run separate applications for the utilities. Instead, independent threads can act as utility daemons, or regular query threads can perform utility functions. Many of the current products built on Berkeley DB are bundled as a single large server with independent threads that perform functions such as checkpoint, deadlock detection, and performance monitoring.

<p>

As mentioned earlier, living in an embedded environment requires flexible management of storage.

Berkeley DB does not require any preallocation of disk space for log or data files.

While many commercial database systems take complete control of a raw device, Berkeley DB uses a normal file system, and can therefore, safely and easily share a data space with other programs.

All

databases and log files are native files of the host environment, so whatever utilities are provided by the environment can be used to manage database files as well.

<p>

Berkeley DB provides three different memory models for its management of shared information.

Applications can use the IEEE Std 1003.1b-1993 (POSIX) `mmap` interface to share

data, they can use system shared memory, as frequently provided by the `shmget` family of interfaces, or they can use per-process heap memory (e.g., `malloc`).

Applications that require no permanent storage and do not provide shared memory facilities can still use Berkeley DB by requesting

strictly private memory and specifying that all databases be memory-resident.

This provides pure-memory operation.

<p>

Lastly, Berkeley DB is designed for rapid startup -- recovery can happen automatically as part of system initialization.

This means that Berkeley DB works correctly in environments where gizmos are suddenly shut down and restarted.

<h2>4.

Extensions for Embedded Environments </h2>

While the Berkeley DB library has been designed for use in embedded systems, all the features described above are useful in more conventional systems as well.

In this section, we discuss a number of features and "automatic knobs" that are specifically geared toward the more constrained environments found in gizmo databases.

<h3>4.1 Automatic compression</h3>

Following the programmatic interface design philosophy, we support application-specific (or default) compression routines. These can be geared toward the particular data types present in the application's dataset, thus providing better compression than a general purpose routine.

Note that the application could instead specify an encryption function and create encrypted databases instead of compressed ones. Alternately, the application might specify a function that performs both compression and encryption.

<p>

As applications are also permitted to specify comparison and hash functions, the application can chose to organize its data based either on uncompressed and clear-text data or compressed and encrypted data.

If the application indicates that data should be compared in its processed form (i.e., compressed and encrypted), then the compression and encryption are performed on individual data items and the in-memory representation retains these characteristics.

However, if the application indicates that data should be compared in its original form, then entire pages are transformed upon being read into or written out of the main memory buffer cache.

These two alternatives provide the flexibility to trade space and security for performance.

<h3>4.2 In-memory logging & transactions</h3>

One of the four key properties of transaction systems is durability. This means that transaction systems are designed for permanent storage (most commonly disk). However, as mentioned above, embedded systems

do not necessarily contain any such storage. Nevertheless, transactions can be useful in this environment to preserve the semantic integrity of the underlying storage. Berkeley DB optionally provides logging functionality and transaction support regardless of whether the database and logs are on disk or in memory.

### <h3>4.3 Remote Logs</h3>

While we do not expect users to backup their television sets and toasters, it is conceivable that a set-top box provided by a cable carrier should, in fact, be backed up by that cable carrier. The ability to store logs remotely can provide "information appliance" functionality, and can also be used in conjunction with local logs to enhance reliability. Furthermore, remote logs provide for catastrophic recovery, e.g., loss of the gizmo, destruction of the gizmo, etc.

### <h3>4.4 Application References to Database Buffers</h3>

Typically, when data is returned to the user, it must be copied from the data manager's buffer cache (or data page) into the application's memory.

However, in an embedded environment, the robustness of the total software package is of paramount importance, not the isolation between the application and the data manager. As a result, it is possible for the data manager to avoid copies by giving applications direct references to data items in a shared memory cache. This is a significant performance optimization that can be allowed when the application and data manager are tightly integrated.

### <h3>4.5 Recoverable database creation/deletion</h3>

In a conventional database management system, the creation of database tables (relations) and indices are heavyweight operations that are not recoverable.

This is not acceptable in a complex embedded environment where instantaneous recovery and robust operation in the face of all types of database operations is essential.

While Berkeley DB files can be removed using normal file system utilities, we provide transaction protected utilities that allow us to recover both database creation and deletion.

### <h3>4.6 Adaptive concurrency control</h3>

The

Berkeley DB package uses page-level locking by default. This trades off fine grain concurrency control for simplicity during recovery. (Finer grain concurrency control can be obtained by reducing the page size in the database.) However, when multiple threads/processes perform page-locking in the presence of writing operations, there is the potential for deadlock.

As some environments do not need or desire the overhead of logging and transactions, it is important to provide the ability for concurrent access without the potential for deadlock.

<p>

Berkeley DB provides an option to perform coarser grain, deadlock-free locking.

Rather than locking on pages, locking is performed at the interface to the database.

Multiple readers or a single writer are allowed to be active in the database at any instant in time, with conflicting requests queued automatically.

The presence of cursors, through which applications can both read and write data, complicates this design.

If a cursor is currently being used for reading, but will later be used to write, the system will be deadlock prone if no special precautions are taken.

To handle this situation, we require that, when a cursor is created, the application specify any future intention to write.

If there is an intention to write, the cursor is granted an intention-to-write lock which does not conflict with readers, but does conflict with other intention-to-write locks and write locks.

The end result is that the application is limited to a single potentially writing cursor accessing the database at any point in time.

<p>

Under periods of low contention (but potentially high throughput), the normal page-level locking provides the best overall throughput.

However, as contention rises, so does the potential for deadlock.

As some cross-over point, switching to the less concurrent, but deadlock-free locking protocol will result in higher throughput as operations must never be retried.

Given the operating conditions of an embedded database manager,

it is useful to make this change automatically as the system itself detects high contention.

### <h3>4.7 Adaptive synchronization</h3>

In addition to the logical locks that protect the integrity of the database pages, Berkeley DB must synchronize access to shared memory data structures, such as the lock table, in-memory buffer pool, and in-memory log buffer.

Each independent module uses a single mutex to protect its shared data structures, under the assumption that operations that require the mutex are very short and the potential for conflict is low.

Unfortunately, in highly concurrent environments with multiple processors present, this assumption is not always true.

When this assumption becomes invalid (that is, we observe significant contention for the subsystem mutexes), we can switch over to a finer-grained concurrency model for the mutexes.

Once again, there is a performance trade-off. Fine-grain mutexes impose a penalty of approximately 25% (due to the increased number of

mutexes required for each operation), but allow for higher throughput. Using fine-grain mutexes under low contention would cause a decrease in performance, so it is important to monitor the system carefully, so that the change can be executed only when it will increase system throughput without jeopardizing latency.

## 5. Footprint of an Embedded System

While traditional systems compete on price-performance, the embedded players will compete on price, features, and footprint.

The earlier sections have focused on features; in this section we focus on footprint.

Oracle reports that Oracle Lite 3.0 requires 350 KB to 750 KB of memory and approximately 2.5 MB of hard disk space [\[7\]](#Oracle).

This includes drivers for interfaces such as ODBC and JDBC.

In contrast, Berkeley DB ranges in size from 75 KB to under 200 KB, foregoing heavyweight interfaces such as ODBC and JDBC and providing a variety of deployed sizes that can be used depending on application needs.

At the low end, applications requiring a simple single-user access method can choose from either extended linear hashing, B+ trees, or record-number based retrieval and pay only the 75 KB space requirement.

Applications requiring all three access methods will observe the 110 KB footprint.

At the high end, a fully recoverable, high-performance system occupies less than a quarter megabyte of memory.

This is a system you can easily incorporate in your toaster oven.

Table 1 shows the per-module break down of the entire Berkeley DB library. Note that this does not include memory used to cache database pages.

| Object sizes in bytes                    |        |      |     |
|------------------------------------------|--------|------|-----|
| Subsystem                                | Text   | Data | Bss |
| Btree-specific routines                  | 28812  | 0    | 0   |
| Recno-specific routines                  | 7211   | 0    | 0   |
| Hash-specific routines                   | 23742  | 0    | 0   |
|                                          |        |      |     |
| Memory Pool                              | 14535  | 0    | 0   |
| Access method common code                | 23252  | 0    | 0   |
| OS compatibility library                 | 4980   | 52   | 0   |
| Support utilities                        | 6165   | 0    | 0   |
|                                          |        |      |     |
| All modules for Btree access method only | 77744  | 52   | 0   |
| All modules for Recno access method only | 84955  | 52   | 0   |
| All modules for Hash access method only  | 72674  | 52   | 0   |
|                                          |        |      |     |
|                                          |        |      |     |
| All Access Methods                       | 108697 | 52   | 0   |
|                                          |        |      |     |
|                                          |        |      |     |
| Locking                                  | 12533  | 0    | 0   |
|                                          |        |      |     |
| Recovery                                 | 26948  | 8    | 4   |
| Logging                                  | 37367  | 0    | 0   |
|                                          |        |      |     |
| Full Package                             | 185545 | 60   | 4   |
|                                          |        |      |     |

## 6. Related Work

Every three to five years, leading researchers in the database community convene to identify future directions in database research.

They produce a report of this meeting, named for the year and location of the meeting.

The most recent of these reports, the 1998 Asilomar report, identifies the embedded



database market as one of the high growth areas in database research [\[1\]](#). Not surprisingly, market analysts identify the embedded database market as a high-growth area in the commercial sector as well [\[5\]](#).

<p>

The Asilomar report identifies a new class of database applications, which they term "gizmo" databases, small databases embedded in tiny mobile appliances, e.g., smart-cards, telephones, personal digital assistants. Such databases must be self-managing, secure and reliable. Thus, the idea is that gizmo databases require plug and play data management with no database administrator (DBA), no human settable parameters, and the ability to adapt to changing conditions. More specifically, the Asilomar authors claim that the goal is self-tuning, including defining the physical DB design, the logical DB design, and automatic reports and utilities [\[1\]](#). To date, few researchers have accepted this challenge, and there is a dearth of research literature on the subject.

<p>

Our approach to embedded database administration is fundamentally different than that described by the Asilomar authors. We adopt their terminology, but view the challenge in supporting gizmo databases to be that of self-sustenance *after* initial deployment. Therefore, we find it, not only acceptable, but desirable to assume that application developers control initial database design and configuration. To the best of our knowledge, none of the published work in this area addresses this approach.

<p>

As the research community has not provided guidance in this arena, most work in embedded database administration has fallen to the commercial vendors.

These vendors fall into two camps, companies selling databases specifically designed for embedding or programmatic access and the major database vendors (e.g., Oracle, Informix, Sybase).

<p>

The embedded vendors all acknowledge the need for automatic administration, but fail to identify precisely how their products actually accomplish this.

A notable exception is Interbase whose white paper comparison with Sybase and Microsoft's SQL servers explicitly address features of maintenance ease.

Interbase claims that as they use no log files, there is no need for log reclamation, checkpoint tuning, or other tasks associated with log management. However, Interbase uses Transaction Information Pages, and it is unclear

how these are reused or reclaimed [\[6\]](#Interbase).  
Additionally, with a log-free system, they must use  
a FORCE policy (write all pages to disk at commit),  
as defined by Haerder and Reuter [\[4\]](#Haerder). This has  
serious performance consequences for disk-based systems.  
The approach described in this paper does use logs and  
therefore requires log reclamation,  
but provides hooks so the application may reclaim logs  
safely and programmatically.  
While Berkeley DB does require checkpoints, the goal of  
tuning the checkpoint interval is  
to bound recovery time.

Since the checkpoint interval in Berkeley DB can be expressed  
by the amount of log data written, it requires no tuning.  
The application designer sets a target recovery time, and  
selects the amount of log data that can be read in that interval  
and specifies the checkpoint interval appropriately. Even as  
load changes, the time to recover does not.

<p>

The backup approaches taken by Interbase and Berkeley DB  
are similar in that they both allow online backup, but  
rather different in their affect on transactions running  
during backup. As Interbase performs backups as transactions  
[\[6\]](#Interbase), concurrent queries can suffer potentially long  
delays. Berkeley DB uses native operating system system utilities  
and recovery for backups, so there is no interference with  
concurrent activity, other than potential contention on disk  
arms.

<p>

There are a number of database vendors selling in  
the embedded market (e.g., Raima,  
Centura, Pervasive, Faircom), but  
none highlight  
the special requirements of embedded database  
applications.

On the other end of the spectrum, the major vendors,  
Oracle, Sybase, Microsoft, are all becoming convinced  
of the importance of the embedded market.

As mentioned earlier, Oracle has announced its  
Oracle Lite server for embedded use.

Sybase has announced its UltraLite platform for "application-optimized,  
high-performance, SQL database engine for professional  
application developers building solutions for mobile and embedded platforms."  
[\[8\]](#Sybase).

We believe that SQL is incompatible with the  
gizmo database environment or truly embedded systems for which Berkeley  
DB is most suitable.

Microsoft research is taking a different approach, developing

technology to assist in automating initial database design and index specification [\[2\]](#Chaud98)[\[3\]](#Chaud982).

As mentioned earlier, we believe that such configuration is, not only acceptable in the embedded market, but desirable so that applications can tune their database management for the target environment.

## 7. Conclusions

The coming wave of embedded systems poses a new set of challenges for data management.

The traditional server-based, big footprint systems designed for high performance on big iron are not the right approach in this environment.

Instead, application developers need small, fast, versatile systems that can be tailored to a specific environment.

In this paper, we have identified several of the key issues in providing these systems and shown how Berkeley DB provides many of the characteristics necessary for such applications.

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<p>

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[4] [Haerder, T., Reuter, A., "Principles of Transaction-Oriented Database Recovery," Computing Surveys 15\(4\) \(1983\), 237-318.](#)

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[5] [Hostetler, M., "Cover Is Off A New Type of Database," Embedded DB News, http://www.theadvisors.com/embeddeddbnews.htm, 5/6/98.](#)

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Found in path(s):

\* /bsddb3-4-4-2-zip/bsddb3-4.4.2/docs/ref/refs/embedded.html

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## 1.384 python 2.7.18

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#### A. HISTORY OF THE SOFTWARE

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Python was created in the early 1990s by Guido van Rossum at Stichting Mathematisch Centrum (CWI, see <http://www.cwi.nl>) in the Netherlands as a successor of a language called ABC. Guido remains Python's principal author, although it includes many contributions from others.

In 1995, Guido continued his work on Python at the Corporation for National Research Initiatives (CNRI, see <http://www.cnri.reston.va.us>) in Reston, Virginia where he released several versions of the software.

In May 2000, Guido and the Python core development team moved to BeOpen.com to form the BeOpen PythonLabs team. In October of the same year, the PythonLabs team moved to Digital Creations, which became Zope Corporation. In 2001, the Python Software Foundation (PSF, see <https://www.python.org/psf/>) was formed, a non-profit organization created specifically to own Python-related Intellectual Property. Zope Corporation was a sponsoring member of the PSF.

All

Python releases are Open Source (see <http://www.opensource.org> for the Open Source Definition). Historically, most, but not all, Python releases have also been GPL-compatible; the table below summarizes the various releases.

| Release        | Derived<br>from | Year      | Owner      | GPL-<br>compatible? (1) |
|----------------|-----------------|-----------|------------|-------------------------|
| 0.9.0 thru 1.2 |                 | 1991-1995 | CWI        | yes                     |
| 1.3 thru 1.5.2 | 1.2             | 1995-1999 | CNRI       | yes                     |
| 1.6            | 1.5.2           | 2000      | CNRI       | no                      |
| 2.0            | 1.6             | 2000      | BeOpen.com | no                      |

|               |           |          |      |         |
|---------------|-----------|----------|------|---------|
| 1.6.1         | 1.6       | 2001     | CNRI | yes (2) |
| 2.1           | 2.0+1.6.1 | 2001     | PSF  | no      |
| 2.0.1         | 2.0+1.6.1 | 2001     | PSF  | yes     |
| 2.1.1         | 2.1+2.0.1 | 2001     | PSF  | yes     |
| 2.1.2         | 2.1.1     | 2002     | PSF  | yes     |
| 2.1.3         | 2.1.2     | 2002     | PSF  | yes     |
| 2.2 and above | 2.1.1     | 2001-now |      |         |
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\* org.eclipse.jetty.orbit:org.eclipse.jdt.core

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\* org.eclipse.jetty.orbit:javax.security.auth.message

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\* org.eclipse.jetty.orbit:javax.mail.glassfish

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<https://glassfish.dev.java.net/nonav/public/CDDL+GPL.html>

\* javax.servlet:javax.servlet-api

\* javax.annotation:javax.annotation-api

\* javax.transaction:javax.transaction-api

\* javax.websocket:javax.websocket-api

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## Oracle OpenJDK

If ALPN is used to negotiate HTTP/2 connections, then the following artifacts may be included in the distribution or downloaded when ALPN module is selected.

\* java.sun.security.ssl

These artifacts replace/modify OpenJDK classes. The modifications are hosted at github and both modified and original are under GPL v2 with classpath exceptions.

<http://openjdk.java.net/legal/gplv2+ce.html>

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org.ow2.asm:asm-commons

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## Apache

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org.apache.taglibs:taglibs-standard-spec

org.apache.taglibs:taglibs-standard-impl

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org.mortbay.jasper:apache-jsp

org.apache.tomcat:tomcat-jasper

org.apache.tomcat:tomcat-juli

org.apache.tomcat:tomcat-jsp-api

org.apache.tomcat:tomcat-el-api

org.apache.tomcat:tomcat-jasper-el

org.apache.tomcat:tomcat-api



org.apache.tomcat:tomcat-util-scan  
org.apache.tomcat:tomcat-util

org.mortbay.jasper:apache-el  
org.apache.tomcat:tomcat-jasper-el  
org.apache.tomcat:tomcat-el-api

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<https://glassfish.dev.java.net/nonav/public/CDDL+GPL.html>

org.eclipse.jetty.toolchain:jetty-schemas

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Assorted

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@item GSS-API CFX, SPNEGO, naming extensions, API extensions.

@item KCM credential cache.

@item HDB LDAP backend.

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@heading Vincent Rijmen, Antoon Bosselaers, Paulo Barreto

AES in libcrypto

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rijndael-alg-fst.c

@version 3.0 (December 2000)

Optimised ANSI C code for the Rijndael cipher (now AES)

@author Vincent Rijmen <vincent.rijmen@esat.kuleuven.ac.be>  
@author Antoon Bosselaers <antoon.bosselaers@esat.kuleuven.ac.be>  
@author Paulo Barreto <paulo.barreto@terra.com.br>

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kdc/announce.c

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DES core in libhcrypto

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D3DES (V5.09) -

A portable, public domain, version of the Data Encryption Standard.

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Thanks to: Dan Hoey for his excellent Initial and Inverse permutation code; Jim Gillogly & Phil Karn for the DES key schedule code; Dennis Ferguson, Eric Young and Dana How for comparing notes; and Ray Lau, for humouring me on.

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Windows support

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lib/hcrypto/test\_dh.c

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```
#!/usr/bin/env bash
# MIT licenses will each have a unique MD5 sum since they contain a unique copyright.
# This script will read the license file into memory, strip out the copyright, and then
# generate an MD5 that is not unique and can be matched against a known MIT MD5 sum.
set -e

calculate_md5_sum() {
    local FILE="$1"

    # Read the contents of the file into a variable
    local raw_license_text=$(<"$FILE")

    # Convert to lowercase
    local lowercase_license_text="${raw_license_text,,}"

    # Remove anything before the beginning of the license
    local stripped_license_text=$(awk '/permission is hereby granted/{p=1} p' <<< "$lowercase_license_text")

    # Replace line breaks (Windows or Linux) with a single space
    local replaced_linebreaks=$(tr '\r\n' ' ' <<< "$stripped_license_text")

    # Replace multiple spaces with a single space
```



```

local normalized_license_text=$(tr -s ' ' <<< "$replaced_linebreaks")

# Strip away any non-printable, non-whitespace characters
local clean_unprintable_license_text=$(tr
-cd '[:print:][:space:]' <<< "$normalized_license_text")

# Remove punctuation and special characters
local clean_license_text=$(echo "$clean_unprintable_license_text" | sed 's/[^a-zA-Z ]//g')

# Calculate the MD5 sum of the cleaned license text
local MD5SUM=$(echo -n "$clean_license_text" | md5sum | awk '{print $1}')

# Output the MD5 sum
echo "$MD5SUM"
}

# Check if the FILE argument is provided
if [ -z "$1" ]; then
    echo "Please provide a FILE as an argument."
    exit 1
fi

# Invoke the function with the provided FILE argument
calculate_md5_sum "$1"
WEV @@ WEV[B "1
x ?"U@,5 @mISmIN<GimCN7g1u|E
43mI,5WEV @@ WEV @mImImIAmImImI0mImImI*mImI
A0mImImI...
lost+found...

;9GimCN7g

!"#$%&'()*+,-
./0123456789;=<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~

!"#$%&'()*+,-
./0123456789;=<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~

!"#$%&'()*+,-
./0123456789;=<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~

!"#$%&'()*+,-
./0123456789;=<=>?@ABCDEFGHIJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz{|}~WEV @@
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### xwd utility
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include/GL/wglxext.h :
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Python was created in the early 1990s by Guido van Rossum at Stichting Mathematisch Centrum (CWI, see <http://www.cwi.nl>) in the Netherlands as a successor of a language called ABC. Guido remains Python's principal author, although it includes many contributions from others.

In 1995, Guido continued his work on Python at the Corporation for

National Research Initiatives (CNRI, see <http://www.cnri.reston.va.us>) in Reston, Virginia where he released several versions of the software.

In May 2000, Guido and the Python core development team moved to BeOpen.com to form the BeOpen PythonLabs team. In October of the same year, the PythonLabs team moved to Digital Creations (now Zope Corporation, see <http://www.zope.com>). In 2001, the Python Software Foundation (PSF, see <http://www.python.org/psf/>) was formed, a non-profit organization created specifically to own Python-related Intellectual Property. Zope Corporation is a sponsoring member of the PSF.

All Python releases are Open Source (see <http://www.opensource.org> for the Open Source Definition). Historically, most, but not all, Python releases have also been GPL-compatible; the table below summarizes the various releases.

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|----------------|--------------|-----------|------------|---------------------|
| 0.9.0 thru 1.2 |              | 1991-1995 | CWI        | yes                 |
| 1.3 thru 1.5.2 | 1.2          | 1995-1999 | CNRI       | yes                 |
| 1.6            | 1.5.2        | 2000      | CNRI       | no                  |
| 2.0            | 1.6          | 2000      | BeOpen.com | no                  |
| 1.6.1          | 1.6          | 2001      | CNRI       | yes (2)             |
| 2.1            | 2.0+1.6.1    | 2001      | PSF        | no                  |
| 2.0.1          | 2.0+1.6.1    | 2001      | PSF        | yes                 |
| 2.1.1          | 2.1+2.0.1    | 2001      | PSF        | yes                 |
| 2.2            | 2.1.1        | 2001      | PSF        | yes                 |
| 2.1.2          | 2.1.1        | 2002      | PSF        | yes                 |
| 2.1.3          |              |           |            |                     |
| 2.1.2          | 2002         | PSF       | yes        |                     |
| 2.2.1          | 2.2          | 2002      | PSF        | yes                 |
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| 2.3            | 2.2.2        | 2002-2003 | PSF        | yes                 |
| 2.3.1          | 2.3          | 2002-2003 | PSF        | yes                 |
| 2.3.2          | 2.3.1        | 2002-2003 | PSF        | yes                 |
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| 2.3.4          | 2.3.3        | 2004      | PSF        | yes                 |
| 2.3.5          | 2.3.4        | 2005      | PSF        | yes                 |
| 2.4            | 2.3          | 2004      | PSF        | yes                 |
| 2.4.1          | 2.4          | 2005      | PSF        | yes                 |
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| 2.4.3          | 2.4.2        | 2006      | PSF        | yes                 |
| 2.4.4          | 2.4.3        | 2006      | PSF        | yes                 |

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|-------|-------|------|-----|-----|
| 2.5   | 2.4   | 2006 | PSF | yes |
| 2.5.1 | 2.5   | 2007 | PSF | yes |
| 2.5.2 | 2.5.1 | 2008 | PSF | yes |
| 2.5.3 | 2.5.2 | 2008 | PSF | yes |
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(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the



application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

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When a "work that uses the Library" uses material from a header file that is part of the Library, the object code for the work may be a derivative work of the Library even though the source code is not. Whether this is true is especially significant if the work can be linked without the Library, or if the work is itself a library. The threshold for this to be true is not precisely defined by law.

If such an object file uses only numerical parameters, data structure layouts and accessors, and small macros and small inline functions (ten lines or less in length), then the use of the object file is unrestricted, regardless of whether it is legally a derivative work. (Executables containing this object code plus portions of the Library will still fall under Section 6.)

Otherwise, if the work is a derivative of the Library, you may distribute the object code for the work under the terms of Section 6. Any executables containing that work also fall under Section 6, whether or not they are linked directly with the Library itself.

6. As an exception to the Sections above, you may also combine or link a "work that uses the Library" with the Library to produce a work containing portions of the Library, and distribute that work under terms of your choice, provided that the terms permit modification of the work for the customer's own use and reverse

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For an executable, the required form of the "work that uses the Library" must include any data and utility programs needed for reproducing the executable from it. However, as a special exception, the materials to be distributed need not include anything that is

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(For example, a function in a library to compute square roots has a purpose that is entirely well-defined independent of the application. Therefore, Subsection 2d requires that any application-supplied function or table used by this function must be optional: if the application does not supply it, the square root function must still compute square roots.)

These requirements apply to the modified work as a whole. If identifiable sections of that work are not derived from the Library, and can be reasonably considered independent and separate works in themselves,

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Python was created in the early 1990s by Guido van Rossum at Stichting Mathematisch Centrum (CWI, see <http://www.cwi.nl>) in the Netherlands as a successor of a language called ABC. Guido remains Python's principal author, although it includes many contributions from others.

In 1995, Guido continued his work on Python at the Corporation for National Research Initiatives (CNRI, see <http://www.cnri.reston.va.us>) in Reston, Virginia where he released several versions of the software.

In May 2000, Guido and the Python core development team moved to BeOpen.com to form the BeOpen PythonLabs team. In October of the same year, the PythonLabs team moved to Digital Creations (now Zope Corporation, see <http://www.zope.com>). In 2001, the Python Software Foundation (PSF, see <http://www.python.org/psf/>) was formed, a non-profit organization created specifically to own Python-related Intellectual Property. Zope Corporation is a sponsoring member of the PSF.

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|----------------|--------------|-----------|------------|---------------------|
| 0.9.0 thru 1.2 |              | 1991-1995 | CWI        | yes                 |
| 1.3 thru 1.5.2 | 1.2          | 1995-1999 | CNRI       | yes                 |
| 1.6            | 1.5.2        | 2000      | CNRI       | no                  |
| 2.0            | 1.6          | 2000      | BeOpen.com | no                  |
| 1.6.1          | 1.6          | 2001      | CNRI       | yes (2)             |
| 2.1            | 2.0+1.6.1    | 2001      | PSF        | no                  |
| 2.0.1          | 2.0+1.6.1    | 2001      | PSF        | yes                 |
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| 2.1.3          | 2.1.2        | 2002      | PSF        | yes                 |
| 2.2 and above  |              |           |            |                     |
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#### A. HISTORY OF THE SOFTWARE

=====

Python was created in the early 1990s by Guido van Rossum at Stichting  
Mathematisch Centrum (CWI, see <http://www.cwi.nl>) in the Netherlands  
as a successor of a language called ABC. Guido remains Python's  
principal author, although it includes many contributions from others.

In 1995, Guido continued his work on Python at the Corporation for  
National Research Initiatives (CNRI, see <http://www.cnri.reston.va.us>)  
in Reston, Virginia where he released several versions of the  
software.

In May 2000, Guido and the Python core development team moved to  
BeOpen.com to form the BeOpen PythonLabs team. In October of the same  
year, the PythonLabs team moved to Digital Creations (now Zope  
Corporation, see <http://www.zope.com>). In 2001, the Python Software  
Foundation (PSF, see <http://www.python.org/psf/>) was formed, a  
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| Release        | Derived<br>from | Year      | Owner | GPL-<br>compatible? (1) |
|----------------|-----------------|-----------|-------|-------------------------|
| 0.9.0 thru 1.2 |                 | 1991-1995 | CWI   | yes                     |
| 1.3 thru 1.5.2 | 1.2             | 1995-1999 | CNRI  | yes                     |

|       |           |           |            |         |
|-------|-----------|-----------|------------|---------|
| 1.6   | 1.5.2     | 2000      | CNRI       | no      |
| 2.0   | 1.6       | 2000      | BeOpen.com | no      |
| 1.6.1 | 1.6       | 2001      | CNRI       | yes (2) |
| 2.1   | 2.0+1.6.1 | 2001      | PSF        | no      |
| 2.0.1 | 2.0+1.6.1 | 2001      | PSF        | yes     |
| 2.1.1 | 2.1+2.0.1 | 2001      | PSF        | yes     |
| 2.2   | 2.1.1     | 2001      | PSF        | yes     |
| 2.1.2 | 2.1.1     | 2002      | PSF        | yes     |
| 2.1.3 |           |           |            |         |
| 2.1.2 | 2002      | PSF       | yes        |         |
| 2.2.1 | 2.2       | 2002      | PSF        | yes     |
| 2.2.2 | 2.2.1     | 2002      | PSF        | yes     |
| 2.2.3 | 2.2.2     | 2003      | PSF        | yes     |
| 2.3   | 2.2.2     | 2002-2003 | PSF        | yes     |
| 2.3.1 | 2.3       | 2002-2003 | PSF        | yes     |
| 2.3.2 | 2.3.1     | 2002-2003 | PSF        | yes     |
| 2.3.3 | 2.3.2     | 2002-2003 | PSF        | yes     |
| 2.3.4 | 2.3.3     | 2004      | PSF        | yes     |
| 2.3.5 | 2.3.4     | 2005      | PSF        | yes     |
| 2.4   | 2.3       | 2004      | PSF        | yes     |
| 2.4.1 | 2.4       | 2005      | PSF        | yes     |
| 2.4.2 | 2.4.1     | 2005      | PSF        | yes     |
| 2.4.3 | 2.4.2     | 2006      | PSF        | yes     |
| 2.4.4 | 2.4.3     | 2006      | PSF        | yes     |
| 2.5   | 2.4       | 2006      | PSF        | yes     |
| 2.5.1 | 2.5       | 2007      | PSF        | yes     |
| 2.5.2 | 2.5.1     | 2008      | PSF        | yes     |
| 2.5.3 | 2.5.2     | 2008      | PSF        | yes     |
| 2.6   | 2.5       | 2008      | PSF        | yes     |
| 2.6.1 | 2.6       | 2008      | PSF        | yes     |
| 2.6.2 | 2.6.1     | 2009      | PSF        | yes     |
| 2.6.3 | 2.6.2     | 2009      | PSF        | yes     |
| 2.6.4 | 2.6.3     | 2009      | PSF        | yes     |
| 2.6.5 | 2.6.4     | 2010      | PSF        | yes     |
| 3.0   | 2.6       | 2008      | PSF        | yes     |
| 3.0.1 | 3.0       | 2009      | PSF        | yes     |
| 3.1   | 3.0.1     | 2009      | PSF        | yes     |
| 3.1.1 | 3.1       | 2009      | PSF        | yes     |
| 3.1.2 | 3.1       | 2010      | PSF        | yes     |
| 3.2   | 3.1       | 2010      | PSF        | yes     |

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file (certdata.txt). This file can be found in the mozilla source tree:

<http://mxr.mozilla.org/mozilla/source/security/nss/lib/ckfw/builtins/certdata.txt?raw=1#>

It contains the certificates in PEM format and therefore  
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an Apache+mod\_ssl webserver for SSL client authentication.  
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## 1.406 pcre 8.35

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The basic library functions are written in C and are freestanding. Also included in the distribution is a set of C++ wrapper functions, and a

just-in-time compiler that can be used to optimize pattern matching. These are both optional features that can be omitted when the library is built.

## THE BASIC LIBRARY FUNCTIONS

-----

Written by: Philip Hazel  
Email local part: ph10  
Email domain: cam.ac.uk

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## 1.408 python-certifi 2019.06.16

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This package contains a modified version of ca-bundle.crt:

ca-bundle.crt -- Bundle of CA Root Certificates

Certificate data from Mozilla as of: Thu Nov 3 19:04:19 2011#

This is a bundle of X.509 certificates of public Certificate Authorities  
(CA). These were automatically extracted from Mozilla's root certificates  
file (certdata.txt). This file can be found in the mozilla source tree:

<http://mxr.mozilla.org/mozilla/source/security/nss/lib/ckfw/builtins/certdata.txt?raw=1#>

It contains the certificates in PEM format and therefore  
can be directly used with curl / libcurl / php\_curl, or with  
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Just configure this file as the SSLCACertificateFile.#

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The basic library functions are written in C and are freestanding. Also included in the distribution is a set of C++ wrapper functions, and a just-in-time compiler that can be used to optimize pattern matching. These are both optional features that can be omitted when the library is built.

### THE BASIC LIBRARY FUNCTIONS

-----

Written by: Philip Hazel

Email local part: ph10

Email domain: cam.ac.uk

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### PCRE JUST-IN-TIME COMPILATION SUPPORT

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```

## 1.411 python 2.6.1

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Python was created in the early 1990s by Guido van Rossum at Stichting  
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as a successor of a language called ABC. Guido remains Python's

principal author, although it includes many contributions from others.

In 1995, Guido continued his work on Python at the Corporation for National Research Initiatives (CNRI, see <http://www.cnri.reston.va.us>) in Reston, Virginia where he released several versions of the software.

In May 2000, Guido and the Python core development team moved to BeOpen.com to form the BeOpen PythonLabs team. In October of the same year, the PythonLabs team moved to Digital Creations (now Zope Corporation, see <http://www.zope.com>). In 2001, the Python Software Foundation (PSF, see <http://www.python.org/psf/>) was formed, a non-profit organization created specifically to own Python-related Intellectual Property. Zope Corporation is a sponsoring member of the PSF.

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|----------------|--------------|-----------|------------|---------------------|
| 0.9.0 thru 1.2 |              | 1991-1995 | CWI        | yes                 |
| 1.3 thru 1.5.2 | 1.2          | 1995-1999 | CNRI       | yes                 |
| 1.6            | 1.5.2        | 2000      | CNRI       | no                  |
| 2.0            | 1.6          | 2000      | BeOpen.com | no                  |
| 1.6.1          | 1.6          | 2001      | CNRI       | yes (2)             |
| 2.1            | 2.0+1.6.1    | 2001      | PSF        | no                  |
| 2.0.1          | 2.0+1.6.1    | 2001      | PSF        | yes                 |
| 2.1.1          | 2.1+2.0.1    | 2001      | PSF        | yes                 |
| 2.2            | 2.1.1        | 2001      | PSF        | yes                 |
| 2.1.2          | 2.1.1        | 2002      | PSF        | yes                 |
| 2.1.3          |              |           |            |                     |
| 2.1.2          | 2002         | PSF       | yes        |                     |
| 2.2.1          | 2.2          | 2002      | PSF        | yes                 |
| 2.2.2          | 2.2.1        | 2002      | PSF        | yes                 |
| 2.2.3          | 2.2.2        | 2003      | PSF        | yes                 |
| 2.3            | 2.2.2        | 2002-2003 | PSF        | yes                 |
| 2.3.1          | 2.3          | 2002-2003 | PSF        | yes                 |
| 2.3.2          | 2.3.1        | 2002-2003 | PSF        | yes                 |
| 2.3.3          | 2.3.2        | 2002-2003 | PSF        | yes                 |
| 2.3.4          | 2.3.3        | 2004      | PSF        | yes                 |
| 2.3.5          | 2.3.4        | 2005      | PSF        | yes                 |
| 2.4            | 2.3          | 2004      | PSF        | yes                 |
| 2.4.1          | 2.4          | 2005      | PSF        | yes                 |



|       |       |      |     |     |
|-------|-------|------|-----|-----|
| 2.4.2 | 2.4.1 | 2005 | PSF | yes |
| 2.4.3 | 2.4.2 | 2006 | PSF | yes |
| 2.4.4 | 2.4.3 | 2006 | PSF | yes |
| 2.5   | 2.4   | 2006 | PSF | yes |
| 2.5.1 | 2.5   | 2007 | PSF | yes |
| 2.6   | 2.5   | 2008 | PSF | yes |

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In 1995, Guido continued his work on Python at the Corporation for National Research Initiatives (CNRI, see <http://www.cnri.reston.va.us>) in Reston, Virginia where he released several versions of the software.

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| 1.6            | 1.5.2        | 2000      | CNRI  | no                  |

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| 2.0           | 1.6       | 2000     | BeOpen.com | no      |
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| 2.1           | 2.0+1.6.1 | 2001     | PSF        | no      |
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\*

\* This file is based on code from bdf.c,v 1.22 2000/03/16 20:08:50

\*

\* taken from Mark Leisher's xmbdfed package

\*

\*/

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|                | GL/ wglxext.h         | Khronos        |
|                | KHR/ khrplatform.h    | Khronos        |

\*\*\*\*\*

----  
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----  
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include/GL/glxext.h

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...

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Mesa 3-D  
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include/GL/glxext.h  
include/GL/wglxext.h :

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#### RECORD

Carriage\_Control carriage\_return  
Format stream\_If

## 1.423 sudo 1.8.22

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Ackeret, Matt  
Adler, Mark  
Allbery, Russ  
Anderson, Jamie  
Andrew, Nick  
Andric, Dimitry  
Barron, Danny  
Bates, Tom  
Behan, Zdenk  
Bellis, Ray  
Benali, Elias  
Beverly, Jamie  
Boardman, Spider  
Bostley, P.J.  
Bowes, Keith  
Boyce, Keith Garry  
Brantley, Michael  
Braun, Rob  
Bezina, Pavel  
Brooks, Piete  
Brown, Jerry  
Burr, Michael E  
Burton, Ross  
Bussjaeger, Andreas  
Calvin, Gary  
Campbell, Aaron  
Chazelas, Stephane  
ek, Vtzslav  
Coleman, Chris  
Corzine, Deven T.  
Cusack, Frank  
Dai, Wei  
Dill, David  
Earickson, Jeff  
Eckhardt, Drew  
Edgington, Ben  
Esipovich, Marc  
Espie, Marc  
Faigon, Ariel  
Farrell, Brian  
Fobes, Steve  
Frysinger, Mike

G., Daniel Richard  
Gailly, Jean-loup  
Gelman, Stephen  
Gerraty, Simon J.  
Graber, Stephane  
Guillory, B.  
Hayman, Randy M.  
Henke, Joachim  
Hideaki, Yoshifuji  
Hieb, Dave  
Holloway, Nick  
Hoover, Adam  
Hunter, Michael T.  
Hutchings, Ben  
Irrgang, Eric  
Jackson, Brian  
Jackson, John R.  
Jackson, Richard L., Jr.  
Janssen, Mark  
Jepeway, Chris  
Jorge, Joel Pele  
Juhani, Timo  
Kikuchi, Ayamura  
Kadow, Kevin  
Kasal, Stepan  
Kienenberger, Mike  
King, Dale  
King, Michael  
Klyachkin, Andrey  
Knoble, Jim  
Knox, Tim  
Komarnitsky, Alek O.  
Kondrashov, Nikolai  
Kopeek, Daniel  
Kranenburg, Paul  
Krause, David  
Lakin, Eric  
Larsen, Case  
Levin, Dmitry V.  
Libby, Kendall  
Lobbess, Phillip E.  
McIntyre, Jason  
MacKenzie, David J.  
McLaughlin, Tom  
Makey, Jeff  
Marchionna, Michael D.  
Markham, Paul  
Martinian, Emin

Meskes,  
Michael  
Michael, David  
Miller, Todd C.  
Minier, Loc  
Moffat, Darren  
Moldung, Jan Thomas  
Morris, Charles  
Mueller, Andreas  
Mller, Dworkin  
Nieusma, Jeff  
Nikitser, Peter A.  
Nussel, Ludwig  
Ouellet, Jean-Philippe  
Paquet, Eric  
Paradis, Chantal  
Percival, Ted  
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Peron, Christian S.J.  
Peschel, Aaron  
Peslyak, Alexander  
Peterson, Toby  
Petten, Diego Elio  
Pickett, Joel  
Plotnick, Alex  
de Raadt, Theo  
Rasch, Gudleik  
Reid, Steve  
Richards, Matt  
Rossum, Guido van  
Rouillard, John P.  
Rowe, William A., Jr.  
Roy, Alain  
Ruusame, Elan  
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Snchez, Wilfredo  
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Smith, Andy  
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Street, Russell  
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Venckus, Martynas  
de Vries, Maarten  
Wagner, Klaus  
Walsh, Dan  
Warburton, John  
Webb, Kirk  
Wetzel, Timm  
Wieringen, Marco van  
Wilk, Jakub  
Winiger, Gary  
Wood, David  
Zacarias, Gustavo  
Zolnowsky, John

The following people have worked to translate sudo into other languages:

Blttermann, Mario  
Bogusz, Jakub  
Casagrande, Milo  
Castro, Felipe  
Cho, Seong-ho  
Chornoivan, Yuri  
Diguez, Francisco  
Fontenelle, Rafael  
Garca-Fontes, Walter  
Gezer, Volkan  
Hamasaki, Takeshi  
Hamming, Peter  
Hansen, Joe  
Hantrais, Frdric

Hein, Jochen  
Hufthammer, Karl Ove  
Jerovek, Damir  
Karvonen, Jorma  
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Margeviius, Algimantas  
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Nikoli, Miroslav  
Nylander, Daniel  
Psa, Petr  
Putanec, Boidar  
Qun, Trn Ngc  
Rasmussen, Sebastian  
Regueiro, Leandro  
Sarer, zgr  
Sendn, Abel  
Sikrom, ka  
Spingos, Dimitris  
Taniguchi, Yasuaki  
Tomat, Fbio  
r, Balzs  
Uranga, Mikel Olasagasti  
Vorotnikov, Artem  
Wang, Wylmer

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GIMP Palette

Name: Test

Columns: 0

#

GIMP Palette

Name: custompalette

Columns: 4

#

0 0 0 Index 3

65 38 30 Index 4

|     |     |     |          |
|-----|-----|-----|----------|
| 103 | 62  | 49  | Index 6  |
| 79  | 73  | 72  | Index 7  |
| 114 | 101 | 97  | Index 8  |
| 208 | 127 | 100 | Index 9  |
| 151 | 144 | 142 | Index 10 |
| 221 | 207 | 199 | Index 11 |

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## GIMP Palette

Name: badpalettefile

Columns: 4

#

0 0 0 Index 3

0123456789012345678901234567890123456789012345678901234567890123456789012  
34567890123456789

103 62 49      Index 6

79 73 72 Index 7

114 101 97 Index 8

208 127 100      Index 9

151 144 142    Index 10

221 207 199      Index 11

## GIMP Palette

Name: badpaletteentry

Columns: 4

#

0 0 0 Index 3

65 38

103 62 49      Index 6

79 73 72 Index 7

114 101 97      Index 8

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151 144 142    Index 10

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@(#)package.html 1.2 07/05/14

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in path(s):

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\* /istack-commons-runtime-3-0-5-jar/META-INF/maven/com.sun.istack/istack-commons-runtime/pom.xml

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Manifest-Version: 1.0

Bundle-Description: istack common utility code

Implementation-Title: istack common utility code runtime

Bundle-License: [https://glassfish.java.net/public/CDDL+GPL\\_1\\_1.html](https://glassfish.java.net/public/CDDL+GPL_1_1.html), h

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Bundle-SymbolicName: com.sun.istack.commons-runtime

Implementation-Version: 3.0.5

Built-By: build

Bnd-LastModified: 1486772850426

Bundle-ManifestVersion: 2

Implementation-Vendor-Id: com.sun.istack

Bundle-DocURL: <http://www.oracle.com/>

Bundle-Vendor: Oracle Corporation

Import-Package: javax.activation,javax.xml.namespace,javax.xml.stream,  
org.xml.sax,org.xml.sax.helpers

Require-Capability: osgi.ee;filter="(&(osgi.ee=JavaSE)(version=1.7))"

Tool: Bnd-3.2.0.201605172007

Implementation-Vendor: Oracle Corporation

Export-Package: com.sun.istack;uses="javax.activation,javax.xml.strea  
m,org.xml.sax,org.xml.sax.helpers";version="3.0.5",com.sun.istack.log  
ging;version="3.0.5",com.sun.istack.localization;version="3.0.5"

Bundle-Name:

istack common utility code runtime

Bundle-Version: 3.0.5

Implementation-Build-Id: tags/istack-commons-3.0.5-321, 2017-02-11T01:  
27:24+0100

Created-By: Apache Maven Bundle Plugin

Build-Jdk: 1.8.0\_112

Found in path(s):

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\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/XmlSeeAlso.java  
 \* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/GetPropertyAction.java  
 \* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/DataBindingException.java  
 \* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/JAXB.java

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\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/UnmarshalException.java

\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/helpers/ValidationEventLocatorImpl.java

\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/ValidationEventHandler.java

\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/util/JAXBSource.java

\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/UnmarshallerHandler.java

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* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/ContextFinder.java
* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/Messages.java
* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/JAXBException.java
* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/util/ValidationEventCollector.java
* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/MarshalException.java
* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/JAXBContext.java
* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/TypeConstraintException.java
*
/jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/Unmarshaller.java
* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/helpers/AbstractMarshallerImpl.java
* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/helpers/ParseConversionEventImpl.java
* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/helpers/ValidationEventImpl.java
* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/Marshaller.java
* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/ValidationEvent.java
* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/helpers/PrintConversionEventImpl.java
* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/ValidationEventLocator.java
* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/helpers/NotIdentifiableEventImpl.java
* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/helpers/AbstractUnmarshallerImpl.java
* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/NotIdentifiableEvent.java
* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/DatatypeConverter.java
* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/DatatypeConverterInterface.java
*
/jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/util/Messages.java
* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/Element.java
* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/Validator.java
* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/ValidationException.java
* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/helpers/DefaultValidationEventHandler.java
* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/helpers/Messages.java
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 \* /jxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/XmlAttachmentRef.java  
 \* /jxb-api-2-2-11-sources-7-jar/javax/xml/bind/attachment/AttachmentMarshaller.java  
 \* /jxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/XmlAccessOrder.java  
 \* /jxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/XmlAccessorType.java  
 \* /jxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/W3CDomHandler.java  
 \* /jxb-api-2-2-11-sources-7-jar/javax/xml/bind/attachment/AttachmentUnmarshaller.java  
 \* /jxb-api-2-2-11-sources-7-jar/javax/xml/bind/Binder.java  
 \* /jxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/XmlElementWrapper.java  
 \* /jxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/XmlSchemaType.java  
 \* /jxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/XmlList.java  
 \* /jxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/XmlMixed.java  
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 /jxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/XmlSchemaTypes.java  
 \* /jxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/XmlAnyAttribute.java  
 \* /jxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/XmlAccessType.java  
 \* /jxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/DomHandler.java  
 \* /jxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/XmlAccessorOrder.java  
 \* /jxb-api-2-2-11-sources-7-jar/javax/xml/bind/SchemaOutputResolver.java  
 \* /jxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/XmlMimeType.java  
 \* /jxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/XmlInlineBinaryData.java

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- \* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/Messages.properties
- \* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/helpers/Messages.properties

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\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/PrintConversionEvent.java  
\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/adapters/NormalizedStringAdapter.java  
\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/XMLElementRef.java  
\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/XMLNsForm.java  
\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/XMLElementDecl.java  
\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/adapters/XMLJavaTypeAdapters.java  
\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/XMLElement.java  
\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/XMLElements.java  
\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/XMLType.java  
\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/XMLIDREF.java  
\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/ParseConversionEvent.java  
\*  
/jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/adapters/XMLAdapter.java  
\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/adapters/CollapsedStringAdapter.java  
\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/XMLAttribute.java  
\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/adapters/HexBinaryAdapter.java  
\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/PropertyException.java  
\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/XMLSchema.java  
\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/XMLNs.java  
\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/XMLEnum.java  
\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/XMLTransient.java  
\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/adapters/XMLJavaTypeAdapter.java  
\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/XMLElementRefs.java  
\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/JAXBElement.java  
\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/XMLValue.java  
\*  
/jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/XMLRootElement.java  
\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/JAXBIntrospector.java  
\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/XMLEnumValue.java  
\* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/annotation/XMLRegistry.java

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- \* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/package.html
- \* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/helpers/package.html

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* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/WhiteSpaceProcessor.java
* /jaxb-api-2-2-11-sources-7-jar/javax/xml/bind/JAXBPermission.java

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## 1.445 jinja 2.10

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