Open Source Used In Network Assurance Engine 4.0(1)

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1.3 alsa-firmware 1.0.28 :2.el7

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Sure. I think there’s a later copy in
~ftp/friedman/shell-inits/init-4.89.tar.gz. There are also some elisp and
es frobs in that file.

It should serve as a pretty good example of how to get carried away. :-)

Sure. The canonical versions are available on ftp.armory.com; you might
want to pick up the latest versions before modifying them.

John

On May 9, 1:36pm, Chet Ramey wrote:

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want to pick up the latest versions before modifying them.
Hi. I'm the maintainer of bash (the GNU `Bourne Again shell') for the FSF.

I picked up a tar file of ksh scripts you wrote from an anon FTP site a while back. I'd like your permission to include modified versions of some of them in the next major bash distribution (with proper credit given, of course). Is it OK if I do that?

Chet Ramey

``The lyf so short, the craft so long to lerne.'' - Chaucer

Chet Ramey, Case Western Reserve University Internet: chet@po.CWRU.Edu

I've modified a (modified) version of Bill Rosenblatt's ksh debugger to work with bash-2.0. Does ORA have any problem with me distributing...
it with bash-2.0?

That's great!

Go ahead and circulate it; in fact, we should probably grab it and stick it in our ftp archive, and put a reference to it in the book. (Too late to actually discuss the thing, at least for this edition).

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1.26 bind 9.9.4 :61.el7

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* configure.ac, Makefile.am: The original versions were derived from the
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  Author: Julio Merino <jmmv@users.sourceforge.net>

* atf-c/ui.c: The format_paragraph and format_text functions were
derived form 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,
extcept 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.

  Author: Julio Merino <jmmv84@gmail.com>
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<xsl:call-template name="isc.copyright.format">
  <xsl:with-param name="text">
    <xsl:for-each select="/refentry/docinfo/copyright | /book/bookinfo/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:text>&#10;</xsl:text>
    </xsl:for-each>
    <xsl:value-of select="$isc.copyright.text"/>
  </xsl:with-param>
</xsl:call-template>
</xsl:variable>

<xsl:stylesheet>

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  - Local variables:
  - mode: sgml
  - End:
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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 (jbr). 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
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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1.28 biosdevname 0.7.3 :1.el7

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1.29 boost 1.53.0 :27.el7
1.29.1 Available under license :

Index: boost/mpl/print.hpp
===================================================================
--- boost/mpl/print.hpp	(revision 83411)
+++ boost/mpl/print.hpp	(working copy)
@@ -45,22 +45,21 @@
: mpl::identity<T>
#if defined(__MWERKS__)
, aux::print_base
-#endif
+#endif

{  
#if defined(BOOST_MSVC)
  enum { n = sizeof(T) + -1 };  
#elif defined(__MWERKS__)
  void f(int);
-#else
-  enum {
-    n =
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#define __EDG_VERSION__
-    aux::dependent_unsigned<T>::value > -1
-# else
-    sizeof(T) > -1
-# endif
-    
-#endif
+#elif defined(__EDG_VERSION__)
+    enum { n = aux::dependent_unsigned<T>::value > -1 };
+#elif defined(BOOST_GCC)
+    enum { n1 };
+    enum { n2 }:
+    enum { n = n1 != n2 };
+#else
+    enum { n = sizeof(T) > -1 };
+#endif

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Open Source Used In Network Assurance Engine 4.0

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--- end ---

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<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE article PUBLIC "-//Boost//DTD BoostBook XML V1.0//EN"
"http://www.boost.org/tools/boostbook/dtd/boostbook.dtd">
<article id="copyright_test" last-revision="DEBUG MODE Date: 2000/12/20 12:00:00 $"
xmlns:xi="http://www.w3.org/2001/XInclude">
<title>Copyright Test</title>
<articleinfo>
<copyright>
<year>1963</year> <year>1964</year> <year>1965</year> <holder>Jane Doe</holder>
</copyright>
<copyright>
<year>2018</year> <holder>Joe Blow, John Coe</holder>
</copyright>
<copyright>
<year>1977</year> <year>1985</year> <holder>Someone else</holder>
</copyright>
</articleinfo>
</article>
[article Copyright Test
[quickbook 1.5]
[copyright 1977,1985 Someone else]
]
[article Invalid copyright
[quickbook 1.5]
[copyright No year]
]

Maybe this should pass?
[article Invalid copyright years
[quickbook 1.5]
[copyright 2010-2001 Timequake man]
]
/*
*
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* LICENSE_1_0.txt or copy at http://www.boost.org/LICENSE_1_0.txt)
*
*/

#include "licence_info.hpp"
// split_path is a small helper for outputting a path name, // complete with a link to that path:

// struct split_path
{
    const fs::path& root;
    const fs::path& file;
    split_path(const fs::path& r, const fs::path& f)
        : root(r), file(f) {}

private:
    split_path& operator=(const split_path&);
};

std::ostream& operator << (std::ostream& os, const split_path& p)
{
    os << "<a href="" << (p.root / p.file).string() << "]" << p.file.string() << "]</a>";
    return os;
}

std::string make_link_target(const std::string& s)
{
    // convert an arbitrary string into something suitable // for an <a> name:
    std::string result;
    for(unsigned i = 0; i < s.size(); ++i)
    {
        result.append(1, static_cast<std::string::value_type>(std::isalnum(s[i]) ? s[i] : '_'));
    }
    return result;
}

void bcp_implementation::output_license_info()
{
    std::pair<const license_info*, int> licenses = get_licenses();

    std::map<int, license_data>::const_iterator i, j;
i = m_license_data.begin();
j = m_license_data.end();

std::ofstream os(m_dest_path.string().c_str());
if(!os)
{
    std::string msg("Error opening ");
    msg += m_dest_path.string();
    msg += " for output."
    std::runtime_error e(msg);
    boost::throw_exception(e);
}
os <<
"<!DOCTYPE HTML PUBLIC \"-//W3C//DTD HTML 4.0 Transitional//EN\"\n"<html>
"<head>
"<title>Boost Licence Dependency Information</title>
if(m_module_list.size() == 1)
{
    os << " for " << *(m_module_list.begin());
}
os <<
"</title>
"</head>
"<body>
"<H1>Boost Licence Dependency Information</H1>
if(m_module_list.size() == 1)
{
    os << " for " << *(m_module_list.begin());
}
os <<
"</H1>
"<H2>Contents</H2>
"<pre><a href="#input">Input Information</a>
if(!m_bsl_summary_mode)
os << "<a href="#summary">Licence Summary</a>
os << "<a href="#details">Licence Details</a>

while(i != j)
{
    // title:
os << " <A href=""#"" make_link_target/licenses.first[i->first].license_name"
""<a href="#files">Files with no recognised license</a>
"<a href="#authors">Files with no recognised copyright holder</a>";
if(!m_bsl_summary_mode)
{
    os <<
    "Moving to the Boost Software License...\n"
    "  <a href="#bsl-converted">Files that can be automatically converted to the Boost Software License</a>\n"
    "  <a href="#to-bsl">Files that can be manually converted to the Boost Software License</a>\n"
    "  <a href="#not-to-bsl">Files that can NOT be moved to the Boost Software License</a>\n"
    "  <a href="#need-bsl-authors">Authors we need to move to the Boost Software License</a>\n"
    "<a href="#copyright">Copyright Holder Information</a>\n";
}

os <<
"<a href="#depend">File Dependency Information</a>\n";


//
// input Information:
//
// os << "<a name="input"></a><h2>Input Information</h2>
if(m_scan_mode)
    os << "<P>The following files were scanned for boost dependencies: <BR>";
else
    os << "<P>The following Boost modules were checked: <BR>";

std::list<std::string>::const_iterator si = m_module_list.begin();
std::list<std::string>::const_iterator sj = m_module_list.end();
while(si != sj)
{
    os << *si << "<BR>";
    ++si;
}

os << "</p><p>The Boost path was: <code>" << m_boost_path.string() << "</code></p>";

//
// extract the boost version number from the boost directory tree,
// not from this app (which may have been built from a previous
// version):
//
fileview version_file(m_boost_path / "boost/version.hpp'');
static const boost::regex version_regex("\^[[:blank:]]*[[:blank:]]+define\[[:blank:]]+BOOST_VERSION\[[:blank:]]+\d+\)");
boost::cmatch what;
if(boost::regex_search(version_file.begin(), version_file.end(), what, version_regex))
{
    int version = boost::lexical_cast<int>(what.str(1));
    os << "<p>The Boost version is: " << version / 100000 << "." << version / 100 % 1000 << "." << version % 100 << "</p>";
}

//
// output each license:
//
i = m_license_data.begin();
j = m_license_data.end();
if(!m_bsl_summary_mode)
{
    // start with the summary:
    os << "<a name="summary">\n</a><h2>Licence Summary</h2><\n";
    while(i != j)
    {
        // title:
        os << "<H3>" << licenses.first[i->first].license_name << "</H3><\n";
        // license text:
        os << "<BLOCKQUOTE>" << licenses.first[i->first].license_text << "</BLOCKQUOTE>";
        // Copyright holders:
        os << "<P>This license is used by " << i->second.authors.size() << " authors <\/P>";
        os << "<P>and " << i->second.files.size() << " files <a href="#" make_link_target(l licenses.first[i->first].license_name) > (see details)\n";
        os << "</P><</BLOCKQUOTE><\n";
        ++i;
    }
    //
    // and now the details:
    //
i = m_license_data.begin();
j = m_license_data.end();
int license_index = 0;
while(i != j)
{
    // title:
    os << "<H3>" make_link_target(l licenses.first[i->first].license_name) "</H3><\n"
    // license text:
    os << "<BLOCKQUOTE>" license_text << "</BLOCKQUOTE>";
    if(!m_bsl_summary_mode || (license_index >= 3))
    {
        // Copyright holders:
        os << "<P>This license is used by the following " second.authors.size() " copyright holders:</P>";<\P>
        std::set<std::string>::const_iterator x, y;
x = i->second.authors.begin();
y = i->second.authors.end();
while(x != y)
{
    os << *x << "<BR>
";
    ++x;
}
os << "</P></BLOCKQUOTE>\n";
// Files using this license:

os << "<P>This license applies to the following " << i->second.files.size() << " files:";

std::set<fs::path, path_less>::const_iterator m, n;
m = i->second.files.begin();
n = i->second.files.end();
while(m != n)
{
    os << split_path(m_boost_path, *m) << "<br>
";
    ++m;
}

os << "</P></BLOCKQUOTE>\n";
}
else
{
    os << "<P>This license is used by " << i->second.authors.size() << " authors (list omitted for brevity).</P>\n";
    os << "<P>This license applies to " << i->second.files.size() << " files (list omitted for brevity).</P>\n";
}
++license_index;
++i;
}
// Output list of files not found to be under license control:

//
// os << "<h2><a name="files"></a>Files With No Recognisable Licence</h2>\n"

"<P>The following " << m_unknown_licenses.size() << " files had no recognisable license information:";

std::set<fs::path, path_less>::const_iterator i2, j2;
i2 = m_unknown_licenses.begin();
j2 = m_unknown_licenses.end();
while(i2 != j2)
{
    os << split_path(m_boost_path, *i2) << "<br>
";
    ++i2;
}

os << "</P></BLOCKQUOTE>";
//
// Output list of files with no found copyright holder:

//
// os << "<h2><a name="authors"></a>Files With No Recognisable Copyright Holder</h2>\n"

"<P>The following " << m_unknown_authors.size() << " files had no recognisable copyright holder:";


i2 = m_unknown_authors.begin();
j2 = m_unknown_authors.end();
while(i2 != j2)
{
    os << split_path(m_boost_path, *i2) << "<br>
    ++i2;
}
os << "</p></BLOCKQUOTE>";
if(!m_bsl_summary_mode)
{
    // Output list of files that have been moved over to the Boost
    // Software License, along with enough information for human
    // verification.
    //
    os << "<h2><a name="bsl-converted"></a>Files that can be automatically converted to the Boost Software
    License</h2>
    " << m_converted_to_bsl.size() << " files can be automatically converted to the Boost
    Software License, but require manual verification before they can be committed to CVS:
    ";
    if (!m_converted_to_bsl.empty())
    {
        typedef std::map<fs::path, std::pair<std::string, std::string>, path_less>
            ::const_iterator conv_iterator;
        conv_iterator i = m_converted_to_bsl.begin(),
            ie = m_converted_to_bsl.end();
        int file_num = 1;
        while (i != ie)
        {
            os << "<P>[" << file_num << "] File: <tt>" << split_path(m_boost_path, i->first)
            "<br>
            |<tr><td>|<pre>
            " << i->second.first << "</pre></td>
            |<tr><td>|<pre>
            " << i->second.second << "</pre></td>
            |</tr></table>
            
            ++i;
            ++file_num;
        }
    }
    // Output list of files that could be moved over to the Boost Software License
    //
    os << "<h2><a name="to-bsl"></a>Files that could be converted to the Boost Software License</h2>
    " << m_can_migrate_to_bsl.size() << " files could be manually converted to the Boost
    Software License, but have not yet been:
    ";
    i2 = m_can_migrate_to_bsl.begin();
j2 = m_can_migrate_to_bsl.end();
while(i2 != j2)
{
    os << split_path(m_boost_path, *i2) << "<br>
    ++i2;
Files that can NOT be converted to the Boost Software License because we need the permission of more authors:

```
// Output list of files that can not be moved over to the Boost Software License
//
os << "\n";

"<p>The following " << m_cannot_migrate_to_bsl.size() << " files cannot be converted to the Boost Software License because we need the permission of more authors:";

i2 = m_cannot_migrate_to_bsl.begin();
j2 = m_cannot_migrate_to_bsl.end();
while(i2 != j2)
{
    os << split_path(m_boost_path, *i2) << "<br>
    ++i2;
}
```

```
// Output list of authors that we need permission for to move to the BSL
//
os << "\n";

"<p>Permission of the following authors is needed before we can convert to the Boost Software License. The list of authors that have given their permission is contained in <code>more/blanket-permission.txt</code>.
```

```
std::copy(m_authors_for_bsl_migration.begin(), m_authors_for_bsl_migration.end(),
          std::ostream_iterator<std::string>(os, "<br>
));
```

```
// output a table of copyright information:
//
os << "\n";

"<h2>Copyright Holder Information</h2>
```

```
std::map<std::string, std::set<fs::path, path_less> >::const_iterator ad, ead;
ad = m_author_data.begin();
ead = m_author_data.end();
while(ad != ead)
{
    os << "\n";
    std::set<fs::path, path_less>::const_iterator fi, efi;
    fi = ad->second.begin();
    efi = ad->second.end();
    while(fi != efi)
    {
        os << split_path(m_boost_path, *fi) << " ";
        ++fi;
    }
    os << "</tr></td><br>
```

```
++ad;
```
os << "</table>\n";

// output file dependency information:
//
// os << "<H2><a name="depend"></a>File Dependency Information</H2><BLOCKQUOTE><pre>
std::map<fs::path, fs::path, path_less>::const_iterator dep, last_dep;
std::set<fs::path, path_less>::const_iterator fi, efi;
fi = m_copy_paths.begin();
efi = m_copy_paths.end();
// if in summary mode, just figure out the "bad" files and print those only:
std::set<fs::path, path_less> bad_paths;
if(m_bsl_summary_mode)
{
    bad_paths.insert(m_unknown_licenses.begin(), m_unknown_licenses.end());
    bad_paths.insert(m_unknown_authors.begin(), m_unknown_authors.end());
    bad_paths.insert(m_can_migrate_to_bsl.begin(), m_can_migrate_to_bsl.end());
    bad_paths.insert(m_cannot_migrate_to_bsl.begin(), m_cannot_migrate_to_bsl.end());
    typedef std::map<fs::path, std::pair<std::string, std::string>, path_less>
::const_iterator conv_iterator;
    conv_iterator i = m_converted_to_bsl.begin(),
        ie = m_converted_to_bsl.end();
    while(i != ie)
    {
        bad_paths.insert(i->first);
        ++i;
    }
    fi = bad_paths.begin();
efi = bad_paths.end();
    os << "<P>For brevity, only files not under the BSL are shown</P>\n";
}
while(fi != efi)
{
    os << split_path(m_boost_path, *fi);
    dep = m_dependencies.find(*fi);
    last_dep = m_dependencies.end();
    std::set<fs::path, path_less> seen_deps;
    if (dep != last_dep)
        while(true)
        {
            os << "- > ";
            if(fs::exists(m_boost_path / dep->second))
                os << split_path(m_boost_path, dep->second);
            else if(fs::exists(dep->second))
                os << split_path(fs::path(), dep->second);
            else
                os << dep->second.string();
            break;
        }
    ++fi;
}

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if(seen_deps.find(dep->second) != seen_deps.end())
{
  os << " <I>(Circular dependency!)</I>";
  break; // circular dependency!!!
}
seen_deps.insert(dep->second);
last_dep = dep;
dep = m_dependencies.find(dep->second);
if((dep == m_dependencies.end()) || (0 == compare_paths(dep->second, last_dep->second)))
    break;
  os << "\n";
++fi;
}
os << " </pre</BLOCKQUOTE>\n";

os << " </body</html>\n";

if(!os)
{
  std::string msg("Error writing to ");
  msg += m_dest_path.string();
  msg += ";
  std::runtime_error e(msg);
  boost::throw_exception(e);
}

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```
/+\  
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\+/
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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 Dossor 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.cs.darness.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.)

Boost.Geometry (aka GGL, Generic Geometry Library)

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=============================================================================

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<title>Boost Date-Time Library License</title>
<bridgehead renderas="sect2">Boost Date-Time Library License</bridgehead>
<!--
<ulink url="../..//index.htm">
<imagedata align="left"
format="GIF"
fileref="../..//boost.png"
alt="C++ Boost" />
</ulink>--> 
<!--hr -->
<para>
The following is the overall license for the boost date_time
library. This notice is found in all source files related to the
All the value based traits in this library conform to MPL's requirements for an Integral Constant type: that includes a number of rather intrusive workarounds for broken compilers.

Purely as an implementation detail, this means that `__true_type` inherits from `boost::mpl::true_`, `__false_type` inherits from `boost::mpl::false_`, and `__integral_constant<T, v>` inherits from `boost::mpl::integral_c<T,v>` (provided `T` is not `bool`)

[endsect]
<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=US-ASCII">
<title>MPL Interoperability</title>
<link rel="stylesheet" href="../../../../doc/src/boostbook.css" type="text/css">
<meta name="generator" content="DocBook XSL Stylesheets V1.77.1">
<link rel="home" href="../index.html" title="Chapter 1. Boost.TypeTraits">
</head>
All the value based traits in this library conform to MPL's requirements for an integral constant type that includes a number of rather intrusive workarounds for broken compilers.

Purely as an implementation detail, this means that `<code class="computeroutput">true_type</code>` inherits from `<a href="../libs/mpl/doc/refmanual/bool.html" target="_top">true_</a>` `<code class="computeroutput">false_type</code>` inherits from `<a href="../libs/mpl/doc/refmanual/bool.html" target="_top">false_</a>` `<code class="computeroutput">integral_constant&lt;T, v&gt;</code>` inherits from `<a href="../libs/mpl/doc/refmanual/integral-c.html" target="_top">integral_constant</a>`.
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// ///////////////////////////////////////////////////////////////////////////

class="identifier">mpl</span><span class="special">::</span><span class="identifier">integral_c</span><span class="special">::</span><span class="identifier">T</span><span class="special">::</span><span class="identifier">v</span><span class="special">::</span><span class="keyword">bool</span><span class="special">::</span></code></a>(provided <code class="computeroutput"><span class="keyword">bool</span></code> is not <code class="computeroutput"><span class="keyword">bool</span></code>)
#ifndef BOOST_CONTAINER_CONTAINER_DETAIL_MPL_HPP
#define BOOST_CONTAINER_CONTAINER_DETAIL_MPL_HPP

#if (defined _MSC_VER) && (_MSC_VER >= 1200)
#  pragma once
#endif

#include <cassert>

namespace boost {
namespace container {
namespace container_detail {

template <class T, T val>
struct integral_constant
{
  static const T value = val;
  typedef integral_constant<T,val> type;
};

template< bool C_ >
struct bool_ : integral_constant<bool, C_>
{
  static const bool value = C_;  
  operator bool() const { return bool_::value; }
};

typedef bool_<true>        true_;
typedef bool_<false>       false_;

typedef true_  true_type;
typedef false_ false_type;

typedef char yes_type;
struct no_type
{
  char padding[8];
};

template <bool B, class T = void>
struct enable_if_c
{
  typedef T type;
};

template <class T>
struct enable_if_c<false, T> {}

} // namespace container_detail
} // namespace container
} // namespace boost

} // namespace _open_source_used_in_network_assurance_engine_4.0(1)
struct enable_if : public enable_if_c<Cond::value, T> {};  

template <class Cond, class T = void>
struct disable_if : public enable_if_c<!Cond::value, T> {};  

template <bool B, class T = void>
struct disable_if_c : public enable_if_c<!B, T> {};  

template <class T, class U>
class is_convertible
{
  typedef char true_t;
  class false_t { char dummy[2]; };  
  static true_t dispatch(U);
  static false_t dispatch(...);
  static T trigger();
  public:
    enum { value = sizeof(dispatch(trigger())) == sizeof(true_t) };  
};  

template<
  bool C
, typename T1
, typename T2
>
struct if_c
{
  typedef T1 type;
};  

template<
  typename T1
, typename T2
>
struct if_c<false,T1,T2>
{
  typedef T2 type;
};  

template<
  typename T1
, typename T2
, typename T3
>
struct if_<
{
  typedef typename if_c<0 != T1::value, T2, T3>::type type;
};
template <class Pair>
struct select1st
//   : public std::unary_function<Pair, typename Pair::first_type>
{
    template<class OtherPair>
    const typename Pair::first_type& operator()(const OtherPair& x) const
    {  return x.first;  }

    const typename Pair::first_type& operator()(const typename Pair::first_type& x) const
    {  return x;   }
};

// identity is an extension: it is not part of the standard.
template <class T>
struct identity
//   : public std::unary_function<T,T>
{
    typedef T type;
    const T& operator()(const T& x) const
    { return x;  }
};

template<std::size_t S>
struct ls_zeros
{
    static const std::size_t value = (S & std::size_t(1)) ? 0 : (1u + ls_zeros<(S >> 1u)>::value);
};

template<>
struct ls_zeros<0>
{
    static const std::size_t value = 0;
};

template<>
struct ls_zeros<1>
{
    static const std::size_t value = 0;
};

template <typename T> struct unvoid { typedef T type; };
template <> struct unvoid<void> { struct type { }; };
template <> struct unvoid<const void> { struct type { }; };

}  //namespace container_detail {
}  //namespace container {
\#ifndef BOOST_CONTAINER_CONTAINER_DETAIL_MPL_HPP

////////////////////////////////////////////////////////////////////////////////

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\//
\//
\////////////////////////////////////////////////////////////////////////////////

\#ifndef BOOST_INTERPROCESS_DETAIL_MPL_HPP
\#define BOOST_INTERPROCESS_DETAIL_MPL_HPP

\#if (defined _MSC_VER) && (_MSC_VER >= 1200)
\#pragma once
\#endif

\#include <cstddef>

namespace boost {
namespace interprocess {
namespace ipcdetail {

    template <class T, T val>
    struct integral_constant {
        static const T value = val;
        typedef integral_constant<T,val> type;
    };

    template< bool C_> 
    struct bool_ : integral_constant<bool, C_> 
    {
        static const bool value = C_; 
    };

    typedef bool_<true>        true_;
    typedef bool_<false>       false_;
    typedef true_  true_type;
    typedef false_ false_type;
    typedef char yes_type;

} //namespace ipcdetail
} //namespace interprocess
} //namespace boost

\#endif   \#ifndef BOOST_CONTAINER_CONTAINER_DETAIL_MPL_HPP
struct no_type
{
    char padding[8];
};

template <bool B, class T = void>
struct enable_if_c {
    typedef T type;
};

template <class T>
struct enable_if_c<false, T> {};

template <class Cond, class T = void>
struct enable_if : public enable_if_c<Cond::value, T> {};

template <class Cond, class T = void>
struct disable_if : public enable_if_c<!Cond::value, T> {};

template <class T, class U>
class is_convertible
{
    typedef char true_t;
    class false_t { char dummy[2]; }; static true_t dispatch(U);
    static false_t dispatch(...);
    static T trigger();
    public:
    static const bool value = sizeof(dispatch(trigger())) == sizeof(true_t);
};

template<
    bool C , typename T1 , typename T2
>
struct if_c {
    typedef T1 type;
};

template<
    typename T1 , typename T2
>
struct if_c<false,T1,T2> {
    typedef T2 type;
template<typename T1, typename T2, typename T3>
struct if_
{
    typedef typename if_c<0 != T1::value, T2, T3>::type type;
};

template <class Pair>
struct select1st
//   : public std::unary_function<Pair, typename Pair::first_type>
{
    template<class OtherPair>
    const typename Pair::first_type& operator()(const OtherPair& x) const
    {  return x.first;  }

    const typename Pair::first_type& operator()(const typename Pair::first_type& x) const
    {  return x;  }
};

// identity is an extension: it is not part of the standard.
template <class T>
struct identity
//   : public std::unary_function<T,T>
{
    typedef T type;
    const T& operator()(const T& x) const
    { return x; }
};

template<std::size_t S>
struct ls_zeros
{
    static const std::size_t value = (S & std::size_t(1)) ? 0 : (1u + ls_zeros<(S >> 1u)>::value);
};

template<>
struct ls_zeros<0>
{
    static const std::size_t value = 0;
};

template<>
struct ls_zeros<1>
{
    static const std::size_t value = 0;
};

} //namespace ipcdetail {
} //namespace interprocess {
} //namespace boost {

#endif   //#ifndef BOOST_INTERPROCESS_DETAIL_MPL_HPP
////////////////////////////////////////////////////////////////////////////
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//
//
////////////////////////////////////////////////////////////////////////////

#ifndef BOOST_INTRUSIVE_DETAIL_MPL_HPP
#define BOOST_INTRUSIVE_DETAIL_MPL_HPP

#include <boost/intrusive/detail/config_begin.hpp>
#include <cstddef>

namespace boost {
namespace intrusive {
namespace detail {

typedef char one;
struct two {one _[2];};

template< bool C_ >
struct bool_ {
    static const bool value = C_; 
};

typedef bool_<true>       true_;
typedef bool_<false>      false_;

typedef true_  true_type;
typedef false_ false_type;

typedef char yes_type;

}}} // namespaces interprocess, boost
}}} // namespace intrusive, detail, boost
#endif // BOOST_INTRUSIVE_DETAIL_MPL_HPP
struct no_type
{
    char padding[8];
};

template <bool B, class T = void>
struct enable_if_c
{
    typedef T type;
};

template <class T>
struct enable_if_c=false, T> {};

template <class Cond, class T = void>
struct enable_if : public enable_if_c<Cond::value, T> {};

template<class F, class Param>
struct apply
{
    typedef typename F::template apply<Param>::type type;
};

template <class T, class U>
class is_convertible
{
    typedef char true_t;
    class false_t { char dummy[2]; }; public:
        static true_t dispatch(U);
        static false_t dispatch(...);
        static const T &trigger();
    public:
        static const bool value = sizeof(dispatch(trigger())) == sizeof(true_t);
};

template<class F, class Param>
struct apply
{
    typedef typename F::template apply<Param>::type type;
};

template <bool C>
struct if_c
{
    typedef T1 type;
};
struct if_c<false,T1,T2>
{
    typedef T2 type;
};

template<
    typename C
 , typename T1
 , typename T2
>
struct if_<
{
    typedef typename if_c<0 != C::value, T1, T2>::type type;
};

template<
    bool C
 , typename F1
 , typename F2
>
struct eval_if_c
 : if_c<C,F1,F2>::type
{ }; 

template<
    typename C
 , typename T1
 , typename T2
>
struct eval_if
 : if_<C,T1,T2>::type
{ }; 

// identity is an extension: it is not part of the standard.
template <class T>
struct identity
{
    typedef T type;
}; 

#if defined(BOOST_MSVC) || defined(__BORLANDC_)
#define BOOST_INTRUSIVE_TT_DECL __cdecl
#else
#define BOOST_INTRUSIVE_TT_DECL
#endif
#if defined(_MSC_EXTENSIONS) && !defined(__BORLAND__) && !defined(_WIN64) &&
!defined(UNDER_CE)
#define BOOST_INTRUSIVE_TT_TEST_MSC_FUNC_SIGS
#endif

template <typename T>
struct is_unary_or_binary_function_impl
{  static const bool value = false;  };

// see boost ticket #4094
// avoid duplicate definitions of is_unary_or_binary_function_impl
#endif

template <typename R>
struct is_unary_or_binary_function_impl<R (*)(())>
{  static const bool value = true;  };

template <typename R>
struct is_unary_or_binary_function_impl<R (*)(...)>  
{  static const bool value = true;  };

#else // BOOST_INTRUSIVE_TT_TEST_MSC_FUNC_SIGS

template <typename R>
struct is_unary_or_binary_function_impl<R (__stdcall*)()> 
{  static const bool value = true;  };

#ifndef _MANAGED

template <typename R>
struct is_unary_or_binary_function_impl<R (__fastcall*)()> 
{  static const bool value = true;  };
#endif

template <typename R>
struct is_unary_or_binary_function_impl<R (__cdecl*)()> 
{  static const bool value = true;  };

template <typename R>
struct is_unary_or_binary_function_impl<R (__cdecl*)(...)> 
{  static const bool value = true;  };
#endif

// see boost ticket #4094
// avoid duplicate definitions of is_unary_or_binary_function_impl
#endif

template <typename R, class T0>

struct is_unary_or_binary_function_impl<R (*)(T0)>
{  static const bool value = true;  };

template <typename R, class T0>
struct is_unary_or_binary_function_impl<R (*)(T0...)>  
{  static const bool value = true;  };

#endif // BOOST_INTRUSIVE_TT_TEST_MSC_FUNC_SIGS

template <typename R, class T0>
struct is_unary_or_binary_function_impl<R (__stdcall*)(T0)>{  static const bool value = true;  };

#ifndef _MANAGED

template <typename R, class T0>
struct is_unary_or_binary_function_impl<R (__fastcall*)(T0)>{  static const bool value = true;  };
#endif

template <typename R, class T0>
struct is_unary_or_binary_function_impl<R (__cdecl*)(T0)>{  static const bool value = true;  };

template <typename R, class T0>
struct is_unary_or_binary_function_impl<R (__cdecl*)(T0...)>{  static const bool value = true;  };

#endif

// see boost ticket #4094
// avoid duplicate definitions of is_unary_or_binary_function_impl
#ifndef BOOST_INTRUSIVE_TT_TEST_MSC_FUNC_SIGS

template <typename R, class T0, class T1>
struct is_unary_or_binary_function_impl<R (*)(T0, T1)>{  static const bool value = true;  };

template <typename R, class T0, class T1>
struct is_unary_or_binary_function_impl<R (*)(T0, T1...)>{  static const bool value = true;  };
#endif // BOOST_INTRUSIVE_TT_TEST_MSC_FUNC_SIGS

//else // BOOST_INTRUSIVE_TT_TEST_MSC_FUNC_SIGS

template <typename R, class T0, class T1>
struct is_unary_or_binary_function_impl<R (__stdcall*)(T0, T1)>{  static const bool value = true;  };

#endif
#ifndef _MANAGED

template <typename R, class T0, class T1>
struct is_unary_or_binary_function_impl<R (__fastcall*)(T0, T1)>
{  static const bool value = true;  };
#endif

template <typename R, class T0, class T1>
struct is_unary_or_binary_function_impl<R (__cdecl*)(T0, T1)>
{  static const bool value = true;  };
#endif

template <typename R, class T0, class T1>
struct is_unary_or_binary_function_impl<R (__cdecl*)(T0, T1...)>
{  static const bool value = true;  };
#endif

template <typename T>
struct is_unary_or_binary_function_impl<T&>
{  static const bool value = false;  };

template<typename T>
struct is_unary_or_binary_function
{  static const bool value = is_unary_or_binary_function_impl<T>::value;   };

//boost::alignment_of yields to 10K lines of preprocessed code, so we
//need an alternative

template <typename T> struct alignment_of;

template <typename T>
struct alignment_of_hack
{  
    char c;
    T t;
    alignment_of_hack();
};

template <unsigned A, unsigned S>
struct alignment_logic
{  
    static const std::size_t value = A < S ? A : S;
};

template< typename T >
struct alignment_of
{  
    static const std::size_t value = alignment_logic
< sizeof(alignment_of_hack<T>) - sizeof(T)
, sizeof(T)
>::value;
};

template<typename T, typename U>
struct is_same
{
    typedef char yes_type;
    struct no_type
    {
        char padding[8];
    };

    template<typename V>
    static yes_type is_same_tester(V*, V*);
    static no_type is_same_tester(...);

    static T *t;
    static U *u;

    static const bool value = sizeof(yes_type) == sizeof(is_same_tester(t,u));
};

template<typename T>
struct add_const
{
    typedef const T type;
};

template<typename T>
struct remove_const
{
    typedef T type;
};

template<typename T>
struct remove_const<const T>
{
    typedef T type;
};

template<typename T>
struct remove_cv
{
    typedef T type;
};

template<typename T>
struct remove_cv<const T>
{
    typedef T type;
};

template<typename T>
struct remove_cv<const volatile T>
{
    typedef T type;
};
template<typename T>
struct remove_cv<volatile T>
{
    typedef T type;
};

template<class T>
struct remove_reference
{
    typedef T type;
};

template<class T>
struct remove_reference<T&>
{
    typedef T type;
};

template<class Class>
class is_empty_class
{
    template<typename T>
    struct empty_helper_t1 : public T
    {
        empty_helper_t1();
        int i[256];
    };

    struct empty_helper_t2
    { int i[256];};

    public:
    static const bool value = sizeof(empty_helper_t1<Class>) == sizeof(empty_helper_t2);
};

template<std::size_t S>
struct ls_zeros
{
    static const std::size_t value = (S & std::size_t(1)) ? 0 : (1 + ls_zeros<(S>>1u)>::value);
};

template<>
struct ls_zeros<0>
{
    static const std::size_t value = 0;
};

template<>
struct ls_zeros<1>
static const std::size_t value = 0;
}
#endif //BOOST_INTRUSIVE_DETAIL_MPL_HPP

1.30 btrfs-progs 4.9.1 :1.el7
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Julian Seward, jseward@bzip.org
bzip2/libbzip2 version 1.0.6 of 6 September 2010

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## Special Recognition ##

One of the key reasons we got delayed on the CentOS-6 release was lack of suitable build resources, especially when we had to repeatedly build large chunks of code. Norwood S came forward and worked with me to setup a large build machine, then tune the build process and help improve the overall build, test and validate process we were using. This build machine he donated to the project was about 5 times more capable than the entire buildsystem we had. And he did this out of his own pocket, from his own time, and has since upgraded the machine as well. It's now a 128GB, 48 core machine, with 4 SSD's and 4 sata disks : but the key metric is that it can build from source, the entire CentOS-7 distro in under 22 hrs.

Having this capability was key in our ability to build, test and deliver CentOS-7 as rapidly as we have been able to.

We'd like to dedicate the CentOS-7 Release to Mr Norwood S, of Phoenix, AZ, USA for his continued support for the project.

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The Red Hat developers, without whom CentOS would look very different

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d) 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.

e) 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.

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<program>  Copyright (C) <year>  <name of author>
This program comes with ABSOLUTELY NO WARRANTY; for details type `show w'.
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The hypothetical commands `show w' and `show c' should show the appropriate parts of the General Public License. Of course, your program's commands might be different; for a GUI interface, you would use an "about box".

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1.39 cracklib 2.9.0 :11.el7
1.39.1 Available under license :

--------
EFFECTIVE OCT 2008, LICENSE IS BEING CHANGED TO LGPL-2.1 (though not reflected in released code until Nov 2009 - slow release cycle...)
--------

Discussion thread from mailing list archive, with approval from everyone actively involved or holding original licensing rights included.

[Cracklib-devel] cracklib license
From: Mike Frysinger <vapier@ge...> - 2007-10-02 01:16

Attachments: Message as HTML
looks like 2.8.11 is out and marked as "GPL-2" ... releasing libraries unde=r=20
GPL-2 is not desirable at all ... this is why the LGPL-2.1 exists
=2Dmike

Re: [Cracklib-devel] cracklib license
From: Neulinger, Nathan <nneul@um...> - 2007-10-02 01:18
I understand that, and you're welcome to bring it up with Alec directly and see if he wants to relicense his code as LGPL... but at this point, it was enough to just get it consistent and documented as to what it was released under. This wasn't actually a license change, just a clarification of the licensing that was already in place.=20

-- Nathan
=20
------------------------------------------------------------
Nathan Neulinger EMail: nneul@um...
University of Missouri - Rolla Phone: (573) 341-6679
UMR Information Technology Fax: (573) 341-4216

> -----Original Message-----
> From: cracklib-devel-bounces@li...
> [mailto:cracklib-devel-bounces@li...] On Behalf Of
> Mike Frysinger
> Sent: Monday, October 01, 2007 8:15 PM
> To: cracklib-devel@li...
> Subject: [Cracklib-devel] cracklib license
> > looks like 2.8.11 is out and marked as "GPL-2" ... releasing
> > libraries under
> > GPL-2 is not desirable at all ... this is why the LGPL-2.1 exists
> > -mike

Re: [Cracklib-devel] cracklib license
From: Mike Frysinger <vapier@ge...> - 2007-10-02 01:33

Attachments: Message as HTML

On Monday 01 October 2007, Neulinger, Nathan wrote:
> I understand that, and you're welcome to bring it up with Alec directly
> and see if he wants to relicense his code as LGPL... but at this point,
> it was enough to just get it consistent and documented as to what it was
> released under. This wasn't actually a license change, just a
> clarification of the licensing that was already in place.

> the original license (before moving to sourceforge -- aka, 2.7) was not=20
> GPL-2 ... it was a modified artistic license ... i didnt notice the license=
> change until it was mentioned in the latest notes.

> unlike the old license, GPL-2 prevents people from using cracklib unless th=
> eir=20
> applications are also GPL-2 which imo is just wrong. it isnt the place of =
> a=20
> library to dictact to application writes what license they should be using.=
> thus LGPL-2.1 enters to fill this void.
> =2Dmike

Re: [Cracklib-devel] cracklib license
From: Neulinger, Nathan <nneul@um...> - 2007-10-02 01:46

Seems like the ideal thing here would be for you and the other distro
maintainers to get together with Alec in a conversation and come to a
decision as to what licensing scheme y'all want. I haven't really done
much other than cleaning up the packaging and patches and a small bit of
additional code, so whatever licensing y'all come up with is fine by me.

-- Nathan
> -----Original Message-----
> From: cracklib-devel-bounces@li...
> [mailto:cracklib-devel-bounces@li...] On Behalf Of
> Mike Frysinger
> Sent: Monday, October 01, 2007 8:33 PM
> To: Neulinger, Nathan
> Cc: cracklib-devel@li...; Alec Muffett
> Subject: Re: [Cracklib-devel] cracklib license
>
> On Monday 01 October 2007, Neulinger, Nathan wrote:
> > I understand that, and you're welcome to bring it up with Alec
> > directly
> > and see if he wants to relicense his code as LGPL... but at this
> > point,
> > it was enough to just get it consistent and documented as to what
> > it was
> > released under. This wasn't actually a license change, just a
> > clarification of the licensing that was already in place.
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> > the original license (before moving to sourceforge -- aka, 2.7) was
> > not
> > GPL-2 ... it was a modified artistic license ... i didnt notice the
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> > change until it was mentioned in the latest notes.
> >
> > unlike the old license, GPL-2 prevents people from using cracklib
> > unless their
> > applications are also GPL-2 which imo is just wrong. it isn't the
> > place of a
> > library to dictact to application writes what license they should
> > be using.
> > thus LGPL-2.1 enters to fill this void.
> > -mike
>
> Re: [Cracklib-devel] cracklib license
> From: Alec Muffett <alecm@cr...> - 2007-10-02 08:57
> > Seems like the ideal thing here would be for you and the other distro
> > maintainers to get together with Alec in a conversation and come to a
> > decision as to what licensing scheme y'all want. I haven't really done
> > much other than cleaning up the packaging and patches and a small
> > bit of
> additional code, so whatever licensing y'all come up with is fine
> by me.

I am sympathetic. Guys, what do you reckon?

What I am hearing so far is that LGPL makes sense, since it can be linked with any code, not just GPL...

-a

Re: [Cracklib-devel] cracklib license
From: Devin Reade <gdr@gn...> - 2007-10-02 15:04
I would like to see it under LGPL as well. I think it is in everyone's best interests to have as secure systems as possible, and I think tainting it via GPL will just make it less likely that the library gets used, and will not usually cause companies/developers to GPL the dependent code (where it is not already GPL).

I like GPL, I use it when I can, but I don't think that it's the correct license in this situation.

Devin

--
If it's sinful, it's more fun.

Re: [Cracklib-devel] cracklib license
From: Nalin Dahyabhai <nalin@re...> - 2008-01-28 16:32
On Tue, Oct 02, 2007 at 09:57:31AM +0100, Alec Muffett wrote:
> > > Seems like the ideal thing here would be for you and the other distro
> > > maintainers to get together with Alec in a conversation and come to a
decision as to what licensing scheme y'all want. I haven't really done
> > > much other than cleaning up the packaging and patches and a small
> > > bit of
> > > additional code, so whatever licensing y'all come up with is fine
> > > by me.
> >
> > I am sympathetic. Guys, what do you reckon?
> >
> > What I am hearing so far is that LGPL makes sense, since it can be
> > linked with any code, not just GPL...

My apologies for not chiming in in anything resembling a reasonable timeframe.

I'd also suggest the LGPL, for the reason you noted above. Alternately, GPLv2 with the option of using the library under a later version of the
GPL would permit applications which were released under version 3 of the GPL to use the library, too, which would be sufficient for the packages which are included in Fedora. FWIW, I'd personally lean toward LGPL.

In any case, I thank you both for working on sorting this out.

Cheers,

Nalin

Re: [Cracklib-devel] cracklib license
From: Mike Fry sing er <vapier@ge...> - 2008-10-05 21:27

Attachments: Message as HTML
On Monday 28 January 2008, Nalin Dahyabhai wrote:
> On Tue, Oct 02, 2007 at 09:57:31AM +0100, Alec Muffett wrote:
> > > > Seems like the ideal thing here would be for you and the other distro
> > > > maintainers to get together with Alec in a conversation and come to a
> > > > decision as to what licensing scheme y'all want. I haven't really done
> > > > much other than cleaning up the packaging and patches and a small
> > > > bit of
> > > > additional code, so whatever licensing y'all come up with is fine
> > > > by me.
> > >
> > > I am sympathetic. Guys, what do you reckon?
> > >
> > > What I am hearing so far is that LGPL makes sense, since it can be
> > > linked with any code, not just GPL....
> >
> > My apologies for not chiming in in anything resembling a reasonable
timeframe.
>
> I'd also suggest the LGPL, for the reason you noted above. Alternately,
> GPLv2 with the option of using the library under a later version of the
> GPL would permit applications which were released under version 3 of the
> GPL to use the library, too, which would be sufficient for the packages
> which are included in Fedora. FWIW, I'd personally lean toward LGPL.
>
> In any case, I thank you both for working on sorting this out.

looks like everyone is OK with LGPL-2.1 (GNU Lesser license), so can we make the change now?

-mike

Re: [Cracklib-devel] cracklib license
From: Alec Muffett <alecm@cr...> - 2008-10-05 23:18
In any case, I thank you both for working on sorting this out.

> looks like everyone is OK with LGPL-2.1 (GNU Lesser license), so can we make the change now?

yes. go for it. thanks++

-a

Re: [Cracklib-devel] cracklib license
From: Mike Frysinger <vapier@ge...> - 2008-10-25 22:34

Attachments: Message as HTML
On Sunday 05 October 2008, Alec Muffett wrote:
> >> In any case, I thank you both for working on sorting this out.
> >
> > looks like everyone is OK with LGPL-2.1 (GNU Lesser license), so can we make the change now?
> >
> yes. go for it. thanks++

Nathan Neulinger is the only one who can actually make said change...

-mike

----------------
BELOW IS ORIGINAL LICENSING DISCUSSION RE CHANGING TO GPL from Artistic.
----------------

CrackLib was originally licensed with a variant of the Artistic license. In the interests of wider acceptance and more modern licensing, it was switched with the original author's blessing to GPL v2.

This approval was carried out in email discussions in 2005, and has been reconfirmed as of 2007-10-01 with the following email from Alec Muffett.

The below email references nneul@umr.edu address, as that is the address that was used at the time. For any future emails regarding this, please use nneul@neulinger.org.

--------------------------

From alecm@crypticide.com Mon Oct 1 12:26:03 2007
Received: from umr-exproto2.cc.umr.edu ([131.151.0.192]) by UMR-CMAIL1.umr.edu with Microsoft

Open Source Used In Network Assurance Engine 4.0(1)
Any chance you could write me a self-contained email stating clearly
that the license is being changed to GPL, so I could include that
email
> in the repository and clean up the repository/tarballs? I have all the
> original discussion, but something succinct and self contained
> would be
> ideal.

The license for my code in the Cracklib distribution is henceforth GPL.

Happy now? :-)

-a

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Version 2.1, February 1999

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as the successor of the GNU Library Public License, version 2, hence
the version number 2.1.]

Preamble

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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.

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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.

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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

That's all there is to it!
This package was debianized by Jean Pierre LeJacq <jplejacq@quoininc.com> on Wed, 25 Feb 1998. Martin Pitt <martin@piware.de> was the package's maintainer up to version 2.7.19-1. The current maintainer is Jan Dittberner <jandd@debian.org>.
It was downloaded from http://sourceforge.net/projects/cracklib

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Copyright (c) 2005-2009 Nathan Neulinger <nneul@umr.edu>,
Copyright (c) 2008-2009 Jan Dittberner <jan@dittberner.info>

Modifications: Added cronjob, configuration file, and man pages.

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Copyright information:

CrackLib was originally licensed with a variant of the Artistic
license. In the interests of wider acceptance and more modern
licensing, it was switched with the original author's blessing to GPL
v2.

This approval was carried out in email discussions in 2005, and has
been reconfirmed as of 2007-10-01 with the following email from Alec
Muffett. Cracklib's license was changed from the GPL to the LGPL after
consensus of all previous developers in October 2008, effective with
release 2.8.15 released on 2009-11-19. See the email discussion below
for both license changes.

-------------------------------------
-----------------
EFFECTIVE OCT 2008, LICENSE IS BEING CHANGED TO LGPL-2.1 (though not reflected
in released code until Nov 2009 - slow release cycle...)
-----------------
Discussion thread from mailing list archive, with approval from everyone actively involved or holding original licensing rights included.

[Cracklib-devel] cracklib license
From: Mike Frysinger <vapier@ge...> - 2007-10-02 01:16

Attachments: Message as HTML
looks like 2.8.11 is out and marked as "GPL-2" ... releasing libraries unde=r=20
GPL-2 is not desirable at all ... this is why the LGPL-2.1 exists
=2Dmike

Re: [Cracklib-devel] cracklib license
From: Neulinger, Nathan <nneul@um...> - 2007-10-02 01:18
I understand that, and you're welcome to bring it up with Alec directly and see if he wants to relicense his code as LGPL... but at this point, it was enough to just get it consistent and documented as to what it was released under. This wasn't actually a license change, just a clarification of the licensing that was already in place.=20

-- Nathan
=20
------------------------------------------------------------------------
Nathan Neulinger EMail: nneul@um...
University of Missouri - Rolla Phone: (573) 341-6679
UMR Information Technology Fax: (573) 341-4216

> -----Original Message-----
> From: cracklib-devel-bounces@li...
> [mailto:cracklib-devel-bounces@li...] On Behalf Of
> Mike Frysinger
> Sent: Monday, October 01, 2007 8:15 PM
> To: cracklib-devel@li...
> Subject: [Cracklib-devel] cracklib license
> =20
> looks like 2.8.11 is out and marked as "GPL-2" ... releasing
> libraries under
> GPL-2 is not desirable at all ... this is why the LGPL-2.1 exists
> -mike

Re: [Cracklib-devel] cracklib license
From: Mike Frysinger <vapier@ge...> - 2007-10-02 01:33
On Monday 01 October 2007, Neulinger, Nathan wrote:
> I understand that, and you're welcome to bring it up with Alec directly
> and see if he wants to relicense his code as LGPL... but at this point,
> it was enough to just get it consistent and documented as to what it was
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the original license (before moving to sourceforge -- aka, 2.7) was not=20
GPL-2 ... it was a modified artistic license ... i didn't notice the license=20
change until it was mentioned in the latest notes.

unlike the old license, GPL-2 prevents people from using cracklib unless th=20
eir=20
applications are also GPL-2 which imo is just wrong. it isn't the place of =20
a=20
library to dictact to application writes what license they should be using.=20
=20
thus LGPL-2.1 enters to fill this void.
=Dmike

Re: [Cracklib-devel] cracklib license
From: Neulinger, Nathan <nneul@um...> - 2007-10-02 01:46
Seems like the ideal thing here would be for you and the other distro
maintainers to get together with Alec in a conversation and come to a
decision as to what licensing scheme y'all want. I haven't really done
much other than cleaning up the packaging and patches and a small bit of
additional code, so whatever licensing y'all come up with is fine by me.

-- Nathan

Nathan Neulinger
EMail: nneul@um...
University of Missouri - Rolla
Phone: (573) 341-6679
Fax: (573) 341-4216

> -----Original Message-----
> From: cracklib-devel-bounces@li...
> [mailto:cracklib-devel-bounces@li...]
> On Behalf Of
> Mike Frysinger
> Sent: Monday, October 01, 2007 8:33 PM
> To: Neulinger, Nathan
> Cc: cracklib-devel@li...; Alec Muffett
> Subject: Re: [Cracklib-devel] cracklib license
> >=20
> On Monday 01 October 2007, Neulinger, Nathan wrote:
I understand that, and you're welcome to bring it up with Alec directly and see if he wants to relicense his code as LGPL... but at this point, it was released under. This wasn't actually a license change, just a clarification of the licensing that was already in place. 

> the original license (before moving to sourceforge -- aka, 2.7) was not GPL-2 ... it was a modified artistic license ... i didnt notice the license change until it was mentioned in the latest notes.

> unlike the old license, GPL-2 prevents people from using cracklib unless their applications are also GPL-2 which imo is just wrong. it isnt the place of a library to dictate to application writes what license they should be using. thus LGPL-2.1 enters to fill this void.

-Re: [Cracklib-devel] cracklib license
From: Alec Muffett <alecm@cr...> - 2007-10-02 08:57
> Seems like the ideal thing here would be for you and the other distro maintainers to get together with Alec in a conversation and come to a decision as to what licensing scheme y'all want. I haven't really done much other than cleaning up the packaging and patches and a small bit of additional code, so whatever licensing y'all come up with is fine by me.

I am sympathetic. Guys, what do you reckon?

What I am hearing so far is that LGPL makes sense, since it can be linked with any code, not just GPL...

-a

Re: [Cracklib-devel] cracklib license
From: Devin Reade <gdr@gm...> - 2007-10-02 15:04
I would like to see it under LGPL as well. I think it is in everyone's best interests to have as secure systems as possible, and I think tainting it via GPL will just make it less likely that the library gets used, and
will not usually cause companies/developers to GPL the dependent code (where it is not already GPL).

I like GPL, I use it when I can, but I don't think that it's the correct license in this situation.

Devin
--
If it's sinful, it's more fun.

Re: [Cracklib-devel] cracklib license
From: Nalin Dahyabhai <nalin@re...> - 2008-01-28 16:32
On Tue, Oct 02, 2007 at 09:57:31AM +0100, Alec Muffett wrote:
> > Seems like the ideal thing here would be for you and the other distro
> > maintainers to get together with Alec in a conversation and come to a
> > decision as to what licensing scheme y'all want. I haven't really done
> > much other than cleaning up the packaging and patches and a small
> > bit of
> > additional code, so whatever licensing y'all come up with is fine
> > by me.
> >
> I am sympathetic. Guys, what do you reckon?
> >
> What I am hearing so far is that LGPL makes sense, since it can be
> linked with any code, not just GPL...

My apologies for not chiming in in anything resembling a reasonable timeframe.

I'd also suggest the LGPL, for the reason you noted above. Alternately, GPLv2 with the option of using the library under a later version of the GPL would permit applications which were released under version 3 of the GPL to use the library, too, which would be sufficient for the packages which are included in Fedora. FWIW, I'd personally lean toward LGPL.

In any case, I thank you both for working on sorting this out.

Cheers,

Nalin

Re: [Cracklib-devel] cracklib license
From: Mike Frysinger <vapier@ge...> - 2008-10-05 21:27

Attachments: Message as HTML
On Monday 28 January 2008, Nalin Dahyabhai wrote:
On Tue, Oct 02, 2007 at 09:57:31AM +0100, Alec Muffett wrote:
> > > Seems like the ideal thing here would be for you and the other distro
> > > maintainers to get together with Alec in a conversation and come to a
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> > > GPL would permit applications which were released under version 3 of the
> > > GPL to use the library, too, which would be sufficient for the packages
> > > which are included in Fedora. FWIW, I'd personally lean toward LGPL.
> > >
> > > In any case, I thank you both for working on sorting this out.

> looks like everyone is OK with LGPL-2.1 (GNU Lesser license), so can we make
the change now ?
- mike

Re: [Cracklib-devel] cracklib license
From: Alec Muffett <alecm@cr...> - 2008-10-05 23:18
>> In any case, I thank you both for working on sorting this out.
>
> looks like everyone is OK with LGPL-2.1 (GNU Lesser license), so can we make
> the change now ?

yes. go for it. thanks++

-a

Re: [Cracklib-devel] cracklib license
From: Mike Frysinger <vapier@ge...> - 2008-10-25 22:34

Attachments: Message as HTML
On Sunday 05 October 2008, Alec Muffett wrote:
> >> In any case, I thank you both for working on sorting this out.
> looks like everyone is OK with LGPL-2.1 (GNU Lesser license), so can we
> make the change now ?
> yes, go for it. thanks++

Nathan Neulinger is the only one who can actually make said change ...
-mike

---------
BELOW IS ORIGINAL LICENSING DISCUSSION RE CHANGING TO GPL from Artistic.
---------

CrackLib was originally licensed with a variant of the Artistic license. In the
interests of wider acceptance and more modern licensing, it was switched with
the original author's blessing to GPL v2.

This approval was carried out in email discussions in 2005, and has been reconfirmed
as of 2007-10-01 with the following email from Alec Muffett.

The below email references nneul@umr.edu address, as that is the address
that was used at the time. For any future emails regarding this, please
use nneul@neulinger.org.

-------------------------------------
From alecm@crypticide.com Mon Oct 1 12:26:03 2007
Received: from umr-exproto2.cc.umr.edu ([131.151.0.192]) by UMR-CMAIL1.umr.edu with Microsoft
SMTPSVC(6.0.3790.3959);
 Mon, 1 Oct 2007 12:26:03 -0500
Received: from scansrv2.srv.mst.edu ([131.151.1.114]) by umr-exproto2.cc.umr.edu with Microsoft
SMTPSVC(6.0.3790.3959);
 Mon, 1 Oct 2007 12:26:02 -0500
Received: (qmail 8022 invoked from network); 1 Oct 2007 16:59:55 -0000
Received: from smtp1.srv.mst.edu ([131.151.1.43]) by scanin-ipv6.cc.umr.edu with SMTP; 1 Oct 2007 16:59:55 -0000
Received: from spunkymail-mx8.g.dreamhost.com (mx1.spunky.mail.dreamhost.com [208.97.132.47])
by smtp1.srv.mst.edu (8.13.1/8.13.1) with ESMTP id l91Gxtpr020623
for <nneul@umr.edu>; Mon, 1 Oct 2007 11:59:55 -0500
Received: from rutherford.zen.co.uk (rutherford.zen.co.uk [212.23.3.142])
by spunkymail-mx8.g.dreamhost.com (Postfix) with ESMTP id 2C7734D311
for <nneul@neulinger.org>; Mon, 1 Oct 2007 09:59:50 -0700 (PDT)
Received: from [82.68.43.14] (helo=[192.168.1.13])
by rutherford.zen.co.uk with esmtp (Exim 4.50)
> > ---------- Forwarded message ----------
> > From: Neulinger, Nathan <nneul@umr.edu>
> > Date: Sep 27, 2007 2:58 PM
> > Subject: RE: cracklib license
> > To: alemc@crypto.dircon.co.uk
> >
> > Any chance you could write me a self-contained email stating clearly
> > that the license is being changed to GPL, so I could include that
> > email
> > in the repository and clean up the repository/tarballs? I have all the
> > original discussion, but something succinct and self contained
> > would be
> > ideal.
>
> The license for my code in the Cracklib distribution is henceforth GPL.
>
> Happy now? :-)
>
> -a

1.40 cronie 1.4.11 :19.el7
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* SUCH DAMAGE.
*
* @(#)bitstring.h 8.1 (Berkeley) 7/19/93
*/

1.41 crontabs 1.11 :6.20121102git.el7
1.41.1 Available under license :

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1.42 cryptsetup 1.7.4 :4.el7

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Preamble

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END OF TERMS AND CONDITIONS

Appendix: How to Apply These Terms to Your New Programs

If you develop a new program, and you want it to be of the greatest possible use to the public, the best way to achieve this is to make it free software which everyone can redistribute and change under these terms.

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.

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

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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.

The hypothetical commands `show w' and `show c' should show the appropriate
parts of the General Public License. Of course, the commands you use may
be called something other than `show w' and `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:

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`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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[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 you distribute copies of the library, or if you modify it.

For example, if you distribute copies of the library, whether gratis or for a fee, you must give the recipients all the rights that we gave you. You must make sure that they, too, receive or can get the source code. If you link a program with the library, you must provide complete object files to the recipients so that they can relink them with the library, after making changes to the library and recompiling it. And you must show them these terms so they know their rights.

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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.

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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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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You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

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   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, 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 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:

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) 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.

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b) 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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1.44 curl 7.62.0

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================

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---

1.45 cyrus-sasl 2.1.26 :23.el7

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1.46 dbus 1.10.24 :7.el7

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1.48 dbus-python 1.1.1 :9.el7

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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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Theodore Ts'o
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That's all there is to it!
This package was added to the e2fsprogs debian source package by Theodore Ts'o <tytso@mit.edu> on Sat Mar 15 15:33:37 EST 2003

It is part of the main e2fsprogs distribution, which can be found at:

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This is the Debian GNU/Linux prepackaged version of the ss command-line interface parsing library library. It is currently
distributed together with the EXT2 file system utilities, which are otherwise packaged as "e2fsprogs".

This package was put together by Yann Dirson <dirson@debian.org>, from sources obtained from a mirror of:
tsx-11.mit.edu:/pub/linux/packages/ext2fs/

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Description library. It is currently distributed together with the EXT2 file
system utilities, which are otherwise packaged as "e2fsprogs".

This package was put together by Yann Dirson <dirson@debian.org>,
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tsx-11.mit.edu/pub/linux/packages/ext2fs/

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Gadi Oxman, August 1995

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#
# This is a Makefile stub which handles the creation of BSD shared libraries.
#
# In order to use this stub, the following makefile variables must be defined.
#
# BSDLIB_VERSION = 1.0
# BSDLIB_IMAGE = libce
# BSDLIB_MYDIR = et
# BSDLIB_INSTALL_DIR = $(SHLIBDIR)
#
all:: image

real-subdirs:: Makefile
@echo "MKDIR pic"
@mkdir -p pic

BSD_LIB = $(BSDLIB_IMAGE).so.$(BSDLIB_VERSION)
BSDLIB_PIC_FLAG = -fpic

image:$(BSD_LIB)

$(BSD_LIB): $(OBJS)
(cd pic; ld -Bshareable -o $(BSD_LIB) $($(LDFLAGS) $(OBJS)))
$(MV) pic/$(BSD_LIB) .
$(RM) -f ../$(BSD_LIB)
(cd ..; $(LN) $(LINK_BUILD_FLAGS) \
`echo $(my_dir) | sed -e 's;lib/;;'`/$(BSD_LIB) $(BSD_LIB))

install-shlibs install:: $(BSD_LIB) 
@echo "INSTALL_PROGRAM $(BSDLIB_INSTALL_DIR)/$(BSD_LIB)"
@
$(DESTDIR)$(BSDLIB_INSTALL_DIR)/$(BSD_LIB)
@-$(LDCONFIG)

install-strip: install

install-shlibs-strip: install-shlibs

uninstall-shlibs uninstall::
$(RM) -f $(DESTDIR)$(BSDLIB_INSTALL_DIR)/$(BSD_LIB)

clean::
$(RM) -rf pic
$(RM) -f $(BSD_LIB)
$(RM) -f ../$(BSD_LIB)
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/*
Index: tdsb/tcb.c

--- tdsb.orig/tcb.c
+++ tdsb/tcb.c
@@ -4,11 +4,11 @@
Last Changed Date: 2007-06-06 20:14:06 -0400 (Wed, 06 Jun 2007)
 */
/*
- Unix SMB/CIFS implementation.
+ trivial database library - standalone version

- trivial database library - private includes
-
- Copyright (C) Andrew Tridgell 2005
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+ Copyright (C) Jeremy Allison 2000-2006
+ Copyright (C) Paul `Rusty' Russell 2000

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The snowball stemmers in analysis/common/src/java/net/sf/snowball were developed by Martin Porter and Richard Boulton. The snowball stopword lists in analysis/common/src/resources/org/apache/lucene/analysis/snowball were developed by Martin Porter and Richard Boulton. The full snowball package is available from http://snowball.tartarus.org/

The KStem stemmer in analysis/common/src/org/apache/lucene/analysis/en was developed by Bob Krovetz and Sergio Guzman-Lara (CIIR-UMass Amherst)
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- analysis/common/src/resources/org/apache/lucene/analysis/ar/stopwords.txt,
- analysis/common/src/resources/org/apache/lucene/analysis/fa/stopwords.txt,
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- analysis/common/src/resources/org/apache/lucene/analysis/hi/stopwords.txt,
- analysis/common/src/resources/org/apache/lucene/analysis/bn/stopwords.txt
See [http://members.unine.ch/jacques.savoy/clef/index.html](http://members.unine.ch/jacques.savoy/clef/index.html).

The German, Spanish, Finnish, French, Hungarian, Italian, Portuguese, Russian and Swedish light stemmers (common) are based on BSD-licensed reference implementations created by Jacques Savoy and Ljiljana Dolamic. These files reside in:
- analysis/common/src/java/org/apache/lucene/analysis/de/GermanLightStemmer.java
- analysis/common/src/java/org/apache/lucene/analysis/de/GermanMinimalStemmer.java
- analysis/common/src/java/org/apache/lucene/analysis/es/SpanishLightStemmer.java
- analysis/common/src/java/org/apache/lucene/analysis/es/SpanishMinimalStemmer.java
- analysis/common/src/java/org/apache/lucene/analysis/hu/HungarianLightStemmer.java
- analysis/common/src/java/org/apache/lucene/analysis/hu/HungarianMinimalStemmer.java
- analysis/common/src/java/org/apache/lucene/analysis/it/ItalianLightStemmer.java
- analysis/common/src/java/org/apache/lucene/analysis/it/ItalianMinimalStemmer.java
- analysis/common/src/java/org/apache/lucene/analysis/pt/PortugueseLightStemmer.java
- analysis/common/src/java/org/apache/lucene/analysis/pt/PortugueseMinimalStemmer.java
- analysis/common/src/java/org/apache/lucene/analysis/sv/SwedishLightStemmer.java

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+
--
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needed.
--
[role="xpack"]
[testenv="basic"]
[[update-license]]

Update License API

This API enables you to update your license.

PUT _xpack/license`

Description

You can update your license at runtime without shutting down your nodes.
License updates take effect immediately. If the license you are installing does
not support all of the features that were available with your previous license,
however, you are notified in the response. You must then re-submit the API
request with the `acknowledge` parameter set to `true`.

For more information about the different types of licenses, see
https://www.elastic.co/subscriptions.

Query Parameters

`acknowledge`:
(boolean) Specifies whether you acknowledge the license changes. The default
value is `false`.

Request Body
`licenses`: (array) A sequence of one or more JSON documents containing the license information.

=== Authorization

If `{security}` is enabled, you need `manage` cluster privileges to install the license.

If `{security}` is enabled and you are installing a gold or platinum license, you must enable TLS on the transport networking layer before you install the license. See <<configuring-tls>>.

=== Examples

The following example updates to a basic license:

[source,js]
------------------------------------------------------------
POST _xpack/license
{
  "licenses": [
    {
      "uid": "893361dc-9749-4997-93cb-802e3d7fa4xx",
      "type": "basic",
      "issue_date_in_millis": 1411948800000,
      "expiry_date_in_millis": 1914278399999,
      "max_nodes": 1,
      "issued_to": "issuedTo",
      "issuer": "issuer",
      "signature": "xx"
    }
  ]
}
------------------------------------------------------------

// CONSOLE
// TEST[skip:license testing issues]

NOTE: These values are invalid; you must substitute the appropriate content from your license file.

You can alternatively use a `curl` command, for example:

[source,js]
curl -XPUT -u <user> 'http://<host>:<port>/_xpack/license' -H "Content-Type: application/json" -d @license.json

// NOTCONSOLE

On Windows machine, use the following command:

gc .license.json | Invoke-WebRequest -uri http://<host>:<port>/_xpack/license -Credential elastic -Method Put -ContentType "application/json"

In these examples,

* `<user>` is a user ID with the appropriate authority.
* `<host>` is the hostname of the {es} node (`localhost` if executing locally)
* `<port>` is the http port (defaults to `9200`)
* `license.json` is the license JSON file

NOTE: If your {es} node has SSL enabled on the HTTP interface, you must start your URL with `https://`

If you previously had a license with more features than the basic license, you receive the following response:

```json
{
  "acknowledged": false,
  "license_status": "valid",
  "acknowledge": {
    "message": "This license update requires acknowledgement. To acknowledge the license, please read the following messages and update the license again, this time with the "acknowledge=true" parameter:"",
    "watcher": ["Watcher will be disabled"],
    "logstash": ["Logstash will no longer poll for centrally-managed pipelines"],
    "security": ["The following X-Pack security functionality will be disabled: ..."]
  }
}
```

// NOTCONSOLE
To complete the update, you must re-submit the API request and set the 'acknowledge' parameter to 'true'. For example:

[source,js]
------------------------------------------------------------
POST _xpack/license?acknowledge=true
{
  "licenses": [
    {
      "uid":"893361dc-9749-4997-93cb-802e3d7fa4xx",
      "type":"basic",
      "issue_date_in_millis":1411948800000,
      "expiry_date_in_millis":1914278399999,
      "max_nodes":1,
      "issued_to":"issuedTo",
      "issuer":"issuer",
      "signature":"xx"
    }
  ]
}
------------------------------------------------------------

// CONSOLE
// TEST[skip:license testing issues]

Alternatively:

[source,sh]
------------------------------------------------------------
curl -XPUT -u elastic 'http://<host>:<port>/_xpack/license?acknowledge=true' -H "Content-Type: application/json"
-d @license.json
------------------------------------------------------------

// NOTCONSOLE

For more information about the features that are disabled when you downgrade your license, see {xpack-ref}/license-expiration.html[License Expiration].

[[delete-license]]

=== Delete License API

This API enables you to delete licensing information.

[delete-license]

==== Request

'DELETE /_xpack/license'
When your license expires, {xpack} operates in a degraded mode. For more information, see {xpack-ref}/license-expiration.html[License Expiration].

You must have `manage` cluster privileges to use this API. For more information, see {xpack-ref}/security-privileges.html[Security Privileges].

The following example queries the info API:

```source,js
DELETE _xpack/license
```

When the license is successfully deleted, the API returns the following response:

```source,js
{
  "acknowledged": true
}
```

This API enables you to retrieve licensing information.
This API returns information about the type of license, when it was issued, and when it expires, for example.

For more information about the different types of licenses, see https://www.elastic.co/subscriptions.

==== Query Parameters

`local`:
(boolean) Specifies whether to retrieve local information. The default value is `false`, which means the information is retrieved from the master node.

==== Authorization

You must have `monitor` cluster privileges to use this API. For more information, see {xpack-ref}/security-privileges.html[Security Privileges].

==== Examples

The following example provides information about a trial license:

[source,js]
____________________________
GET _xpack/license           
____________________________

// CONSOLE
____________________________

[source,js]
____________________________
{
  "license": {
    "status": "active",
    "uid": "cbff45e7-c553-41f7-ae4f-9205eab80xx",
    "type": "trial",
    "issue_date": "2018-10-20T22:05:12.332Z",
    "issue_date_in_millis": 1540073112332,
    "expiry_date": "2018-11-19T22:05:12.332Z",
    "expiry_date_in_millis": 1542665112332,
    "max_nodes": 1000,
    "issued_to": "test",
    "issuer": "elasticsearch",}
"start_date_in_millis" : -1
}
}

// TESTRESPONSE[s/"cbff45e7-c553-41f7-ae4f-9205eabd80xx"/$body.license.uid/

// TESTRESPONSE[s/"basic"/$body.license.type/

// TESTRESPONSE[s/"2018-10-20T22:05:12.332Z"/$body.license.issue_date/

// TESTRESPONSE[s/1540073112332/$body.license.issue_date_in_millis/

// TESTRESPONSE[s/"2018-11-19T22:05:12.332Z"/$body.license.expiry_date/

// TESTRESPONSE[s/1542665112332/$body.license.expiry_date_in_millis/

// TESTRESPONSE[s/1000/$body.license.max_nodes/

// TESTRESPONSE[s/"test"/$body.license.issued_to/

// TESTRESPONSE[s/"elasticsearch"/$body.license.issuer/

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[[java-rest-high-delete-license]]

=== Delete License

[[java-rest-high-delete-license-execution]]

==== Execution

The license can be deleted using the `deleteLicense()` method:

["source","java",subs="attributes,callouts,macros"]

--------------------------------------------------
include-tagged::{doc-tests}/LicensingDocumentationIT.java[delete-license-execute]
--------------------------------------------------

[[java-rest-high-delete-license-response]]

==== Response

The returned `DeleteLicenseResponse` contains the `acknowledged` flag, which
returns true if the request was processed by all nodes.

["source","java",subs="attributes,callouts,macros"]
<1> Check the acknowledge flag. It should be true if license deletion is acknowledged.

[[java-rest-high-delete-license-async]]

==== Asynchronous Execution

This request can be executed asynchronously:

["source","java",subs="attributes,callouts,macros"]

include-tagged::[doc-tests]/LicensingDocumentationIT.java[delete-license-execute-async]

--------------------------------------------------

<1> The `DeleteLicenseRequest` to execute and the `ActionListener` to use when the execution completes

The asynchronous method does not block and returns immediately. Once it is completed the `ActionListener` is called back using the `onResponse` method if the execution successfully completed or using the `onFailure` method if it failed.

A typical listener for `DeleteLicenseResponse` looks like:

["source","java",subs="attributes,callouts,macros"]

include-tagged::[doc-tests]/LicensingDocumentationIT.java[delete-license-execute-listener]

--------------------------------------------------

<1> Called when the execution is successfully completed. The response is provided as an argument
<2> Called in case of failure. The raised exception is provided as an argument

[[java-rest-high-put-license]]

==== Update License

[[java-rest-high-put-license-execution]]

==== Execution

The license can be added or updated using the `putLicense()` method:

["source","java",subs="attributes,callouts,macros"]

include-tagged::[doc-tests]/LicensingDocumentationIT.java[put-license-execute]

--------------------------------------------------

<1> Set the categories of information to retrieve. The default is to return no information which is useful for checking if `xpack` is installed but not much else.
<2> A JSON document containing the license information.
The returned `PutLicenseResponse` contains the `LicensesStatus`, `acknowledged` flag and possible acknowledge messages. The acknowledge messages are present if you previously had a license with more features than one you are trying to update and you didn't set the `acknowledge` flag to `true`. In this case you need to display the messages to the end user and if they agree, resubmit the license with the `acknowledge` flag set to `true`. Please note that the request will still return a 200 return code even if requires an acknowledgement. So, it is necessary to check the `acknowledged` flag.

This request can be executed asynchronously:

The asynchronous method does not block and returns immediately. Once it is completed the `ActionListener` is called back using the `onResponse` method if the execution successfully completed or using the `onFailure` method if it failed.

A typical listener for `PutLicenseResponse` looks like:

*Called when the execution is successfully completed. The response is provided as an argument*
*Called in case of failure. The raised exception is provided as an argument*
The license can be added or updated using the `getLicense()` method:

```java
include-tagged:::{doc-tests}/LicensingDocumentationIT.java[get-license-execute]
```

The returned `GetLicenseResponse` contains the license in the JSON format.

```java
include-tagged:::{doc-tests}/LicensingDocumentationIT.java[get-license-response]
```

This request can be executed asynchronously:

```java
include-tagged:::{doc-tests}/LicensingDocumentationIT.java[get-license-execute-async]
```

The asynchronous method does not block and returns immediately. Once it is completed the `ActionListener` is called back using the `onResponse` method if the execution successfully completed or using the `onFailure` method if it failed.

A typical listener for `GetLicenseResponse` looks like:

```java
include-tagged:::{doc-tests}/LicensingDocumentationIT.java[get-license-execute-listener]
```

<1> Called when the execution is successfully completed. The response is
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Posted Date: April 20, 2018

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# Jackson JSON processor

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### The art of simplicity is a puzzle of complexity.###

## Overview ##

[YAML](http://yaml.org) is a data serialization format designed for human readability and interaction with scripting languages.

SnakeYAML is a YAML processor for the Java Virtual Machine.

### SnakeYAML features ###

* a **complete** [YAML 1.1 processor](http://yaml.org/spec/1.1/current.html). In particular, SnakeYAML can parse all examples from the specification.
* Unicode support including UTF-8/UTF-16 input/output.
* high-level API for serializing and deserializing native Java objects.
* support for all types from the [YAML types repository](http://yaml.org/type/index.html).
* relatively sensible error messages.

### Info ###

* [Changes](https://bitbucket.org/asomov/snakeyaml/wiki/Changes)
* [Documentation](https://bitbucket.org/asomov/snakeyaml/wiki/Documentation)

### Contribute ###

* Mercurial DVCS is used to dance with the [source code](https://bitbucket.org/asomov/snakeyaml/src).  
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import org.elasticsearch.common.xcontent.XContentBuilder;
import org.elasticsearch.common.xcontent.XContentFactory;
import org.elasticsearch.client.common.ProtocolUtils;
import org.elasticsearch.test.ESTestCase;
import java.io.IOException;
import java.util.Collections;
import java.util.HashMap;
import java.util.Map;

import java.io.IOException;
import java.util.Collections;
import java.util.HashMap;
import java.util.Map;
public class StartBasicResponseTests extends ETestCase {

    public void testFromXContent() throws Exception {
        StartBasicResponse.Status status = randomFrom(StartBasicResponse.Status.values());

        boolean acknowledged = status != StartBasicResponse.Status.NEED_ACKNOWLEDGEMENT;
        String acknowledgeMessage = null;
        Map<String, String[]> ackMessages = Collections.emptyMap();
        if (status != StartBasicResponse.Status.GENERATED_BASIC) {
            acknowledgeMessage = randomAlphaOfLength(10);
            ackMessages = randomAckMessages();
        }

        final StartBasicResponse startBasicResponse = new StartBasicResponse(status, ackMessages, acknowledgeMessage);

        XContentType xContentType = randomFrom(XContentType.values());
        XContentBuilder builder = XContentFactory.contentBuilder(xContentType);
        toXContent(startBasicResponse, builder);

        final StartBasicResponse response = StartBasicResponse.fromXContent(createParser(builder));
        assertThat(response.isAcknowledged(), equalTo(acknowledged));
        assertThat(response.isBasicStarted(), equalTo(status.isBasicStarted()));
        assertThat(response.getAcknowledgeMessage(), equalTo(acknowledgeMessage));
        assertThat(ProtocolUtils.equals(response.getAcknowledgeMessages(), ackMessages), equalTo(true));
    }

    private static void toXContent(StartBasicResponse response, XContentBuilder builder) throws IOException {
        builder.startObject();
        builder.field("acknowledged", response.isAcknowledged());
        if (response.isBasicStarted()) {
            builder.field("basic_was_started", true);
        } else {
            builder.field("basic_was_started", false);
            builder.field("error_message", response.getErrorMessage());
        }
        if (response.getAcknowledgeMessages().isEmpty() == false) {
            builder.startObject("acknowledge");
            builder.field("message", response.getAcknowledgeMessage());
            for (Map.Entry<String, String[]> entry : response.getAcknowledgeMessages().entrySet()) {
                builder.startArray(entry.getKey());
                for (String message : entry.getValue()) {
                    builder.value(message);
                }
            }
        }
    }
}
private static Map<String, String[]> randomAckMessages() {
    int nFeatures = randomIntBetween(1, 5);
    Map<String, String[]> ackMessages = new HashMap<>();
    for (int i = 0; i < nFeatures; i++) {
        String feature = randomAlphaOfLengthBetween(9, 15);
        int nMessages = randomIntBetween(1, 5);
        String[] messages = new String[nMessages];
        for (int j = 0; j < nMessages; j++) {
            messages[j] = randomAlphaOfLengthBetween(10, 30);
        }
        ackMessages.put(feature, messages);
    }
    return ackMessages;
}

package org.elasticsearch.client.license;
import org.elasticsearch.client.Validatable;
public class GetLicenseRequest implements Validatable {

    protected boolean local = false;

    public GetLicenseRequest() {
    }

    public boolean isLocal() {
        return local;
    }

    public void setLocal(boolean local) {
        this.local = local;
    }
}

-package org.elasticsearch.client.license;

-import org.elasticsearch.client.Validatable;
-import org.elasticsearch.common.Nullable;

-public class StartTrialRequest implements Validatable {

    private final boolean acknowledge;
    private final String licenseType;

    public StartTrialRequest() {
        this(false);
    }

    public StartTrialRequest() {
        this(false);
    }

    public StartTrialRequest() {
    }

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     */

    package org.elasticsearch.client.license;

    import org.elasticsearch.client.Validatable;
    import org.elasticsearch.common.Nullable;

    public class StartTrialRequest implements Validatable {

        private final boolean acknowledge;
        private final String licenseType;

        public StartTrialRequest() {
            this(false);
        }
    }
public StartTrialRequest(boolean acknowledge) {
    this(acknowledge, null);
}

public StartTrialRequest(boolean acknowledge, @Nullable String licenseType) {
    this.acknowledge = acknowledge;
    this.licenseType = licenseType;
}

public boolean isAcknowledge() {
    return acknowledge;
}

public String getLicenseType() {
    return licenseType;
}

package org.elasticsearch.client.license;

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 */

/**
 * Request and Response objects for the default distribution's License APIs.
 */
package org.elasticsearch.client.license;
import org.elasticsearch.client.TimedRequest;

public class StartBasicRequest extends TimedRequest {
    private final boolean acknowledge;

    public StartBasicRequest() {
        this(false);
    }

    public StartBasicRequest(boolean acknowledge) {
        this.acknowledge = acknowledge;
    }

    public boolean isAcknowledge() {
        return acknowledge;
    }
}

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 */
package org.elasticsearch.client.license;

import org.elasticsearch.client.TimedRequest;

public class PutLicenseRequest extends TimedRequest {

    private String licenseDefinition;
    private boolean acknowledge = false;

    public PutLicenseRequest() {
    }

    public void setLicenseDefinition(String licenseDefinition) {
        this.licenseDefinition = licenseDefinition;
    }

    public String getLicenseDefinition() {
        return licenseDefinition;
    }

    public void setAcknowledge(boolean acknowledge) {
        this.acknowledge = acknowledge;
    }

    public boolean isAcknowledge() {
        return acknowledge;
    }
}

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 */

package org.elasticsearch.client.license;
import org.elasticsearch.common.ParseField;
import org.elasticsearch.common.collect.Tuple;
import org.elasticsearch.common.xcontent.ConstructingObjectParser;
import org.elasticsearch.common.xcontent.XContentParseException;
import org.elasticsearch.common.xcontent.XContentParser;
import org.elasticsearch.rest.RestStatus;
import java.io.IOException;
import java.util.ArrayList;
import java.util.Collections;
import java.util.HashMap;
import java.util.List;
import java.util.Map;
import java.util.Objects;
import static org.elasticsearch.common.xcontent.ConstructingObjectParser.constructorArg;
import static org.elasticsearch.common.xcontent.ConstructingObjectParser.optionalConstructorArg;
import static org.elasticsearch.common.xcontent.XContentParserUtils.ensureExpectedToken;

public class StartBasicResponse {

    private static final ConstructingObjectParser<StartBasicResponse, Void> PARSER = new ConstructingObjectParser<StartBasicResponse, Void>(
            "start_basic_response", true, (a, v) -> {
                boolean basicWasStarted = (Boolean) a[0];
                String errorMessage = (String) a[1];
                if (basicWasStarted) {
                    return new StartBasicResponse(StartBasicResponse.Status.GENERATED_BASIC);
                }
                StartBasicResponse.Status status = StartBasicResponse.Status.fromErrorMessage(errorMessage);
                @SuppressWarnings("unchecked") Tuple<String, Map<String, String[]>> acknowledgements = (Tuple<String, Map<String, String[]>>) a[2];
                return new StartBasicResponse(status, acknowledgements.v2(), acknowledgements.v1());
            });

    static {
        PARSER.declareBoolean(constructorArg(), new ParseField("basic_was_started"));
        PARSER.declareString(optionalConstructorArg(), new ParseField("error_message"));
        PARSER.declareObject(optionalConstructorArg(), (parser, v) -> {
            Map<String, String[]> acknowledgeMessages = new HashMap<>();
            String message = null;
            XContentParser.Token token;
            String currentFieldName = null;
            while ((token = parser.nextToken()) != XContentParser.Token.END_OBJECT) {
                if (token == XContentParser.Token.FIELD_NAME) {
                    currentFieldName = parser.currentName();
                    // Process the current field name here
                } else {
                    // Process the token here
                }
            }
        });
    }
}

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if (currentFieldName == null) {
    throw new XContentParseException(parser.getTokenLocation(), "expected message header or acknowledgement");
} else {
    if (new ParseField("message").getPreferredName().equals(currentFieldName)) {
        ensureExpectedToken(XContentParser.Token.VALUE_STRING, token, parser::getTokenLocation);
        message = parser.text();
    } else {
        if (token != XContentParser.Token.START_ARRAY) {
            throw new XContentParseException(parser.getTokenLocation(), "unexpected acknowledgement type");
        }
        List<String> acknowledgeMessagesList = new ArrayList<>();
        while ((token = parser.nextToken()) != XContentParser.Token.END_ARRAY) {
            ensureExpectedToken(XContentParser.Token.VALUE_STRING, token, parser::getTokenLocation);
            acknowledgeMessagesList.add(parser.text());
        }
        acknowledgeMessages.put(currentFieldName, acknowledgeMessagesList.toArray(new String[0]));
    }
}
return new Tuple<>(message, acknowledgeMessages);

private Map<String, String[]> acknowledgeMessages;
private String acknowledgeMessage;

enum Status {
    GENERATED_BASIC(true, null, RestStatus.OK),
    ALREADY_USING_BASIC(false, "Operation failed: Current license is basic.", RestStatus.FORBIDDEN),
    NEED_ACKNOWLEDGEMENT(false, "Operation failed: Needs acknowledgement.", RestStatus.OK);
    private final boolean isBasicStarted;
    private final String errorMessage;
    private final RestStatus restStatus;
    Status(boolean isBasicStarted, String errorMessage, RestStatus restStatus) {
        this.isBasicStarted = isBasicStarted;
        this.errorMessage = errorMessage;
        this.restStatus = restStatus;
    }

    String getErrorMessage() {
return errorMessage;
}

boolean isBasicStarted() {
    return isBasicStarted;
}

static StartBasicResponse.Status fromErrorMessage(final String errorMessage) {
    final StartBasicResponse.Status[] values = StartBasicResponse.Status.values();
    for (StartBasicResponse.Status status : values) {
        if (Objects.equals(status.errorMessage, errorMessage)) {
            return status;
        }
    }
    throw new IllegalArgumentException("No status for error message [" + errorMessage + "]");
}

private StartBasicResponse.Status status;

public StartBasicResponse() {
}

StartBasicResponse(StartBasicResponse.Status status) {
    this(status, Collections.emptyMap(), null);
}

StartBasicResponse(StartBasicResponse.Status status,
        Map<String, String[]> acknowledgeMessages, String acknowledgeMessage) {
    this.status = status;
    this.acknowledgeMessages = acknowledgeMessages;
    this.acknowledgeMessage = acknowledgeMessage;
}

public boolean isAcknowledged() {
    return status != StartBasicResponse.Status.NEED_ACKNOWLEDGEMENT;
}

public boolean isBasicStarted() {
    return status.isBasicStarted;
}

public String getErrorMessage() {
    return status.errorMessage;
}

public String getAcknowledgeMessage() {
    return acknowledgeMessage;
public Map<String, String[]> getAcknowledgeMessages() {
    return acknowledgeMessages;
}

public static StartBasicResponse fromXContent(XContentParser parser) throws IOException {
    return PARSER.parse(parser, null);
}

package org.elasticsearch.client.license;

import org.elasticsearch.common.ParseField;
import org.elasticsearch.common.collect.Tuple;
import org.elasticsearch.common.xcontent.ConstructingObjectParser;
import org.elasticsearch.common.xcontent.XContentParseException;
import org.elasticsearch.common.xcontent.XContentParser;
import org.elasticsearch.client.common.ProtocolUtils;
import java.io.IOException;
import java.util.ArrayList;
import java.util.Collections;
import java.util.HashMap;
import java.util.List;
import java.util.Map;
import java.util.Objects;
import static org.elasticsearch.common.xcontent.ConstructingObjectParser.constructorArg;
import static org.elasticsearch.common.xcontent.ConstructingObjectParser.optionalConstructorArg;

public final class PutLicenseResponse {

    private static final ConstructingObjectParser<PutLicenseResponse, Void> PARSER = new
            ConstructingObjectParser<"put_license_response", true, (a, v) -> {
                boolean acknowledged = (Boolean) a[0];
                LicensesStatus licensesStatus = LicensesStatus.fromString((String) a[1]);
                @SuppressWarnings("unchecked") Tuple<String, Map<String, String[]>> acknowledgements = (Tuple<String, Map<String, String[]>>) a[2];
                if (acknowledgements == null) {
                    return new PutLicenseResponse(acknowledged, licensesStatus);
                } else {
                    return new PutLicenseResponse(acknowledged, licensesStatus, acknowledgements.v1(),
                            acknowledgements.v2());
                }
            });

    static {
        PARSER.declareBoolean(constructorArg(), new ParseField("acknowledged"));
        PARSER.declareString(constructorArg(), new ParseField("license_status"));
        PARSER.declareObject(optionalConstructorArg(), (parser, v) -> {
            Map<String, String[]> acknowledgeMessages = new HashMap<>();
            String message = null;
            XContentParser.Token token;
            String currentFieldName = null;
            while ((token = parser.nextToken()) != XContentParser.Token.END_OBJECT) {
                if (token == XContentParser.Token.FIELD_NAME) {
                    currentFieldName = parser.currentName();
                } else {
                    if (currentFieldName == null) {
                        throw new XContentParseException(parser.getTokenLocation(), "expected message header or
                                acknowledgement");
                    } else {
                        if ("message".equals(currentFieldName)) {
                            if (token != XContentParser.Token.VALUE_STRING) {
                                throw new XContentParseException(parser getTokenLocation(), "unexpected message header
                                        type");
                            }
                            message = parser.text();
                        } else {
                            if (token != XContentParser.Token.START_ARRAY) {
                                throw new XContentParseException(parser getTokenLocation(), "unexpected acknowledgement
                                        type");
                            }
                            List<String> acknowledgeMessagesList = new ArrayList<>();
                        }
                    }
                }
            }
        });
    }

}
while ((token = parser.nextToken()) != XContentParser.Token.END_ARRAY) {
    if (token != XContentParser.Token.VALUE_STRING) {
        throw new XContentParseException(parser.getTokenLocation(), "unexpected acknowledgement text");
    }
    acknowledgeMessagesList.add(parser.text());
    acknowledgeMessages.put(currentFieldName, acknowledgeMessagesList.toArray(new String[0]));
}
return new Tuple<>(message, acknowledgeMessages);

private boolean acknowledged;
private LicensesStatus status;
private Map<String, String[]> acknowledgeMessages;
private String acknowledgeHeader;

public PutLicenseResponse() {
}

public PutLicenseResponse(boolean acknowledged, LicensesStatus status) {
    this(acknowledged, status, null, Collections.<String, String[]>emptyMap());
}

public PutLicenseResponse(boolean acknowledged, LicensesStatus status, String acknowledgeHeader,
        Map<String, String[]> acknowledgeMessages) {
    this.acknowledged = acknowledged;
    this.status = status;
    this.acknowledgeHeader = acknowledgeHeader;
    this.acknowledgeMessages = acknowledgeMessages;
}

public boolean isAcknowledged() {
    return acknowledged;
}

public LicensesStatus status() {
    return status;
}

public Map<String, String[]> acknowledgeMessages() {
    return acknowledgeMessages;
}
public String acknowledgeHeader() {
    return acknowledgeHeader;
}

public static PutLicenseResponse fromXContent(XContentParser parser) throws IOException {
    return PARSER.parse(parser, null);
}

@Override
public boolean equals(Object o) {
    if (this == o) return true;
    if (o == null || getClass() != o.getClass()) return false;
    if (!super.equals(o)) return false;
    PutLicenseResponse that = (PutLicenseResponse) o;

    return status == that.status &&
           ProtocolUtils.equals(acknowledgeMessages, that.acknowledgeMessages) &&
           Objects.equals(acknowledgeHeader, that.acknowledgeHeader);
}

@Override
public int hashCode() {
    return Objects.hash(super.hashCode(), status, ProtocolUtils.hashCode(acknowledgeMessages),
                        acknowledgeHeader);
}

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 * specific language governing permissions and limitations under the License.
 */
package org.elasticsearch.client.license;

public class GetLicenseResponse {


private String license;

GetLicenseResponse() {
}

public GetLicenseResponse(String license) {
    this.license = license;
}

public String getLicenseDefinition() {
    return license;
}

}

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 */

package org.elasticsearch.client.license;

/**
 * Status of an X-Pack license.
 */

public enum LicenseStatus {

    ACTIVE("active"),
    INVALID("invalid"),
    EXPIRED("expired");

    private final String label;

    LicenseStatus(String label) {
        this.label = label;
    }
public String label() {
    return label;
}

public static LicenseStatus fromString(String value) {
    switch (value) {
    case "active":
        return ACTIVE;
    case "invalid":
        return INVALID;
    case "expired":
        return EXPIRED;
    default:
        throw new IllegalArgumentException("unknown license status [" + value + "]");
    }
}

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 */

package org.elasticsearch.client.license;

import org.elasticsearch.client.TimedRequest;

public class DeleteLicenseRequest extends TimedRequest {

}
package org.elasticsearch.client.license;

import org.elasticsearch.common.ParseField;
import org.elasticsearch.common.collect.Tuple;
import org.elasticsearch.common.xcontent.ConstructingObjectParser;
import org.elasticsearch.common.xcontent.XContentParseException;
import org.elasticsearch.common.xcontent.XContentParser;
import java.io.IOException;
import java.util.ArrayList;
import java.util.HashMap;
import java.util.List;
import java.util.Map;
import static org.elasticsearch.common.xcontent.ConstructingObjectParser.constructorArg;
import static org.elasticsearch.common.xcontent.ConstructingObjectParser.optionalConstructorArg;

public class StartTrialResponse {

    private static final ConstructingObjectParser<StartTrialResponse, Void> PARSER = new
    ConstructingObjectParser<StartTrialResponse, Void>(
            "start_trial_response",
            true,
            (Object[] arguments, Void aVoid) -> {
                final boolean acknowledged = (boolean) arguments[0];
                final boolean trialWasStarted = (boolean) arguments[1];
                final String licenseType = (String) arguments[2];
                final String errorMessage = (String) arguments[3];
                @SuppressWarnings("unchecked")
                final Tuple<String, Map<String, String[]>> acknowledgeDetails = (Tuple<String, Map<String, String[]>>) arguments[4];
                final String acknowledgeHeader;

            };

    }

    private static final ConstructingObjectParser<StartTrialResponse, Void> PARSER = new
    ConstructingObjectParser<StartTrialResponse, Void>(
            "start_trial_response",
            true,
            (Object[] arguments, Void aVoid) -> {
                final boolean acknowledged = (boolean) arguments[0];
                final boolean trialWasStarted = (boolean) arguments[1];
                final String licenseType = (String) arguments[2];
                final String errorMessage = (String) arguments[3];
                @SuppressWarnings("unchecked")
                final Tuple<String, Map<String, String[]>> acknowledgeDetails = (Tuple<String, Map<String, String[]>>) arguments[4];
                final String acknowledgeHeader;

            };

    }

    private static final ConstructingObjectParser<StartTrialResponse, Void> PARSER = new
    ConstructingObjectParser<StartTrialResponse, Void>(
            "start_trial_response",
            true,
            (Object[] arguments, Void aVoid) -> {
                final boolean acknowledged = (boolean) arguments[0];
                final boolean trialWasStarted = (boolean) arguments[1];
                final String licenseType = (String) arguments[2];
                final String errorMessage = (String) arguments[3];
                @SuppressWarnings("unchecked")
                final Tuple<String, Map<String, String[]>> acknowledgeDetails = (Tuple<String, Map<String, String[]>>) arguments[4];
                final String acknowledgeHeader;

            };

    }

    private static final ConstructingObjectParser<StartTrialResponse, Void> PARSER = new
    ConstructingObjectParser<StartTrialResponse, Void>(
            "start_trial_response",
            true,
            (Object[] arguments, Void aVoid) -> {
                final boolean acknowledged = (boolean) arguments[0];
                final boolean trialWasStarted = (boolean) arguments[1];
                final String licenseType = (String) arguments[2];
                final String errorMessage = (String) arguments[3];
                @SuppressWarnings("unchecked")
                final Tuple<String, Map<String, String[]>> acknowledgeDetails = (Tuple<String, Map<String, String[]>>) arguments[4];
                final String acknowledgeHeader;

            };

    }

    private static final ConstructingObjectParser<StartTrialResponse, Void> PARSER = new
    ConstructingObjectParser<StartTrialResponse, Void>(
            "start_trial_response",
            true,
            (Object[] arguments, Void aVoid) -> {
                final boolean acknowledged = (boolean) arguments[0];
                final boolean trialWasStarted = (boolean) arguments[1];
                final String licenseType = (String) arguments[2];
                final String errorMessage = (String) arguments[3];
                @SuppressWarnings("unchecked")
                final Tuple<String, Map<String, String[]>> acknowledgeDetails = (Tuple<String, Map<String, String[]>>) arguments[4];
                final String acknowledgeHeader;

            };

    }

    private static final ConstructingObjectParser<StartTrialResponse, Void> PARSER = new
    ConstructingObjectParser<StartTrialResponse, Void>(
            "start_trial_response",
            true,
            (Object[] arguments, Void aVoid) -> {
                final boolean acknowledged = (boolean) arguments[0];
                final boolean trialWasStarted = (boolean) arguments[1];
                final String licenseType = (String) arguments[2];
                final String errorMessage = (String) arguments[3];
                @SuppressWarnings("unchecked")
                final Tuple<String, Map<String, String[]>> acknowledgeDetails = (Tuple<String, Map<String, String[]>>) arguments[4];
                final String acknowledgeHeader;

            };

    }

    private static final ConstructingObjectParser<StartTrialResponse, Void> PARSER = new
    ConstructingObjectParser<StartTrialResponse, Void>(
            "start_trial_response",
            true,
            (Object[] arguments, Void aVoid) -> {
                final boolean acknowledged = (boolean) arguments[0];
                final boolean trialWasStarted = (boolean) arguments[1];
                final String licenseType = (String) arguments[2];
                final String errorMessage = (String) arguments[3];
                @SuppressWarnings("unchecked")
                final Tuple<String, Map<String, String[]>> acknowledgeDetails = (Tuple<String, Map<String, String[]>>) arguments[4];
                final String acknowledgeHeader;

            };

    }

    private static final ConstructingObjectParser<StartTrialResponse, Void> PARSER = new
    ConstructingObjectParser<StartTrialResponse, Void>(
            "start_trial_response",
            true,
            (Object[] arguments, Void aVoid) -> {
                final boolean acknowledged = (boolean) arguments[0];
                final boolean trialWasStarted = (boolean) arguments[1];
                final String licenseType = (String) arguments[2];
                final String errorMessage = (String) arguments[3];
                @SuppressWarnings("unchecked")
                final Tuple<String, Map<String, String[]>> acknowledgeDetails = (Tuple<String, Map<String, String[]>>) arguments[4];
                final String acknowledgeHeader;

            };

    }

    private static final ConstructingObjectParser<StartTrialResponse, Void> PARSER = new
    ConstructingObjectParser<StartTrialResponse, Void>(
            "start_trial_response",
            true,
            (Object[] arguments, Void aVoid) -> {
                final boolean acknowledged = (boolean) arguments[0];
                final boolean trialWasStarted = (boolean) arguments[1];
                final String licenseType = (String) arguments[2];
                final String errorMessage = (String) arguments[3];
                @SuppressWarnings("unchecked")
                final Tuple<String, Map<String, String[]>> acknowledgeDetails = (Tuple<String, Map<String, String[]>>) arguments[4];
                final String acknowledgeHeader;

            };

    }

    private static final ConstructingObjectParser<StartTrialResponse, Void> PARSER = new
    ConstructingObjectParser<StartTrialResponse, Void>(
            "start_trial_response",
            true,
            (Object[] arguments, Void aVoid) -> {
                final boolean acknowledged = (boolean) arguments[0];
                final boolean trialWasStarted = (boolean) arguments[1];
                final String licenseType = (String) arguments[2];
                final String errorMessage = (String) arguments[3];
                @SuppressWarnings("unchecked")
                final Tuple<String, Map<String, String[]>> acknowledgeDetails = (Tuple<String, Map<String, String[]>>) arguments[4];
                final String acknowledgeHeader;

            };

    }

    private static final ConstructingObjectParser<StartTrialResponse, Void> PARSER = new
    ConstructingObjectParser<StartTrialResponse, Void>(
            "start_trial_response",
            true,
            (Object[] arguments, Void aVoid) -> {
                final boolean acknowledged = (boolean) arguments[0];
                final boolean trialWasStarted = (boolean) arguments[1];
                final String licenseType = (String) arguments[2];
                final String errorMessage = (String) arguments[3];
                @SuppressWarnings("unchecked")
                final Tuple<String, Map<String, String[]>> acknowledgeDetails = (Tuple<String, Map<String, String[]>>) arguments[4];
                final String acknowledgeHeader;

            };

    }

    private static final ConstructingObjectParser<StartTrialResponse, Void> PARSER = new
    ConstructingObjectParser<StartTrialResponse, Void>(
            "start_trial_response",
            true,
final Map<String, String[]> acknowledgeMessages;

if (acknowledgeDetails != null) {
    acknowledgeHeader = acknowledgeDetails.v1();
    acknowledgeMessages = acknowledgeDetails.v2();
} else {
    acknowledgeHeader = null;
    acknowledgeMessages = null;
}

return new StartTrialResponse(acknowledged, trialWasStarted, licenseType, errorMessage,
    acknowledgeHeader,
    acknowledgeMessages);

static {
    PARSER.declareBoolean(constructorArg(), new ParseField("acknowledged"));
    PARSER.declareBoolean(constructorArg(), new ParseField("trial_was_started"));
    PARSER.declareString(optionalConstructorArg(), new ParseField("type"));
    PARSER.declareString(optionalConstructorArg(), new ParseField("error_message"));
    // todo consolidate this parsing with the parsing in PutLicenseResponse
    PARSER.declareObject(optionalConstructorArg(), (parser, aVoid) -> {
        final Map<String, String[]> acknowledgeMessages = new HashMap<>();
        String message = null;
        final Map<String, Object> parsedMap = parser.map();
        for (Map.Entry<String, Object> entry : parsedMap.entrySet()) {
            if (entry.getKey().equals("message")) {
                if (entry.getValue() instanceof String) {
                    message = (String) entry.getValue();
                } else {
                    throw new XContentParseException(parser.getTokenLocation(), "unexpected acknowledgement header type");
                }
            } else {
                if (entry.getValue() instanceof List) {
                    final List<String> messageStrings = new ArrayList<>();
                    @SuppressWarnings("unchecked")
                    final List<Object> messageObjects = (List<Object>) entry.getValue();
                    for (Object messageObject : messageObjects) {
                        if (messageObject instanceof String) {
                            messageStrings.add((String) messageObject);
                        } else {
                            throw new XContentParseException(parser.getTokenLocation(), "expected text in acknowledgement message");
                        }
                    }
                }
            }
        }
    });
}
acknowledgeMessages.put(entry.getKey(), messageStrings.toArray(new String[messageStrings.size()]);
} else {
    throw new XContentParseException(parser.getTokenLocation(), "unexpected acknowledgement message type");
}
}
}

if (message == null) {
    throw new XContentParseException(parser.getTokenLocation(), "expected acknowledgement header");
}

return new Tuple<>(message, acknowledgeMessages);

}, new ParseField("acknowledge");
}

public static StartTrialResponse fromXContent(XContentParser parser) throws IOException {
    return PARSER.apply(parser, null);
}

private final boolean acknowledged;
private final boolean trialWasStarted;
private final String licenseType;
private final String errorMessage;
private final String acknowledgeHeader;
private final Map<String, String[]> acknowledgeMessages;

public StartTrialResponse(boolean acknowledged, 
    boolean trialWasStarted, 
    String licenseType, 
    String errorMessage, 
    String acknowledgeHeader, 
    Map<String, String[]> acknowledgeMessages) {
    this.acknowledged = acknowledged;
    this.trialWasStarted = trialWasStarted;
    this.licenseType = licenseType;
    this.errorMessage = errorMessage;
    this.acknowledgeHeader = acknowledgeHeader;
    this.acknowledgeMessages = acknowledgeMessages;
}

/**
 * Returns true if the request that corresponds to this response acknowledged license changes that would occur as a result of starting
public boolean isAcknowledged() {
    return acknowledged;
}

/**
 * Returns true if a trial license was started as a result of the request corresponding to this response. Returns false
 * if the cluster
 * did not start a trial, or a trial had already been started before the corresponding request was made
 */
public boolean isTrialWasStarted() {
    return trialWasStarted;
}

/**
 * If a trial license was started as a result of the request corresponding to this response (see {@link
 * #isTrialWasStarted()}) then
 * returns the type of license that was started on the cluster. Returns null otherwise
 */
public String getLicenseType() {
    return licenseType;
}

/**
 * If a trial license was not started as a result of the request corresponding to this response (see {@link
 * #isTrialWasStarted()}) then
 * returns a brief message explaining why the trial could not be started. Returns false otherwise
 */
public String getErrorMessage() {
    return errorMessage;
}

/**
 * If the request corresponding to this response did not acknowledge licensing changes that would result from
 * starting a trial license
 * (see {@link #isAcknowledged()}), returns a message describing how the user must acknowledge licensing
 * changes as a result of
 * such a request. Returns null otherwise
 */
public String getAcknowledgeHeader() {
    return acknowledgeHeader;
}

/*
 * a trial license
 */

/**
 * If the request corresponding to this response did not acknowledge licensing changes that would result from
 * starting a trial license
 * (see {@link #isAcknowledged()}), returns a map. The map's keys are names of commercial Elasticsearch
features, and their values are

* messages about how those features will be affected by licensing changes as a result of starting a trial license

*/

public Map<String, String[]> getAcknowledgeMessages() {
    return acknowledgeMessages;
}
}

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*/

package org.elasticsearch.client.license;

import java.util.Locale;

public enum LicensesStatus {
    VALID((byte) 0),
    INVALID((byte) 1),
    EXPIRED((byte) 2);

    private final byte id;

    LicensesStatus(byte id) {
        this.id = id;
    }

    public int id() {
        return id;
    }

    public static LicensesStatus fromId(int id) {
        if (id == 0) {
            return VALID;
        } else if (id == 1) {

            return INVALID;
        } else if (id == 2) {

            return EXPIRED;
        } else {
            throw new IllegalArgumentException("Invalid license state: \"" + id + \"\");
        }
    }
}
return INVALID;
} else if (id == 2) {
    return EXPIRED;
} else {
    throw new IllegalStateException("no valid LicensesStatus for id=" + id);
}
}

@Override
public String toString() {
    return this.name().toLowerCase(Locale.ROOT);
}

public static LicensesStatus fromString(String value) {
    switch (value) {
    case "valid":
        return VALID;
    case "invalid":
        return INVALID;
    case "expired":
        return EXPIRED;
    default:
        throw new IllegalArgumentException("unknown licenses status [" + value + "]");
    }
}

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*/
package org.elasticsearch.license.licensor.tools;
import org.elasticsearch.cli.Command;
import org.elasticsearch.cli.CommandTestCase;
import org.elasticsearch.cli.ExitCodes;
import org.elasticsearch.cli.UserException;
import org.elasticsearch.common.bytes.BytesArray;
import org.elasticsearch.common.xcontent.XContentType;
import org.elasticsearch.license.License;
import org.elasticsearch.license.licensor.TestUtils;
import org.junit.Before;
import java.nio.charset.StandardCharsets;
import java.nio.file.Files;
import java.nio.file.Path;

public class LicenseGenerationToolTests extends CommandTestCase {

    protected Path pubKeyPath = null;
    protected Path priKeyPath = null;

    @Before
    public void setup() throws Exception {
        pubKeyPath = getDataPath(TestUtils.PUBLIC_KEY_RESOURCE);
        priKeyPath = getDataPath(TestUtils.PRIVATE_KEY_RESOURCE);
    }

    @Override
    protected Command newCommand() {
        return new LicenseGeneratorTool();
    }

    public void testMissingKeyPaths() throws Exception {
        Path pub = createTempDir().resolve("pub");
        Path pri = createTempDir().resolve("pri");
        UserException e = expectThrows(
            UserException.class,
            () -> execute(  
                "--publicKeyPath",
                pub.toString(),  
                "--privateKeyPath",
                pri.toString()));
        assertTrue(e.getMessage(), e.getMessage().contains("pri does not exist"));
        assertEquals(ExitCodes.USAGE, e.exitCode);
        Files.createFile(pri);
        e = expectThrows(
            UserException.class,
            () -> execute(  
                "--publicKeyPath",
                pub.toString(),  
                "--privateKeyPath",  
                pri.toString()));
        assertTrue(e.getMessage(), e.getMessage().contains("pri does not exist"));
        assertEquals(ExitCodes.USAGE, e.exitCode);
    }
}
pri.toString()));
assertTrue(e.getMessage(), e.getMessage().contains("pub does not exist"));
assertEquals(ExitCodes.USAGE, e.exitCode);
}

class TestLicenseSpec {
  public static void testMissingLicenseSpec() throws Exception {
    UserException e = expectThrows(UserException.class, () -> execute(
      "--publicKeyPath",
      pubKeyPath.toString(),
      "--privateKeyPath",
      priKeyPath.toString()));
    assertTrue(e.getMessage(), e.getMessage().contains("Must specify either --license or --licenseFile");
    assertEquals(ExitCodes.USAGE, e.exitCode);
  }

  public static void testLicenseSpecString() throws Exception {
    TestUtils.LicenseSpec inputLicenseSpec =
      TestUtils.generateRandomLicenseSpec(License.VERSION_CURRENT);
    String licenseSpecString = TestUtils.generateLicenseSpecString(inputLicenseSpec);
    String output = execute(
      "--publicKeyPath",
      pubKeyPath.toString(),
      "--privateKeyPath",
      priKeyPath.toString(),
      "--license",
      licenseSpecString);
    final BytesArray bytes = new BytesArray(output.getBytes(StandardCharsets.UTF_8));
    License outputLicense = License.fromSource(bytes, XContentType.JSON);
    TestUtils.assertLicenseSpec(inputLicenseSpec, outputLicense);
  }

  public static void testLicenseSpecFile() throws Exception {
    TestUtils.LicenseSpec inputLicenseSpec =
      TestUtils.generateRandomLicenseSpec(License.VERSION_CURRENT);
    String licenseSpecString = TestUtils.generateLicenseSpecString(inputLicenseSpec);
    Path licenseSpecFile = createTempFile();
    Files.write(licenseSpecFile, licenseSpecString.getBytes(StandardCharsets.UTF_8));
    String output = execute(
      "--publicKeyPath",
      pubKeyPath.toString(),
      "--privateKeyPath",
      priKeyPath.toString(),
      "--licenseFile",
      licenseSpecFile.toString());
final BytesArray bytes = new BytesArray(output.getBytes(StandardCharsets.UTF_8));
License outputLicense = License.fromSource(bytes, XContentType.JSON);
TestUtils.assertLicenseSpec(inputLicenseSpec, outputLicense);
}
}
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package org.elasticsearch.license.licensor.tools;
import org.elasticsearch.cli.Command;
import org.elasticsearch.cli.CommandTestCase;
import org.elasticsearch.cli.ExitCodes;
import org.elasticsearch.cli.UserException;
import java.nio.file.Files;
import java.nio.file.Path;
import static org.hamcrest.CoreMatchers.containsString;
public class KeyPairGenerationToolTests extends CommandTestCase {
@Override
protected Command newCommand() {
return new KeyPairGeneratorTool();
}
public void testMissingKeyPaths() throws Exception {
Path exists = createTempFile("", "existing");
Path dne = createTempDir().resolve("dne");
UserException e = expectThrows(
UserException.class,
() -> execute(
"--publicKeyPath",
exists.toString(),
"--privateKeyPath",
dne.toString()));
assertThat(e.getMessage(), containsString("existing"));
assertEquals(ExitCodes.USAGE, e.exitCode);
e = expectThrows(
UserException.class,
() -> execute(
"--publicKeyPath",
dne.toString(),
"--privateKeyPath",

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exists.toString()));
assertThat(e.getMessage(), containsString("existing"));
assertEquals(ExitCodes.USAGE, e.exitCode);
}

public void testTool() throws Exception {
    Path keysDir = createTempDir();
    Path publicKeyFilePath = keysDir.resolve("public");
    Path privateKeyFilePath = keysDir.resolve("private");

    execute(
        "--publicKeyPath",
        publicKeyFilePath.toString(),
        "--privateKeyPath",
        privateKeyFilePath.toString());
    assertTrue(publicKeyFilePath.toString(), Files.exists(publicKeyFilePath));
    assertTrue(privateKeyFilePath.toString(), Files.exists(privateKeyFilePath));
}

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 */
package org.elasticsearch.license.licensor.tools;

import org.elasticsearch.cli.Command;
import org.elasticsearch.cli.CommandTestCase;
import org.elasticsearch.cli.ExitCodes;
import org.elasticsearch.cli.UserException;
import org.elasticsearch.common.unit.TimeValue;
import org.elasticsearch.license.License;
import org.elasticsearch.license.licensor.TestUtils;
import org.junit.Before;
import java.nio.charset.StandardCharsets;
import java.nio.file.Files;
import java.nio.file.Path;

public class LicenseVerificationToolTests extends CommandTestCase {
    protected Path pubKeyPath = null;
    protected Path priKeyPath = null;

    @Before
    public void setup() throws Exception {
        logger.error("project.basedir [{}]", System.getProperty("project.basedir"));
        pubKeyPath = getDataPath(TestUtils.PUBLIC_KEY_RESOURCE);
        priKeyPath = getDataPath(TestUtils.PRIVATE_KEY_RESOURCE);
    }

    public class LicenseVerificationToolTests extends CommandTestCase {
        protected Path pubKeyPath = null;
        protected Path priKeyPath = null;

        @Before
        public void setup() throws Exception {
            logger.error("project.basedir [{}]", System.getProperty("project.basedir"));
            pubKeyPath = getDataPath(TestUtils.PUBLIC_KEY_RESOURCE);
        }
priKeyPath = getDataPath(TestUtils.PRIVATE_KEY_RESOURCE);
}

@Override
protected Command newCommand() {
    return new LicenseVerificationTool();
}

public void testMissingKeyPath() throws Exception {
    Path pub = createTempDir().resolve("pub");
    UserException e = expectThrows(UserException.class, () -> execute("--publicKeyPath", pub.toString()));
    assertTrue(e.getMessage(), e.getMessage().contains("pub does not exist"));
    assertEquals(ExitCodes.USAGE, e.exitCode);
}

public void testMissingLicenseSpec() throws Exception {
    UserException e = expectThrows(UserException.class, () -> {
        execute("--publicKeyPath", pubKeyPath.toString());
    });
    assertTrue(
        e.getMessage(), e.getMessage().contains("Must specify either --license or --licenseFile");
    assertEquals(ExitCodes.USAGE, e.exitCode);
}

public void testBrokenLicense() throws Exception {
    final TimeValue oneHour = TimeValue.timeValueHours(1);
    License signedLicense = TestUtils.generateSignedLicense(oneHour, pubKeyPath, priKeyPath);
    License tamperedLicense = License.builder().fromLicenseSpec(signedLicense, signedLicense.signature()).expiryDate(signedLicense.expiryDate() + randomIntBetween(1, 1000)).build();
    UserException e = expectThrows(UserException.class, () -> execute("--publicKeyPath", pubKeyPath.toString(), "--license", TestUtils.dumpLicense(tamperedLicense)));
    assertEquals("Invalid License!", e.getMessage());
    assertEquals(ExitCodes.DATA_ERROR, e.exitCode);
}

public void testLicenseSpecString() throws Exception {
    final TimeValue oneHour = TimeValue.timeValueHours(1);
    License signedLicense = TestUtils.generateSignedLicense(oneHour, pubKeyPath, priKeyPath);
    String output = execute("--publicKeyPath", pubKeyPath.toString(), "--license", TestUtils.dumpLicense(signedLicense));
    assertTrue(output.contains("License verified.");
    assertEquals(ExitCodes.SUCCESS, output.exitCode);
}
"--publicKeyPath",
pubKeyPath.toString(),
"--license",
TestUtils.dumpLicense(signedLicense));
assertFalse(output, output.isEmpty());
}

public void testLicenseSpecFile() throws Exception {
final TimeValue oneHour = TimeValue.timeValueHours(1);
License signedLicense = TestUtils.generateSignedLicense(oneHour, pubKeyPath, priKeyPath);
Path licenseSpecFile = createTempFile();
Files.write(
    licenseSpecFile,
    TestUtils.dumpLicense(signedLicense).getBytes(StandardCharsets.UTF_8));
String output = execute(
    "--publicKeyPath",
    pubKeyPath.toString(),
    "--licenseFile",
    licenseSpecFile.toString());
assertFalse(output, output.isEmpty());
}

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*/
package org.elasticsearch.license.licensor;

import org.elasticsearch.common.unit.TimeValue;
import org.elasticsearch.license.DateUtils;
import org.elasticsearch.license.License;
import org.elasticsearch.license.LicenseVerifier;
import org.elasticsearch.test.ESTestCase;
import org.junit.After;
import org.junit.Before;
import java.nio.file.Files;
import java.nio.file.Path;

public class LicenseVerificationTests extends ESTestCase {

    protected Path pubKeyPath = null;
    protected Path priKeyPath = null;

    @Before
    public void setup() throws Exception {
        // Setup code here
    }

    // Test methods go here

    @After
    public void teardown() {
        // Teardown code here
    }

    // Further test methods...
}
pubKeyPath = getDataPath("/public.key");
priKeyPath = getDataPath("/private.key");

@After
public void cleanUp() {
    pubKeyPath = null;
    priKeyPath = null;
}

public void testGeneratedLicenses() throws Exception {
    final TimeValue fortyEightHours = TimeValue.timeValueHours(2 * 24);
    final License license =
        TestUtils.generateSignedLicense(fortyEightHours, pubKeyPath, priKeyPath);
    assertTrue(LicenseVerifier.verifyLicense(license, Files.readAllBytes(pubKeyPath)));
}

public void testLicenseTampering() throws Exception {
    final TimeValue twoHours = TimeValue.timeValueHours(2);
    License license = TestUtils.generateSignedLicense(twoHours, pubKeyPath, priKeyPath);

    final License tamperedLicense = License.builder()
        .fromLicenseSpec(license, license.signature())
        .expiryDate(license.expiryDate() + 10 * 24 * 60 * 60 * 1000L)
        .validate()
        .build();

    assertFalse(LicenseVerifier.verifyLicense(tamperedLicense, Files.readAllBytes(pubKeyPath)));
}

public void testRandomLicenseVerification() throws Exception {
    TestUtils.LicenseSpec licenseSpec = TestUtils.generateRandomLicenseSpec(
        randomIntBetween(License.VERSION_START, License.VERSION_CURRENT));
    License generatedLicense = generateSignedLicense(licenseSpec, pubKeyPath, priKeyPath);
    assertTrue(LicenseVerifier.verifyLicense(generatedLicense, Files.readAllBytes(pubKeyPath)));
}

private static License generateSignedLicense(
    TestUtils.LicenseSpec spec, Path pubKeyPath, Path priKeyPath) throws Exception {
    LicenseSigner signer = new LicenseSigner(priKeyPath, pubKeyPath);
    License.builder = License.builder()
        .uid(spec.uid)
        .feature(spec.feature)
        .type(spec.type)
        .subscriptionType(spec.subscriptionType)
        .issuedTo(spec.issuedTo)
        .issuer(spec.issuer)
        .maxNodes(spec.maxNodes);
if (spec.expiryDate != null) {
    builder.expiryDate(DateUtils.endOfTheDay(spec.expiryDate));
} else {
    builder.expiryDate(spec.expiryDateInMillis);
}
if (spec.issueDate != null) {
    builder.issueDate(DateUtils.beginningOfTheDay(spec.issueDate));
} else {
    builder.issueDate(spec.issueDateInMillis);
}
builder.version(spec.version);
return signer.sign(builder.build());
}

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package org.elasticsearch.license.licensor;

import org.elasticsearch.common.Strings;
import org.elasticsearch.common.joda.FormatDateTimeFormatter;
import org.elasticsearch.common.joda.Joda;
import org.elasticsearch.common.time.DateMathParser;
import org.elasticsearch.common.unit.TimeValue;
import org.elasticsearch.common.xcontent.ToXContent;
import org.elasticsearch.common.xcontent.XContentBuilder;
import org.elasticsearch.common.xcontent.XContentType;
import org.elasticsearch.license.DateUtils;
import org.elasticsearch.license.License;
import org.elasticsearch.test.ESTestCase;
import org.joda.time.format.DateTimeFormatter;
import java.io.IOException;
import java.nio.file.Path;
import java.util.UUID;
import static com.carrotsearch.randomizedtesting.RandomizedTest.randomBoolean;
import static com.carrotsearch.randomizedtesting.RandomizedTest.randomInt;
import static com.carrotsearch.randomizedtesting.RandomizedTest.randomIntBetween;
import static org.elasticsearch.common.xcontent.XContentFactory.jsonBuilder;
import static org.elasticsearch.test.ESTestCase.randomFrom;
import static org.hamcrest.core.IsEqual.equalTo;
public class TestUtils {

    public static final String PUBLIC_KEY_RESOURCE = "/public.key";
    public static final String PRIVATE_KEY_RESOURCE = "/private.key";

    private static final FormatDateTimeFormatter formatDateTimeFormatter =
            Joda.forPattern("yyyy-MM-dd");
    private static final DateMathParser dateMathParser = formatDateTimeFormatter.toDateMathParser();
    private static final DateTimeFormatter dateTimeFormatter = formatDateTimeFormatter.printer();

    public static String dumpLicense(License license) throws Exception {
        XContentBuilder builder = XContentFactory.contentBuilder(XContentType.JSON);
        builder.startObject();
        builder.startObject("license");
        license.toInnerXContent(builder, ToXContent.EMPTY_PARAMS);
        builder.endObject();
        builder.endObject();
        return Strings.toString(builder);
    }

    public static String dateMathString(String time, final long now) {
        return dateTimeFormatter.print(dateMathParser.parse(time, () -> now));
    }

    public static long dateMath(String time, final long now) {
        return dateMathParser.parse(time, () -> now);
    }

    public static LicenseSpec generateRandomLicenseSpec(int version) {
        boolean datesInMillis = randomBoolean();
        long now = System.currentTimeMillis();
        String uid = UUID.randomUUID().toString();
        String issuer = "issuer__" + randomInt();
        String issuedTo = "issuedTo__" + randomInt();
        String type = version < License.VERSION_NO_FEATURE_TYPE ?
                randomFrom("subscription", "internal", "development") :
                randomFrom("basic", "silver", "dev", "gold", "platinum");
        final String subscriptionType;
        final String feature;
        if (version < License.VERSION_NO_FEATURE_TYPE) {
            subscriptionType = randomFrom("gold", "silver", "platinum");
            feature = "feature__" + randomInt();
        } else {
            subscriptionType = null;
            feature = null;
        }
        int maxNodes = randomIntBetween(5, 100);
if (datesInMillis) {
    long issueDateInMillis = dateMath("now", now);
    long expiryDateInMillis = dateMath("now+10d/d", now);
    return new LicenseSpec(
        version,
        uid,
        feature,
        issueDateInMillis,
        expiryDateInMillis,
        type,
        subscriptionType,
        issuedTo,
        issuer,
        maxNodes);
} else {
    String issueDate = dateMathString("now", now);
    String expiryDate = dateMathString("now+10d/d", now);
    return new LicenseSpec(
        version,
        uid,
        feature,
        issueDate,
        expiryDate, type,
        subscriptionType,
        issuedTo,
        issuer,
        maxNodes);
}

public static String generateLicenseSpecString(LicenseSpec licenseSpec) throws IOException {
    XContentBuilder licenses = jsonBuilder();
    licenses.startObject();
    licenses.startObject("license")
        .field("uid", licenseSpec.uid)
        .field("type", licenseSpec.type)
        .field("subscription_type", licenseSpec.subscriptionType)
        .field("issued_to", licenseSpec.issuedTo)
        .field("issuer", licenseSpec.issuer)
        .field("feature", licenseSpec.feature)
        .field("max_nodes", licenseSpec.maxNodes);
    if (licenseSpec.issueDate != null) {
        licenses.field("issue_date", licenseSpec.issueDate);
    } else {
        licenses.field("issue_date_in_millis", licenseSpec.issueDateInMillis);
    }
    if (licenseSpec.expiryDate != null) {
        licenses.field("expiry_date", licenseSpec.expiryDate);
    } else {
        licenses.field("expiry_date_in_millis", licenseSpec.expiryDateInMillis);
    }
    licenses.endObject();
    return licenses.string();
}
licenses.field("expiry_date", licenseSpec.expiryDate);
} else {
    licenses.field("expiry_date_in_millis", licenseSpec.expiryDateInMillis);
}
licenses.field("version", licenseSpec.version);
licenses.endObject();
licenses.endObject();
return Strings.toString(licenses);

public static void assertLicenseSpec(LicenseSpec spec, License license) {
    MatcherAssert.assertThat(license.uid(), equalTo(spec.uid));
    MatcherAssert.assertThat(license.issuedTo(), equalTo(spec.issuedTo));
    MatcherAssert.assertThat(license.issuer(), equalTo(spec.issuer));
    MatcherAssert.assertThat(license.type(), equalTo(spec.type));
    MatcherAssert.assertThat(license.maxNodes(), equalTo(spec.maxNodes));
    if (spec.issueDate != null) {
        MatcherAssert.assertThat(
            license.issueDate(),
            equalTo(DateUtils.beginningOfTheDay(spec.issueDate)));
    } else {
        MatcherAssert.assertThat(license.issueDate(), equalTo(spec.issueDateInMillis));
    }
    if (spec.expiryDate != null) {
        MatcherAssert.assertThat(
            license.expiryDate(),
            equalTo(DateUtils.endOfTheDay(spec.expiryDate)));
    } else {
        MatcherAssert.assertThat(license.expiryDate(), equalTo(spec.expiryDateInMillis));
    }
}

public static License generateSignedLicense(TimeValue expiryDuration, Path pubKeyPath, Path priKeyPath) throws Exception {
    long issue = System.currentTimeMillis();
    int version = ESTestCase.randomIntBetween(License.VERSION_START, License.VERSION_CURRENT);
    String type = version < License.VERSION_NO_FEATURE_TYPE ?
        randomFrom("subscription", "internal", "development") :
        randomFrom("trial", "basic", "silver", "dev", "gold", "platinum");
    final License.Bui...
if (version == License.VERSION_START) {
    builder.subscriptionType(randomFrom("dev", "gold", "platinum", "silver"));
    builder.feature(ESTestCase.randomAlphaOfLength(10));
}
LicenseSigner signer = new LicenseSigner(priKeyPath, pubKeyPath);
return signer.sign(builder.build());

public static class LicenseSpec {
    public final int version;
    public final String feature;
    public final String issueDate;
    public final long issueDateInMillis;
    public final String expiryDate;
    public final long expiryDateInMillis;
    public final String uid;
    public final String type;
    public final String subscriptionType;
    public final String issuedTo;
    public final String issuer;
    public final int maxNodes;

    public LicenseSpec(
            int version,
            String uid,
            String feature,
            long issueDateInMillis,
            long expiryDateInMillis,
            String type,
            String subscriptionType,
            String issuedTo,
            String issuer,
            int maxNodes) {
        this.version = version;
        this.feature = feature;
        this.issueDateInMillis = issueDateInMillis;
        this.issueDate = null;
        this.expiryDateInMillis = expiryDateInMillis;
        this.expiryDate = null;
        this.uid = uid;
        this.type = type;
        this.subscriptionType = subscriptionType;
        this.issuedTo = issuedTo;
        this.issuer = issuer;
        this.maxNodes = maxNodes;
    }

    public LicenseSpec(
```java
int version,
String uid,
String feature,
String issueDate,
String expiryDate,
String type,
String subscriptionType,
String issuedTo,
String issuer,
int maxNodes) {
    this.version = version;
    this.feature = feature;
    this.issueDate = issueDate;
    this.issueDateInMillis = -1;
    this.expiryDate = expiryDate;
    this.expiryDateInMillis = -1;
    this.uid = uid;
    this.type = type;
    this.subscriptionType = subscriptionType;
    this.issuedTo = issuedTo;
    this.issuer = issuer;
    this.maxNodes = maxNodes;
}
```

```java
0"0
*H
0
+5BjhSTTs\&avDgpi]2oR<;CizzzE(yhZ}TC]h~!P\j499cq5b!Y{VX=,Vd ;g9hD`Xv8nj[i) 34aYfsWBkuOo@u@175/YmI4~
d&^wt$q"XQ^KG#|X?rV]f:5ENHgXyk9Mh/WM*D:D^|H"
]W"o"Y¥@9"\h\nb+a3>8ZOSd]\R4HxQU99dQuTbL?+*}QMB7fhIE952^hn=--m2-
pF8T_Jh^T]=]dc=*Ge^\l71cb~_}_5yZl&9LSdxR8XNUCI/%R,CiVIN~O)c%\hj&UXj]\_#9/\1H@_WrSl,})v[?;m;O'ZiB<Pu
OkH4jhr
WvF\w#)&Vx[/?\zDa
\hGEi<?r=N
zm"nL~1-~/?b?gyk,b'_4IK?3d2kgb$7~QjJqNjLr-9V134u Ne+4dpP.V]uvq4D]08LrTeg5Z+n@&+(P=M"
[rw8bqJJaam++?b]u&2tW!!Yi.fj/@)G#uZv_sgj2UXk,fdbsqkT%h5Nv5[D4!l@1
5}"*"DK[%N\Af9l]0X'M;c01uAm\jB/.;f
es.logger.level=INFO
log4j.rootLogger=${es.logger.level}, out
log4j.logger.org.apache.http=INFO, out
log4j.additivity.org.apache.http=false
log4j.logger.org.elasticsearch.license=TRACE
```
import org.apache.lucene.util.BytesRef;
import org.apache.lucene.util.BytesRefIterator;
import org.elasticsearch.common.bytes.BytesReference;
import org.elasticsearch.common.hash.MessageDigests;
import org.elasticsearch.common.xcontent.ToXContent;
import org.elasticsearch.common.xcontent.XContentBuilder;
import org.elasticsearch.common.xcontent.XContentType;
import org.elasticsearch.license.CryptUtils;
import org.elasticsearch.license.License;
import java.io.IOException;
import java.nio.ByteBuffer;
import java.nio.file.Files;
import java.security.InvalidKeyException;
import java.security.MessageDigest;
import java.security.NoSuchAlgorithmException;
import java.security.PrivateKey;
import java.security.PublicKey;
import java.security.SecureRandom;
import java.security.Signature;
import java.security.SignatureException;
import java.util.Base64;
import java.util.Collections;
import java.util.Map;

/**
 * Responsible for generating a license signature according to the signature spec and sign it with
 * the provided encrypted private key
 */
public class LicenseSigner {

    private static final int MAGIC_LENGTH = 13;
    private final Path publicKeyPath;
    private final Path privateKeyPath;

    public LicenseSigner {
        private static final int MAGIC_LENGTH = 13;
        private final Path publicKeyPath;
        private final Path privateKeyPath;
    }

    // Method implementations...
}
public LicenseSigner(final Path privateKeyPath, final Path publicKeyPath) {
    this.publicKeyPath = publicKeyPath;
    this.privateKeyPath = privateKeyPath;
}

/**
 * Generates a signature for the @code licenseSpec}. Signature structure:
 * <code>
 * | VERSION | MAGIC | PUB_KEY_DIGEST | SIGNED_LICENSE_CONTENT |
 * </code>
 *
 * @return a signed License
 */
public License sign(License licenseSpec) throws IOException {
    XContentBuilder contentBuilder = XContentFactory.contentBuilder(XContentType.JSON);
    final Map<String, String> licenseSpecViewMode =
            Collections.singletonMap(License.LICENSE_SPEC_VIEW_MODE, "true");
    licenseSpec.toXContent(contentBuilder, new ToXContent.MapParams(licenseSpecViewMode));
    final byte[] signedContent;
    final boolean preV4 = licenseSpec.version() < License.VERSION_CRYPTO_ALGORITHMS;
    try {
        final Signature rsa = Signature.getInstance("SHA512withRSA");
        PrivateKey decryptedPrivateKey =
                CryptUtils.readEncryptedPrivateKey(Files.readAllBytes(privateKeyPath));
        rsa.initSign(decryptedPrivateKey);
        final BytesRefIterator iterator = BytesReference.bytes(contentBuilder).iterator();
        BytesRef ref;
        while((ref = iterator.next()) != null) {
            rsa.update(ref.bytes, ref.offset, ref.length);
        }
        signedContent = rsa.sign();
    } catch (InvalidKeyException |
            IOException |
            NoSuchAlgorithmException |
            SignatureException e) {
        throw new IllegalStateException(e);
    }
    final byte[] magic = new byte[MAGIC_LENGTH];
    SecureRandom random = new SecureRandom();
    random.nextBytes(magic);
    final byte[] publicKeyBytes = Files.readAllBytes(publicKeyPath);
    PublicKey publicKey = CryptUtils.readPublicKey(publicKeyBytes);
    final byte[] pubKeyFingerprint = preV4 ?
            Base64.getEncoder().encode(CryptUtils.writeEncryptedPublicKey(publicKey)) :
            getPublicKeyFingerprint(publicKeyBytes);
    byte[] bytes = new byte[4 + 4 + MAGIC_LENGTH + 4 + pubKeyFingerprint.length + 4 +
            signedContent.length];
    ByteBuffer byteBuffer = ByteBuffer.wrap(bytes);
byteBuffer.putInt(licenseSpec.version())
    .putInt(magic.length)
    .put(magic)
    .putInt(pubKeyFingerprint.length)
    .put(pubKeyFingerprint)
    .putInt(signedContent.length)
    .put(signedContent);

return License.builder()
    .fromLicenseSpec(licenseSpec, Base64.getEncoder().encodeToString(bytes))
    .build();
}

private byte[] getPublicKeyFingerprint(byte[] keyBytes) {
    MessageDigest sha256 = MessageDigests.sha256();
    sha256.update(keyBytes);
    return sha256.digest();
}

apply plugin: 'elasticsearch.build'

dependencies {
    compile "org.elasticsearch.plugin:x-pack-core:${version}"
    compile "org.elasticsearch:elasticsearch:${version}"
    testCompile "org.elasticsearch.test:framework:${version}"
}

project.forbiddenPatterns {
    exclude "**/*.key"
}

dependencyLicenses.enabled = false

task buildZip(type: Zip, dependsOn: jar) {
    String parentDir = "license-tools-${version}"
    into(parentDir + '/lib') {
        from jar
        from configurations.runtime
    }
    into(parentDir + '/bin') {
        from 'bin'
    }
}

assemble.dependsOn buildZip
/*
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 */
package org.elasticsearch.xpack;

import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.license.LicenseService;
import org.elasticsearch.license.XPackLicenseState;
import org.elasticsearch.xpack.core.LocalStateCompositeXPackPlugin;
import org.elasticsearch.xpack.core.ssl.SSLService;
import org.elasticsearch.xpack.deprecation.Deprecation;
import org.elasticsearch.xpack.graph.Graph;
import org.elasticsearch.xpack.logstash.Logstash;
import org.elasticsearch.xpack.ml.MachineLearning;
import org.elasticsearch.xpack.monitoring.Monitoring;
import org.elasticsearch.xpack.security.Security;
import org.elasticsearch.xpack.xpack.watcher.Watcher;

import java.nio.file.Path;

public class CompositeTestingXPackPlugin extends LocalStateCompositeXPackPlugin {

    public CompositeTestingXPackPlugin(final Settings settings, final Path configPath) throws Exception {
        super(settings, configPath);
        CompositeTestingXPackPlugin thisVar = this;
        plugins.add(new Deprecation());
        plugins.add(new Graph(settings));
        plugins.add(new Logstash(settings));
        plugins.add(new MachineLearning(settings, configPath) {
            @Override
            protected XPackLicenseState getLicenseState() {
                return super.getLicenseState();
            }
        });
        plugins.add(new Monitoring(settings)) {
            @Override
            protected SSLService getSslService() {
                return thisVar.getSslService();
            }
        };

        @Override
        protected LicenseService getLicenseService() {
            return thisVar.getLicenseService();
        }

        @Override
        protected XPackLicenseState getLicenseState() {
            return thisVar.getLicenseState();
        }
    }
}
plugins.add(new Watcher(settings) {
    @Override
    protected SSLService getSslService() {
        return thisVar.getSslService();
    }

    @Override
    protected XPackLicenseState getLicenseState() {
        return thisVar.getLicenseState();
    }
});
plugins.add(new Security(settings, configPath) {
    @Override
    protected SSLService getSslService() { return thisVar.getSsslService(); }

    @Override
    protected XPackLicenseState getLicenseState() { return thisVar.getLicenseState(); }
});
*/

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   */

package org.elasticsearch.xpack.monitoring;

import org.elasticsearch.action.admin.cluster.node.info.NodeInfo;
import org.elasticsearch.action.admin.cluster.node.info.NodesInfoResponse;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.env.Environment;
import org.elasticsearch.node.MockNode;
import org.elasticsearch.node.Node;
import org.elasticsearch.plugins.Plugin;
import org.elasticsearch.plugins.PluginInfo;
import org.elasticsearch.test.ESIntegTestCase.ClusterScope;
import org.elasticsearch.test.discovery.TestZenDiscovery;
import org.elasticsearch.tribe.TribePlugin;
import org.elasticsearch.xpack.core.XPackSettings;
import org.elasticsearch.xpack.monitoring.test.MonitoringIntegTestCase;
import java.nio.file.Path;
import java.util.ArrayList;
import java.util.Collection;
import java.util.function.Function;
import static org.elasticsearch.test.ESIntegTestCase.Scope.TEST;
import static org.hamcrest.Matchers.equalTo;

@ClusterScope(scope = TEST, transportClientRatio = 0, numClientNodes = 0, numDataNodes = 0)
public class MonitoringPluginTests extends MonitoringIntegTestCase {

    public MonitoringPluginTests() throws Exception {
        super();
    }

    @Override
    protected void startMonitoringService() {
        // do nothing as monitoring is sometime unbound
    }

    @Override
    protected void stopMonitoringService() {
        // do nothing as monitoring is sometime unbound
    }

    @Override
    protected boolean addTestZenDiscovery() {
        return false;
    }

    public static class TribeAwareTestZenDiscoveryPlugin extends TestZenDiscovery.TestPlugin {

        public TribeAwareTestZenDiscoveryPlugin(Settings settings) {
            super(settings);
        }

        @Override
        public Settings additionalSettings() {
            if (settings.getGroups("tribe", true).isEmpty()) {
                return super.additionalSettings();
            } else {
                return Settings.EMPTY;
            }
        }
    }

    public static class MockTribePlugin extends TribePlugin {

        public MockTribePlugin(Settings settings) {
            super(settings);
        }

        protected Function<Settings, Node> nodeBuilder(Path configPath) {
            return settings -> new MockNode(new Environment(settings, configPath), internalCluster().getPlugins());
@Override
protected Collection<Class<? extends Plugin>> nodePlugins() {
    ArrayList<Class<? extends Plugin>> plugins = new ArrayList<>(super.nodePlugins());
    plugins.add(MockTribePlugin.class);
    plugins.add(TribeAwareTestZenDiscoveryPlugin.class);
    return plugins;
}

@Override
protected Settings nodeSettings(int nodeOrdinal) {
    return Settings.builder()
            .put(super.nodeSettings(nodeOrdinal))
            .put(MonitoringService.INTERVAL.getKey(), "-1")
            .put(XPackSettings.SECURITY_ENABLED.getKey(), false)
            .put(XPackSettings.WATCHER_ENABLED.getKey(), false)
            .build();
}

@Override
protected Settings transportClientSettings() {
    return Settings.builder()
            .put(super.transportClientSettings())
            .put(XPackSettings.SECURITY_ENABLED.getKey(), false)
            .build();
}

public void testMonitoringEnabled() {
    internalCluster().startNode(Settings.builder()
            .put(XPackSettings.MONITORING_ENABLED.getKey(), true)
            .build());
    assertPluginIsLoaded();
    assertServiceIsBound(MonitoringService.class);
}

public void testMonitoringDisabled() {
    internalCluster().startNode(Settings.builder()
            .put(XPackSettings.MONITORING_ENABLED.getKey(), false)
            .build());
    assertPluginIsLoaded();
    assertServiceIsNotBound(MonitoringService.class);
}

public void testMonitoringEnabledOnTribeNode() {
    internalCluster().startNode(Settings.builder()
.put(XPackSettings.MONITORING_ENABLED.getKey(), true)
    .put("tribe.name", "t1")
    .build());
assertPluginIsLoaded();
assertServiceIsBound(MonitoringService.class);
}

public void testMonitoringDisabledOnTribeNode() {
    internalCluster().startNode(Settings.builder().put("tribe.name", "t1").build());
    assertPluginIsLoaded();
    assertServiceIsNotBound(MonitoringService.class);
}

private void assertPluginIsLoaded() {
    NodesInfoResponse response = client().admin().cluster().prepareNodesInfo().setPlugins(true).get();
    for (NodeInfo nodeInfo : response.getNodes()) {
        assertNotNull(nodeInfo.getPlugins());

        boolean found = false;
        for (PluginInfo plugin : nodeInfo.getPlugins().getPluginInfos()) {
            assertNotNull(plugin);
            if (LocalStateMonitoring.class.getName().equals(plugin.getName())) {
                found = true;
                break;
            }
        }
        assertThat("xpack plugin not found", found, equalTo(true));
    }
}

private void assertServiceIsBound(Class<?> klass) {
    try {
        Object binding = internalCluster().getDataNodeInstance(klass);
        assertNotNull(binding);
        assertTrue(klass.isInstance(binding));
    } catch (Exception e) {
        fail("no service bound for class " + klass.getSimpleName());
    }
}

private void assertServiceIsNotBound(Class<?> klass) {
    try {
        // it should be bound, but directly as null
        assertNotNull(internalCluster().getDataNodeInstance(klass));
    } catch (Exception ce) {
        assertThat("message contains error about missing implementation: " + ce.getMessage(),
            ce.getMessage().contains("Could not find a suitable constructor"), equalTo(true));
    }
package org.elasticsearch.xpack.monitoring;

import org.elasticsearch.client.Client;
import org.elasticsearch.license.TribeTransportTestCase;
import org.elasticsearch.xpack.core.XPackField;
import org.elasticsearch.xpack.core.monitoring.action.MonitoringBulkAction;
import org.elasticsearch.xpack.core.monitoring.action.MonitoringBulkRequest;

import java.util.Collections;
import java.util.List;

public class MonitoringTribeTests extends TribeTransportTestCase {

    @Override
    protected List<String> enabledFeatures() {
        return Collections.singletonList(XPackField.MONITORING);
    }

    @Override
    protected void verifyActionOnClientNode(Client client) throws Exception {
        assertMonitoringTransportActionsWorks(client);
    }

    @Override
    protected void verifyActionOnMasterNode(Client masterClient) throws Exception {
        assertMonitoringTransportActionsWorks(masterClient);
    }

    @Override
    protected void verifyActionOnDataNode(Client dataNodeClient) throws Exception {
        assertMonitoringTransportActionsWorks(dataNodeClient);
    }

    private static void assertMonitoringTransportActionsWorks(Client client) throws Exception {
        client.execute(MonitoringBulkAction.INSTANCE, new MonitoringBulkRequest());
    }

    @Override
    protected void verifyActionOnTribeNode(Client tribeClient) {
        failAction(tribeClient, MonitoringBulkAction.INSTANCE);
    }
}
package org.elasticsearch.test;

import org.elasticsearch.Build;
import org.elasticsearch.common.bytes.BytesArray;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.common.transport.TransportAddress;
import org.elasticsearch.common.xcontent.XContentType;
import org.elasticsearch.license.GetLicenseResponse;
import org.elasticsearch.license.License;
import org.elasticsearch.license.LicensingClient;
import org.elasticsearch.plugins.Plugin;
import org.elasticsearch.protocol.xpack.license.LicensesStatus;
import org.elasticsearch.protocol.xpack.license.PutLicenseResponse;
import org.elasticsearch.xpack.core.LocalStateCompositeXPackPlugin;
import org.elasticsearch.xpack.core.XPackPlugin;
import org.elasticsearch.xpack.core.XPackSettings;
import org.junit.AfterClass;
import java.io.IOException;
import java.net.InetAddress;
import java.net.InetSocketAddress;
import java.net.URL;
import java.nio.charset.StandardCharsets;
import java.util.Collection;
import java.util.Collections;
import static org.hamcrest.CoreMatchers.equalTo;

public class LicensingTribeIT extends ESIntegTestCase {
    private static TestCluster cluster2;
    private static TestCluster tribeNode;

    @Override
    protected Collection<Class<? extends Plugin>> nodePlugins() {
        return Collections.singletonList(XPackPlugin.class);
    }

    @Override
    protected Collection<Class<? extends Plugin>> transportClientPlugins() {
        return Collections.singletonList(LocalStateCompositeXPackPlugin.class);
    }

    import static org.hamcrest.CoreMatchers.equalTo;
    import java.io.IOException;
    import java.net.InetAddress;
    import java.net.InetSocketAddress;
    import java.net.URL;
    import java.nio.charset.StandardCharsets;
    import java.util.Collection;
    import java.util.Collections;
    import static org.hamcrest.CoreMatchers.equalTo;

    public class LicensingTribeIT extends ESIntegTestBase {
        private static TestCluster cluster2;
        private static TestCluster tribeNode;

        @Override
        protected Collection<Class<? extends Plugin>> nodePlugins() {
            return Collections.singletonList(XPackPlugin.class);
        }

        @Override
        protected Collection<Class<? extends Plugin>> transportClientPlugins() {
            return Collections.singletonList(LocalStateCompositeXPackPlugin.class);
        }
    }
}

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 */
@Override
public void setUp() throws Exception {
    super.setUp();
    if (cluster2 == null) {
        cluster2 = buildExternalCluster(System.getProperty("tests.cluster2"));
    }
    if (tribeNode == null) {
        tribeNode = buildExternalCluster(System.getProperty("tests.tribe"));
    }
}

@Override
protected Settings nodeSettings(int nodeOrdinal) {
    Settings.Builder builder = Settings.builder();
    builder.put(super.nodeSettings(nodeOrdinal));
    return builder.build();
}

@AfterClass
public static void tearDownExternalClusters() throws IOException {
    if (cluster2 != null) {
        try {
            cluster2.close();
        } finally {
            cluster2 = null;
        }
    }
    if (tribeNode != null) {
        try {
            tribeNode.close();
        } finally {
            tribeNode = null;
        }
    }
}

@Override
protected Settings externalClusterClientSettings() {
    Settings.Builder builder = Settings.builder();
    builder.put(XPackSettings.SECURITY_ENABLED.getKey(), false);
    builder.put(XPackSettings.MONITORING_ENABLED.getKey(), false);
    builder.put(XPackSettings.WATCHER_ENABLED.getKey(), false);
    builder.put(XPackSettings.GRAPH_ENABLED.getKey(), false);
    builder.put(XPackSettings.MACHINE_LEARNING_ENABLED.getKey(), false);
    return builder.build();
}
private ExternalTestCluster buildExternalCluster(String clusterAddresses) throws IOException {
    String[] stringAddresses = clusterAddresses.split(",");
    TransportAddress[] transportAddresses = new TransportAddress[stringAddresses.length];
    int i = 0;
    for (String stringAddress : stringAddresses) {
        URL url = new URL("http://" + stringAddress);
        InetAddress inetAddress = InetAddress.getByName(url.getHost());
        transportAddresses[i++] = new TransportAddress(new InetSocketAddress(inetAddress, url.getPort()));
    }
    return new ExternalTestCluster(createTempDir(), externalClusterClientSettings(), transportClientPlugins(),
    transportAddresses);
}

public void testLicensePropagateToTribeNode() throws Exception {
    assumeTrue("License is only valid when tested against snapshot/test keys", Build.CURRENT.isSnapshot());
    // test that auto-generated basic license propagates to tribe
    assertBusy(() -> {
        LicensingClient getLicenseResponse = new LicensingClient(tribeNode.client()).prepareGetLicense().get();
        assertNotNull(getLicenseResponse.license());
        assertThat(getLicenseResponse.license().operationMode(), equalTo(License.OperationMode.BASIC));
    });
    // test that signed license with higher operation mode takes precedence
    LicensingClient cluster2Client = new LicensingClient(cluster2.client());
    PutLicenseResponse licenseResponse = cluster2Client.
        preparePutLicense(License.fromSource(new
            BytesArray(PLATINUM_LICENSE.getBytes(StandardCharsets.UTF_8)), XContentType.JSON))
        .setAcknowledge(true).get();
    assertThat(licenseResponse.isAcknowledged(), equalTo(true));
    assertThat(licenseResponse.status(), equalTo(LicensesStatus.VALID));
    assertBusy(() -> {
        LicensingClient getLicenseResponse = new LicensingClient(tribeNode.client()).prepareGetLicense().get();
        assertNotNull(getLicenseResponse.license());
        assertThat(getLicenseResponse.license().operationMode(), equalTo(License.OperationMode.PLATINUM));
    });
    // test removing signed license falls back works
    assertTrue(cluster2Client.prepareDeleteLicense().get().isAcknowledged());
    assertBusy(() -> {
        LicensingClient getLicenseResponse = new LicensingClient(tribeNode.client()).prepareGetLicense().get();
        assertNotNull(getLicenseResponse.license());
        assertThat(getLicenseResponse.license().operationMode(), equalTo(License.OperationMode.BASIC));
    });
}
public void testDummy() throws Exception {
    // this test is here so that testLicensePropagateToTribeNode's assumption
    // doesn't result in this test suite to have no tests run and trigger a build failure
}

private static final String PLATINUM_LICENSE = "{"license":{"uid":"1","type":"platinum","issue_date_in_millis":1411948800000,"expiry_date_in_millis":1914278399999,"max_nodes":1},"issued_to":null,"issuer":null,"signature":null}"

package org.elasticsearch.license;

import org.elasticsearch.client.Client;
import org.elasticsearch.common.unit.TimeValue;
import org.elasticsearch.protocol.xpack.license.DeleteLicenseRequest;
import org.elasticsearch.protocol.xpack.license.GetLicenseRequest;
import static org.elasticsearch.license.TestUtils.generateSignedLicense;

public class LicenseTribeTests extends TribeTransportTestCase {
    @Override
    protected void verifyActionOnClientNode(Client client) throws Exception {
        assertLicenseTransportActionsWorks(client);
    }

    import org.elasticsearch.license.Client;
    import org.elasticsearch.license.common.unit.TimeValue;
    import org.elasticsearch.license.protocol.xpack.license.DeleteLicenseRequest;
    import org.elasticsearch.license.protocol.xpack.license.GetLicenseRequest;

    public static class LicenseTribeTests extends TribeTransportTestCase {
        @Override
        protected void verifyActionOnClientNode(Client client) throws Exception {
            assertLicenseTransportActionsWorks(client);
        }
    }
}
@Override
protected void verifyActionOnMasterNode(Client masterClient) throws Exception {
    assertLicenseTransportActionsWorks(masterClient);
}

@Override
protected void verifyActionOnDataNode(Client dataNodeClient) throws Exception {
    assertLicenseTransportActionsWorks(dataNodeClient);
}

private static void assertLicenseTransportActionsWorks(Client client) throws Exception {
    client.execute(GetLicenseAction.INSTANCE, new GetLicenseRequest()).get();
    client.execute(PutLicenseAction.INSTANCE, new PutLicenseRequest()
        .license(generateSignedLicense(TimeValue.timeValueHours(1))));
    client.execute(DeleteLicenseAction.INSTANCE, new DeleteLicenseRequest());
}

@Override
protected void verifyActionOnTribeNode(Client tribeClient) throws Exception {
    // The get licence action should work, but everything else should fail
    tribeClient.execute(GetLicenseAction.INSTANCE, new GetLicenseRequest()).get();
    failAction(tribeClient, PutLicenseAction.INSTANCE);
    failAction(tribeClient, DeleteLicenseAction.INSTANCE);
}

/*
 * Copyright Elasticsearch B.V. and/or licensed to Elasticsearch B.V. under one
 * or more contributor license agreements. Licensed under the Elastic License;
 * you may not use this file except in compliance with the Elastic License.
 */
package org.elasticsearch.license;

import org.elasticsearch.action.Action;
import org.elasticsearch.action.admin.cluster.health.ClusterHealthResponse;
import org.elasticsearch.action.admin.cluster.node.info.NodeInfo;
import org.elasticsearch.action.admin.cluster.node.info.NodesInfoResponse;
import org.elasticsearch.analysis.common.CommonAnalysisPlugin;
import org.elasticsearch.client.Client;
import org.elasticsearch.client.Requests;
import org.elasticsearch.cluster.health.ClusterHealthStatus;
import org.elasticsearch.cluster.node.DiscoveryNode;
import org.elasticsearch.cluster.node.DiscoveryNodes;
import org.elasticsearch.common.Priority;
import org.elasticsearch.common.UUIDs;
import org.elasticsearch.common.network.NetworkModule;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.common.transport.TransportAddress;
import org.elasticsearch.discovery.zen.SettingsBasedHostsProvider;
import org.elasticsearch.env.Environment;
import org.elasticsearch.node.MockNode;
import org.elasticsearch.node.Node;
import org.elasticsearch.plugins.Plugin;
import org.elasticsearch.test.ESIntegTestCase;
import org.elasticsearch.test.ESTestCase.ClusterScope;
import org.elasticsearch.test.ESTestCase.Scope;
import org.elasticsearch.test.InternalTestCluster;
import org.elasticsearch.test.NodeConfigurationSource;
import org.elasticsearch.test.TestCluster;
import org.elasticsearch.test.test.discovery.TestZenDiscovery;
import org.elasticsearch.test.tribe.TribePlugin;
import org.elasticsearch.xpack.compositeTestingXPackPlugin;
import org.elasticsearch.xpack.core.XPackClientPlugin;
import org.elasticsearch.xpack.core.XPackPlugin;
import org.elasticsearch.xpack.core.XPackSettings;
import org.elasticsearch.xpack.core.XPackField;
import org.elasticsearch.xpack.deprecation.Deprecation;
import org.elasticsearch.xpack.graph.Graph;
import org.elasticsearch.xpack.logstash.Logstash;
import org.elasticsearch.xpack.ml.MachineLearning;
import org.elasticsearch.xpack.core.ml.MachineLearningField;
import org.elasticsearch.xpack.monitoring.Monitoring;
import org.elasticsearch.xpack.security.Security;
import org.elasticsearch.xpack.upgrade.Upgrade;
import org.elasticsearch.xpack.watcher.Watcher;

import java.nio.file.Path;
import java.util.ArrayList;
import java.util.Arrays;
import java.util.Collection;
import java.util.Collections;
import java.util.List;
import java.util.function.Function;
import static org.elasticsearch.test.hamcrest.ElasticsearchAssertions.assertAcked;
import static org.hamcrest.Matchers.anyOf;
import static org.hamcrest.Matchers.containsString;
import static org.hamcrest.Matchers.equalTo;

@ClusterScope(scope = Scope.TEST, transportClientRatio = 0, numClientNodes = 1, numDataNodes = 2)
public abstract class TribeTransportTestCase extends ESIntegTestCase {

    protected List<String> enabledFeatures() {
        return Collections.emptyList();
    }

}

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@Override
protected final Settings nodeSettings(int nodeOrdinal) {
    final Settings.Builder builder = Settings.builder()
        .put(NetworkModule.HTTP_ENABLED.getKey(), false)
        .put("transport.type", getTestTransportType());
    List<String> enabledFeatures = enabledFeatures();
    builder.put(XPackSettings.SECURITY_ENABLED.getKey(),
        enabledFeatures.contains(XPackField.SECURITY));
    builder.put(XPackSettings.MONITORING_ENABLED.getKey(),
        enabledFeatures.contains(XPackField.MONITORING));
    builder.put(XPackSettings.WATCHER_ENABLED.getKey(),
        enabledFeatures.contains(XPackField.WATCHER));
    builder.put(XPackSettings.GRAPH_ENABLED.getKey(), enabledFeatures.contains(XPackField.GRAPH));
    builder.put(XPackSettings.MACHINE_LEARNING_ENABLED.getKey(),
        enabledFeatures.contains(XPackField.MACHINE_LEARNING));
    builder.put(MachineLearningField.AUTODETECT_PROCESS.getKey(), false);
    return builder.build();
}

@Override
protected boolean ignoreExternalCluster() {
    return true;
}

@Override
protected boolean addTestZenDiscovery() {
    return false;
}

public static class TribeAwareTestZenDiscoveryPlugin extends TestZenDiscovery.TestPlugin {

    public TribeAwareTestZenDiscoveryPlugin(Settings settings) {
        super(settings);
    }

    @Override
    public Settings additionalSettings() {
        if (settings.getGroups("tribe", true).isEmpty()) {
            return super.additionalSettings();
        } else {
            return Settings.EMPTY;
        }
    }
}

public static class MockTribePlugin extends TribePlugin {

    public MockTribePlugin(Settings settings) {

}
super(settings);
}

protected Function<Settings, Node> nodeBuilder(Path configPath) {
    return settings -> new MockNode(new Environment(settings, configPath), internalCluster().getPlugins());
}

@Override
protected Collection<Class<? extends Plugin>> nodePlugins() {
    ArrayList<Class<? extends Plugin>> plugins = new ArrayList<>();
    plugins.add(MockTribePlugin.class);
    plugins.add(TribeAwareTestZenDiscoveryPlugin.class);
    plugins.add(CompositeTestingXPackPlugin.class);
    plugins.add(CommonAnalysisPlugin.class);
    return plugins;
}

@Override
protected final Collection<Class<? extends Plugin>> transportClientPlugins() {
    ArrayList<Class<? extends Plugin>> plugins = new ArrayList<>();
    plugins.add(MockTribePlugin.class);
    plugins.add(TribeAwareTestZenDiscoveryPlugin.class);
    plugins.add(XPackClientPlugin.class);
    plugins.add(CommonAnalysisPlugin.class);
    return plugins;
}

public void testTribeSetup() throws Exception {
    NodeConfigurationSource nodeConfigurationSource = new NodeConfigurationSource() {
        @Override
        public Settings nodeSettings(int nodeOrdinal) {
            return TribeTransportTestCase.this.nodeSettings(nodeOrdinal);
        }

        @Override
        public Path nodeConfigPath(int nodeOrdinal) {
            return null;
        }

        @Override
        public Collection<Class<? extends Plugin>> nodePlugins() {
            return TribeTransportTestCase.this.nodePlugins();
        }

        @Override
        public Settings transportClientSettings() {
            return TribeTransportTestCase.this.transportClientSettings();
        }
    }
```java
@javax.annotation.ParametersAreNonnullByDefault
public Collection<Class<? extends Plugin>> transportClientPlugins() {
    return TribeTransportTestCase.this.transportClientPlugins();
}

final InternalTestCluster cluster2 = new InternalTestCluster(
    randomLong(), createTempDir(), true, true, 2, 2,
    UUIDs.randomBase64UUID(random()), nodeConfigurationSource, 1, false, "tribe_node2",
    getMockPlugins(), getClientWrapper());

cluster2.beforeTest(random(), 0.0);

logger.info("create 2 indices, test1 on t1, and test2 on t2");
assertAcked(internalCluster().client().admin().indices().prepareCreate("test1").get());
assertAcked(cluster2.client().admin().indices().prepareCreate("test2").get());
ensureYellow(internalCluster());
ensureYellow(cluster2);
//    Map<String,String> asMap = internalCluster().getDefaultSettings().getAsMap();
    Settings.Builder tribe1Defaults = Settings.builder();
    Settings.Builder tribe2Defaults = Settings.builder();
    internalCluster().getDefaultSettings().keySet().forEach(k -> {
        if (k.startsWith("path.") == false) {
            tribe1Defaults.copy(k, internalCluster().getDefaultSettings());
            tribe2Defaults.copy(k, internalCluster().getDefaultSettings());
        }
    });
    tribe1Defaults.normalizePrefix("tribe.t1.");
    tribe2Defaults.normalizePrefix("tribe.t2.");
    // give each tribe it's unicast hosts to connect to
    tribe1Defaults.putList("tribe.t1." + SettingsBasedHostsProvider.DISCOVERY_ZEN_PING_UNICAST_HOSTS_SETTING.getKey(),
        getUnicastHosts(internalCluster().client()));
    tribe1Defaults.putList("tribe.t2." + SettingsBasedHostsProvider.DISCOVERY_ZEN_PING_UNICAST_HOSTS_SETTING.getKey(),
        getUnicastHosts(cluster2.client()));

    Settings merged = Settings.builder()
        .put("tribe.t1.cluster.name", internalCluster().getClusterName())
        .put("tribe.t2.cluster.name", cluster2.getClusterName())
        .put("tribe.t1.transport.tcp.port", 0)
        .put("tribe.t2.transport.tcp.port", 0)
        .put("tribe.t1.transport.type", getTestTransportType())
        .put("tribe.t2.transport.type", getTestTransportType())
        .put("tribe.blocks.write", false)
        .put(tribe1Defaults.build())
        .put(tribe2Defaults.build())
```

.put(NetworkModule.HTTP_ENABLED.getKey(), false)
.put(internalCluster().getDefaultSettings())
.put(XPackSettings.SECURITY_ENABLED.getKey(), false) // otherwise it conflicts with mock transport
.put(XPackSettings.MACHINE_LEARNING_ENABLED.getKey(), false)
.put(MachineLearningField.AUTODETECT_PROCESS.getKey(), false)
.put("tribe.t1." + XPackSettings.SECURITY_ENABLED.getKey(), false)
.put("tribe.t2." + XPackSettings.SECURITY_ENABLED.getKey(), false)
.put("tribe.t1." + XPackSettings.WATCHER_ENABLED.getKey(), false)
.put("tribe.t2." + XPackSettings.WATCHER_ENABLED.getKey(), false)
.put("tribe.t1." + XPackSettings.MACHINE_LEARNING_ENABLED.getKey(), false)
.put("tribe.t2." + XPackSettings.MACHINE_LEARNING_ENABLED.getKey(), false)
.put("tribe.t1." + MachineLearningField.AUTODETECT_PROCESS.getKey(), false)
.put("tribe.t2." + MachineLearningField.AUTODETECT_PROCESS.getKey(), false)
.put("node.name", "tribe_node") // make sure we can identify threads from this node
.put("transport.type", getTestTransportType())
.build();

final List<Class<? extends Plugin>> mockPlugins = Arrays.asList(MockTribePlugin.class,
TribeAwareTestZenDiscoveryPlugin.class,
getTestTransportPlugin(), Deprecation.class, Graph.class, Logstash.class, MachineLearning.class,
Monitoring.class,
Security.class, Upgrade.class, Watcher.class, XPackPlugin.class);
final Node tribeNode = new MockNode(merged, mockPlugins).start();
Client tribeClient = tribeNode.client();

logger.info("wait till tribe has the same nodes as the 2 clusters");
assertBusy(() -> {
    DiscoveryNodes tribeNodes = tribeNode.client().admin().cluster().prepareState().get().getNodes();
    assertThat(countDataNodesForTribe("t1", tribeNodes), equalTo(internalCluster().client().admin().cluster().prepareState().get().getNodes().getDataNodes().size()));
    assertThat(countDataNodesForTribe("t2", tribeNodes), equalTo(cluster2.client().admin().cluster().prepareState().get().getNodes().getDataNodes().size()));
});
logger.info(" --> verify transport actions for tribe node");
verifyActionOnTribeNode(tribeClient);
logger.info(" --> verify transport actions for data node");
verifyActionOnDataNode(randomBoolean() ? internalCluster() : cluster2).dataNodeClient());
logger.info(" --> verify transport actions for master node");
verifyActionOnMasterNode((randomBoolean() ? internalCluster() : cluster2).masterClient());
logger.info(" --> verify transport actions for client node");
verifyActionOnClientNode((randomBoolean() ? internalCluster() : cluster2).coordOnlyNodeClient());
try {
    cluster2.wipe(Collections.<String>emptySet());
} finally {
    cluster2.afterTest();
}
tribeNode.close();
cluster2.close();
}

/**
* Verify transport action behaviour on client node
*/
protected abstract void verifyActionOnClientNode(Client client) throws Exception;

/**
* Verify transport action behaviour on master node
*/
protected abstract void verifyActionOnMasterNode(Client masterClient) throws Exception;

/**
* Verify transport action behaviour on data node
*/
protected abstract void verifyActionOnDataNode(Client dataNodeClient) throws Exception;

/**
* Verify transport action behaviour on tribe node
*/
protected abstract void verifyActionOnTribeNode(Client tribeClient) throws Exception;

protected void failAction(Client client, Action action) {
try {
    client.execute(action, action.newRequestBuilder(client).request());
    fail("expected 
" + action.name() + 
" to fail");
} catch (IllegalStateException e) {
    assertThat(e.getMessage(), containsString("failed to find action"));
}
}

private void ensureYellow(TestCluster testCluster) {
    ClusterHealthResponse actionGet = testCluster.client().admin().cluster().
        .health(Requests.clusterHealthRequest().waitForYellowStatus().
        .waitForEvents(Priority.ANY).waitForNoRelocatingShards(true)).actionGet();
    if (actionGet.isTimedOut()) {
        logger.info("ensureGreen timed out, cluster state:
\n{}\n", testCluster.client().admin().cluster().
        .prepareState().get().getState(),
        testCluster.client().admin().cluster().preparePendingClusterTasks().get());
        assertThat("timed out waiting for yellow state", actionGet.isTimedOut(), equalTo(false));
    }
    assertThat(actionGet.getStatus(), anyOf(equalTo(ClusterHealthStatus.YELLOW),
    equalTo(ClusterHealthStatus.GREEN)));
}

private int countDataNodesForTribe(String tribeName, DiscoveryNodes nodes) {


int count = 0;
for (DiscoveryNode node : nodes) {
    if (!node.isDataNode()) {
        continue;
    }
    if (tribeName.equals(node.getAttributes().get("tribe.name"))) {
        count++;
    }
}
return count;

private static String[] getUnicastHosts(Client client) {
    ArrayList<String> unicastHosts = new ArrayList<>();
    NodesInfoResponse nodeInfos = client.admin().cluster().prepareNodesInfo().clear().setTransport(true).get();
    for (NodeInfo info : nodeInfos.getNodes()) {
        TransportAddress address = info.getTransport().getAddress().publishAddress();
        unicastHosts.add(address.getAddress() + ":" + address.getPort());
    }
    return unicastHosts.toArray(new String[unicastHosts.size()]);
}

import org.elasticsearch.gradle.test.ClusterConfiguration
import org.elasticsearch.gradle.test.ClusterFormationTasks
import org.elasticsearch.gradle.test.NodeInfo

apply plugin: 'elasticsearch.standalone-test'
apply plugin: 'elasticsearch.standalone-rest-test'
apply plugin: 'elasticsearch.rest-test'

dependencies {
    testCompile project(path: ':modules:tribe', configuration: 'runtime')
    testCompile project(path: xpackProject('plugin').path, configuration: 'testArtifacts')

    // TODO: remove all these test deps, this is completely bogus, guava is being force upgraded
    testCompile project(path: xpackModule('deprecation'), configuration: 'runtime')
    testCompile project(path: xpackModule('graph'), configuration: 'runtime')
    testCompile project(path: xpackModule('logstash'), configuration: 'runtime')
    testCompile project(path: xpackModule('ml'), configuration: 'runtime')
    testCompile project(path: xpackModule('monitoring'), configuration: 'runtime')
    testCompile project(path: xpackModule('security'), configuration: 'runtime')
    testCompile project(path: xpackModule('upgrade'), configuration: 'runtime')
    testCompile project(path: xpackModule('watcher'), configuration: 'runtime')
    testCompile project(path: xpackModule('core'), configuration: 'testArtifacts')
    testCompile project(path: xpackModule('monitoring'), configuration: 'testArtifacts')
}
compileTestJava.options.compilerArgs << "-Xlint:-rawtypes,-unchecked"
namingConventions.skipIntegTestInDisguise = true

test {
  /*
   * We have to disable setting the number of available processors as tests in the same JVM randomize processors and
   * will step on each
   * other if we allow them to set the number of available processors as it's set-once in Netty.
   */
  systemProperty 'es.set.netty.runtime.available.processors', 'false'
  include '**/*.Tests.class'
}

String licensePath = xpackProject('license-tools').projectDir.toPath().resolve('src/test/resources').toString()

sourceSets {
  test {
    resources {
      srcDirs += [licensePath]
    }
  }
}

project.forbiddenPatterns {
  exclude '**/*.key'
}

task setupClusterOne {}
ClusterConfiguration cluster1Config = new ClusterConfiguration(project)
cluster1Config.clusterName = 'cluster1'
cluster1Config.setting('node.name', 'cluster1-node1')
  // x-pack
  cluster1Config.setting('xpack.monitoring.enabled', false)
  cluster1Config.setting('xpack.security.enabled', false)
  cluster1Config.setting('xpack.watcher.enabled', false)
  cluster1Config.setting('xpack.graph.enabled', false)
  cluster1Config.setting('xpack.ml.enabled', false)

List<NodeInfo> cluster1Nodes = ClusterFormationTasks.setup(project, 'clusterOne', setupClusterOne,
  cluster1Config)

task setupClusterTwo {}
ClusterConfiguration cluster2Config = new ClusterConfiguration(project)
cluster2Config.clusterName = 'cluster2'
cluster2Config.setting('node.name', 'cluster2-node1')
  // x-pack
  cluster2Config.setting('xpack.monitoring.enabled', false)
  cluster2Config.setting('xpack.security.enabled', false)
  cluster2Config.setting('xpack.ml.enabled', false)
cluster2Config.setting('xpack.watcher.enabled', false)
cluster2Config.setting('xpack.graph.enabled', false)
cluster2Config.setting('xpack.ml.enabled', false)

List<NodeInfo> cluster2Nodes = ClusterFormationTasks.setup(project, 'clusterTwo', setupClusterTwo, cluster2Config)

integTestCluster {
    dependsOn setupClusterOne, setupClusterTwo
    setting 'node.name', 'tribe-node'
    setting 'tribe.on_conflict', 'prefer_cluster1'
    setting 'tribe.cluster1.cluster.name', 'cluster1'
    setting 'tribe.cluster1.discovery.zen.ping.unicast.hosts', """${-> cluster1Nodes.get(0).transportUri()}"""
    setting 'tribe.cluster1.http.enabled', 'true'
    setting 'tribe.cluster1.http.port', '0'
    setting 'tribe.cluster1.transport.tcp.port', '0'
    setting 'tribe.cluster1.xpack.monitoring.enabled', false
    setting 'tribe.cluster1.xpack.security.enabled', false
    setting 'tribe.cluster1.xpack.watcher.enabled', false
    setting 'tribe.cluster1.xpack.graph.enabled', false
    setting 'tribe.cluster1.xpack.ml.enabled', false
    setting 'tribe.cluster1.xpack.license.self_generated.type', 'trial'
    setting 'tribe.cluster2.cluster.name', 'cluster2'
    setting 'tribe.cluster2.discovery.zen.ping.unicast.hosts', """${-> cluster2Nodes.get(0).transportUri()}"""
    setting 'tribe.cluster2.http.enabled', 'true'
    setting 'tribe.cluster2.http.port', '0'
    setting 'tribe.cluster2.transport.tcp.port', '0'
    setting 'tribe.cluster2.xpack.monitoring.enabled', false
    setting 'tribe.cluster2.xpack.security.enabled', false
    setting 'tribe.cluster2.xpack.watcher.enabled', false
    setting 'tribe.cluster2.xpack.graph.enabled', false
    setting 'tribe.cluster2.xpack.ml.enabled', false
    setting 'tribe.cluster2.xpack.license.self_generated.type', 'trial'
    // x-pack
    setting 'xpack.monitoring.enabled', false
    setting 'xpack.monitoring.enabled', false
    setting 'xpack.security.enabled', false
    setting 'xpack.watcher.enabled', false
    setting 'xpack.graph.enabled', false
    setting 'xpack.ml.enabled', false
    setting 'xpack.license.self_generated.type', 'trial'
    waitCondition = { node, ant ->
        File tmpFile = new File(node.cwd, 'wait.success')
        // 5 nodes: tribe + clusterOne (1 node + tribe internal node) + clusterTwo (1 node + tribe internal node)
                dest: tmpFile.toString(),
...
ignoreerrors: true,
retries: 10)
return tmpFile.exists()
}
}

integTestRunner {
/*
* We have to disable setting the number of available processors as tests in the same JVM randomize processors and
* will step on each
* other if we allow them to set the number of available processors as it's set-once in Netty.
*/
systemProperty 'es.set.netty.runtime.available.processors', 'false'
systemProperty 'tests.cluster', "{$-> cluster1Nodes.get(0).transportUri()}
"
systemProperty 'tests.cluster2', "{$-> cluster2Nodes.get(0).transportUri()}
"
systemProperty 'tests.tribe', "{$-> integTest.nodes.get(0).transportUri()}
"
finalizedBy 'clusterOne#stop'
finalizedBy 'clusterTwo#stop'
}
---

teardown:
- do:
xpack.license.post:
  acknowledge: true
  body: |
  [{"licenses":[]}]"3aa62ffe-36e1-4fad-bfd-de-9df8301eb22","type":"trial","issue_date_in_millis":1523456691721,"expiry_date_in_millis":1838816691721,"maximumnodes":5,"issued_to":"customer","issuer":"elasticsearch","signature":"AAAAABAAAAA2kWNcuc+DT0lrlmYZKA AAAAIo5x6hrsGh1GqqrJmyq4gmEC7gK0U4zQ6qZEMhnm4jAAAAEn6fG9y2VxkBn2T3D5hffh56kz0QOD COhr0y2d17ZSIIMZRq07ZywPCWN51aR33GhiHknTER0ysMLOxMH/gXavhyRvMBnldj0UBKzuvpTawSNmx YtcqN8mSBlyJC7ki+i1SpAILC2Z9fnfRlwQxBIwYn7xnZgw9DKKOWru/ipTPObo7jcePIL8VT6nWFe7/h CFDQTFUZjQvd=|4nq7A1PacHGNxGdfbMVmAXCXXGwK0Rt3clo9/vadgo+iNyh1spQ9mN7gwsVAKtA1Frp H2EXXYybI0sSpBvUmhYMgErlg1k3/CbS0pCWLKOaX1xTMayosdZOjagU3auZXY","start_date_in_millis":"-1}
"
---
"Installing and getting license works":

## current license version
- do:
xpack.license.post:
  acknowledge: true
  body: |
  [{"licenses":[]}]"894371dc-9t49-4997-93cb-802e37afa68","type":"trial","issue_date_in_millis":1411948800000,"expiry_date_in_millis":1916956799999,"maximumnodes":1,"issued_to":"generated","issuer":"generated","signature":"AAAAAgAAAA0FWh0T9njHtjQ2qamAppAAABmC 9ZN0hjZDBGYnYVxRXpCOW5Bb3fJiZDAxOWpSBTvOMVzWuRxfVkiPSmzmkdZdW51MlhiTHN0n1N2NMMX vRFk4d3JTZex3R3RRZ0pzU3lohWJKZnQvSEFv0dpTHBkwkprZWSQh9iNmRQknu1SlpL0nlDaZCS095M XRGN11IZipYcVVTTHnFrcTE2dzHjZmZrdFqR3jJQeGxwboU0MXZ0dDJHSEriZTVL0HNaSDByWnpoZEpZH
BEZjUrTVbXRENNSXNsWWjZllaODdzVmEzUjNiWktWNGM5TUhzQV2plaUo4Q1JOuM4MXNuL0pSOEhQa
VB2a2zhmUk9QVzhFeTf0M1Q0RnJXSG53MWk2K055c28zSmRnVkJ1b2JSQkFLV2XUmVHNDZ2R3o2VE1q
bVNQ5S2isOHN5bUrErZlIWKzSVMzIWEtaSU9wTTJENDVvT1NCYklaUCYYK2FwRW9xa0t6dlMdmMzSGiQ
c3FWOTfzZ3UcXMvQktzRUZwMFJnZzlvL2d2bDRWzhu6U5pdENGWFReXNKKkE9PQAAAQBZhvozA0
ttxhUZlqbaTkSrn9C5KY6pqv68y1pgnBpZC1k8kX1srgoFnnllbQx6l1Jwfw5qnnYNH3hRTO9EyaCBqaLk8
NXZQ6TrRkSpEmnBwAYUkZexKxsuBoOk4BmzwCt/8aMAkzTrIrBtBbgog+57caU9y37Gkdd+1jXCQxP+jO
EU7gnXWzvE6oeRroLvCt1fYn909CF8KKBtrPTstC6igZ3ruvTHyec74XQ9PRavvHax73T4OUEdQQZX/Piib5
QfWKbBRD5YQ1POYVkJTaxoTsNTLnxFeEcAkkATZJLhpBEHST7kZWjrTS6j1dCRE7c7a8Vsj/78HXvOly"[1]

- match: { license_status: "valid" }

- do:
  xpack.license.get: {}

## a license object has 11 attributes

- length: { license: 11 }

## bwc for licenses format

- do:
  xpack.license.post:
    acknowledge: true
    body: |
      "{"licenses":[{"uid":"893361dc-9749-4997-3cb-
43fdaa8"},"type":"gold","issue_date_in_millis":1411948800000,"expiry_date_in_millis":1914278399999,"ma
x_nodes":1,"issued_to":null,"issuer":null,"signature":null,"status":"valid"}]

- match: { license_status: "valid" }

- do:
  xpack.license.get: {}

## license version: 1.x

- do:
  xpack.license.post:

- length: { license: 11 }

### version 4.0
acknowledge: true

body:

"licenses": [{ "uid": "893361dc-9749-4997-93cb-802e3d7fa4a8", "type": "subscription", "subscription_type": "gold", "issue_date_in_millis": 1419488000000, "feature": "shield", "expiry_date_in_millis": 1914278399999, "max_nodes": 1, "issued_to": "issuedTo", "issuer": "issuer", "signature": "AAAAAQAAAA0LVAywwpSH94cyXr4zAAAAbnC9ZN0hjZDBGyVyRxpCOW5BbhjZDAxOWpsbTvOmMVZwUzRvKIpMsmxaZdW51MlhTHN0nI1N2MXMvRFkd4d3JTZe3R3RRZ0pzU3loboWJKZnQvSEFvaoBp
THBKwkpRZWQSqi9hMtRNQKkw1slpIN0lDaZCS095MXRGN11lZlpYcVVTnFrCtEDzhUZzmZrdFQrn3JQeGe
wxb0U0MXZ0dIJJHSErIzTVLOHNz5DByWnpozEphHBEzJUrTVbBrERNNSXNvWWJjZlalOdzVnEzUnI
WkTnNMG5TUHqV2pla0u4Q1JOUmI4MXNuL0pSOEhQaVb2azhmUk9QVzhFeTFoMIQ0RnJXSG53MwK2K
055c28zSmRrVfK1b2JSQkFLYV2xVMvVHNDZMr3o2VE1QbVQNSQ2xOHN5BueErZINIKwZSMvZmWtEaSU9wTTJ
EvnV1lNCKlc4UyYK2FvR9xa066dMMbzMgSQGc3FWoTgZ3ZUCxmXVmq2RZUwFMJnzLtZld2bDRWuzh6UG5
pdeENGWFRerreXNKNkE9PQAAAQA4qcsec/URRZVdFlwog9ydqbyQELW8YIaIyPV5XXHH
dtk+dlZlNepIDkUXhxS2wajhN8R8/4kqDfWNoDo2TUM8fTgllfSiZYGDGTGTY+ST+Sw5EavEUE5j11iBN27b
wkJ+4VYq107cm7NNKkJw4sWCAHlITU3x8F8chPKGfCHE0kQgVpVC9R082pTw0s/6rU4PILGNgfQPM0uiE5n
ucfVrty9QJqO/KA/7ZyFbo7VTVNnxZq7T77rzWZBPC9rIjptZxcWuk08Q5S+r5oJNYBo3HGBKtrCVrsZ55rceNtd
wKXXu1lWnSeir14I/ ketoQTeFLy0+1th87V8S78T88UT" } ]

- match: { license_status: "valid" }

- do:
  xpack.license.get: {}

- length: { license: 11 }

## multiple licenses version: 1.x

- do:
  xpack.license.post:
    acknowledge: true
    body:

"licenses": [{ "uid": "893361dc-9749-4997-93cb-802e3d7fa4a8", "type": "internal", "subscription_type": "none", "issue_date_in_millis": 1440892799999, "max_nodes": 1, "issued_to": "issuedTo", "issuer": "issuer", "signature": "AAAAAQAAAA04Q4ky3rFyyWLFkytEAAABmC9ZN0hjZDBGynVyrpCOW5BbhjZDAxOWpsbTvOmMVZwUzRvKIpMsmxaZdW51MlhTHN0nI1N2MXMvRFkd4d3JTZe3R3RRZ0pzU3loboWJKZnQvSEFvaoBp
THBKwkpRZWQSqi9hMtRNQKkw1slpIN0lDaZCS095MXRGN11lZlpYcVVTnFrCtEDzhUZzmZrdFQrn3JQeGe
wxb0U0MXZ0dIJJHSErIzTVLOHNz5DByWnpozEphHBEzJUrTVbBrERNNSXNvWWJjZlalOdzVnEzUnI
WkTnNMG5TUHqV2pla0u4Q1JOUmI4MXNuL0pSOEhQaVb2azhmUk9QVzhFeTFoMIQ0RnJXSG53MwK2K
055c28zSmRrVfK1b2JSQkFLYV2xVMvVHNDZMr3o2VE1QbVQNSQ2xOHN5BueErZINIKwZSMvZmWtEaSU9wTTJ
EvnV1lNCKlc4UyYK2FvR9xa066dMMbzMgSQGc3FWoTgZ3ZUCxmXVmq2RZUwFMJnzLtZld2bDRWuzh6UG5
pdeENGWFRerreXNKNkE9PQAAAQA4qcsec/URRZVdFlwog9ydqbyQELW8YIaIyPV5XXHH
dtk+dlZlNepIDkUXhxS2wajhN8R8/4kqDfWNoDo2TUM8fTgllfSiZYGDGTGTY+ST+Sw5EavEUE5j11iBN27b
wkJ+4VYq107cm7NNKkJw4sWCAHlITU3x8F8chPKGfCHE0kQgVpVC9R082pTw0s/6rU4PILGNgfQPM0uiE5n
ucfVrty9QJqO/KA/7ZyFbo7VTVNnxZq7T77rzWZBPC9rIjptZxcWuk08Q5S+r5oJNYBo3HGBKtrCVrsZ55rceNtd
wKXXu1lWnSeir14I/ ketoQTeFLy0+1th87V8S78T88UT" } ]

- do:
  xpack.license.get: {}

- length: { license: 11 }
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- match: { license_status: "valid" }
  
  - do:
    xpack.license.get: {}
    
  - length: { license: 11 }

- match: { license.uid: "893361dc-9749-4997-93cb-802e3dofh7aa" }

---

"Should throw 404 after license deletion":

- do:
  xpack.license.delete: {}

- match: { acknowledged: true }

- do:
  xpack.license.get: {}
  catch: missing

---

"Should install a feature type license":

# VERSION_NO_FEATURE_TYPE license version

- do:
  xpack.license.post:
    acknowledge: true
    body: |
      
      ["license": {"uid":"893361dc-9749-4997-93cb-802e3d7fa4a8"},"type":"gold","issue_date_in_millis":1411948800000,"expiry_date_in_millis":1914278399999,"max_nodes":1,"issued_to":null,"issuer":null,"signature":null]
- do:
  xpack.license.get: {}
- length: { license: 11 }
---
"Cannot start basic":
- do:
  catch: bad_request
  xpack.license.post:
  acknowledge: true
  body: |
    {"license": {"uid": "893361dc-9749-4997-93cb-802e3d7fa4a8", "type": "basic", "issue_date_in_millis": 1411948800000, "expiry_date_in_millis": 1914278399999, "max_nodes": 1, "issued_to": "issuedTo", "issuer": "issuer", "signature": "AAAAAgAAAA0lKPZ0a7aZquUltho/AAABmA9Zf0hjzDBGyNvRxyRxpxCOW5Bb5fjZdAxFOWpShbTVonMVZwUrzxK1Ps5mXkaxZdW51MiNt8lTHvOvNlNl2XMMxRFk4d3TJZEx3R3RRZ0puz3U3lobWJKZnQvSFEvapopTHBkWkprZWZSQi9iNmRQkw1SlpLN01DalZCSo95MXRGN11IIZpYeVTTHnFrceTE2drhJZmZrdFGrM3jQeGxwboU0MXZ0dDH5sEriZTVL0H3nSDByWnpoZEpiZHEZjUrTVBxRENNXXSNWjZlflaOdzVmEuzmJnlKwtNWMGM5TUohVQ2pUo4Q1JOulM4MXNuL0pSOEhQaVB2azhmUt9QVzhFsTfOMIq0RnIXSG53Mwk2K055c28sSmRnVkJf1b2JSqFLV2XUmVHNDZ2R3o2VE1qubVNQs2IxOHN5bUErZINIKwKZVsmZlWetuSU9w9TJENDVDv1TNYkIklcUYyK2FwRW9xa0t6dMdBmMzMzGtQc3FWQOFgzzZUcXMvQk2RUZwMFJnZzIVL2d2bDRWUzh6UG5pdENGFtRenXNKKnk9EPQAAQQAAALu4Q43S1G6SzoelXVJ6Z4CICXORDrYQ+wlDCeey0XdujTsAQj+k+VNo6wauc7Usiw01esHu4lbf5gvyKy7RRCbb5bJz2ubu2qMjopp9BQyD7DQvVfQmG6seUMJwJi5Avvmm9r4i1YPSPcrri3hBK2e116jK6NisbVnTyXkYGC3rBWTSejPDhge6FyvodyvZ37s1L5tBPWcNAkmweyHjDInyYnbeZZ07A3NmbXZjW7Tfd8/YwQyE00PmcJf7TVY3hKkPaEhf8aaJbqkKYbqZuER3EWJTXZLVb1dNdNg8aXSn7YrkQcvWgqTYQpfV+D7eyEj45muAholer"}}

- match: { error.root_cause.0.reason: 'Installing basic licenses is no longer allowed. Use the POST /_xpack/license/start_basic API to install a basic license that does not expire.' }  
---
"Should fail gracefully when body content is not provided":
- do:
  catch: bad_request
  xpack.license.post:
  acknowledge: true
  body: |
    {"license": {"uid": "89361dc-9749-4997-93cb-802e3d7fa4a8", "type": "basic", "issue_date_in_millis": 1411948800000, "expiry_date_in_millis": 1914278399999, "max_nodes": 1, "issued_to": "issuedTo", "issuer": "issuer", "signature": "AAAAAgAAAA0lKPZ0a7aZquUltho/AAABmA9Zf0hjzDBGyNvRxyRxpxCOW5Bb5fjZdAxFOWpShbTVonMVZwUrzxK1Ps5mXkaxZdW51MiNt8lTHvOvNlNl2XMMxRFk4d3TJZEx3R3RRZ0puz3U3lobWJKZnQvSFEvapopTHBkWkprZWZSQi9iNmRQkw1SlpLN01DalZCSo95MXRGN11IIZpYeVTTHnFrceTE2drhJZmZrdFGrM3jQeGxwboU0MXZ0dDH5sEriZTVL0H3nSDByWnpoZEpiZHEZjUrTVBxRENNXXSNWjZlflaOdzVmEuzmJnlKwtNWMGM5TUohVQ2pUo4Q1JOulM4MXNuL0pSOEhQaVB2azhmUt9QVzhFsTfOMIq0RnIXSG53Mwk2K055c28sSmRnVkJf1b2JSqFLV2XUmVHNDZ2R3o2VE1qubVNQs2IxOHN5bUErZINIKwKZVsmZlWetuSU9w9TJENDVDv1TNYkIklcUYyK2FwRW9xa0t6dMdBmMzMzGtQc3FWQOFgzzZUcXMvQk2RUZwMFJnZzIVL2d2bDRWUzh6UG5pdENGFtRenXNKKnk9EPQAAQQAAALu4Q43S1G6SzoelXVJ6Z4CICXORDrYQ+wlDCeey0XdujTsAQj+k+VNo6wauc7Usiw01esHu4lbf5gvyKy7RRCbb5bJz2ubu2qMjopp9BQyD7DQvVfQmG6seUMJwJi5Avvmm9r4i1YPSPcrri3hBK2e116jK6NisbVnTyXkYGC3rBWTSejPDhge6FyvodyvZ37s1L5tBPWcNAkmweyHjDInyYnbeZZ07A3NmbXZjW7Tfd8/YwQyE00PmcJf7TVY3hKkPaEhf8aaJbqkKYbqZuER3EWJTXZLVb1dNdNg8aXSn7YrkQcvWgqTYQpfV+D7eyEj45muAholer"}}

- match: { error.root_cause.0.reason: 'The license must be provided in the request body' }  
---
"Current license is trial means not eligible to start trial":

- do:
  xpack.license.get_trial_status: {}

- match: { eligible_to_start_trial: false }

- do:
  xpack.license.post_start_basic:
    acknowledge: true

- match: { basic_was_started: true }

- do:
  xpack.license.get_trial_status: {}

- match: { eligible_to_start_trial: false }

- do:
  catch: forbidden
  xpack.license.post_start_trial:
    acknowledge: true

- match: { trial_was_started: false }
- match: { error_message: "Operation failed: Trial was already activated." }

---
"Trial license cannot be basic":
- do:
  catch: bad_request
  xpack.license.post_start_trial:
    type: "basic"
    acknowledge: true

---
"Can start basic license if do not already have basic":
- do:
  xpack.license.get_basic_status: {}

- match: { eligible_to_start_basic: true }

- do:
  xpack.license.post_start_basic:
    acknowledge: true

- match: { basic_was_started: true }
- match: { acknowledged: true }

- do:
  xpack.license.get_basic_status: {}
- match: { eligible_to_start_basic: false }

- do:
  catch: forbidden
  xpack.license.post_start_basic: {}

- match: { basic_was_started: false }
- match: { acknowledged: true }
- match: { error_message: "Operation failed: Current license is basic." }

---

"Must acknowledge to start basic":
- do:
  xpack.license.post_start_basic: {}

- match: { basic_was_started: false }
- match: { acknowledged: false }
- match: { error_message: "Operation failed: Needs acknowledgement." }

"xpack.license.post_start_trial": 
  "methods": ["POST"],
  "url": {
    "path": "/_xpack/license/start_trial",
    "paths": ["/_xpack/license/start_trial"],
    "parts": {},
  },
  "params": {
    "type": {
      "type" : "string",
      "description" : "The type of trial license to generate (default: \"trial\")"
    },
    "acknowledge": {
      "type" : "boolean",
      "description" : "whether the user has acknowledged acknowledge messages (default: false)"
    }
  }
  },
  "body": null

"xpack.license.get": 
  "methods": ["GET"],
  "url": {
    "path": "/_xpack/license",
    "paths": ["/_xpack/license"],
    "parts": {
"params": { 
  "local": { 
    "type": "boolean",
    "description": "Return local information, do not retrieve the state from master node (default: false)"
  }
},
"body": null
},
"xpack.license.delete": {
  "methods": ["DELETE"],
  "url": { 
    "path": "/_xpack/license",
    "paths": ["/_xpack/license"],
    "parts" : {} 
  },
  "body": null
},
"xpack.license.get_basic_status": {
  "methods": ["GET"],
  "url": { 
    "path": "/_xpack/license/basic_status",
    "paths": ["/_xpack/license/basic_status"],
    "parts" : {} 
  },
  "params": {
    "local": {} 
  },
  "body": null
},
"xpack.license.post": {
  "methods": ["PUT", "POST"],
  "url": { 
    "path": "/_xpack/license",
    "paths": ["/_xpack/license"],
    "parts" : {} 
  },
  "params": { 
    "local": {} 
  },
  "body": null
}
"acknowledge": {
  "type": "boolean",
  "description": "whether the user has acknowledged acknowledge messages (default: false)"
}
}
}
"body": {
  "description": "licenses to be installed"
}
}
}
"xpack.license.post_start_basic": {
  "methods": ["POST"],
  "url": {
    "path": "/_xpack/license/start_basic",
    "paths": ["/_xpack/license/start_basic"],
    "parts": {
    },
    "params": {
      "acknowledge": {
        "type": "boolean",
        "description": "whether the user has acknowledged acknowledge messages (default: false)"
      }
    },
    "body": null
  }
}
"xpack.license.get_trial_status": {
  "methods": ["GET"],
  "url": {
    "path": "/_xpack/license/trial_status",
    "paths": ["/_xpack/license/trial_status"],
    "parts": {
    },
    "params": {
    }
  },
  "body": null
}
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{
  "metadata": {
    "name": "X-Pack Monitoring: License Expiration",
    "xpack": {
      "link": "license",
      "expires_days": [ 60, 30, 14, 7 ],
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      "version_created": 6040099,
      "watch": "${monitoring.watch.id}"}
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"source": "if (ctx.payload.check.hits.total == 0) {return false;}def license =
ctx.payload.check.hits.hits[0]._source.license;if (license == null) {return false;}ctx.vars.fails_check = false;Instant
expiry = Instant.ofEpochMilli(license.expiry_date_in_millis);ctx.vars.expiry = expiry;if (license.status != 'active')
{ctx.vars.expired = true;ctx.vars.fails_check = true;ctx.metadata.xpack.severity = 2001;} else {Instant now =
Instant.ofEpochMilli(new Date().getTime());ctx.vars.now = now;for (int i = ctx.metadata.xpack.expires_days.length
- 1;i > -1;--i) {if (license.type == 'trial' && i < 2) {break;}Instant fromNow =
now.plusSeconds(ctx.metadata.xpack.expires_days[i] * 24 * 60 * 60);if (fromNow.isAfter(expiry))
{ctx.vars.fails_check = true;ctx.metadata.xpack.severity = i * 1000;break;}}}ctx.vars.not_resolved =
(ctx.payload.alert.hits.total == 1 && ctx.payload.alert.hits.hits[0]._source.resolved_timestamp ==
null);ctx.vars.update = ctx.vars.fails_check || ctx.vars.not_resolved;"
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},
"transform": {
"script": {
"source": "ctx.vars.email_recipient = (ctx.payload.kibana_settings.hits.total > 0 &&
ctx.payload.kibana_settings.hits.hits[0]._source.kibana_settings.xpack != null) ?
ctx.payload.kibana_settings.hits.hits[0]._source.kibana_settings.xpack.default_admin_email : null;ctx.vars.is_new =
ctx.vars.fails_check && !ctx.vars.not_resolved;ctx.vars.is_resolved = !ctx.vars.fails_check &&
ctx.vars.not_resolved;def alertMessage = null;if (ctx.vars.fails_check) { alertMessage = 'Update your license.';} if
(ctx.vars.not_resolved) { ctx.payload = ctx.payload.alert.hits.hits[0]._source;ctx.payload.metadata =
ctx.metadata.xpack;if (ctx.vars.fails_check == false) { ctx.payload.resolved_timestamp = ctx.execution_time;} }
else { ctx.payload = [ 'timestamp': ctx.execution_time, 'prefix': 'This cluster\\'s license is going to expire in
{{#relativeTime}}metadata.time{{/relativeTime}} at {{#absoluteTime}}metadata.time{{/absoluteTime}}.',
'message': alertMessage, 'metadata': ctx.metadata.xpack ];} if (ctx.vars.fails_check) { ctx.payload.metadata.time =
ctx.vars.expiry.toString();} ctx.payload.update_timestamp = ctx.execution_time;return ctx.payload;"
}
},
"actions": {
"add_to_alerts_index": {
"index": {
"index": ".monitoring-alerts-6",
"doc_type": "doc",

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1076


"doc_id": "${monitoring.watch.unique_id}"
],
"send_email_to_admin": {
  "condition": {
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    "from": "X-Pack Admin <{{ctx.vars.email_recipient}}>",
    "subject": "[[#ctx.vars.is_new]]NEW[[/ctx.vars.is_new]]{{#ctx.vars.is_resolved}}RESOLVED[/ctx.vars.is_resolved][ctx.metadata.name]]",
    "body": {
      "text": "{{#ctx.vars.is_resolved}}This cluster alert has been resolved: [/ctx.vars.is_resolved]} This cluster's license [[#ctx.vars.is_new]]is going to expire on[/ctx.payload.metadata.time]{{#ctx.vars.is_new}}was going to expire[/ctx.payload.metadata.time]{{#ctx.vars.is_resolved}}. [/ctx.vars.is_new]"
    }
  }
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 */
package org.elasticsearch.license;

import org.elasticsearch.ElasticsearchSecurityException;
import org.elasticsearch.action.support.PlainActionFuture;
import org.elasticsearch.action.support.master.AcknowledgedResponse;
import org.elasticsearch.client.transport.TransportClient;
import org.elasticsearch.cluster.ClusterState;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.common.unit.TimeValue;
import org.elasticsearch.common.xcontent.XContentType;
import org.elasticsearch.license.License.OperationMode;
import org.elasticsearch.persistent.PersistentTasksCustomMetaData;
import org.elasticsearch.rest.RestStatus;
import org.elasticsearch.test.junit.annotations.TestLogging;
import org.elasticsearch.transport.Transport;
import org.elasticsearch.xpack.core.TestXPackTransportClient;
import org.elasticsearch.xpack.core.XPackField;
import org.elasticsearch.xpack.core.ml.action.CloseJobAction;
import org.elasticsearch.xpack.core.ml.action.DeleteDatafeedAction;

import org.elasticsearch.ElasticsearchSecurityException;
import org.elasticsearch.action.support.PlainActionFuture;
import org.elasticsearch.action.support.master.AcknowledgedResponse;
import org.elasticsearch.client.transport.TransportClient;
import org.elasticsearch.cluster.ClusterState;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.common.unit.TimeValue;
import org.elasticsearch.common.xcontent.XContentType;
import org.elasticsearch.license.License.OperationMode;
import org.elasticsearch.persistent.PersistentTasksCustomMetaData;
import org.elasticsearch.rest.RestStatus;
import org.elasticsearch.test.junit.annotations.TestLogging;
import org.elasticsearch.transport.Transport;
import org.elasticsearch.xpack.core.TestXPackTransportClient;
import org.elasticsearch.xpack.core.XPackField;
import org.elasticsearch.xpack.core.ml.action.CloseJobAction;
import org.elasticsearch.xpack.core.ml.action.DeleteDatafeedAction;
import org.elasticsearch.xpack.core.ml.action.DeleteJobAction;
import org.elasticsearch.xpack.core.ml.action.GetDatafeedsStatsAction;
import org.elasticsearch.xpack.core.ml.action.GetJobsStatsAction;
import org.elasticsearch.xpack.core.ml.action.OpenJobAction;
import org.elasticsearch.xpack.core.ml.action.PutDatafeedAction;
import org.elasticsearch.xpack.core.ml.action.PutJobAction;
import org.elasticsearch.xpack.core.ml.action.StartDatafeedAction;
import org.elasticsearch.xpack.core.ml.action.StopDatafeedAction;
import org.elasticsearch.xpack.core.ml.client.MachineLearningClient;
import org.elasticsearch.xpack.core.ml.datafeed.DatafeedState;
import org.elasticsearch.xpack.core.ml.job.config.JobState;
import org.elasticsearch.xpack.core.ml.state.MachineLearningClient;
import org.elasticsearch.xpack.ml.LocalStateMachineLearning;
import org.elasticsearch.xpack.ml.support.BaseMlIntegTestCase;
import org.junit.Before;
import java.util.Collections;
import static org.hamcrest.Matchers.containsString;
import static org.hamcrest.Matchers.hasItem;
import static org.hamcrest.Matchers.is;

@TestLogging("org.elasticsearch.xpack.ml.action:DEBUG")
public class MachineLearningLicensingTests extends BaseMlIntegTestCase {

    @Before
    public void resetLicensing() {
        enableLicensing();

        ensureStableCluster(1);
        ensureYellow();
    }

    public void testMachineLearningPutJobActionRestricted() throws Exception {
        String jobId = "testmachinelearningputjobactionrestricted";
        // Pick a license that does not allow machine learning
        License.OperationMode mode = randomInvalidLicenseType();
        enableLicensing(mode);
        assertMLAllowed(false);
        // test that license restricted apis do not work
        Settings settings = internalCluster().transportClient().settings();
        try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
            PlainActionFuture<PutJobAction.Response> listener = PlainActionFuture.newFuture();
            new MachineLearningClient(client).putJob(new PutJobAction.Request(createJob(jobId)), listener);
            listener.actionGet();
            fail("put job action should not be enabled!");
        } catch (ElasticsearchSecurityException e) {
            if (e.causedBy(ElasticsearchSecurityException.class) && e.cause().getCause() instanceof ElasticsearchSecurityException)
                // expected
            else
                throw e;
        }
    }
}
assertThat(e.status(), is(RestStatus.FORBIDDEN));
assertThat(e.getMessage(), containsString(“non-compliant”));
assertThat(e.getMetadata(LicenseUtils.EXPIRED_FEATURE_METADATA),
hasItem(XPackField.MACHINE_LEARNING));
}

// Pick a license that does allow machine learning
mode = randomValidLicenseType();
enableLicensing(mode);
assertMLAllowed(true);
// test that license restricted apis do now work
try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
    client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress());
    PlainActionFuture<PutJobAction.Response> listener = PlainActionFuture.newFuture();
    new MachineLearningClient(client).putJob(new PutJobAction.Request(createJob(jobId)), listener);
    PutJobAction.Response response = listener.actionGet();
    assertNotNull(response);
}

public void testMachineLearningOpenJobActionRestricted() throws Exception {
    String jobId = "testmachinelearningopenjobactionrestricted”;
    assertMLAllowed(true);
    // test that license restricted apis do now work
    Settings settings = internalCluster().transportClient().settings();
    try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
        client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress());
        PlainActionFuture<PutJobAction.Response> putJobListener = PlainActionFuture.newFuture();
        new MachineLearningClient(client).putJob(new PutJobAction.Request(createJob(jobId)), putJobListener);
        PutJobAction.Response response = putJobListener.actionGet();
        assertNotNull(response);
    }

    // Pick a license that does not allow machine learning
    License.OperationMode mode = randomInvalidLicenseType();
    enableLicensing(mode);
    assertMLAllowed(false);
    // test that license restricted apis do not work
    try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
        client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress());
        PlainActionFuture<AcknowledgedResponse> listener = PlainActionFuture.newFuture();
        new MachineLearningClient(client).openJob(new OpenJobAction.Request(jobId), listener);
        listener.actionGet();
        fail(“open job action should not be enabled!”);
    } catch (ElasticsearchSecurityException e) {
assertThat(e.status(), is(RestStatus.FORBIDDEN));
assertThat(e.getMessage(), containsString("non-compliant"));
assertThat(e.getMetadata(LicenseUtils.EXPIRED_FEATURE_METADATA), hasItem(XPackField.MACHINE_LEARNING));
}

// Pick a license that does allow machine learning
mode = randomValidLicenseType();
enableLicensing(mode);
assertMLAllowed(true);

// now that the license is invalid, the job should get closed:
assertBusy(() -> {
    JobState jobState = getJobStats(jobId).getState();
    assertEquals(JobState.CLOSED, jobState);
});

// test that license restricted apis do now work
try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
    client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress);
    PlainActionFuture<AcknowledgedResponse> listener = PlainActionFuture.newFuture();
    new MachineLearningClient(client).openJob(new OpenJobAction.Request(jobId), listener);
    AcknowledgedResponse response = listener.actionGet();
    assertNotNull(response);
}

public void testMachineLearningPutDatafeedActionRestricted() throws Exception {
    String jobId = "testmachinelearningputdatafeedactionrestricted";
    String datafeedId = jobId + "-datafeed";
    assertMLAllowed(true);
    // test that license restricted apis do now work
    Settings settings = internalCluster().transportClient().settings();
    try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
        client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress);
        PlainActionFuture<PutJobAction.Response> putJobListener = PlainActionFuture.newFuture();
        new MachineLearningClient(client).putJob(new PutJobAction.Request(createJob(jobId)), putJobListener);
        PutJobAction.Response putJobResponse = putJobListener.actionGet();
        assertNotNull(putJobResponse);
    }
}

// Pick a license that does not allow machine learning
License.OperationMode mode = randomInvalidLicenseType();
enableLicensing(mode);
assertMLAllowed(false);
// test that license restricted apis do not work
try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
    client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress);
    PlainActionFuture<PutDatafeedAction.Response> listener = PlainActionFuture.newFuture();
    new MachineLearningClient(client).putDatafeed(new PutDatafeedAction.Request(createDatafeed(datafeedId, jobId, Collections.singletonList(jobId))),
        listener);
    listener.actionGet();
    fail("put datafeed action should not be enabled!");
} catch (ElasticsearchSecurityException e) {
    assertThat(e.status(), is(RestStatus.FORBIDDEN));
    assertThat(e.getMessage(), containsString("non-compliant");
    assertThat(e.getMetadata(LicenseUtils.EXPIRED_FEATURE_METADATA), hasItem(XPackField.MACHINE_LEARNING));

    // Pick a license that does allow machine learning
    mode = randomValidLicenseType();
    enableLicensing(mode);
    assertMLAllowed(true);
    // test that license restricted apis do now work
    try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
        PlainActionFuture<PutDatafeedAction.Response> listener = PlainActionFuture.newFuture();
        new MachineLearningClient(client).putDatafeed(new PutDatafeedAction.Request(createDatafeed(datafeedId, jobId, Collections.singletonList(jobId))),
            listener);
        PutDatafeedAction.Response response = listener.actionGet();
        assertNotNull(response);
    }
}

public void testAutoCloseJobWithDatafeed() throws Exception {
    String jobId = "testautoclosejobwithdatafeed";
    String datafeedId = jobId + "-datafeed";
    assertMLAllowed(true);
    String datafeedIndex = jobId + "-data";
    prepareCreate(datafeedIndex).addMapping("type", "{\"type\":\"{\"properties\":\"{\"time\":\"{\"type\":\"date\"}}\"}}", XContentType.JSON).get();
    Settings settings = internalCluster().transportClient().settings();
    try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
        client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress);
        // put job
        PlainActionFuture<PutJobAction.Response> putJobListener = PlainActionFuture.newFuture();
        new MachineLearningClient(client).putJob(new PutJobAction.Request(createJob(jobId)), putJobListener);
        PutJobAction.Response putJobResponse = putJobListener.actionGet();
        // put datafeed
        PutDatafeedAction.Response putDatafeedResponse = putDatafeedResponse.actionGet();
    }
}
assertNotNull(putJobResponse);
// put datafeed
PlainActionFuture<PutDatafeedAction.Response> putDatafeedListener = PlainActionFuture.newFuture();
new MachineLearningClient(client).putDatafeed(
    new PutDatafeedAction.Request(createDatafeed(datafeedId, jobId,
            Collections.singletonList(datafeedIndex))), putDatafeedListener);
PutDatafeedAction.Response putDatafeedResponse = putDatafeedListener.actionGet();
assertNotNull(putDatafeedResponse);
// open job
PlainActionFuture<AcknowledgedResponse> openJobListener = PlainActionFuture.newFuture();
new MachineLearningClient(client).openJob(new OpenJobAction.Request(jobId), openJobListener);
AcknowledgedResponse openJobResponse = openJobListener.actionGet();
assertNotNull(openJobResponse);
// start datafeed
PlainActionFuture<AcknowledgedResponse> listener = PlainActionFuture.newFuture();
new MachineLearningClient(client).startDatafeed(new StartDatafeedAction.Request(datafeedId, 0L),
        listener);
        listener.actionGet();
}

if (randomBoolean()) {
    enableLicensing(randomInvalidLicenseType());
} else {
    disableLicensing();
}
assertMLAllowed(false);

// now that the license is invalid, the job should be closed and datafeed stopped:
assertBusy(() -> {
    JobState jobState = getJobStats(jobId).getState();
    assertEquals(JobState.CLOSED, jobState);
    DatafeedState datafeedState = getDatafeedStats(datafeedId).getDatafeedState();
    assertEquals(DatafeedState.STOPPED, datafeedState);
    ClusterState state = client().admin().cluster().prepareState().get().getState();
    PersistentTasksCustomMetaData tasks = state.metaData().custom(PersistentTasksCustomMetaData.TYPE);
    assertEquals(0, tasks.taskMap().size());
});

enableLicensing(randomValidLicenseType());
assertMLAllowed(true);

try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
    client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress());
    // open job
    PlainActionFuture<AcknowledgedResponse> openJobListener = PlainActionFuture.newFuture();
new MachineLearningClient(client).openJob(new OpenJobAction.Request(jobId), openJobListener);
AcknowledgedResponse openJobResponse = openJobListener.actionGet();
assertNotNull(openJobResponse);
// start datafeed
PlainActionFuture<AcknowledgedResponse> listener = PlainActionFuture.newFuture();
new MachineLearningClient(client).startDatafeed(new StartDatafeedAction.Request(datafeedId, 0L),
listener);
listener.actionGet();
}

assertBusy(() -> {
    JobState jobState = getJobStats(jobId).getState();
    assertEquals(JobState.OPENED, jobState);

    DatafeedState datafeedState = getDatafeedStats(datafeedId).getDatafeedState();
    assertEquals(DatafeedState.STARTED, datafeedState);

    ClusterState state = client().admin().cluster().prepareState().get().getState();
    PersistentTasksCustomMetaData tasks = state.metaData().custom(PersistentTasksCustomMetaData.TYPE);
    assertEquals(2, tasks.taskMap().size());
});

if (randomBoolean()) {
    enableLicensing(randomInvalidLicenseType());
} else {
    disableLicensing();
}
assertMLAllowed(false);

// now that the license is invalid, the job should be closed and datafeed stopped:
assertBusy(() -> {
    JobState jobState = getJobStats(jobId).getState();
    assertEquals(JobState.CLOSED, jobState);

    DatafeedState datafeedState = getDatafeedStats(datafeedId).getDatafeedState();
    assertEquals(DatafeedState.STOPPED, datafeedState);

    ClusterState state = client().admin().cluster().prepareState().get().getState();
    PersistentTasksCustomMetaData tasks = state.metaData().custom(PersistentTasksCustomMetaData.TYPE);
    assertEquals(0, tasks.taskMap().size());
});
}

public void testMachineLearningStartDatafeedActionRestricted() throws Exception {
    String jobId = "testmachinelearningstartdatafeedactionrestricted";
    String datafeedId = jobId + "-datafeed";
    assertMLAllowed(true);
    String datafeedIndex = jobId + "-data";
prepareCreate(datafeedIndex).addMapping("type", "{\"type\":{\"properties\":{\"time\":{\"type\":\"date\"}}}}").get();
// test that license restricted apis do now work
Settings settings = internalCluster().transportClient().settings();
try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
    client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress());
    PlainActionFuture<PutJobAction.Response> putJobListener = PlainActionFuture.newFuture();
    new MachineLearningClient(client).putJob(new PutJobAction.Request(createJob(jobId)), putJobListener);
    PutJobAction.Response putJobResponse = putJobListener.actionGet();
    assertNotNull(putJobResponse);
    PlainActionFuture<PutDatafeedAction.Response> putDatafeedListener = PlainActionFuture.newFuture();
    new MachineLearningClient(client).putDatafeed(new PutDatafeedAction.Request(createDatafeed(datafeedId, jobId, Collections.singletonList(datafeedIndex))), putDatafeedListener);
    PutDatafeedAction.Response putDatafeedResponse = putDatafeedListener.actionGet();
    assertNotNull(putDatafeedResponse);
    PlainActionFuture<AcknowledgedResponse> openJobListener = PlainActionFuture.newFuture();
    new MachineLearningClient(client).openJob(new OpenJobAction.Request(jobId), openJobListener);
    AcknowledgedResponse openJobResponse = openJobListener.actionGet();
    assertNotNull(openJobResponse);
}

// Pick a license that does not allow machine learning
License.OperationMode mode = randomInvalidLicenseType();
navigateToInvalidLicenseOperationMode();
assertMLAllowed(false);

// now that the license is invalid, the job should get closed:
assertBusy(() -> {
    JobState jobState = getJobStats(jobId).get();
    assertJobState(JobState.CLOSED, jobState);
    ClusterState state = client().admin().cluster().prepareState().get();
    PersistentTasksCustomMetaData tasks = state.metaData().custom(PersistentTasksCustomMetaData.TYPE);
    assertTaskState(0, tasks.taskMap().size());
});

// test that license restricted apis do not work
try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
    client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress());
    PlainActionFuture<AcknowledgedResponse> listener = PlainActionFuture.newFuture();
    new MachineLearningClient(client).startDatafeed(new StartDatafeedAction.Request(datafeedId, 0L), listener);
    listener.actionGet();
    fail("start datafeed action should not be enabled!");
    catch (ElasticsearchSecurityException e) { 
        assertThat(e.status(), is(RestStatus.FORBIDDEN));
    }
assertThat(e.getMessage(), containsString("non-compliant"));
assertThat(e.getMetadata(LicenseUtils.EXPIRED_FEATURE_METADATA),
hasItem(XPackField.MACHINE_LEARNING));
}

// Pick a license that does allow machine learning
mode = randomValidLicenseType();
ableLicenseing(mode);
assertMLAllowed(true);
// test that license restricted apis do now work
try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
    client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress());
    // re-open job now that the license is valid again
    PlainActionFuture<AcknowledgedResponse> openJobListener = PlainActionFuture.newFuture();
    new MachineLearningClient(client).openJob(new OpenJobAction.Request(jobId), openJobListener);
    AcknowledgedResponse openJobResponse = openJobListener.actionGet();
    assertNotNull(openJobResponse);

    PlainActionFuture<AcknowledgedResponse> listener = PlainActionFuture.newFuture();
    new MachineLearningClient(client).startDatafeed(new StartDatafeedAction.Request(datafeedId, 0L),
    listener);
    AcknowledgedResponse response = listener.actionGet();
    assertNotNull(response);
}

public void testMachineLearningStopDatafeedActionNotRestricted() throws Exception {
    String jobId = "testmachinelearningstopdatafeedactionnotrestricted";
    String datafeedId = jobId + ":datafeed";
    assertMLAllowed(true);
    String datafeedIndex = jobId + ":data";
    prepareCreate(datafeedIndex).addMapping("type", "{\"type\":{\"properties\":{\"time\":{\"type\":\"date\"}}}}",
    XContentType.JSON).get();
    // test that license restricted apis do now work
    Settings settings = internalCluster().transportClient().settings();
    try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
        client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress());
        PlainActionFuture<PutJobAction.Response> putJobListener = PlainActionFuture.newFuture();
        new MachineLearningClient(client).putJob(new PutJobAction.Request(createJob(jobId)), putJobListener);
        PutJobAction.Response putJobResponse = putJobListener.actionGet();
        assertNotNull(putJobResponse);

        PlainActionFuture<PutDatafeedAction.Response> putDatafeedListener = PlainActionFuture.newFuture();
        new MachineLearningClient(client).putDatafeed(new PutDatafeedAction.Request(createDatafeed(datafeedId, jobId,
        Collections.singletonList(datafeedIndex))), putDatafeedListener);
        PutDatafeedAction.Response putDatafeedResponse = putDatafeedListener.actionGet();
    }
assertNotNull(putDatafeedResponse);
PlainActionFuture<AcknowledgedResponse> openJobListener = PlainActionFuture.newFuture();
new MachineLearningClient(client).openJob(new OpenJobAction.Request(jobId), openJobListener);
AcknowledgedResponse openJobResponse = openJobListener.actionGet();
assertNotNull(openJobResponse);

PlainActionFuture<AcknowledgedResponse> startDatafeedListener = PlainActionFuture.newFuture();
new MachineLearningClient(client).startDatafeed(
    new StartDatafeedAction.Request(datafeedId, 0L), startDatafeedListener);
AcknowledgedResponse startDatafeedResponse = startDatafeedListener.actionGet();
assertNotNull(startDatafeedResponse);
}

} boolean invalidLicense = randomBoolean();
if (invalidLicense) {
    enableLicensing(randomInvalidLicenseType());
} else {
    enableLicensing(randomValidLicenseType());
}

try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
    client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress());
    PlainActionFuture<StopDatafeedAction.Response> listener = PlainActionFuture.newFuture();
    new MachineLearningClient(client).stopDatafeed(new StopDatafeedAction.Request(datafeedId), listener);
    if (invalidLicense) {
        // the stop datafeed due to invalid license happens async, so check if the datafeed turns into stopped state:
        assertBusy(() -> {
            GetDatafeedsStatsAction.Response response =
                new MachineLearningClient(client)
                        .getDatafeedsStats(new GetDatafeedsStatsAction.Request(datafeedId)).actionGet();
            assertEquals(DatafeedState.STOPPED, response.getResponse().results().get(0).getDatafeedState());
        });
    } else {
        listener.actionGet();
    }

    if (invalidLicense) {
        // the close due to invalid license happens async, so check if the job turns into closed state:
        assertBusy(() -> {
            GetJobsStatsAction.Response response =
                new MachineLearningClient(client).getJobsStats(new GetJobsStatsAction.Request(jobId)).actionGet();
            assertEquals(JobState.CLOSED, response.getResponse().results().get(0).getState());
        });
    }
}

public void testMachineLearningCloseJobActionNotRestricted() throws Exception {
    String jobId = "testmachinelearningclosejobactionnotrestricted";
    assertMLAllowed(true);
    // test that license restricted apis do now work
    Settings settings = internalCluster().transportClient().settings();
    try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
        client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress());
        PlainActionFuture<PutJobAction.Response> putJobListener = PlainActionFuture.newFuture();
        new MachineLearningClient(client).putJob(new PutJobAction.Request(createJob(jobId)), putJobListener);
        PutJobAction.Response putJobResponse = putJobListener.actionGet();
        assertNotNull(putJobResponse);
        PlainActionFuture<AcknowledgedResponse> openJobListener = PlainActionFuture.newFuture();
        new MachineLearningClient(client).openJob(new OpenJobAction.Request(jobId), openJobListener);
        AcknowledgedResponse openJobResponse = openJobListener.actionGet();
        assertNotNull(openJobResponse);
    }

    boolean invalidLicense = randomBoolean();
    if (invalidLicense) {
        enableLicensing(randomInvalidLicenseType());
    } else {
        enableLicensing(randomValidLicenseType());
    }

    try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
        client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress());
        PlainActionFuture<CloseJobAction.Response> listener = PlainActionFuture.newFuture();
        CloseJobAction.Request request = new CloseJobAction.Request(jobId);
        request.setCloseTimeout(TimeValue.timeValueSeconds(20));
        if (invalidLicense) {
            // the close due to invalid license happens async, so check if the job turns into closed state:
            assertBusy(() -> {
                GetJobsStatsAction.Response response =
                    new MachineLearningClient(client).getJobsStats(new GetJobsStatsAction.Request(jobId)).actionGet();
                assertEquals(JobState.CLOSED, response.getResponse().results().get(0).getState());
            });
        } else {
            new MachineLearningClient(client).closeJob(request, listener);
            listener.actionGet();
        }
    }
}

public void testMachineLearningDeleteJobActionNotRestricted() throws Exception {
    String jobId = "testmachinelearningclosejobactionnotrestricted";
assertMLAllowed(true);
// test that license restricted apis do now work
Settings settings = internalCluster().transportClient().settings();
try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
    client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress());
    PlainActionFuture<PutJobAction.Response> putJobListener = PlainActionFuture.newFuture();
    new MachineLearningClient(client).putJob(new PutJobAction.Request(createJob(jobId)), putJobListener);
    PutJobAction.Response putJobResponse = putJobListener.actionGet();
    assertNotNull(putJobResponse);
    // Pick a random license
    License.OperationMode mode = randomLicenseType();
    enableLicensing(mode);
}

public void testMachineLearningDeleteDatafeedActionNotRestricted() throws Exception {
    String jobId = "testmachinelearningdeleteodatafeedactionnotrestricted";
    String datafeedId = jobId + ".datafeed";
    assertMLAllowed(true);
    // test that license restricted apis do now work
    Settings settings = internalCluster().transportClient().settings();
    try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
        client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress());
        PlainActionFuture<AcknowledgedResponse> listener = PlainActionFuture.newFuture();
        new MachineLearningClient(client).deleteJob(new DeleteJobAction.Request(jobId), listener);
        listener.actionGet();
    }
}

public void testMachineLearningDeleteDatafeedActionNotRestricted() throws Exception {
    String jobId = "testmachinelearningdeleteodatafeedactionnotrestricted";
    String datafeedId = jobId + ".datafeed";
    assertMLAllowed(true);
    // test that license restricted apis do now work
    Settings settings = internalCluster().transportClient().settings();
    try (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
        client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress());
        PlainActionFuture<PutJobAction.Response> putJobListener = PlainActionFuture.newFuture();
        new MachineLearningClient(client).putJob(new PutJobAction.Request(createJob(jobId)), putJobListener);
        PutJobAction.Response putJobResponse = putJobListener.actionGet();
        assertNotNull(putJobResponse);
        PlainActionFuture<PutDatafeedAction.Response> putDatafeedListener = PlainActionFuture.newFuture();
        new MachineLearningClient(client).putDatafeed(new PutDatafeedAction.Request(createDatafeed(datafeedId, jobId, Collections.singletonList(jobId))), putDatafeedListener);
        PutDatafeedAction.Response putDatafeedResponse = putDatafeedListener.actionGet();
        assertNotNull(putDatafeedResponse);
    }
}

// Pick a random license
License.OperationMode mode = randomLicenseType();
enableLicensing(mode);
	ry (TransportClient client = new TestXPackTransportClient(settings, LocalStateMachineLearning.class)) {
   client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress());
   PlainActionFuture<AcknowledgedResponse> listener = PlainActionFuture.newFuture();
   new MachineLearningClient(client).deleteDatafeed(new DeleteDatafeedAction.Request(datafeedId), listener);
   listener.actionGet();
}

private static OperationMode randomInvalidLicenseType() {
   return randomFrom(License.OperationMode.GOLD, License.OperationMode.STANDARD, License.OperationMode.BASIC);
}

private static OperationMode randomValidLicenseType() {
   return randomFrom(License.OperationMode.TRIAL, License.OperationMode.PLATINUM);
}

private static OperationMode randomLicenseType() {
   return randomFrom(License.OperationMode.values());
}

private static void assertMLAllowed(boolean expected) {
   for (XPackLicenseState licenseState : internalCluster().getInstances(XPackLicenseState.class)) {
      assertEquals(licenseState.isMachineLearningAllowed(), expected);
   }
}

public static void disableLicensing() {
   disableLicensing(randomValidLicenseType());
}

public static void disableLicensing(License.OperationMode operationMode) {
   for (XPackLicenseState licenseState : internalCluster().getInstances(XPackLicenseState.class)) {
      licenseState.update(operationMode, false, null);
   }
}

public static void enableLicensing() {
   enableLicensing(randomValidLicenseType());
}

public static void enableLicensing(License.OperationMode operationMode) {
   for (XPackLicenseState licenseState : internalCluster().getInstances(XPackLicenseState.class)) {
      licenseState.update(operationMode, true, null);
   }
}
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/
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 */
package org.elasticsearch.xpack.security.authz.permission;

import org.elasticsearch.ElasticsearchParseException;
import org.elasticsearch.common.bytes.BytesArray;
import org.elasticsearch.common.xcontent.XContentType;
import org.elasticsearch.test.ESTestCase;
import org.elasticsearch.xpack.core.security.authz.RoleDescriptor;
import org.elasticsearch.xpack.core.security.authz.permission.FieldPermissions;
import org.elasticsearch.xpack.core.security.authz.permission.FieldPermissionsDefinition;

import java.util.ArrayList;
import java.util.Arrays;
import java.util.Collections;
import java.util.List;
import java.util.concurrent.CountDownLatch;
import java.util.concurrent.atomic.AtomicReferenceArray;

import static org.hamcrest.Matchers.containsString;

public class FieldPermissionsTests extends ESTestCase {

public void testParseFieldPermissions() throws Exception {
    String q = "{"indices": [ {"names": "idx2", "privileges": ["p3"], "field_security": {
            "grant": ["f1", "f2", "f3", "f4"],
            "except": ["f3","f4"]
        } ] }
    ";
    RoleDescriptor rd = RoleDescriptor.parse("test", new BytesArray(q), false, XContentType.JSON);
    assertArrayEquals(rd.getIndicesPrivileges()[0].getGrantedFields(), new String[]{ "f1", "f2", "f3", "f4" });
    assertArrayEquals(rd.getIndicesPrivileges()[0].getDeniedFields(), new String[]{ "f3", "f4" });

    q = "{"indices": [ {"names": "idx2", "privileges": ["p3"], "field_security": {
            "grant": ["f1", "f2", "f3", "f4"],
            "except": ["f3","f4"]
        } ] }
    ";
    rd = RoleDescriptor.parse("test", new BytesArray(q), false, XContentType.JSON);
}
assertArrayEquals(rd.getIndicesPrivileges()[0].getGrantedFields(),
    new String[] { "f1", "f2", "f3", "f4" });
assertArrayEquals(rd.getIndicesPrivileges()[0].getDeniedFields(),
    new String[] { "f3", "f4" });

q = "{"indices": [ {"names": "idx2", "privileges": ["p3"], "field_security": {
"grant": ["f1", "f2"]}
] }"; 
rd = RoleDescriptor.parse("test", new BytesArray(q), false, XContentType.JSON);
assertArrayEquals(rd.getIndicesPrivileges()[0].getGrantedFields(),
    new String[] { "f1", "f2" });
assertNull(rd.getIndicesPrivileges()[0].getDeniedFields());

q = "{"indices": [ {"names": "idx2", "privileges": ["p3"], "field_security": {
"grant": []
] }"; 
rd = RoleDescriptor.parse("test", new BytesArray(q), false, XContentType.JSON);
assertArrayEquals(rd.getIndicesPrivileges()[0].getGrantedFields(), new String[] {});
assertArrayEquals(rd.getIndicesPrivileges()[0].getDeniedFields(), new String[] {});

final String exceptWithoutGrant = "{"indices": [ {"names": "idx2", "privileges": ["p3"], "field_security": {
"except": ["f1"]
] }"; 
ElasticsearchParseException e = expectThrows(ElasticsearchParseException.class,
    () -> RoleDescriptor.parse("test", new BytesArray(exceptWithoutGrant), false,
    XContentType.JSON));
assertThat(e.getDetailedMessage(),
    containsString("failed to parse indices privileges for role [test]. field_security" + " requires grant if except is given");

final String grantNull = "{"indices": [ {"names": "idx2", "privileges": ["p3"], "field_security": {
"grant": null
] }"; 
e = expectThrows(ElasticsearchParseException.class,
    () -> RoleDescriptor.parse("test", new BytesArray(grantNull), false,
XContentType.JSON));
assertThat(e.getDetailedMessage(), containsString("failed to parse indices privileges for" +
  " role [test]. grant must not be null.");

final String exceptNull = "{"indices": [ {"names": "idx2", "privileges": " +
  "["p3"]}, "field_security": {" +
  "grant": ["*"], " +
  "except": null" +
  ""]}, "]});
e = expectThrows(ElasticsearchParseException.class,
  () -> RoleDescriptor.parse("test", new BytesArray(exceptNull), false, XContentType.JSON));
assertThat(e.getDetailedMessage(),
  containsString("failed to parse indices privileges for role [test]. except must" +
    " not be null.");

final String exceptGrantNull = "{"indices": [ {"names": "idx2", "privileges": " +
  "["p3"]}, "field_security": {" +
  "grant": null," +
  "except": null" +
  ""]}, "]});
e = expectThrows(ElasticsearchParseException.class,
  () -> RoleDescriptor.parse("test", new BytesArray(exceptGrantNull), false, XContentType.JSON));
assertThat(e.getDetailedMessage(),
  containsString("failed to parse indices privileges " +
    "for role [test]. grant must not be null.");

final String bothFieldsMissing = "{"indices": [ {"names": "idx2", "privileges": " +
  "["p3"]}, "field_security": {" +
  "grant": ["] +
  "except": ["f2"]},
  "privileges": ["p3"]}
"};
e = expectThrows(ElasticsearchParseException.class,
  () -> RoleDescriptor.parse("test", new BytesArray(bothFieldsMissing), false, XContentType.JSON));
assertThat(e.getDetailedMessage(),
  containsString("failed to parse indices privileges " +
    "for role [test]. "field_security" must not be empty.");

// try with two indices and mix order a little
q = "{"indices": [ {"names": "idx2", "privileges": ["p3"]}, " +
  "field_security": {" +
  "grant": ["] +
  "except": ["f2"]},
  "privileges": ["p3"]}
"};
rd = RoleDescriptor.parse("test", new BytesArray(q), false, XContentType.JSON);
assertArrayEquals(rd.getIndicesPrivileges()[0].getGrantedFields(), new String[] {});
assertNull(rd.getIndicesPrivileges()[0].getDeniedFields());
assertArrayEquals(rd.getIndicesPrivileges()[1].getGrantedFields(), new String[] {"*"});
assertArrayEquals(rd.getIndicesPrivileges()[1].getDeniedFields(), new String[] {"f2"});
}

// test old syntax for field permissions
public void testBWCFieldPermissions() throws Exception {
    String q = "{"indices": [ {"names": "idx2", "privileges": ["p3"], "fields": ["f1", "f2"] } ]};
    RoleDescriptor rd = RoleDescriptor.parse("test", new BytesArray(q), true,
            XContentType.JSON);
    assertArrayEquals(rd.getIndicesPrivileges()[0].getGrantedFields(),
            new String[] {"f1", "f2"});
    assertNull(rd.getIndicesPrivileges()[0].getDeniedFields());
        final String failingQuery = q;
    ElasticsearchParseException e = expectThrows(ElasticsearchParseException.class,
            () -> RoleDescriptor.parse("test", new BytesArray(failingQuery), false,
                    XContentType.JSON));
    assertThat(e.getDetailedMessage(), containsString("["fields": [...]] format has " +
            "changed for field permissions in role [test]" +
            ", use ["field_security": {"grant": [...],"except": [...]}} instead");

    q = "{"indices": [ {"names": "idx2", "privileges": ["p3"], "fields": null" +
            "]" } ]};
    rd = RoleDescriptor.parse("test", new BytesArray(q), true, XContentType.JSON);
    assertNull(rd.getIndicesPrivileges()[0].getGrantedFields());
    assertNull(rd.getIndicesPrivileges()[0].getDeniedFields());
        final String failingQuery2 = q;
    e = expectThrows(ElasticsearchParseException.class,
            () -> RoleDescriptor.parse("test", new BytesArray(failingQuery2), false,
                    XContentType.JSON));
    assertThat(e.getDetailedMessage(), containsString("["fields": [...]] format has " +
            "changed for field permissions in role [test]" +
            ", use ["field_security": {"grant": [...],"except": [...]}} instead");

    q = "{"indices": [ {"names": "idx2", "privileges": ["p3"], "fields": [null" +
            "]" } ]};
    rd = RoleDescriptor.parse("test", new BytesArray(q), true, XContentType.JSON);
    assertNull(rd.getIndicesPrivileges()[0].getGrantedFields());
    assertNull(rd.getIndicesPrivileges()[0].getDeniedFields());
        final String failingQuery3 = q;
    e = expectThrows(ElasticsearchParseException.class,
            () -> RoleDescriptor.parse("test", new BytesArray(failingQuery3), false,
                    XContentType.JSON));
assertThat(e.getDetailedMessage(), containsString("\"fields\": [...\] format has " +
"changed for field permissions in role [test]\" +
", use [\"field_security\": {\"grant\": [...\},\"except\": [...]\]] instead");

public void testFieldPermissionsHashCodeThreadSafe() throws Exception {
    final int numThreads = scaledRandomIntBetween(4, 16);
    final FieldPermissions fieldPermissions = new FieldPermissions(
        new FieldPermissionsDefinition(new String[] { "*" }, new String[] { "foo" }));
    final CountDownLatch latch = new CountDownLatch(numThreads + 1);
    final AtomicReferenceArray<Integer> hashCodes = new AtomicReferenceArray<>(numThreads);
    List<Thread> threads = new ArrayList<>(numThreads);
    for (int i = 0; i < numThreads; i++) {
        final int threadNum = i;
        threads.add(new Thread(() -> {
            latch.countDown();
            try {
                latch.await();
            } catch (InterruptedException e) {
                Thread.currentThread().interrupt();
            }
            final int hashCode = fieldPermissions.hashCode();
            hashCodes.set(threadNum, hashCode);
        }));
    }
    for (Thread thread : threads) {
        thread.start();
    }
    latch.countDown();
    for (Thread thread : threads) {
        thread.join();
    }
    final int hashCode = fieldPermissions.hashCode();
    for (int i = 0; i < numThreads; i++) {
        assertEquals((Integer) hashCode, hashCodes.get(i));
    }
}

public void testAllFieldIsAutomaticallyExcludedIfNotExplicitlyGranted() throws Exception {
    final FieldPermissions fieldPermissions = new FieldPermissions(
        new FieldPermissionsDefinition(new String[] { "_a*" }, new String[0]));
    assertTrue(fieldPermissions.grantsAccessTo("_animal"));
    assertFalse(fieldPermissions.grantsAccessTo("_all"));
}

public void testAllFieldIsNotExcludedIfExplicitlyGranted() throws Exception {

    final FieldPermissions fieldPermissions = new FieldPermissions(
        new FieldPermissionsDefinition(new String[] { "*" }, new String[0]));
    assertTrue(fieldPermissions.grantsAccessTo("*"));
    assertFalse(fieldPermissions.grantsAccessTo("_animal"));
}

public void testAllFieldIsAutomaticallyExcludedIfNotExplicitlyGranted() throws Exception {
    final FieldPermissions fieldPermissions = new FieldPermissions(
        new FieldPermissionsDefinition(new String[] { "_a*" }, new String[0]));
    assertTrue(fieldPermissions.grantsAccessTo("_animal"));
    assertFalse(fieldPermissions.grantsAccessTo("_all"));
}

public void testAllFieldIsNotExcludedIfExplicitlyGranted() throws Exception {

    final FieldPermissions fieldPermissions = new FieldPermissions(
        new FieldPermissionsDefinition(new String[] { "*" }, new String[0]));
    assertTrue(fieldPermissions.grantsAccessTo("*"));
    assertEquals((Integer) hashCode, hashCodes.get(i));
}
final String[] grant = { "foo", "bar", "baz", "_all" }; Collections.shuffle(Arrays.asList(grant), random);

final FieldPermissions fieldPermissions = new FieldPermissions(
   new FieldPermissionsDefinition(grant, new String[0]));

assertTrue(fieldPermissions.grantsAccessTo("_all"));
assertTrue(fieldPermissions.grantsAccessTo("foo"));
assertTrue(fieldPermissions.grantsAccessTo("bar"));
assertTrue(fieldPermissions.grantsAccessTo("baz"));
assertFalse(fieldPermissions.grantsAccessTo(randomAlphaOfLengthBetween(5, 8)));

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 */
package org.elasticsearch.xpack.security.authz.permission;

import org.elasticsearch.action.get.GetAction;
import org.elasticsearch.test.ESTestCase;
import org.elasticsearch.xpack.core.security.authz.permission.Role;
import org.elasticsearch.xpack.core.security.authz.privilege.Privilege;
import java.util.function.Predicate;
import static org.elasticsearch.xpack.core.security.authz.privilege.IndexPrivilege.MONITOR;
import static org.elasticsearch.xpack.core.security.authz.privilege.IndexPrivilege.READ;
import static org.hamcrest.Matchers.is;
import static org.hamcrest.Matchers.notNullValue;

public class PermissionTests extends ESTestCase {
   private Role permission;

   @Before
   public void init() {
      Role.Builder builder = Role.builder("test");
      builder.add(MONITOR, "test_*", "/foo.*/"),
      builder.add(READ, "baz_*foo", "/fool.*bar/*"),
      builder.add(MONITOR, "/bar.*/"),
      permission = builder.build();
   }

   public void testAllowedIndicesMatcherAction() throws Exception {
      testAllowedIndicesMatcher(permission.indices().allowedIndicesMatcher(GetAction.NAME));
   }
}
public void testAllowedIndicesMatcherActionCaching() throws Exception {
    Predicate<String> matcher1 = permission.indices().allowedIndicesMatcher(GetAction.NAME);
    Predicate<String> matcher2 = permission.indices().allowedIndicesMatcher(GetAction.NAME);
    assertThat(matcher1, is(matcher2));
}

public void testBuildEmptyRole() {
    Role.Builder permission = Role.builder(new String[] { "some_role" });
    Role role = permission.build();
    assertThat(role, notNullValue());
    assertThat(role.cluster(), notNullValue());
    assertThat(role.indices(), notNullValue());
    assertThat(role.runAs(), notNullValue());
}

public void testRunAs() {
    Role permission = Role.builder("some_role")
        .runAs(new Privilege("name", "user1", "run*"))
        .build();
    assertThat(permission.runAs().check("user1"), is(true));
    assertThat(permission.runAs().check("user"), is(false));
    assertThat(permission.runAs().check("run" + randomAlphaOfLengthBetween(1, 10)), is(true));
}

private void testAllowedIndicesMatcher(Predicate<String> indicesMatcher) {
    assertThat(indicesMatcher.test("foobar"), is(false));
    assertThat(indicesMatcher.test("fool"), is(false));
    assertThat(indicesMatcher.test("fool2bar"), is(true));
    assertThat(indicesMatcher.test("baz_foo"), is(true));
    assertThat(indicesMatcher.test("barbapapa"), is(false));
}
}

// "baz_*foo", "/fool.*bar/"
package org.elasticsearch.license;

import org.elasticsearch.ElasticsearchSecurityException;
import org.elasticsearch.action.DocWriteResponse;
import org.elasticsearch.action.admin.cluster.health.ClusterHealthResponse;
import org.elasticsearch.action.admin.cluster.node.info.NodesInfoRequest;
import org.elasticsearch.action.admin.cluster.node.stats.NodesStatsResponse;
import org.elasticsearch.action.admin.cluster.stats.ClusterStatsIndices;
import org.elasticsearch.action.admin.cluster.stats.ClusterStatsResponse;

import org.elasticsearch.ElasticsearchSecurityException;
import org.elasticsearch.action.DocWriteResponse;
import org.elasticsearch.action.admin.cluster.health.ClusterHealthResponse;
import org.elasticsearch.action.admin.cluster.node.info.NodesInfoRequest;
import org.elasticsearch.action.admin.cluster.node.stats.NodesStatsResponse;
import org.elasticsearch.action.admin.cluster.stats.ClusterStatsIndices;
import org.elasticsearch.action.admin.cluster.stats.ClusterStatsResponse;

package org.elasticsearch.license;

import org.elasticsearch.ElasticsearchSecurityException;
import org.elasticsearch.action.DocWriteResponse;
import org.elasticsearch.action.admin.cluster.health.ClusterHealthResponse;
import org.elasticsearch.action.admin.cluster.node.info.NodesInfoRequest;
import org.elasticsearch.action.admin.cluster.node.stats.NodesStatsResponse;
import org.elasticsearch.action.admin.cluster.stats.ClusterStatsIndices;
import org.elasticsearch.action.admin.cluster.stats.ClusterStatsResponse;

package org.elasticsearch.license;

import org.elasticsearch.ElasticsearchSecurityException;
import org.elasticsearch.action.DocWriteResponse;
import org.elasticsearch.action.admin.cluster.health.ClusterHealthResponse;
import org.elasticsearch.action.admin.cluster.node.info.NodesInfoRequest;
import org.elasticsearch.action.admin.cluster.node.stats.NodesStatsResponse;
import org.elasticsearch.action.admin.cluster.stats.ClusterStatsIndices;
import org.elasticsearch.action.admin.cluster.stats.ClusterStatsResponse;
import org.elasticsearch.action.admin.indices.stats.IndicesStatsResponse;
import org.elasticsearch.action.index.IndexResponse;
import org.elasticsearch.client.Client;
import org.elasticsearch.client.Request;
import org.elasticsearch.client.RequestOptions;
import org.elasticsearch.client.Response;
import org.elasticsearch.client.ResponseException;
import org.elasticsearch.client.transport.NoNodeAvailableException;
import org.elasticsearch.client.transport.TransportClient;
import org.elasticsearch.cluster.routing.ShardRoutingState;
import org.elasticsearch.common.network.NetworkModule;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.common.util.concurrent.ThreadContext;
import org.elasticsearch.discovery.DiscoveryModule;
import org.elasticsearch.node.MockNode;
import org.elasticsearch.node.Node;
import org.elasticsearch.plugins.Plugin;
import org.elasticsearch.test.SecurityIntegTestCase;
import org.elasticsearch.test.SecuritySettingsSource;
import org.elasticsearch.test.SecuritySettingsSourceField;
import org.elasticsearch.test.discovery.TestZenDiscovery;
import org.elasticsearch.test.junit.annotations.TestLogging;
import org.elasticsearch.transport.Netty4Plugin;
import org.elasticsearch.Transport;
import org.elasticsearch.xpack.core.TestXPackTransportClient;
import org.elasticsearch.xpack.core.XPackField;
import org.elasticsearch.xpack.core.security.SecurityField;
import org.elasticsearch.xpack.core.security.action.user.PutUserResponse;
import org.elasticsearch.xpack.core.security.authc.support.Hasher;
import org.elasticsearch.xpack.core.security.authc.support.UsernamePasswordToken;
import org.elasticsearch.xpack.security.LocalStateSecurity;
import org.junit.After;
import org.junit.Before;
import java.nio.file.Files;
import java.nio.file.Path;
import java.util.ArrayList;
import java.util.Arrays;
import java.util.Collection;
import java.util.List;
import java.util.stream.Collectors;
import static org.elasticsearch.common.xcontent.XContentFactory.jsonBuilder;
import static org.elasticsearch.discovery.zen.SettingsBasedHostsProvider.DISCOVERY_ZEN_PING_UNICAST_HOSTS_SETT
import static org.elasticsearch.test.hamcrest.ElasticsearchAssertions.assertNoFailures;
import static org.elasticsearch Matcher.containsString;
import static org.elasticsearch Matcher.greaterThanOrEqualTo;
import static org.elasticsearch Matcher.hasItem;
import static org.elasticsearch Matcher.is;
import static org.elasticsearch Matcher.notNullValue;

@TestLogging("org.elasticsearch.cluster.service:TRACE,org.elasticsearch.discovery.zen:TRACE,org.elasticsearch.action.search:TRACE," +
        "org.elasticsearch.search:TRACE")
public class LicensingTests extends SecurityIntegTestCase {
    public static final String ROLES =
            SecuritySettingsSource.TEST_ROLE + ":\n" +
            "  cluster: [ all ]\n" +
            "    - names: *\n" +
            "        privileges: [manage]\n" +
            "    - names: /.*\n" +
            "        privileges: [write]\n" +
            "    - names: test\n" +
            "        privileges: [read]\n" +
            "    - names: test1\n" +
            "        privileges: [read]\n" +
            "\n" +
            "  role_a:\n" +
            "    - names: a\n" +
            "        privileges: [all]\n" +
            "\n" +
            "  role_b:\n" +
            "    - names: b\n" +
            "        privileges: [all];

    public static final String USERS_ROLES =
            SecuritySettingsSource.CONFIG_STANDARD_USER_ROLES +
            "role_a:user_a,user_b\n" +
            "role_b:user_b";

    @Override
    protected String configRoles() {
        return ROLES;
    }

    @Override
    protected String configUsers() {
        return SecuritySettingsSource.CONFIG_STANDARD_USER +
"user_a:{plain}passwd" +
"user_b:{plain}passwd";
}

@Override
protected String configUsersRoles() {
    return USERS_ROLES;
}

@Override
public Settings nodeSettings(int nodeOrdinal) {
    return Settings.builder().put(super.nodeSettings(nodeOrdinal))
        .put(NetworkModule.HTTP_ENABLED.getKey(), true)
        .put(TestZenDiscovery.USE_MOCK_PINGS.getKey(), false)
        .build();
}

@Override
protected Collection<Class<? extends Plugin>> nodePlugins() {
    ArrayList<Class<? extends Plugin>> plugins = new ArrayList<>(super.nodePlugins());
    plugins.add(Netty4Plugin.class); // for http
    return plugins;
}

@Override
protected int maxNumberOfNodes() {
    return super.maxNumberOfNodes() + 1;
}

@Before
public void resetLicensing() {
    enableLicensing();
}

@After
public void cleanupSecurityIndex() {
    deleteSecurityIndex();
}

public void testEnableDisableBehaviour() throws Exception {
    IndexResponse indexResponse = index("test", "type", jsonBuilder()
        .startObject()
        .field("name", "value")
        .endObject());
    assertEquals(DocWriteResponse.Result.CREATED, indexResponse.getResult());
    indexResponse = index("test1", "type", jsonBuilder()
public void testRestAuthenticationByLicenseType() throws Exception {
    Response unauthorizedRootResponse = getRestClient().performRequest(new Request("GET", "/"));
    // the default of the licensing tests is basic
    assertThat(unauthorizedRootResponse.getStatusLine().getStatusCode(), is(200));
    ResponseException e = expectThrows(ResponseException.class,
            () -> getRestClient().performRequest(new Request("GET", "/_xpack/security/_authenticate")));
    assertThat(e.getResponse().getStatusLine().getStatusCode(), is(403));

    // generate a new license with a mode that enables auth
    License.OperationMode mode = randomFrom(License.OperationMode.values());
    enableLicensing(mode);
License.OperationMode.TRIAL,
License.OperationMode.PLATINUM, License.OperationMode.STANDARD);
    enableLicensing(mode);
    e = expectThrows(ResponseException.class, () -> getRestClient().performRequest(new Request("GET", "/")));
    assertThat(e.getResponse().getStatusCode(), is(401));
    e = expectThrows(ResponseException.class,
            () -> getRestClient().performRequest(new Request("GET", "/_xpack/security/_authenticate")));
    assertThat(e.getResponse().getStatusCode(), is(401));

    RequestOptions.Builder optionsBuilder = RequestOptions.DEFAULT.toBuilder();
    optionsBuilder.addHeader("Authorization",
            UsernamePasswordToken.basicAuthHeaderValue(SecuritySettingsSource.TEST_USER_NAME,
                    new SecureString(SecuritySettingsSourceField.TEST_PASSWORD.toCharArray())));
    RequestOptions options = optionsBuilder.build();

    Request rootRequest = new Request("GET", "/");
    rootRequest.setOptions(options);
    Response authorizedRootResponse = getRestClient().performRequest(rootRequest);
    assertThat(authorizedRootResponse.getStatusCode(), is(200));
    Request authenticateRequest = new Request("GET", "/_xpack/security/_authenticate");
    authenticateRequest.setOptions(options);
    Response authorizedAuthenticateResponse = getRestClient().performRequest(authenticateRequest);
    assertThat(authorizedAuthenticateResponse.getStatusCode(), is(200));
}

public void testSecurityActionsByLicenseType() throws Exception {
    // security actions should not work!
    Settings settings = internalCluster().transportClient().settings();
    try (TransportClient client = new TestXPackTransportClient(settings, LocalStateSecurity.class)) {
        client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress()
                ());
        fail("security actions should not be enabled!");
    } catch (ElasticsearchSecurityException e) {
        assertThat(e.status(), is(RestStatus.FORBIDDEN));
        assertThat(e.getMessage(), containsString("non-compliant"));
    }

    // enable a license that enables security
    License.OperationMode mode = randomFrom(License.OperationMode.GOLD,
            License.OperationMode.TRIAL,
            License.OperationMode.PLATINUM, License.OperationMode.STANDARD);
    enableLicensing(mode);
    // security actions should work!
    try (TransportClient client = new TestXPackTransportClient(settings, LocalStateSecurity.class)) {
        client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress()
                ());
        PutUserResponse response = new SecurityClient(client).preparePutUser("john", "password".toCharArray(),

public void testTransportClientAuthenticationByLicenseType() throws Exception {
    Settings.Builder builder = Settings.builder()
        .put(internalCluster().transportClient().settings());
    // remove user info
    builder.remove(SecurityField.USER_SETTING.getKey());
    builder.remove(ThreadContext.PREFIX + "." + UsernamePasswordToken.BASIC_AUTH_HEADER);

    // basic has no auth
    try (TransportClient client = new TestXPackTransportClient(builder.build(), LocalStateSecurity.class)) {
        client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress());
        assertGreenClusterState(client);
    }

    // enable a license that enables security
    License.OperationMode mode = randomFrom(License.OperationMode.GOLD,
        License.OperationMode.TRIAL,
        License.OperationMode.PLATINUM,
        License.OperationMode.STANDARD);
    enableLicensing(mode);

    try (TransportClient client = new TestXPackTransportClient(builder.build(), LocalStateSecurity.class)) {
        client.addTransportAddress(internalCluster().getDataNodeInstance(Transport.class).boundAddress().publishAddress());
        client.admin().cluster().prepareHealth().get();
        fail("should not have been able to connect to a node!");
    } catch (NoNodeAvailableException e) {
        // expected
    }
}

public void testNodeJoinWithoutSecurityExplicitlyEnabled() throws Exception {
    License.OperationMode mode = randomFrom(License.OperationMode.GOLD,
        License.OperationMode.TRIAL,
        License.OperationMode.PLATINUM,
        License.OperationMode.STANDARD);
    enableLicensing(mode);
    ensureGreen();

    final List<String> unicastHostsList = internalCluster().masterClient().admin().cluster().nodesInfo(new
        NodesInfoRequest()).get()
        .getNodes().stream().map(n -> n.getTransport().getAddress().publishAddress().toString()).distinct()
        .collect(Collectors.toList());

    Path home = createTempDir();
    Path conf = home.resolve("config");
Files.createDirectories(conf);
Settings nodeSettings = Settings.builder()
   .put(nodeSettings(maxNumberOfNodes() - 1).filter(s -> "xpack.security.enabled".equals(s) == false))
   .put("node.name", "my-test-node")
   .put("network.host", "localhost")
   .put("cluster.name", internalCluster().getClusterName())
   .put("discovery.zen.minimum_master_nodes",
       internalCluster().getInstance(Settings.class).get("discovery.zen.minimum_master_nodes"))
   .put("path.home", home)
   .put(TestZenDiscovery.USE_MOCK_PINGS.getKey(), false)
   .put(DiscoveryModule.DISCOVERY_TYPE_SETTING.getKey(), "test-zen")
   .putList(DiscoveryModule.DISCOVERY_HOSTS_PROVIDER_SETTING.getKey())
   .putList(DISCOVERY_ZEN_PING_UNICAST_HOSTS_SETTING.getKey(), unicastHostsList)
   .build();
Collection<Class<? extends Plugin>> mockPlugins = Arrays.asList(LocalStateSecurity.class,
   TestZenDiscovery.TestPlugin.class);
try (Node node = new MockNode(nodeSettings, mockPlugins)) {
   node.start();
   ensureStableCluster(cluster().size() + 1);
}

private static void assertElasticsearchSecurityException(ThrowingRunnable runnable) {
   ElasticsearchSecurityException ee = expectThrows(ElasticsearchSecurityException.class, runnable);
   assertThat(ee.getMetadata(LicenseUtils.EXPIRED_FEATURE_METADATA), hasItem(XPackField.SECURITY));
   assertThat(ee.status(), is(RestStatus.FORBIDDEN));
}

public static void disableLicensing() {
   disableLicensing(License.OperationMode.BASIC);
}

public static void disableLicensing(License.OperationMode operationMode) {
   for (XPackLicenseState licenseState : internalCluster().getInstances(XPackLicenseState.class)) {
      licenseState.update(operationMode, false, null);
   }
}

public static void enableLicensing() {
   enableLicensing(License.OperationMode.BASIC);
}

public static void enableLicensing(License.OperationMode operationMode) {
   for (XPackLicenseState licenseState : internalCluster().getInstances(XPackLicenseState.class)) {
      licenseState.update(operationMode, true, null);
   }
}
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package org.elasticsearch.xpack.ccr;

import org.elasticsearch.client.Request;
import org.elasticsearch.client.ResponseException;
import java.util.Locale;

import static org.hamcrest.Matchers.containsString;
import static org.hamcrest.Matchers.hasToString;

public class CcrMultiClusterLicenseIT extends ESCCRRestTestCase {

    public void testFollow() {
        if ("follow".equals(targetCluster)) {
            final Request request = new Request("PUT", "/follower/_ccr/follow");
            request.setJsonEntity("{"remote_cluster": "leader_cluster", "leader_index": "leader" }");
            assertNonCompliantLicense(request);
        }
    }

    public void testAutoFollow() throws Exception {
        if ("follow".equals(targetCluster)) {
            final Request request = new Request("PUT", "/_ccr/auto_follow/test_pattern");
            request.setJsonEntity("{"leader_index_patterns":["*"], "remote_cluster": "leader_cluster" }");
            final ResponseException e = expectThrows(ResponseException.class, () ->
                    client().performRequest(request));
            final String expected = String.format(Locale.ROOT,
                "can not fetch remote cluster state as the remote cluster [%s] is not licensed for [ccr]; " +
                "the license mode [BASIC] on cluster [%s] does not enable [ccr]",
                "leader_cluster",
                "leader_cluster");
            assertThat(e, hasToString(containsString(expected)));
        }
    }

    private static void assertNonCompliantLicense(final Request request) {
        final ResponseException e = expectThrows(ResponseException.class, () -> client().performRequest(request));
        final String expected = String.format(Locale.ROOT,
            "can not fetch remote index [%s] metadata as the remote cluster [%s] is not licensed for [ccr]; " +
            "the license mode [BASIC] on cluster [%s] does not enable [ccr]",
            "leader_cluster",
            "leader_cluster");
        assertThat(e, hasToString(containsString(expected)));
    }
}
"the license mode [BASIC] on cluster [%s] does not enable [ccr]",
"leader_cluster:leader",
"leader_cluster",
"leader_cluster";
assertThat(e, hasToString(containsString(expected)));
}
}
import org.elasticsearch.gradle.test.RestIntegTestTask

apply plugin: 'elasticsearch.standalone-test'

dependencies {
    testCompile project(path: xpackModule('core'), configuration: 'testArtifacts')
    testCompile project(path: xpackModule('ccr'), configuration: 'runtime')
    testCompile project(':x-pack:plugin:ccr:qa:')
}

task leaderClusterTest(type: RestIntegTestTask) {
    mustRunAfter(precommit)
}

leaderClusterTestCluster {
    numNodes = 1
    clusterName = 'leader-cluster'
}

leaderClusterTestRunner {
    systemProperty 'tests.target_cluster', 'leader'
}

task followClusterTest(type: RestIntegTestTask) {
}

followClusterTestCluster {
    dependsOn leaderClusterTestRunner
    numNodes = 1
    clusterName = 'follow-cluster'
    setting 'xpack.license.self_generated.type', 'trial'
    setting 'cluster.remote.leader_cluster.seeds', """$->{leaderTest.nodes.get(0).transportUri()}""
}

followClusterTestRunner {
    systemProperty 'tests.target_cluster', 'follow'
    systemProperty 'tests.leader_host', "$->{leaderTest.nodes.get(0).httpUri()}"
    finalizedBy 'leaderClusterTestCluster#stop'
}

check.dependsOn followClusterTest
test.enabled = false

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 */

declared package org.elasticsearch.xpack.ccr;

import org.apache.lucene.util.Constants;
import org.elasticsearch.client.Request;
import org.elasticsearch.client.ResponseException;
import org.elasticsearch.client.RestClient;
import org.elasticsearch.common.Strings;
import org.elasticsearch.common.io.PathUtils;
import org.elasticsearch.common.settings.Settings;
import java.io.IOException;
import java.nio.file.Files;
import java.util.Iterator;
import java.util.List;
import java.util.Map;
import static org.elasticsearch.xpack.core.watcher.support.xcontent.ObjectPath.eval;
import static org.hamcrest.Matchers.containsString;
import static org.hamcrest.Matchers.equalTo;
import static org.hamcrest.Matchers.greaterThanOrEqualTo;
import static org.hamcrest.core.Is.is;

public class FollowIndexIT extends ESCCRRestTestCase {

    public void testDowngradeRemoteClusterToBasic() throws Exception {
        if (!"follow".equals(targetCluster)) {
            return;
        }

        Request request = new Request("PUT", "/_ccr/auto_follow/test_pattern")
            .setJsonEntity("{"leader_index_patterns": ["logs-*"], "remote_cluster": "leader_cluster"}");
        assertOK(client().performRequest(request));
    }

    String index1 = "logs-20190101";
    try (RestClient leaderClient = buildLeaderClient()) {
        createNewIndexAndIndexDocs(leaderClient, index1);
        ensureYellow(index1);
    }
}
verifyDocuments(index1, 5, "filtered_field:true");
});

String index2 = "logs-20190102";
try (RestClient leaderClient = buildLeaderClient()) {
    Request request = new Request("POST", "/_xpack/license/start_basic");
    request.addParameter("acknowledge", "true");
    Map<?, ?> response = toMap(leaderClient.performRequest(request));
    assertThat(response.get("basic_was_started"), is(true));
    assertThat(response.get("acknowledged"), is(true));

    createNewIndexAndIndexDocs(leaderClient, index2);
    index(leaderClient, index1, "5", "field", 5, "filtered_field", "true");
}

assertBusy(() -> {
    Request statsRequest = new Request("GET", "/_ccr/stats");
    Map<?, ?> response = toMap(client().performRequest(statsRequest));
    assertThat(eval("auto_follow_stats.number_of_successful_follow_indices", response), equalTo(1));
    assertThat(eval("auto_follow_stats.number_of_failed_remote_cluster_state_requests", response),
        greaterThanOrEqualTo(1));
    assertThat(eval("auto_follow_stats.recent_auto_follow_errors.0.auto_follow_exception.reason", response),
        containsString("the license mode [BASIC] on cluster [leader_cluster] does not enable [ccr]"));

    // Follow indices actively following leader indices before the downgrade to basic license remain to follow
    // the leader index after the downgrade, so document with id 5 should be replicated to follower index:
    verifyDocuments(index1, 6, "filtered_field:true");

    // Index2 was created in leader cluster after the downgrade and therefor the auto follow coordinator in
    // follow cluster should not pick that index up:
    assertThat(indexExists(index2), is(false));

    // parse the logs and ensure that the auto-coordinator skipped coordination on the leader cluster
    // (does not work on windows...)
    if (Constants.WINDOWS == false) {
        assertBusy(() -> {
            final List<String> lines = Files.readAllLines(PathUtils.get(System.getProperty("log")));
            final Iterator<String> it = lines.iterator();
            boolean warn = false;
            while (it.hasNext()) {
                final String line = it.next();
                if (line.matches(".*\[WARN\\s*\\]\[o\.e\.x\.a\.AutoFollowCoordinator\\s*\\] \[node-0\\] " +
                        "failure occurred while fetching cluster state for auto follow pattern \[test_pattern\\]\))+
                    warn = true;
                break;
            }
            assertTrue(warn);
        });
    }
}

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assertTrue(it.hasNext());

final String lineAfterWarn = it.next();

assertThat(lineAfterWarn,
equalTo("org.elasticsearch.ElasticsearchStatusException: " +
"can not fetch remote cluster state as the remote cluster [leader_cluster] is not licensed for [ccr]; " +
"the license mode [BASIC] on cluster [leader_cluster] does not enable [ccr"]));

});
});

// Manually following index2 also does not work after the downgrade:
Exception e = expectThrows(ResponseException.class, () -> followIndex("leader_cluster", index2));
assertThat(e.getMessage(), containsString("the license mode [BASIC] on cluster [leader_cluster] does not enable [ccr"]));
}

private void createNewIndexAndIndexDocs(RestClient client, String index) throws IOException {
  Settings settings = Settings.builder()
  .put("index.soft_deletes.enabled", true)
  .build();
  Request request = new Request("PUT", "/" + index);
  request.setJsonEntity("{"settings": " + Strings.toString(settings) + ", " + "mappings": " + Strings.toString(settings) + ", " + "properties": " + Strings.toString(settings) + "}"");
  assertOK(client.performRequest(request));

  for (int i = 0; i < 5; i++) {
    String id = Integer.toString(i);
    index(client, index, id, "field", i, "filtered_field", "true");
  }
}

import org.elasticsearch.gradle.test.RestIntegTestTask

apply plugin: 'elasticsearch.standalone-test'

dependencies {
  testCompile project(path: xpackModule('core'), configuration: 'testArtifacts')
  testCompile project(path: xpackModule('ccr'), configuration: 'runtime')
  testCompile project(':x-pack:plugin:ccr:qa')
}

task leaderClusterTest(type: RestIntegTestTask) {
  mustRunAfter(precommit)
}

leaderClusterTestCluster {
numNodes = 1
clanName = 'leader-cluster'
setting 'xpack.license.self_generated.type', 'trial'
}

leaderClusterTestRunner {
    systemProperty 'tests.target_cluster', 'leader'
}

task writeJavaPolicy {
doLast {
    final File tmp = file("${buildDir}/tmp")
    if (tmp.exists() == false && tmp.mkdirs() == false) {
        throw new GradleException("failed to create temporary directory [${tmp}]")
    }
    final File javaPolicy = file("${tmp}/java.policy")
    javaPolicy.write(
        ["grant {",
        "  permission java.io.FilePermission \"${-> followClusterTest.getNodes().get(0).homeDir}/logs/${-> followClusterTest.getNodes().get(0).clusterName}.log\", "read";
        "};",
        ].join("\n"))
    }
}

followClusterTest(type: RestIntegTestTask) {}
followClusterTestCluster {
    dependsOn leaderClusterTestRunner
    numNodes = 1
    clusterName = 'follow-cluster'
    setting 'xpack.monitoring.collection.enabled', 'true'
    setting 'xpack.license.self_generated.type', 'trial'
    setting 'cluster.remote.leader_cluster.seeds', "$\{-> leaderClusterTest.nodes.get(0).transportUri()\}"'
}

followClusterTestRunner {
    systemProperty 'java.security.policy', "file://${buildDir}/tmp/java.policy"
    systemProperty 'tests.target_cluster', 'follow'
    systemProperty 'tests.leader_host', "$\{-> leaderClusterTest.nodes.get(0).httpUri()\}"
    systemProperty 'log', "$\{-> followClusterTest.getNodes().get(0).homeDir}/logs/${-> followClusterTest.getNodes().get(0).clusterName}.log"'
    finalizedBy 'leaderClusterTestCluster#stop'
}

cHECK.dependsOn followClusterTest
test.enabled = false // no unit tests for multi-cluster-search, only the rest integration test
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*/
package org.elasticsearch.xpack.core.security.authz.permission;

import org.elasticsearch.common.collect.Tuple;
import org.elasticsearch.common.util.set.Sets;
import org.elasticsearch.test.ESTestCase;
import org.elasticsearch.xpack.core.security.authz.privilege.ApplicationPrivilege;
import org.elasticsearch.xpack.core.security.authz.privilege.ApplicationPrivilegeDescriptor;

import java.util.ArrayList;
import java.util.Arrays;
import java.util.Collections;
import java.util.List;
import java.util.Set;
import java.util.stream.Collectors;
import java.util.stream.Stream;
import static java.util.Collections.singletonList;
import static org.hamcrest.Matchers.containsInAnyOrder;
import static org.hamcrest.Matchers.equalTo;

public class ApplicationPermissionTests extends ESTestCase {

    private List<ApplicationPrivilegeDescriptor> store = new ArrayList<>();

    private ApplicationPrivilege app1All = storePrivilege("app1", "all", "*);
    private ApplicationPrivilege app1Empty = storePrivilege("app1", "empty");
    private ApplicationPrivilege app1Read = storePrivilege("app1", "read", "read/*");
    private ApplicationPrivilege app1Write = storePrivilege("app1", "write", "write/*");
    private ApplicationPrivilege app1Delete = storePrivilege("app1", "delete", "write/delete");
    private ApplicationPrivilege app1Create = storePrivilege("app1", "create", "write/create");
    private ApplicationPrivilege app2Read = storePrivilege("app2", "read", "read/*");

    private ApplicationPrivilege storePrivilege(String app, String name, String... patterns) {
        store.add(new ApplicationPrivilegeDescriptor(app, name, Sets.newHashSet(patterns), Collections.emptyMap()));
        return new ApplicationPrivilege(app, name, patterns);
    }

    public void testCheckSimplePermission() {
        final ApplicationPermission hasPermission = buildPermission(app1Write, "*");
        assertThat(hasPermission.grants(app1Write, "*"), equalTo(true));
        assertThat(hasPermission.grants(app1Write, "foo"), equalTo(true));
    }
}
assertThat(hasPermission.grants(app1Delete, "*"), equalTo(true));
assertThat(hasPermission.grants(app1Create, "foo"), equalTo(true));

assertThat(hasPermission.grants(app1Read, "*"), equalTo(false));
assertThat(hasPermission.grants(app1Read, "foo"), equalTo(false));
assertThat(hasPermission.grants(app1All, "*"), equalTo(false));
assertThat(hasPermission.grants(app1All, "foo"), equalTo(false));
}

public void testNonePermission() {
    final ApplicationPermission hasPermission = buildPermission(ApplicationPrivilege.NONE.apply("app1"), "*");
    for (ApplicationPrivilege privilege : Arrays.asList(app1All, app1Empty, app1Create, app1Delete, app1Read, app1Write, app2Read)) {
        assertThat("Privilege " + privilege + " on ", hasPermission.grants(privilege, ", equalTo(false));
        final String resource = randomAlphaOfLengthBetween(1, 6);
        assertThat("Privilege " + privilege + " on " + resource, hasPermission.grants(privilege, resource), equalTo(false));
    }
}

public void testResourceMatching() {
    final ApplicationPermission hasPermission = buildPermission(app1All, "dashboard/*", "audit/*", "user/12345");

    assertThat(hasPermission.grants(app1Write, "*"), equalTo(false));
    assertThat(hasPermission.grants(app1Write, "dashboard"), equalTo(false));
    assertThat(hasPermission.grants(app1Write, "dashboard/999"), equalTo(true));

    assertThat(hasPermission.grants(app1Create, "audit/2018-02-21"), equalTo(true));
    assertThat(hasPermission.grants(app1Create, "report/2018-02-21"), equalTo(false));

    assertThat(hasPermission.grants(app1Read, "user/12345"), equalTo(true));
    assertThat(hasPermission.grants(app1Read, "user/67890"), equalTo(false));

    assertThat(hasPermission.grants(app1All, "dashboard/999"), equalTo(true));
    assertThat(hasPermission.grants(app1All, "audit/2018-02-21"), equalTo(true));
    assertThat(hasPermission.grants(app1All, "user/12345"), equalTo(true));
}

public void testActionMatching() {
    final ApplicationPermission hasPermission = buildPermission(app1Write, "allow/*");

    final ApplicationPrivilege update = actionPrivilege("app1", "write/update");
    assertThat(hasPermission.grants(update, "allow/1"), equalTo(true));
    assertThat(hasPermission.grants(update, "deny/1"), equalTo(false));

    final ApplicationPrivilege updateCreate = actionPrivilege("app1", "write/update", "write/create");
    assertThat(hasPermission.grants(updateCreate, "allow/1"), equalTo(true));
assertThat(hasPermission.grants(updateCreate, "deny/1"), equalTo(false));

final ApplicationPrivilege manage = actionPrivilege("app1", "admin/manage");
assertThat(hasPermission.grants(manage, "allow/1"), equalTo(false));
assertThat(hasPermission.grants(manage, "deny/1"), equalTo(false));
}

public void testDoesNotMatchAcrossApplications() {
    assertThat(buildPermission(app1Read, "+").grants(app1Read, "123"), equalTo(true));
    assertThat(buildPermission(app1All, "+").grants(app1Read, "123"), equalTo(true));
    assertThat(buildPermission(app1Read, "+").grants(app2Read, "123"), equalTo(false));
    assertThat(buildPermission(app1All, "+").grants(app2Read, "123"), equalTo(false));
}

public void testMergedPermissionChecking() {
    final ApplicationPrivilege app1ReadWrite = compositePrivilege("app1", app1Read, app1Write);
    final ApplicationPermission hasPermission = buildPermission(app1ReadWrite, "allow/*");
    assertThat(hasPermission.grants(app1Read, "allow/1"), equalTo(true));
    assertThat(hasPermission.grants(app1Write, "allow/1"), equalTo(true));
    assertThat(hasPermission.grants(app1Read, "deny/1"), equalTo(false));
    assertThat(hasPermission.grants(app1Write, "deny/1"), equalTo(false));
    assertThat(hasPermission.grants(app1All, "allow/1"), equalTo(false));
    assertThat(hasPermission.grants(app2Read, "allow/1"), equalTo(false));
}

public void testInspectPermissionContents() {
    final ApplicationPrivilege app1ReadWrite = compositePrivilege("app1", app1Read, app1Write);
    ApplicationPermission perm = new ApplicationPermission(Arrays.asList(
            new Tuple<>(app1Read, Sets.newHashSet("obj/1", "obj/2")),
            new Tuple<>(app1Write, Sets.newHashSet("obj/3", "obj/4")),
            new Tuple<>(app1ReadWrite, Sets.newHashSet("obj/5")),
            new Tuple<>(app1All, Sets.newHashSet("obj/6", "obj/7")),
            new Tuple<>(app2Read, Sets.newHashSet("obj/1", "obj/8"))
        ));
    assertThat(perm.getApplicationNames(), containsInAnyOrder("app1", "app2"));
    assertThat(perm.getPrivileges("app1"), containsInAnyOrder(app1Read, app1Write, app1ReadWrite, app1All));
    assertThat(perm.getPrivileges("app2"), containsInAnyOrder(app2Read));
    assertThat(perm.getResourcePatterns(app1Read), containsInAnyOrder("obj/1", "obj/2", "obj/5", "obj/6", "obj/7"));
    assertThat(perm.getResourcePatterns(app1Write), containsInAnyOrder("obj/3", "obj/4", "obj/5", "obj/6", "obj/7"));
    assertThat(perm.getResourcePatterns(app1ReadWrite), containsInAnyOrder("obj/5", "obj/6", "obj/7"));
    assertThat(perm.getResourcePatterns(app1All), containsInAnyOrder("obj/6", "obj/7"));
    assertThat(perm.getResourcePatterns(app2Read), containsInAnyOrder("obj/1", "obj/8"));
}
private ApplicationPrivilege actionPrivilege(String appName, String... actions) {
return ApplicationPrivilege.get(appName, Sets.newHashSet(actions), Collections.emptyList());
}
private ApplicationPrivilege compositePrivilege(String application, ApplicationPrivilege... children) {
Set<String> names =
Stream.of(children).map(ApplicationPrivilege::name).flatMap(Set::stream).collect(Collectors.toSet());
return ApplicationPrivilege.get(application, names, store);
}

private ApplicationPermission buildPermission(ApplicationPrivilege privilege, String... resources) {
return new ApplicationPermission(singletonList(new Tuple<>(privilege, Sets.newHashSet(resources))));
}
}
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*/
package org.elasticsearch.xpack.core.security.authz.permission;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.test.ESTestCase;
import java.util.ArrayList;
import java.util.Arrays;
import java.util.Collections;
import java.util.List;
public class FieldPermissionsCacheTests extends ESTestCase {
public void testFieldPermissionsCaching() {
FieldPermissionsCache fieldPermissionsCache = new FieldPermissionsCache(Settings.EMPTY);
String[] allowed = new String[]{randomAlphaOfLength(5) + "*", randomAlphaOfLength(5) + "*",
randomAlphaOfLength(5) + "*"};
String[] denied = new String[]{allowed[0] + randomAlphaOfLength(5), allowed[1] +
randomAlphaOfLength(5),
allowed[2] + randomAlphaOfLength(5)};
FieldPermissions fieldPermissions = fieldPermissionsCache.getFieldPermissions(allowed, denied);
assertNotNull(fieldPermissions);
final String[] allowed2 = randomBoolean() ? allowed : Arrays.copyOf(allowed, allowed.length);
final String[] denied2 = randomBoolean() ? denied : Arrays.copyOf(denied, denied.length);
assertSame(fieldPermissions, fieldPermissionsCache.getFieldPermissions(allowed2, denied2));
}

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public void testMergeFieldPermissions() {
FieldPermissionsCache fieldPermissionsCache = new FieldPermissionsCache(Settings.EMPTY);
String allowedPrefix1 = randomAlphaOfLength(5);
String allowedPrefix2 = randomAlphaOfLength(5);
String[] allowed1 = new String[]{allowedPrefix1 + "*"};
String[] allowed2 = new String[]{allowedPrefix2 + "*"};
String[] denied1 = new String[]{allowedPrefix1 + "a"};
String[] denied2 = new String[]{allowedPrefix2 + "a"};
FieldPermissions fieldPermissions1 = randomBoolean() ?
fieldPermissionsCache.getFieldPermissions(allowed1, denied1) :
new FieldPermissions(fieldPermissionDef(allowed1, denied1));
FieldPermissions fieldPermissions2 = randomBoolean() ?
fieldPermissionsCache.getFieldPermissions(allowed2, denied2) :
new FieldPermissions(fieldPermissionDef(allowed2, denied2));
FieldPermissions mergedFieldPermissions =
fieldPermissionsCache.getFieldPermissions(Arrays.asList(fieldPermissions1, fieldPermissions2));
assertTrue(mergedFieldPermissions.grantsAccessTo(allowedPrefix1 + "b"));
assertTrue(mergedFieldPermissions.grantsAccessTo(allowedPrefix2 + "b"));
assertFalse(mergedFieldPermissions.grantsAccessTo(denied1[0]));
assertFalse(mergedFieldPermissions.grantsAccessTo(denied2[0]));
allowed1 = new String[]{randomAlphaOfLength(5) + "*", randomAlphaOfLength(5) + "*"};
allowed2 = null;
denied1 = new String[]{allowed1[0] + "a", allowed1[1] + "a"};
denied2 = null;
fieldPermissions1 = randomBoolean() ? fieldPermissionsCache.getFieldPermissions(allowed1, denied1) :
new FieldPermissions(fieldPermissionDef(allowed1, denied1));
fieldPermissions2 = randomBoolean() ? fieldPermissionsCache.getFieldPermissions(allowed2, denied2) :
new FieldPermissions(fieldPermissionDef(allowed2, denied2));
mergedFieldPermissions =
fieldPermissionsCache.getFieldPermissions(Arrays.asList(fieldPermissions1, fieldPermissions2));
assertFalse(mergedFieldPermissions.hasFieldLevelSecurity());
allowed1 = new String[]{};
allowed2 = new String[]{randomAlphaOfLength(5) + "*", randomAlphaOfLength(5) + "*"};
denied1 = new String[]{};
denied2 = new String[]{allowed2[0] + "a", allowed2[1] + "a"};
fieldPermissions1 = randomBoolean() ? fieldPermissionsCache.getFieldPermissions(allowed1, denied1) :
new FieldPermissions(fieldPermissionDef(allowed1, denied1));
fieldPermissions2 = randomBoolean() ? fieldPermissionsCache.getFieldPermissions(allowed2, denied2) :
new FieldPermissions(fieldPermissionDef(allowed2, denied2));
mergedFieldPermissions =
fieldPermissionsCache.getFieldPermissions(Arrays.asList(fieldPermissions1, fieldPermissions2));
for (String field : allowed2) {
assertTrue(mergedFieldPermissions.grantsAccessTo(field));
}
for (String field : denied2) {
assertFalse(mergedFieldPermissions.grantsAccessTo(field));

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allowed1 = randomBoolean() ? null : new String[] {"*"};
allowed2 = randomBoolean() ? null : new String[] {"*"};
denied1 = new String[] {"a"};
denied2 = new String[] {"b"};
fieldPermissions1 = randomBoolean() ? fieldPermissionsCache.getFieldPermissions(allowed1, denied1) :
            new FieldPermissions(fieldPermissionDef(allowed1, denied1));
fieldPermissions2 = randomBoolean() ? fieldPermissionsCache.getFieldPermissions(allowed2, denied2) :
            new FieldPermissions(fieldPermissionDef(allowed2, denied2));
mergedFieldPermissions =
    fieldPermissionsCache.getFieldPermissions(Arrays.asList(fieldPermissions1, fieldPermissions2));
assertTrue(mergedFieldPermissions.grantsAccessTo("a"));
assertTrue(mergedFieldPermissions.grantsAccessTo("b"));

// test merge does not remove _all
allowed1 = new String[] {"_all"};
allowed2 = new String[] {""};
denied1 = null;
denied2 = null;
fieldPermissions1 = randomBoolean() ? fieldPermissionsCache.getFieldPermissions(allowed1, denied1) :
            new FieldPermissions(fieldPermissionDef(allowed1, denied1));
fieldPermissions2 = randomBoolean() ? fieldPermissionsCache.getFieldPermissions(allowed2, denied2) :
            new FieldPermissions(fieldPermissionDef(allowed2, denied2));
mergedFieldPermissions =
    fieldPermissionsCache.getFieldPermissions(Arrays.asList(fieldPermissions1, fieldPermissions2));
assertTrue(fieldPermissions1.grantsAccessTo("_all"));
assertFalse(fieldPermissions2.grantsAccessTo("_all"));
assertTrue(mergedFieldPermissions.grantsAccessTo("_all"));

allowed1 = new String[] {"a*"};
allowed2 = new String[] {"b*"};
denied1 = new String[] {"aa*"};
denied2 = null;
fieldPermissions1 = randomBoolean() ? fieldPermissionsCache.getFieldPermissions(allowed1, denied1) :
            new FieldPermissions(fieldPermissionDef(allowed1, denied1));
fieldPermissions2 = randomBoolean() ? fieldPermissionsCache.getFieldPermissions(allowed2, denied2) :
            new FieldPermissions(fieldPermissionDef(allowed2, denied2));
mergedFieldPermissions =
    fieldPermissionsCache.getFieldPermissions(Arrays.asList(fieldPermissions1, fieldPermissions2));
assertTrue(mergedFieldPermissions.grantsAccessTo("a"));
assertTrue(mergedFieldPermissions.grantsAccessTo("b"));
assertFalse(mergedFieldPermissions.grantsAccessTo("aa"));
assertFalse(mergedFieldPermissions.grantsAccessTo("aa1"));
assertTrue(mergedFieldPermissions.grantsAccessTo("a1"));
}

public void testNonFlsAndFlsMerging() {

List<FieldPermissions> permissionsList = new ArrayList<>();
permissionsList.add(new FieldPermissions(fieldPermissionDef(new String[] {"field1"}, null)));
permissionsList.add(new FieldPermissions(fieldPermissionDef(new String[] {"field2", "query*"}, null)));
permissionsList.add(new FieldPermissions(fieldPermissionDef(new String[] {"field1", "field2"}, null)));
permissionsList.add(new FieldPermissions(fieldPermissionDef(new String[] {}, null)));
permissionsList.add(new FieldPermissions(fieldPermissionDef(null, null)));

FieldPermissionsCache cache = new FieldPermissionsCache(Settings.EMPTY);
for (int i = 0; i < scaledRandomIntBetween(1, 12); i++) {
  Collections.shuffle(permissionsList, random());
  FieldPermissions result = cache.getFieldPermissions(permissionsList);
  assertFalse(result.hasFieldLevelSecurity());
}

private static FieldPermissionsDefinition fieldPermissionDef(String[] granted, String[] denied) {
  return new FieldPermissionsDefinition(granted, denied);
}

package org.elasticsearch.protocol.xpack.license;
import java.io.IOException;
import org.elasticsearch.test.ESTestCase;
import java.util.Collections;

import java.io.IOException;
import java.util.Collections;

public class LicenseStatusTests extends ESTestCase {
  public void testSerialization() throws IOException {
    LicenseStatus status = randomFrom(LicenseStatus.values());
    LicenseStatus status = randomFrom(LicenseStatus.values());
    assertEquals(status, copyWriteable(status, writableRegistry(), LicenseStatus::readFrom));
  }
}

package org.elasticsearch.protocol.xpack.license;
import org.elasticsearch.common.xcontent.XContentParser;
import org.elasticsearch.test.AbstractStreamableXContentTestCase;
import java.io.IOException;
import java.util.Collections;

import java.io.IOException;
import java.util.Collections;

public class LicenseStatusTests extends ESTestCase {
  public void testSerialization() throws IOException {
    LicenseStatus status = randomFrom(LicenseStatus.values());
    LicenseStatus status = randomFrom(LicenseStatus.values());
    assertEquals(status, copyWriteable(status, writableRegistry(), LicenseStatus::readFrom));
  }
}

package org.elasticsearch.protocol.xpack.license;
import org.elasticsearch.common.xcontent.XContentParser;
import org.elasticsearch.test.AbstractStreamableXContentTestCase;
import java.io.IOException;
import java.util.Collections;

import java.io.IOException;
import java.util.Collections;

public class LicenseStatusTests extends ESTestCase {
  public void testSerialization() throws IOException {
    LicenseStatus status = randomFrom(LicenseStatus.values());
    LicenseStatus status = randomFrom(LicenseStatus.values());
    assertEquals(status, copyWriteable(status, writableRegistry(), LicenseStatus::readFrom));
  }
}
import java.util.HashMap;
import java.util.Map;
import java.util.function.Function;
import java.util.function.Predicate;

public class PutLicenseResponseTests extends AbstractStreamableXContentTest
Case<PutLicenseResponse> {

    @Override
    protected boolean supportsUnknownFields() {
        return true;
    }

    @Override
    protected Predicate<String> getRandomFieldsExcludeFilter() {
        // The structure of the response is such that unknown fields inside acknowledge cannot be supported since they
        // are treated as messages from new services
        return p -> p.startsWith("acknowledge");
    }

    @Override
    protected PutLicenseResponse createTestInstance() {
        boolean acknowledged = randomBoolean();
        LicensesStatus status = randomFrom(LicensesStatus.VALID, LicensesStatus.INVALID,
            LicensesStatus.EXPIRED);
        String messageHeader;
        Map<String, String[]> ackMessages;
        if (randomBoolean()) {
            messageHeader = randomAlphaOfLength(10);
            ackMessages = randomAckMessages();
        } else {
            messageHeader = null;
            ackMessages = Collections.emptyMap();
        }

        return new PutLicenseResponse(acknowledged, status, messageHeader, ackMessages);
    }

    private static Map<String, String[]> randomAckMessages() {
        int nFeatures = randomIntBetween(1, 5);
        Map<String, String[]> ackMessages = new HashMap<>();
        for (int i = 0; i < nFeatures; i++) {
            String feature = randomAlphaOfLengthBetween(9, 15);
            int nMessages = randomIntBetween(1, 5);
            String[] messages = new String[nMessages];
            for (int j = 0; j < nMessages; j++) {
                messages[j] = randomAlphaOfLengthBetween(10, 30);
            }
            ackMessages.put(feature, messages);
        }
        return ackMessages;
    }
ackMessages.put(feature, messages);
}

return ackMessages;

@Override
protected PutLicenseResponse doParseInstance(XContentParser parser) throws IOException {
    return PutLicenseResponse.fromXContent(parser);
}

@Override
protected PutLicenseResponse createBlankInstance() {
    return new PutLicenseResponse();
}

@Override
protected PutLicenseResponse mutateInstance(PutLicenseResponse response) {
    @SuppressWarnings("unchecked")
    Function<PutLicenseResponse, PutLicenseResponse> mutator = randomFrom(
        r -> new PutLicenseResponse(
            r.isAcknowledged() == false,
            r.status(),
            r.acknowledgeHeader(),
            r.acknowledgeMessages()),
        r -> new PutLicenseResponse(
            r.isAcknowledged(),
            mutateStatus(r.status()),
            r.acknowledgeHeader(),
            r.acknowledgeMessages()),
        r -> {
            if (r.acknowledgeMessages().isEmpty()) {
                return new PutLicenseResponse(
                    r.isAcknowledged(),
                    r.status(),
                    randomAlphaOfLength(10),
                    randomAckMessages());
            } else {
                return new PutLicenseResponse(r.isAcknowledged(), r.status());
            }
        });
    return mutator.apply(response);
}
private LicensesStatus mutateStatus(LicensesStatus status) {
    return randomValueOtherThan(status, () -> randomFrom(LicensesStatus.values()));
}

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 * or more contributor license agreements. Licensed under the Elastic License;
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 */
package org.elasticsearch.license;

import org.elasticsearch.Version;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.license.License.OperationMode;
import org.elasticsearch.test.ESTestCase;
import org.elasticsearch.test.VersionUtils;
import org.elasticsearch.xpack.core.XPackField;
import org.elasticsearch.xpack.core.XPackSettings;
import java.util.Arrays;
import java.util.function.Predicate;
import java.util.stream.Collectors;
import static org.elasticsearch.license.License.OperationMode.BASIC;
import static org.elasticsearch.license.License.OperationMode.GOLD;
import static org.elasticsearch.license.License.OperationMode.MISSING;
import static org.elasticsearch.license.License.OperationMode.Platinum;
import static org.elasticsearch.license.License.OperationMode.STANDARD;
import static org.elasticsearch.license.License.OperationMode.TRIAL;
import static org.hamcrest.Matchers.is;

/**
 * Unit tests for the {@link XPackLicenseState}
 */
public class XPackLicenseStateTests extends ESTestCase {

    /** Creates a license state with the given license type and active state, and checks the given method returns
     * expected. */
    void assertAllowed(OperationMode mode, boolean active, Predicate<XPackLicenseState> predicate, boolean expected) {
        XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
        licenseState.update(mode, active, null);
        assertEquals(expected, predicate.test(licenseState));
    }

    /**
     * Checks the ack message going from the { @link XPackLicenseState } license type to { @code to } license type.
     */
}
* TODO: check the actual messages, not just the number of them! This was copied from previous license tests...
*/
void assertAckMesssages(String feature, OperationMode from, OperationMode to, int expectedMessages) {
    String[] gotMessages = XPackLicenseState.ACKNOWLEDGMENT_MESSAGES.get(feature).apply(from, to);
    assertEquals(expectedMessages, gotMessages.length);
}

static <T> T randomFrom(T[] values, Predicate<T> filter) {
    return randomFrom(Arrays.stream(values).filter(filter).collect(Collectors.toList()));
}

static OperationMode randomMode() {
    return randomFrom(OperationMode.values());
}

public static OperationMode randomTrialStandardGoldOrPlatinumMode() {
    return randomFrom(TRIAL, STANDARD, GOLD, PLATINUM);
}

public static OperationMode randomTrialOrPlatinumMode() {
    return randomFrom(TRIAL, PLATINUM);
}

public static OperationMode randomTrialBasicStandardGoldOrPlatinumMode() {
    return randomFrom(TRIAL, BASIC, STANDARD, GOLD, PLATINUM);
}

public static OperationMode randomBasicStandardOrGold() {
    return randomFrom(BASIC, STANDARD, GOLD);
}

public void testSecurityDefaults() {
    XPackLicenseState licenseState =
        new XPackLicenseState(Settings.builder().put(XPackSettings.SECURITY_ENABLED.getKey(),
true).build());
    assertThat(licenseState.isAuthAllowed(), is(true));
    assertThat(licenseState.isIpFilteringAllowed(), is(true));
    assertThat(licenseState.isAuditingAllowed(), is(true));
    assertThat(licenseState.isStatsAndHealthAllowed(), is(true));
    assertThat(licenseState.isDocumentAndFieldLevelSecurityAllowed(), is(true));
    assertThat(licenseState.allowedRealmType(), is(XPackLicenseState.AllowedRealmType.ALL));
    assertThat(licenseState.isCustomRoleProvidersAllowed(), is(true));

    licenseState =
        new XPackLicenseState(Settings.builder().put(XPackSettings.TRANSPORT_SSL_ENABLED.getKey(),
true).build());
    assertThat(licenseState.isAuthAllowed(), is(true));
    assertThat(licenseState.isIpFilteringAllowed(), is(true));
assertThat(licenseState.isAuditingAllowed(), is(true));
assertThat(licenseState.isStatsAndHealthAllowed(), is(true));
assertThat(licenseState.isDocumentAndFieldLevelSecurityAllowed(), is(true));
assertThat(licenseState.allowedRealmType(), is(XPackLicenseState.AllowedRealmType.ALL));
assertThat(licenseState.isCustomRoleProvidersAllowed(), is(true));

licenseState = new XPackLicenseState(Settings.EMPTY);
assertThat(licenseState.isAuthAllowed(), is(false));
assertThat(licenseState.isIpFilteringAllowed(), is(false));
assertThat(licenseState.isAuditingAllowed(), is(false));
assertThat(licenseState.isStatsAndHealthAllowed(), is(true));
assertThat(licenseState.isDocumentAndFieldLevelSecurityAllowed(), is(false));
assertThat(licenseState.allowedRealmType(), is(XPackLicenseState.AllowedRealmType.NONE));
assertThat(licenseState.isCustomRoleProvidersAllowed(), is(false));
}

public void testSecurityBasic() {
    XPackLicenseState licenseState = new XPackLicenseState(randomFrom(Settings.EMPTY,
        Settings.builder().put(XPackSettings.SECURITY_ENABLED.getKey(), true).build()));
    licenseState.update(BASIC, true, null);
    assertThat(licenseState.isAuthAllowed(), is(false));
    assertThat(licenseState.isIpFilteringAllowed(), is(false));
    assertThat(licenseState.isAuditingAllowed(), is(false));
    assertThat(licenseState.isStatsAndHealthAllowed(), is(true));
    assertThat(licenseState.isDocumentAndFieldLevelSecurityAllowed(), is(false));
    assertThat(licenseState.allowedRealmType(), is(XPackLicenseState.AllowedRealmType.NONE));
    assertThat(licenseState.isCustomRoleProvidersAllowed(), is(false));
}

public void testSecurityStandard() {
    XPackLicenseState licenseState = new XPackLicenseState(randomFrom(Settings.EMPTY,
        Settings.builder().put(XPackSettings.SECURITY_ENABLED.getKey(), true).build()));
    licenseState.update(STANDARD, true, null);
    assertT...
assertThat(licenseState.isAuthAllowed(), is(true));
assertThat(licenseState.isIpFilteringAllowed(), is(false));
assertThat(licenseState.isAuditingAllowed(), is(false));
assertThat(licenseState.isStatsAndHealthAllowed(), is(true));
assertThat(licenseState.isDocumentAndFieldLevelSecurityAllowed(), is(false));
assertThat(licenseState.allowedRealmType(), is(XPackLicenseState.AllowedRealmType.NATIVE));
assertThat(licenseState.isCustomRoleProvidersAllowed(), is(false));
}

public void testSecurityStandardExpired() {
    XPackLicenseState licenseState = new XPackLicenseState(randomFrom(Settings.EMPTY,
                        Settings.builder().put(XPackSettings.SECURITY_ENABLED.getKey(), true).build()));
    licenseState.update(STANDARD, false, null);

    assertThat(licenseState.isAuthAllowed(), is(true));
    assertThat(licenseState.isIpFilteringAllowed(), is(false));
    assertThat(licenseState.isAuditingAllowed(), is(false));
    assertThat(licenseState.isStatsAndHealthAllowed(), is(false));
    assertThat(licenseState.isDocumentAndFieldLevelSecurityAllowed(), is(false));
    assertThat(licenseState.allowedRealmType(), is(XPackLicenseState.AllowedRealmType.NATIVE));
    assertThat(licenseState.isCustomRoleProvidersAllowed(), is(false));
}

public void testSecurityGold() {
    XPackLicenseState licenseState = new XPackLicenseState(randomFrom(Settings.EMPTY,
                        Settings.builder().put(XPackSettings.SECURITY_ENABLED.getKey(), true).build()));
    licenseState.update(GOLD, true, null);

    assertThat(licenseState.isAuthAllowed(), is(true));
    assertThat(licenseState.isIpFilteringAllowed(), is(true));
    assertThat(licenseState.isAuditingAllowed(), is(true));
    assertThat(licenseState.isStatsAndHealthAllowed(), is(false));
    assertThat(licenseState.isDocumentAndFieldLevelSecurityAllowed(), is(false));
    assertThat(licenseState.allowedRealmType(), is(XPackLicenseState.AllowedRealmType.DEFAULT));
    assertThat(licenseState.isCustomRoleProvidersAllowed(), is(false));
}

public void testSecurityGoldExpired() {
    XPackLicenseState licenseState = new XPackLicenseState(randomFrom(Settings.EMPTY,
                        Settings.builder().put(XPackSettings.SECURITY_ENABLED.getKey(), true).build()));
    licenseState.update(GOLD, false, null);

    assertThat(licenseState.isAuthAllowed(), is(true));
    assertThat(licenseState.isIpFilteringAllowed(), is(true));
    assertThat(licenseState.isAuditingAllowed(), is(true));
    assertThat(licenseState.isStatsAndHealthAllowed(), is(false));
    assertThat(licenseState.isDocumentAndFieldLevelSecurityAllowed(), is(false));
    assertThat(licenseState.allowedRealmType(), is(XPackLicenseState.AllowedRealmType.DEFAULT));
    assertThat(licenseState.isCustomRoleProvidersAllowed(), is(false));
}

assertThat(licenseState.allowedRealmType(), is(XPackLicenseState.AllowedRealmType.DEFAULT));
assertThat(licenseState.isCustomRoleProvidersAllowed(), is(false));
}

public void testSecurityPlatinum() {
    XPackLicenseState licenseState = new XPackLicenseState(randomFrom(Settings.EMPTY,
        Settings.builder().put(XPackSettings.SECURITY_ENABLED.getKey(), true).build()));
    licenseState.update(PLATINUM, true, null);

    assertThat(licenseState.isAuthAllowed(), is(true));
    assertThat(licenseState.isIpFilteringAllowed(), is(true));
    assertThat(licenseState.isAuditingAllowed(), is(true));
    assertThat(licenseState.isStatsAndHealthAllowed(), is(true));
    assertThat(licenseState.isDocumentAndFieldLevelSecurityAllowed(), is(true));
    assertThat(licenseState.allowedRealmType(), is(XPackLicenseState.AllowedRealmType.ALL));
    assertThat(licenseState.isCustomRoleProvidersAllowed(), is(true));
}

public void testSecurityPlatinumExpired() {
    XPackLicenseState licenseState = new XPackLicenseState(randomFrom(Settings.EMPTY,
        Settings.builder().put(XPackSettings.SECURITY_ENABLED.getKey(), true).build()));
    licenseState.update(PLATINUM, false, null);

    assertThat(licenseState.isAuthAllowed(), is(true));
    assertThat(licenseState.isIpFilteringAllowed(), is(true));
    assertThat(licenseState.isAuditingAllowed(), is(true));
    assertThat(licenseState.isStatsAndHealthAllowed(), is(false));
    assertThat(licenseState.isDocumentAndFieldLevelSecurityAllowed(), is(true));
    assertThat(licenseState.allowedRealmType(), is(XPackLicenseState.AllowedRealmType.ALL));
    assertThat(licenseState.isCustomRoleProvidersAllowed(), is(false));
}

public void testNewTrialDefaultsSecurityOff() {
    XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
    licenseState.update(TRIAL, true, VersionUtils.randomVersionBetween(random(), Version.V_6_3_0, Version.CURRENT));

    assertThat(licenseState.isSecurityDisabledByTrialLicense(), is(true));
    assertThat(licenseState.isAuthAllowed(), is(false));
    assertThat(licenseState.isIpFilteringAllowed(), is(false));
    assertThat(licenseState.isAuditingAllowed(), is(false));
    assertThat(licenseState.isStatsAndHealthAllowed(), is(true));
    assertThat(licenseState.isDocumentAndFieldLevelSecurityAllowed(), is(false));
    assertThat(licenseState.allowedRealmType(), is(XPackLicenseState.AllowedRealmType.ALL));
    assertThat(licenseState.isCustomRoleProvidersAllowed(), is(false));
}

public void testOldTrialDefaultsSecurityOn() {


XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
licenseState.update(TRIAL, true, rarely() ? null : VersionUtils.randomVersionBetween(random(),
Version.V_5_6_0, Version.V_6_2_4));

assertThat(licenseState.isSecurityDisabledByTrialLicense(), is(false));
assertThat(licenseState.isAuthAllowed(), is(true));
assertThat(licenseState.isIpFilteringAllowed(), is(true));
assertThat(licenseState.isAuditingAllowed(), is(true));
assertThat(licenseState.isStatsAndHealthAllowed(), is(true));
assertThat(licenseState.isDocumentAndFieldLevelSecurityAllowed(), is(true));
assertThat(licenseState.allowedRealmType(), is(XPackLicenseState.AllowedRealmType.ALL));
assertThat(licenseState.isCustomRoleProvidersAllowed(), is(true));
}

public void testSecurityAckBasicToNotGoldOrStandard() {
    OperationMode toMode = randomFrom(OperationMode.values(), mode -> mode != GOLD && mode !=
STANDARD);
    assertAckMessages(XPackField.SECURITY, BASIC, toMode, 0);
}

public void testSecurityAckAnyToTrialOrPlatinum() {
    assertAckMessages(XPackField.SECURITY, randomMode(), randomTrialOrPlatinumMode(), 0);
}

public void testSecurityAckTrialStandardGoldOrPlatinumToBasic() {
    assertAckMessages(XPackField.SECURITY, randomTrialStandardGoldOrPlatinumMode(), BASIC, 3);
}

public void testSecurityAckAnyToStandard() {
    OperationMode from = randomFrom(BASIC, GOLD, PLATINUM, TRIAL);
    assertAckMessages(XPackField.SECURITY, from, STANDARD, 4);
}

public void testSecurityAckBasicStandardTrialOrPlatinumToGold() {
    OperationMode from = randomFrom(BASIC, PLATINUM, TRIAL, STANDARD);
    assertAckMessages(XPackField.SECURITY, from, GOLD, 2);
}

public void testMonitoringAckBasicToAny() {
    assertAckMessages(XPackField.MONITORING, BASIC, randomMode(), 0);
}

public void testMonitoringAckAnyToTrialGoldOrPlatinum() {
    assertAckMessages(XPackField.MONITORING, randomMode(),
randomTrialStandardGoldOrPlatinumMode(), 0);
}

public void testMonitoringAckNotBasicToBasic() {

OperationMode from = randomFrom(STANDARD, GOLD, PLATINUM, TRIAL);
assertAckMessages(XPackField.MONITORING, from, BASIC, 2);
}

public void testMonitoringAllowed() {
    assertAllowed(randomMode(), true, XPackLicenseState::isMonitoringAllowed, true);
    assertAllowed(randomMode(), false, XPackLicenseState::isMonitoringAllowed, false);
}

public void testMonitoringUpdateRetention() {
    assertAllowed(STANDARD, true, XPackLicenseState::isUpdateRetentionAllowed, true);
    assertAllowed(GOLD, true, XPackLicenseState::isUpdateRetentionAllowed, true);
    assertAllowed(PLATINUM, true, XPackLicenseState::isUpdateRetentionAllowed, true);
    assertAllowed(TRIAL, true, XPackLicenseState::isUpdateRetentionAllowed, true);
    assertAllowed(BASIC, true, XPackLicenseState::isUpdateRetentionAllowed, false);
    assertAllowed(MISSING, false, XPackLicenseState::isUpdateRetentionAllowed, false);
}

public void testWatcherPlatinumGoldTrialStandard() throws Exception {
    assertAllowed(TRIAL, true, XPackLicenseState::isWatcherAllowed, true);
    assertAllowed(GOLD, true, XPackLicenseState::isWatcherAllowed, true);
    assertAllowed(PLATINUM, true, XPackLicenseState::isWatcherAllowed, true);
    assertAllowed(STANDARD, true, XPackLicenseState::isWatcherAllowed, true);
}

public void testWatcherBasicLicense() throws Exception {
    assertAllowed(BASIC, true, XPackLicenseState::isWatcherAllowed, false);
}

public void testWatcherInactive() {
    assertAllowed(BASIC, false, XPackLicenseState::isWatcherAllowed, false);
}

public void testWatcherInactivePlatinumGoldTrial() throws Exception {
    assertAllowed(TRIAL, false, XPackLicenseState::isWatcherAllowed, false);
    assertAllowed(GOLD, false, XPackLicenseState::isWatcherAllowed, false);
    assertAllowed(PLATINUM, false, XPackLicenseState::isWatcherAllowed, false);
    assertAllowed(STANDARD, false, XPackLicenseState::isWatcherAllowed, false);
}

public void testGraphPlatinumTrial() throws Exception {
    assertAllowed(TRIAL, true, XPackLicenseState::isGraphAllowed, true);
    assertAllowed(PLATINUM, true, XPackLicenseState::isGraphAllowed, true);
}

public void testGraphBasic() throws Exception {
    assertAllowed(BASIC, true, XPackLicenseState::isGraphAllowed, false);
}
public void testGraphStandard() throws Exception {
    assertAllowed(STANDARD, true, XPackLicenseState::isGraphAllowed, false);
}

public void testGraphInactiveBasic() {
    assertAllowed(BASIC, false, XPackLicenseState::isGraphAllowed, false);
}

public void testGraphInactivePlatinumTrial() throws Exception {
    assertAllowed(TRIAL, false, XPackLicenseState::isGraphAllowed, false);
    assertAllowed(PLATINUM, false, XPackLicenseState::isGraphAllowed, false);
}

public void testMachineLearningPlatinumTrial() throws Exception {
    assertAllowed(TRIAL, true, XPackLicenseState::isMachineLearningAllowed, true);
    assertAllowed(PLATINUM, true, XPackLicenseState::isMachineLearningAllowed, true);
}

public void testMachineLearningBasic() throws Exception {
    assertAllowed(BASIC, true, XPackLicenseState::isMachineLearningAllowed, false);
}

public void testMachineLearningStandard() throws Exception {
    assertAllowed(STANDARD, true, XPackLicenseState::isMachineLearningAllowed, false);
}

public void testMachineLearningInactiveBasic() {
    assertAllowed(BASIC, false, XPackLicenseState::isMachineLearningAllowed, false);
}

public void testMachineLearningInactivePlatinumTrial() throws Exception {
    assertAllowed(TRIAL, false, XPackLicenseState::isMachineLearningAllowed, false);
    assertAllowed(PLATINUM, false, XPackLicenseState::isMachineLearningAllowed, false);
}

public void testLogstashPlatinumGoldTrialStandard() throws Exception {
    assertAllowed(TRIAL, true, XPackLicenseState::isLogstashAllowed, true);
    assertAllowed(GOLD, true, XPackLicenseState::isLogstashAllowed, true);
    assertAllowed(PLATINUM, true, XPackLicenseState::isLogstashAllowed, true);
    assertAllowed(STANDARD, true, XPackLicenseState::isLogstashAllowed, true);
}

public void testLogstashBasicLicense() throws Exception {
    assertAllowed(BASIC, true, XPackLicenseState::isLogstashAllowed, false);
}

public void testLogstashInactive() {
    assertAllowed(BASIC, false, XPackLicenseState::isLogstashAllowed, false);
}
assertAllowed(BASIC, false, XPackLicenseState::isLogstashAllowed, false);
assertAllowed(TRIAL, false, XPackLicenseState::isLogstashAllowed, false);
assertAllowed(GOLD, false, XPackLicenseState::isLogstashAllowed, false);
assertAllowed(PLATINUM, false, XPackLicenseState::isLogstashAllowed, false);
assertAllowed(STANDARD, false, XPackLicenseState::isLogstashAllowed, false);
}

public void testSqlDefaults() {
    XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
    assertThat(licenseState.isSqlAllowed(), is(true));
    assertThat(licenseState.isJdbcAllowed(), is(true));
}

public void testSqlBasic() {
    XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
    licenseState.update(BASIC, true, null);
    assertThat(licenseState.isSqlAllowed(), is(true));
    assertThat(licenseState.isJdbcAllowed(), is(false));
}

public void testSqlBasicExpired() {
    XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
    licenseState.update(BASIC, false, null);
    assertThat(licenseState.isSqlAllowed(), is(false));
    assertThat(licenseState.isJdbcAllowed(), is(false));
}

public void testSqlStandard() {
    XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
    licenseState.update(STANDARD, true, null);
    assertThat(licenseState.isSqlAllowed(), is(true));
    assertThat(licenseState.isJdbcAllowed(), is(false));
}

public void testSqlStandardExpired() {
    XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
    licenseState.update(STANDARD, false, null);
    assertThat(licenseState.isSqlAllowed(), is(false));
    assertThat(licenseState.isJdbcAllowed(), is(false));
}

public void testSqlGold() {
    XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
    licenseState.update(GOLD, true, null);
assertThat(licenseState.isSqlAllowed(), is(true));
assertThat(licenseState.isJdbcAllowed(), is(false));
}

public void testSqlGoldExpired() {
    XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
    licenseState.update(GOLD, false, null);

    assertThat(licenseState.isSqlAllowed(), is(false));
    assertThat(licenseState.isJdbcAllowed(), is(false));
}

public void testSqlPlatinum() {
    XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
    licenseState.update(PLATINUM, true, null);

    assertThat(licenseState.isSqlAllowed(), is(true));
    assertThat(licenseState.isJdbcAllowed(), is(true));
}

public void testSqlPlatinumExpired() {
    XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
    licenseState.update(PLATINUM, false, null);

    assertThat(licenseState.isSqlAllowed(), is(false));
    assertThat(licenseState.isJdbcAllowed(), is(false));
}

public void testSqlAckAnyToTrialOrPlatinum() {
    assertAckMessages(XPackField.SQL, randomMode(), randomTrialOrPlatinumMode(), 0);
}

public void testSqlAckTrialOrPlatinumToNotTrialOrPlatinum() {
    assertAckMessages(XPackField.SQL, randomTrialOrPlatinumMode(), randomBasicStandardOrGold(), 1);
}

}/*
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 * or more contributor license agreements. Licensed under the Elastic License;
 * you may not use this file except in compliance with the Elastic License.
 */
package org.elasticsearch.license;

import org.elasticsearch.common.unit.TimeValue;
import org.elasticsearch.test.ESTestCase;
import org.elasticsearch.xpack.core.scheduler.SchedulerEngine;
import org.junit.Before;
import static org.hamcrest.Matchers.equalTo;

public class LicenseScheduleTests extends ESTestCase {

    private License license;
    private SchedulerEngine.Schedule schedule;

    @Before
    public void setuo() throws Exception {
        license = TestUtils.generateSignedLicense(TimeValue.timeValueHours(12));
        schedule = LicenseService.nextLicenseCheck(license);
    }

    public void testEnabledLicenseSchedule() throws Exception {
        int expiryDuration = (int) (license.expiryDate() - license.issueDate());
        long triggeredTime = license.issueDate() + between(0, expiryDuration);
        assertThat(schedule.nextScheduledTimeAfter(license.issueDate(), triggeredTime),
                   equalTo(license.expiryDate()));
    }

    public void testGraceLicenseSchedule() throws Exception {
        long triggeredTime = license.expiryDate() + between(1,
            (int) LicenseService.GRACE_PERIOD_DURATION.getMillis());
        assertThat(schedule.nextScheduledTimeAfter(license.issueDate(), triggeredTime),
                   equalTo(license.expiryDate() + LicenseService.GRACE_PERIOD_DURATION.getMillis()));
    }

    public void testExpiredLicenseSchedule() throws Exception {
        long triggeredTime = license.expiryDate() + LicenseService.GRACE_PERIOD_DURATION.getMillis() +
            randomIntBetween(1, 1000);
        assertThat(schedule.nextScheduledTimeAfter(license.issueDate(), triggeredTime),
                   equalTo(-1L));
    }

    public void testInvalidLicenseSchedule() throws Exception {
        long triggeredTime = license.issueDate() - randomIntBetween(1, 1000);
        assertThat(schedule.nextScheduledTimeAfter(triggeredTime, triggeredTime),
                   equalTo(license.issueDate()));
    }
}

/*
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 * or more contributor license agreements. Licensed under the Elastic License;
 * you may not use this file except in compliance with the Elastic License.
 */
package org.elasticsearch.license;

import org.elasticsearch.analysis.common.CommonAnalysisPlugin;
import org.elasticsearch.common.network.NetworkModule;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.plugins.Plugin;
import org.elasticsearch.test.ESIntegTestCase;
import org.elasticsearch.transport.Netty4Plugin;
import org.elasticsearch.xpack.core.LocalStateCompositeXPackPlugin;

import java.util.Arrays;
import java.util.Collection;
import static org.elasticsearch.test.ESIntegTestCase.Scope.TEST;

@ESIntegTestCase.ClusterScope(scope = TEST, numDataNodes = 0, numClientNodes = 0, maxNumDataNodes = 0, transportClientRatio = 0,
    autoMinMasterNodes = false)
public class LicenseServiceClusterNotRecoveredTests extends AbstractLicensesIntegrationTestCase {

    @Override
    protected Settings nodeSettings(int nodeOrdinal) {
        return nodeSettingsBuilder(nodeOrdinal).build();
    }

    private Settings.Builder nodeSettingsBuilder(int nodeOrdinal) {
        return Settings.builder()
            .put(super.nodeSettings(nodeOrdinal))
            .put("node.data", true)
            .put("resource.reload.interval.high", "500ms") // for license mode file watcher
            .put(NetworkModule.HTTP_ENABLED.getKey(), true);
    }

    @Override
    protected Collection<Class<? extends Plugin>> nodePlugins() {
        return Arrays.asList(LocalStateCompositeXPackPlugin.class, CommonAnalysisPlugin.class,
            Netty4Plugin.class);
    }

    @Override
    protected Collection<Class<? extends Plugin>> transportClientPlugins() {
        return nodePlugins();
    }

    public void testClusterNotRecovered() throws Exception {
        logger.info("--> start one master out of two [recovery state]");
        internalCluster().startNode(nodeSettingsBuilder(0).put("discovery.zen.minimum_master_nodes", 2).put("node.master", true)).put("discovery.zen.minimum_master_nodes", 2).put("node.master", true));
        logger.info("--> start second master out of two [recovered state]");
internalCluster().startNode(nodeSettingsBuilder(1).put("discovery.zen.minimum_master_nodes", 2).put("node.master", true));
assertLicenseActive(true);

import org.elasticsearch.ElasticsearchException;
import org.elasticsearch.action.ActionListener;
import org.elasticsearch.client.Client;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.common.util.concurrent.ThreadContext;
import org.elasticsearch.protocol.xpack.XPackInfoResponse;
import org.elasticsearch.protocol.xpack.license.LicenseStatus;
import org.elasticsearch.test.ESTestCase;
import org.elasticsearch.threadpool.TestThreadPool;
import org.elasticsearch.threadpool.ThreadPool;
import org.elasticsearch.xpack.core.action.XPackInfoAction;

import java.util.ArrayList;
import java.util.Arrays;
import java.util.Collections;
import java.util.List;
import java.util.concurrent.atomic.AtomicBoolean;
import java.util.concurrent.atomic.AtomicInteger;
import java.util.concurrent.atomic.AtomicReference;
import java.util.function.Consumer;

import static org.hamcrest.Matchers.contains;
import static org.hamcrest.Matchers.containsInAnyOrder;
import static org.hamcrest.Matchers.containsString;
import static org.hamcrest.Matchers.empty;
import static org.hamcrest.Matchers.equalTo;
import static org.hamcrest.Matchers.hasToString;
import static org.hamcrest.Matchers.instanceOf;
import static org.hamcrest.Matchers.is;
import static org.hamcrest.Matchers.not;
import static org.mockito.Matchers.any;
import static org.mockito.Matchers.anyString;
import static org.mockito.Matchers.argThat;
import static org.mockito.Mockito.doAnswer;
import static org.mockito.Mockito.mock;
import static org.mockito.Mockito.times;
import static org.mockito.Mockito.verify;
import static org.mockito.Mockito.when;

public final class RemoteClusterLicenseCheckerTests extends ESTestCase {

    public void testIsNotRemoteIndex() {
        assertFalse(RemoteClusterLicenseChecker.isRemoteIndex("local-index"));
    }

    public void testIsRemoteIndex() {
        assertTrue(RemoteClusterLicenseChecker.isRemoteIndex("remote-cluster:remote-index"));
    }

    public void testNoRemoteIndex() {
        final List<String> indices = Arrays.asList("local-index1", "local-index2");
        assertFalse(RemoteClusterLicenseChecker.containsRemoteIndex(indices));
    }

    public void testRemoteIndex() {
        final List<String> indices = Arrays.asList("local-index", "remote-cluster:remote-index");
        assertTrue(RemoteClusterLicenseChecker.containsRemoteIndex(indices));
    }

    public void testNoRemoteIndices() {
        final List<String> indices = Collections.singletonList("local-index");
        assertThat(RemoteClusterLicenseChecker.remoteIndices(indices), is(empty()));
    }

    public void testRemoteIndices() {
        final List<String> indices = Arrays.asList("local-index1", "remote-cluster1:index1", "local-index2", "remote-cluster2:index1");
        assertThat(RemoteClusterLicenseChecker.remoteIndices(indices), containsInAnyOrder("remote-cluster1:index1", "remote-cluster2:index1"));
    }

    public void testNoRemoteClusterAliases() {
        final List<String> indices = Arrays.asList("local-index1", "local-index2");
        assertThat(RemoteClusterLicenseChecker.remoteClusterAliases(indices), empty());
    }

    public void testOneRemoteClusterAlias() {
        final List<String> indices = Arrays.asList("local-index1", "remote-cluster1:remote-index1");
        assertThat(RemoteClusterLicenseChecker.remoteClusterAliases(indices), contains("remote-cluster1"));
    }
}
public void testMoreThanOneRemoteClusterAlias() {
    final List<String> indices = Arrays.asList("remote-cluster1:remote-index1", "local-index1", "remote-cluster2:remote-index1");
    assertThat(RemoteClusterLicenseChecker.remoteClusterAliases(indices), contains("remote-cluster1", "remote-cluster2"));
}

public void testDuplicateRemoteClusterAlias() {
    final List<String> indices = Arrays.asList("remote-cluster1:remote-index1", "local-index1", "remote-cluster2:index1", "remote-cluster2:remote-index2");
    assertThat(RemoteClusterLicenseChecker.remoteClusterAliases(indices), contains("remote-cluster1", "remote-cluster2"));
}

public void testCheckRemoteClusterLicensesGivenCompatibleLicenses() {
    final AtomicInteger index = new AtomicInteger();
    final List<XPackInfoResponse> responses = new ArrayList<>();
    final ThreadPool threadPool = createMockThreadPool();
    final Client client = createMockClient(threadPool);
    doAnswer(invocationMock -> {
        @SuppressWarnings("unchecked") ActionListener<XPackInfoResponse> listener =
            (ActionListener<XPackInfoResponse>) invocationMock.getArguments()[2];
        listener.onResponse(responses.get(index.getAndIncrement()));
        return null;
    }).when(client).execute(same(XPackInfoAction.INSTANCE), any(), any());

    final List<String> remoteClusterAliases = Arrays.asList("valid1", "valid2", "valid3");
    responses.add(new XPackInfoResponse(null, createPlatinumLicenseResponse(), null));
    responses.add(new XPackInfoResponse(null, createPlatinumLicenseResponse(), null));
    responses.add(new XPackInfoResponse(null, createPlatinumLicenseResponse(), null));
    final RemoteClusterLicenseChecker licenseChecker =
        new RemoteClusterLicenseChecker(client, XPackLicenseState::isPlatinumOrTrialOperationMode);
    final AtomicReference<RemoteClusterLicenseChecker.LicenseCheck> licenseCheck = new
        AtomicReference<>();

    licenseChecker.checkRemoteClusterLicenses(
        remoteClusterAliases,
        doubleInvocationProtectingListener(new ActionListener<RemoteClusterLicenseChecker.LicenseCheck>(){
            @Override
            public void onResponse(final RemoteClusterLicenseChecker.LicenseCheck response) {
                licenseCheck.set(response);
            }
        });
    }
}

public void testCheckRemoteClusterLicensesGivenIncompatibleLicenses() {
    final List<String> remoteClusterAliases = Arrays.asList("invalid1", "invalid2", "invalid3");
    final AtomicInteger index = new AtomicInteger();
    final List<XPackInfoResponse> responses = new ArrayList<>();
    final ThreadPool threadPool = createMockThreadPool();
    final Client client = createMockClient(threadPool);
    doAnswer(invocationMock -> {
        @SuppressWarnings("unchecked") ActionListener<XPackInfoResponse> listener =
            (ActionListener<XPackInfoResponse>) invocationMock.getArguments()[2];
        listener.onResponse(responses.get(index.getAndIncrement()));
        return null;
    }).when(client).execute(same(XPackInfoAction.INSTANCE), any(), any());

    final List<String> remoteClusterAliases = Arrays.asList("valid1", "valid2", "valid3");
    responses.add(new XPackInfoResponse(null, createPlatinumLicenseResponse(), null));
    responses.add(new XPackInfoResponse(null, createPlatinumLicenseResponse(), null));
    responses.add(new XPackInfoResponse(null, createPlatinumLicenseResponse(), null));
    final RemoteClusterLicenseChecker licenseChecker =
        new RemoteClusterLicenseChecker(client, XPackLicenseState::isPlatinumOrTrialOperationMode);
    final AtomicReference<RemoteClusterLicenseChecker.LicenseCheck> licenseCheck = new
        AtomicReference<>();

    licenseChecker.checkRemoteClusterLicenses(
        remoteClusterAliases,
        doubleInvocationProtectingListener(new ActionListener<RemoteClusterLicenseChecker.LicenseCheck>(){
            @Override
            public void onResponse(final RemoteClusterLicenseChecker.LicenseCheck response) {
                licenseCheck.set(response);
            }
        });
    }
}

public void testCheckRemoteClusterLicensesGivenIncompatibleLicenses2() {
    final List<String> remoteClusterAliases = Arrays.asList("invalid1", "invalid2", "invalid3");
    final AtomicInteger index = new AtomicInteger();
    final List<XPackInfoResponse> responses = new ArrayList<>();
    final ThreadPool threadPool = createMockThreadPool();
    final Client client = createMockClient(threadPool);
    doAnswer(invocationMock -> {
        @SuppressWarnings("unchecked") ActionListener<XPackInfoResponse> listener =
            (ActionListener<XPackInfoResponse>) invocationMock.getArguments()[2];
        listener.onResponse(responses.get(index.getAndIncrement()));
        return null;
    }).when(client).execute(same(XPackInfoAction.INSTANCE), any(), any());

    final List<String> remoteClusterAliases = Arrays.asList("valid1", "valid2", "valid3");
    responses.add(new XPackInfoResponse(null, createPlatinumLicenseResponse(), null));
    responses.add(new XPackInfoResponse(null, createPlatinumLicenseResponse(), null));
    responses.add(new XPackInfoResponse(null, createPlatinumLicenseResponse(), null));
    final RemoteClusterLicenseChecker licenseChecker =
        new RemoteClusterLicenseChecker(client, XPackLicenseState::isPlatinumOrTrialOperationMode);
    final AtomicReference<RemoteClusterLicenseChecker.LicenseCheck> licenseCheck = new
        AtomicReference<>();

    licenseChecker.checkRemoteClusterLicenses(
        remoteClusterAliases,
        doubleInvocationProtectingListener(new ActionListener<RemoteClusterLicenseChecker.LicenseCheck>(){
            @Override
            public void onResponse(final RemoteClusterLicenseChecker.LicenseCheck response) {
                licenseCheck.set(response);
            }
        });
    }
}
```java
@Override
public void onFailure(final Exception e) {
    fail(e.getMessage());
}

verify(client, times(3)).execute(same(XPackInfoAction.INSTANCE), any(), any());
assertNotNull(licenseCheck.get());
assertTrue(licenseCheck.get().isSuccess());
}

public void testCheckRemoteClusterLicensesGivenIncompatibleLicense() {
    final AtomicInteger index = new AtomicInteger();
    final List<String> remoteClusterAliases = Arrays.asList("good", "cluster-with-basic-license", "good2");
    final List<XPackInfoResponse> responses = new ArrayList<>();
    responses.add(new XPackInfoResponse(null, createPlatinumLicenseResponse(), null));
    responses.add(new XPackInfoResponse(null, createBasicLicenseResponse(), null));
    responses.add(new XPackInfoResponse(null, createPlatinumLicenseResponse(), null));
    final ThreadPool threadPool = createMockThreadPool();
    final Client client = createMockClient(threadPool);
    doAnswer(invocationMock -> {
        @SuppressWarnings("unchecked") ActionListener<XPackInfoResponse> listener =
            (ActionListener<XPackInfoResponse>) invocationMock.getArguments()[2];
        listener.onResponse(responses.get(index.getAndIncrement()));
        return null;
    }).when(client).execute(same(XPackInfoAction.INSTANCE), any(), any());

    final RemoteClusterLicenseChecker licenseChecker =
        new RemoteClusterLicenseChecker(client, XPackLicenseState::isPlatinumOrTrialOperationMode);
    final AtomicReference<RemoteClusterLicenseChecker.LicenseCheck> licenseCheck = new
        AtomicReference<>();

    licenseChecker.checkRemoteClusterLicenses(
        remoteClusterAliases,
        doubleInvocationProtectingListener(new ActionListener<RemoteClusterLicenseChecker.LicenseCheck>()
        {
            @Override
            public void onResponse(final RemoteClusterLicenseChecker.LicenseCheck response) {
                licenseCheck.set(response);
            }

            @Override
            public void onFailure(final Exception e) {
                fail(e.getMessage());
            }
        }
    );
```
verify(client, times(2)).execute(same(XPackInfoAction.INSTANCE), any(), any());
assertNotNull(licenseCheck.get());
assertFalse(licenseCheck.get().isSuccess());
assertThat(licenseCheck.get().remoteClusterLicenseInfo().clusterAlias(), equalTo("cluster-with-basic-license"));
assertThat(licenseCheck.get().remoteClusterLicenseInfo().licenseInfo().getType(), equalTo("BASIC"));
}

public void testCheckRemoteClusterLicencesGivenNonExistentCluster() {
    final AtomicInteger index = new AtomicInteger();
    final List<XPackInfoResponse> responses = new ArrayList<>();

    final List<String> remoteClusterAliases = Arrays.asList("valid1", "valid2", "valid3");
    final String failingClusterAlias = randomFrom(remoteClusterAliases);
    final ThreadPool threadPool = createMockThreadPool();
    final Client client = createMockClientThatThrowsOnGetRemoteClusterClient(threadPool, failingClusterAlias);
    doAnswer(invocationMock -> {
        @SuppressWarnings("unchecked") ActionListener<XPackInfoResponse> listener =
            (ActionListener<XPackInfoResponse>) invocationMock.getArguments()[2];
        listener.onResponse(responses.get(index.getAndIncrement()));
        return null;
    }).when(client).execute(same(XPackInfoAction.INSTANCE), any(), any());

    responses.add(new XPackInfoResponse(null, createPlatinumLicenseResponse(), null));
    responses.add(new XPackInfoResponse(null, createPlatinumLicenseResponse(), null));
    responses.add(new XPackInfoResponse(null, createPlatinumLicenseResponse(), null));

    final RemoteClusterLicenseChecker licenseChecker =
        new RemoteClusterLicenseChecker(client, XPackLicenseState::isPlatinumOrTrialOperationMode);
    final AtomicReference<Exception> exception = new AtomicReference<>();

    licenseChecker.checkRemoteClusterLicenses(
        remoteClusterAliases,
        doubleInvocationProtectingListener(new ActionListener<RemoteClusterLicenseChecker.LicenseCheck>()
            {
                @Override
                public void onResponse(final RemoteClusterLicenseChecker.LicenseCheck response) {
                    fail();
                }
            }
        ));
    }
    }
    @Override
    public void onFailure(final Exception e) {
        exception.set(e);
    }
}
assertNotNull(exception.get());
assertThat(exception.get(), instanceOf(ElasticsearchException.class));
assertThat(exception.get().getMessage(), equalTo("could not determine the license type for cluster [" +
        failingClusterAlias + "]");
assertNotNull(exception.get().getCause());
assertThat(exception.get().getCause(), instanceOf(IllegalArgumentException.class));
}

public void testRemoteClusterLicenseCallUsesSystemContext() throws InterruptedException {
    final ThreadPool threadPool = new TestThreadPool(getTestName());

    try {
        final Client client = createMockClient(threadPool);
        doAnswer(invocationMock -> {
            assertTrue(threadPool.getThreadContext().isSystemContext());
            @SuppressWarnings("unchecked") ActionListener<XPackInfoResponse> listener =
                    (ActionListener<XPackInfoResponse>) invocationMock.getArguments()[2];
            listener.onResponse(new XPackInfoResponse(null, createPlatinumLicenseResponse(), null));
            return null;
        }).when(client).execute(same(XPackInfoAction.INSTANCE), any(), any());

        final RemoteClusterLicenseChecker licenseChecker =
                new RemoteClusterLicenseChecker(client, XPackLicenseState::isPlatinumOrTrialOperationMode);

        final List<String> remoteClusterAliases = Collections.singletonList("valid");
        licenseChecker.checkRemoteClusterLicenses(
                remoteClusterAliases, doubleInvocationProtectingListener(ActionListener.wrap(() -> {})));

        verify(client, times(1)).execute(same(XPackInfoAction.INSTANCE), any(), any());
    } finally {
        terminate(threadPool);
    }
}

public void testListenerIsExecutedWithContext() throws InterruptedException {
    final AtomicInteger index = new AtomicInteger();
    final List<XPackInfoResponse> responses = new ArrayList<>();

    final ThreadPool threadPool = new TestThreadPool(getTestName());

    try {
        final List<String> remoteClusterAliases = Arrays.asList("valid1", "valid2", "valid3");
        final Client client;
        final boolean failure = randomBoolean();
        if (failure) {
            final List<String> remoteClusterAliases = Arrays.asList("valid1", "valid2", "valid3");
            final Client client;
            final boolean failure = randomBoolean();
            if (failure) {
                final List<String> remoteClusterAliases = Arrays.asList("valid1", "valid2", "valid3");
                final Client client;
                final boolean failure = randomBoolean();
                if (failure) {
                    final List<String> remoteClusterAliases = Arrays.asList("valid1", "valid2", "valid3");
                    final Client client;
                    final boolean failure = randomBoolean();
                    if (failure) {
                        final List<String> remoteClusterAliases = Arrays.asList("valid1", "valid2", "valid3");
                        final Client client;
                        final boolean failure = randomBoolean();
                        if (failure) {
                            final List<String> remoteClusterAliases = Arrays.asList("valid1", "valid2", "valid3");
                            final Client client;
                            final boolean failure = randomBoolean();
                        }
                    }
                }
            }
        }
    }
}
client = createMockClientThatThrowsOnGetRemoteClusterClient(threadPool, randomFrom(remoteClusterAliases));
} else {
    client = createMockClient(threadPool);
}
doAnswer(invocationMock -> {
    @SuppressWarnings("unchecked") ActionListener<XPackInfoResponse> listener =
    (ActionListener<XPackInfoResponse>) invocationMock.getArguments()[2];
    listener.onResponse(responses.get(index.getAndIncrement()));
    return null;
}).when(client).execute(same(XPackInfoAction.INSTANCE), any(), any());

responses.add(new XPackInfoResponse(null, createPlatinumLicenseResponse(), null));
responses.add(new XPackInfoResponse(null, createPlatinumLicenseResponse(), null));
responses.add(new XPackInfoResponse(null, createPlatinumLicenseResponse(), null));

final RemoteClusterLicenseChecker licenseChecker =
new RemoteClusterLicenseChecker(client, XPackLicenseState::isPlatinumOrTrialOperationMode);

final AtomicBoolean listenerInvoked = new AtomicBoolean();
threadPool.getThreadContext().putHeader("key", "value");
licenseChecker.checkRemoteClusterLicenses(
remoteClusterAliases,
doubleInvocationProtectingListener(new
ActionListener<RemoteClusterLicenseChecker.LicenseCheck>() {

@Override
public void onResponse(final RemoteClusterLicenseChecker.LicenseCheck response) {
    if (failure) {
        fail();
    }
    assertThat(threadPool.getThreadContext().getHeader("key"), equalTo("value"));
    assertFalse(threadPool.getThreadContext().isSystemContext());
    listenerInvoked.set(true);
}

@Override
public void onFailure(final Exception e) {
    if (failure == false) {
        fail();
    }
    assertThat(threadPool.getThreadContext().getHeader("key"), equalTo("value"));
    assertFalse(threadPool.getThreadContext().isSystemContext());
    listenerInvoked.set(true);
}
});
public void testBuildErrorMessageForActiveCompatibleLicense() {
    final XPackInfoResponse.LicenseInfo platinumLicence = createPlatinumLicenseResponse();
    final RemoteClusterLicenseChecker.RemoteClusterLicenseInfo info =
        new RemoteClusterLicenseChecker.RemoteClusterLicenseInfo("platinum-cluster", platinumLicence);
    final AssertionError e = expectThrows(
        AssertionError.class,
        () -> RemoteClusterLicenseChecker.buildErrorMessage("", info,
            RemoteClusterLicenseChecker::isLicensePlatinumOrTrial));
    assertThat(e, hasToString(containsString("license must be incompatible to build error message")));
}

public void testBuildErrorMessageForIncompatibleLicense() {
    final XPackInfoResponse.LicenseInfo basicLicense = createBasicLicenseResponse();
    final RemoteClusterLicenseChecker.RemoteClusterLicenseInfo info =
        new RemoteClusterLicenseChecker.RemoteClusterLicenseInfo("basic-cluster", basicLicense);
    assertThat(
        RemoteClusterLicenseChecker.buildErrorMessage("Feature", info,
            RemoteClusterLicenseChecker::isLicensePlatinumOrTrial),
        equalTo("the license mode [BASIC] on cluster [basic-cluster] does not enable [Feature]"));
}

public void testBuildErrorMessageForInactiveLicense() {
    final XPackInfoResponse.LicenseInfo expiredLicense = createExpiredLicenseResponse();
    final RemoteClusterLicenseChecker.RemoteClusterLicenseInfo info =
        new RemoteClusterLicenseChecker.RemoteClusterLicenseInfo("expired-cluster", expiredLicense);
    assertThat(
        RemoteClusterLicenseChecker.buildErrorMessage("Feature", info,
            RemoteClusterLicenseChecker::isLicensePlatinumOrTrial),
        equalTo("the license on cluster [expired-cluster] is not active"));
}

private ActionListener<RemoteClusterLicenseChecker.LicenseCheck> doubleInvocationProtectingListener(
    final ActionListener<RemoteClusterLicenseChecker.LicenseCheck> listener) {
    final AtomicBoolean listenerInvoked = new AtomicBoolean();
    return new ActionListener<RemoteClusterLicenseChecker.LicenseCheck>() {
        @Override
        public void onResponse(final RemoteClusterLicenseChecker.LicenseCheck response) {
            if (listenerInvoked.compareAndSet(false, true) == false) {
                fail("listener invoked twice");
            }
            listener.onResponse(response);
        }
    }
@Override
public void onFailure(final Exception e) {
    if (listenerInvoked.compareAndSet(false, true) == false) {
        fail("listener invoked twice");
    }
    listener.onFailure(e);
}

private ThreadPool createMockThreadPool() {
    final ThreadPool threadPool = mock(ThreadPool.class);
    when(threadPool.getThreadContext()).thenReturn(new ThreadContext(Settings.EMPTY));
    return threadPool;
}

private Client createMockClient(final ThreadPool threadPool) {
    return createMockClient(threadPool, client ->
        when(client.getRemoteClusterClient(anyString())).thenReturn(client));
}

private Client createMockClientThatThrowsOnGetRemoteClusterClient(final ThreadPool threadPool, final String clusterAlias) {
    return createMockClient(
        threadPool,
        client -> {
            when(client.getRemoteClusterClient(clusterAlias)).thenThrow(new IllegalArgumentException());
            when(client.getRemoteClusterClient(argThat(not(clusterAlias)))).thenReturn(client);
        });
}

private Client createMockClient(final ThreadPool threadPool, final Consumer<Client> finish) {
    final Client client = mock(Client.class);
    when(client.threadPool()).thenReturn(threadPool);
    finish.accept(client);
    return client;
}

private XPackInfoResponse.LicenseInfo createPlatinumLicenseResponse() {
    return new XPackInfoResponse.LicenseInfo("uid", "PLATINUM", "PLATINUM", LicenseStatus.ACTIVE,
        randomNonNegativeLong());
}

private XPackInfoResponse.LicenseInfo createBasicLicenseResponse() {
    return new XPackInfoResponse.LicenseInfo("uid", "BASIC", "BASIC", LicenseStatus.ACTIVE,
private XPackInfoResponse.LicenseInfo createExpiredLicenseResponse() {
    return new XPackInfoResponse.LicenseInfo("uid", "PLATINUM", "PLATINUM", LicenseStatus.EXPIRED,
        randomNonNegativeLong());
}

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 */
package org.elasticsearch.license;

import org.elasticsearch.action.ActionFuture;
import org.elasticsearch.action.support.master.AcknowledgedResponse;
import org.elasticsearch.common.bytes.BytesArray;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.common.unit.TimeValue;
import org.elasticsearch.common.xcontent.XContentType;
import org.elasticsearch.node.Node;
import org.elasticsearch.plugins.Plugin;
import org.elasticsearch.protocol.xpack.license.LicensesStatus;
import org.elasticsearch.protocol.xpack.license.PutLicenseResponse;
import org.elasticsearch.test.ESSingleNodeTestCase;
import org.elasticsearch.xpack.core.LocalStateCompositeXPackPlugin;
import org.elasticsearch.xpack.core.XPackSettings;
import java.nio.charset.StandardCharsets;
import java.util.Collection;
import java.util.Collections;
import java.util.UUID;
import static org.elasticsearch.license.TestUtils.dateMath;
import static org.elasticsearch.license.TestUtils.generateExpiredNonBasicLicense;
import static org.elasticsearch.license.TestUtils.generateSignedLicense;
import static org.hamcrest.CoreMatchers.equalTo;
import static org.hamcrest.CoreMatchers.not;
public class LicensesTransportTests extends ESSingleNodeTestCase {

    @Override
    protected boolean resetNodeAfterTest() {
        return true;
    }
}
@Override
protected Collection<Class<? extends Plugin>> getPlugins() {
    return Collections.singletonList(LocalStateCompositeXPackPlugin.class);
}

@Override
protected Settings nodeSettings() {
    Settings.Builder newSettings = Settings.builder();
    newSettings.put(super.nodeSettings());
    newSettings.put(XPackSettings.SECURITY_ENABLED.getKey(), false);
    // newSettings.put(XPackSettings.MONITORING_ENABLED.getKey(), false);
    // newSettings.put(XPackSettings.WATCHER_ENABLED.getKey(), false);
    newSettings.put(Node.NODE_DATA_SETTING.getKey(), true);
    return newSettings.build();
}

public void testEmptyGetLicense() throws Exception {
    // basic license is added async, we should wait for it
    assertBusy(() -> {
        try {
            final ActionFuture<GetLicenseResponse> getLicenseFuture =
                new GetLicenseRequestBuilder(client().admin().cluster(), GetLicenseAction.INSTANCE).execute();
            final GetLicenseResponse getLicenseResponse;
            getLicenseResponse = getLicenseFuture.get();
            assertNotNull(getLicenseResponse.license());
            assertThat(getLicenseResponse.license().operationMode(), equalTo(License.OperationMode.BASIC));
        } catch (Exception e) {
            throw new RuntimeException("unexpected exception", e);
        }
    });
}

public void testPutLicense() throws Exception {
    License signedLicense = generateSignedLicense(TimeValue.timeValueMinutes(2));

    // put license
    PutLicenseRequestBuilder putLicenseRequestBuilder =
        new PutLicenseRequestBuilder(client().admin().cluster(),
                                    PutLicenseAction.INSTANCE).setLicense(signedLicense)
                                .setAcknowledge(true);
    PutLicenseResponse putLicenseResponse = putLicenseRequestBuilder.get();
    assertThat(putLicenseResponse.isAcknowledged(), equalTo(true));
    assertThat(putLicenseResponse.status(), equalTo(LicensesStatus.VALID));

    // get and check license
    GetLicenseResponse getLicenseResponse = new GetLicenseRequestBuilder(client().admin().cluster(),
                                                                         GetLicenseAction.INSTANCE).get();
    assertThat(getLicenseResponse.license(), equalTo(signedLicense));
}
public void testPutLicenseFromString() throws Exception {
    License signedLicense = generateSignedLicense(TimeValue.timeValueMinutes(2));
    String licenseString = TestUtils.dumpLicense(signedLicense);
    // put license source
    PutLicenseRequestBuilder putLicenseRequestBuilder =
        new PutLicenseRequestBuilder(client().admin().cluster(), PutLicenseAction.INSTANCE)
            .setLicense(new BytesArray(licenseString.getBytes(StandardCharsets.UTF_8)),
                XContentType.JSON)
            .setAcknowledge(true);
    PutLicenseResponse putLicenseResponse = putLicenseRequestBuilder.get();
    assertThat(putLicenseResponse.isAcknowledged(), equalTo(true));
    assertThat(putLicenseResponse.status(), equalTo(LicensesStatus.VALID));
    // get and check license
    GetLicenseResponse getLicenseResponse = new GetLicenseRequestBuilder(client().admin().cluster(),
        GetLicenseAction.INSTANCE).get();
    assertThat(getLicenseResponse.license(), equalTo(signedLicense));
}

public void testPutInvalidLicense() throws Exception {
    License signedLicense = generateSignedLicense(TimeValue.timeValueMinutes(2));
    // modify content of signed license
    License tamperedLicense = License.builder()
        .fromLicenseSpec(signedLicense, signedLicense.signature())
        .expiryDate(signedLicense.expiryDate() + 10 * 24 * 60 * 60 * 1000L)
        .validate()
        .build();
    PutLicenseRequestBuilder builder = new PutLicenseRequestBuilder(client().admin().cluster(),
        PutLicenseAction.INSTANCE);
    builder.setLicense(tamperedLicense);
    // try to put license (should be invalid)
    final PutLicenseResponse putLicenseResponse = builder.get();
    assertThat(putLicenseResponse.status(), equalTo(LicensesStatus.INVALID));
    // try to get invalid license
    GetLicenseResponse getLicenseResponse = new GetLicenseRequestBuilder(client().admin().cluster(),
        GetLicenseAction.INSTANCE).get();
    assertThat(getLicenseResponse.license(), not(tamperedLicense));
}

public void testPutBasicLicenseIsInvalid() throws Exception {
    License signedLicense = generateSignedLicense("basic", License.VERSION_CURRENT, -1,
PutLicenseRequestBuilder builder = new PutLicenseRequestBuilder(client().admin().cluster(),
PutLicenseAction.INSTANCE);
builder.setLicense(signedLicense);

// try to put license (should be invalid)
IllegalArgumentException iae = expectThrows(IllegalArgumentException.class, builder::get);
assertEquals(iae.getMessage(), "Registering basic licenses is not allowed.");

// try to get invalid license
GetLicenseResponse getLicenseResponse = new GetLicenseRequestBuilder(client().admin().cluster(),
GetLicenseAction.INSTANCE).get();
assertThat(getLicenseResponse.license(), not(signedLicense));
}

public void testPutExpiredLicense() throws Exception {
License expiredLicense = generateExpiredNonBasicLicense();
PutLicenseRequestBuilder builder = new PutLicenseRequestBuilder(client().admin().cluster(),
PutLicenseAction.INSTANCE);
builder.setLicense(expiredLicense);
PutLicenseResponse putLicenseResponse = builder.get();
assertThat(putLicenseResponse.status(), equalTo(LicensesStatus.EXPIRED));
// get license should not return the expired license
GetLicenseResponse getLicenseResponse = new GetLicenseRequestBuilder(client().admin().cluster(),
GetLicenseAction.INSTANCE).get();
assertThat(getLicenseResponse.license(), not(expiredLicense));
}

public void testPutLicensesSimple() throws Exception {
License goldSignedLicense = generateSignedLicense("gold", TimeValue.timeValueMinutes(5));
PutLicenseRequestBuilder putLicenseRequestBuilder =
new PutLicenseRequestBuilder(client().admin().cluster(),
PutLicenseAction.INSTANCE).setLicense(goldSignedLicense)
.setAcknowledge(true);
PutLicenseResponse putLicenseResponse = putLicenseRequestBuilder.get();
assertThat(putLicenseResponse.status(), equalTo(LicensesStatus.VALID));
GetLicenseResponse getLicenseResponse = new GetLicenseRequestBuilder(client().admin().cluster(),
GetLicenseAction.INSTANCE).get();
assertThat(getLicenseResponse.license(), equalTo(goldSignedLicense));

License platinumSignedLicense = generateSignedLicense("platinum", TimeValue.timeValueMinutes(2));
putLicenseRequestBuilder.setLicense(platinumSignedLicense);
putLicenseResponse = putLicenseRequestBuilder.get();
assertThat(putLicenseResponse.isAcknowledged(), equalTo(true));
assertThat(putLicenseResponse.status(), equalTo(LicensesStatus.VALID));
getLicenseResponse = new GetLicenseRequestBuilder(client().admin().cluster(),
GetLicenseAction.INSTANCE).get();
}
assertThat(getLicenseResponse.license(), equalTo(platinumSignedLicense));
}

public void testRemoveLicensesSimple() throws Exception {
    License goldLicense = generateSignedLicense("gold", TimeValue.timeValueMinutes(5));
    PutLicenseRequestBuilder putLicenseRequestBuilder =
        new PutLicenseRequestBuilder(client().admin().cluster(),
            PutLicenseAction.INSTANCE).setLicense(goldLicense)
            .setAcknowledge(true);
    PutLicenseResponse putLicenseResponse = putLicenseRequestBuilder.get();
    assertThat(putLicenseResponse.isAcknowledged(), equalTo(true));
    assertThat(putLicenseResponse.status(), equalTo(LicensesStatus.VALID));
    GetLicenseResponse getLicenseResponse = new GetLicenseRequestBuilder(client().admin().cluster(),
        GetLicenseAction.INSTANCE).get();
    assertThat(getLicenseResponse.license(), equalTo(goldLicense));
    // delete all licenses
    DeleteLicenseRequestBuilder deleteLicenseRequestBuilder =
        new DeleteLicenseRequestBuilder(client().admin().cluster(), DeleteLicenseAction.INSTANCE);
    AcknowledgedResponse deleteLicenseResponse = deleteLicenseRequestBuilder.get();
    assertThat(deleteLicenseResponse.isAcknowledged(), equalTo(true));
    // get licenses (expected no licenses)
    getLicenseResponse = new GetLicenseRequestBuilder(client().admin().cluster(),
        GetLicenseAction.INSTANCE).get();
    assertNull(getLicenseResponse.license());
}

public void testLicenseIsRejectWhenStartDateLaterThanNow() throws Exception {
    long now = System.currentTimeMillis();
    final License.Builder builder = License.builder()
        .uid(UUID.randomUUID().toString())
        .version(License.VERSION_CURRENT)
        .expiryDate(dateMath("now+2h", now))
        .startDate(dateMath("now+1h", now))
        .issueDate(now)
        .type(License.OperationMode.TRIAL.toString())
        .issuedTo("customer")
        .issuer("elasticsearch")
        .maxNodes(5);
    License license = TestUtils.generateSignedLicense(builder);
    PutLicenseRequestBuilder putLicenseRequestBuilder =
        new PutLicenseRequestBuilder(client().admin().cluster(),
            PutLicenseAction.INSTANCE).setLicense(license)
            .setAcknowledge(true);
    PutLicenseResponse putLicenseResponse = putLicenseRequestBuilder.get();
    assertThat(putLicenseResponse.isAcknowledged(), equalTo(true));
    assertThat(putLicenseResponse.status(), equalTo(LicensesStatus.INVALID));
}

public void testLicenseIsRejectWhenStartDateLaterThanNow() throws Exception {
    long now = System.currentTimeMillis();
    final License.Builder builder = License.builder()
        .uid(UUID.randomUUID().toString())
        .version(License.VERSION_CURRENT)
        .expiryDate(dateMath("now+2h", now))
        .startDate(dateMath("now+1h", now))
        .issueDate(now)
        .type(License.OperationMode.TRIAL.toString())
        .issuedTo("customer")
        .issuer("elasticsearch")
        .maxNodes(5);
    License license = TestUtils.generateSignedLicense(builder);
    PutLicenseRequestBuilder putLicenseRequestBuilder =
        new PutLicenseRequestBuilder(client().admin().cluster(),
            PutLicenseAction.INSTANCE).setLicense(license)
            .setAcknowledge(true);
    PutLicenseResponse putLicenseResponse = putLicenseRequestBuilder.get();
    assertThat(putLicenseResponse.isAcknowledged(), equalTo(true));
    assertThat(putLicenseResponse.status(), equalTo(LicensesStatus.INVALID));
}
public void testLicenseIsAcceptedWhenStartDateBeforeThanNow() throws Exception {
    long now = System.currentTimeMillis();
    final License.Builder builder = License.builder()
        .uid(UUID.randomUUID().toString())
        .version(License.VERSION_CURRENT)
        .expiryDate(dateMath("now+2h", now))
        .startDate(now)
        .issueDate(now)
        .type(License.OperationMode.TRIAL.toString())
        .issuedTo("customer")
        .issuer("elasticsearch")
        .maxNodes(5);
    License license = TestUtils.generateSignedLicense(builder);

    PutLicenseRequestBuilder putLicenseRequestBuilder =
        new PutLicenseRequestBuilder(client().admin().cluster(),
        PutLicenseAction.INSTANCE).setLicense(license)
            .setAcknowledge(true);
    PutLicenseResponse putLicenseResponse = putLicenseRequestBuilder.get();
    assertThat(putLicenseResponse.isAcknowledged(), equalTo(true));
    assertThat(putLicenseResponse.status(), equalTo(LicensesStatus.VALID));
}

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*/
package org.elasticsearch.license;

import org.elasticsearch.Version;
import org.elasticsearch.action.support.PlainActionFuture;
import org.elasticsearch.cluster.ClusterStateUpdateTask;
import org.elasticsearch.cluster.node.DiscoveryNode;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.common.transport.TransportAddress;
import org.elasticsearch.common.unit.TimeValue;
import org.elasticsearch.protocol.xpack.license.PutLicenseResponse;
import java.net.InetAddress;
import static java.util.Collections.emptyMap;
import static java.util.Collections.emptySet;
import static org.hamcrest.Matchers.containsString;
import static org.mockito.Matchers.any;
import static org.mockito.Mockito.times;
import static org.mockito.Mockito.verify;

import java.net.InetAddress;
import static java.util.Collections.emptyMap;
import static java.util.Collections.emptySet;
import static org.hamcrest.Matchers.containsString;
import static org.mockito.Matchers.any;
import static org.mockito.Mockito.times;
import static org.mockito.Mockito.verify;
public class LicenseTLSTests extends AbstractLicenseServiceTestCase {

    private InetAddress inetAddress;

    public void testApplyLicenseInDevMode() throws Exception {
        License newLicense = TestUtils.generateSignedLicense(randomFrom("gold", "platinum"),
            TimeValue.timeValueHours(24L));
        PutLicenseRequest request = new PutLicenseRequest();
        request.acknowledge(true);
        request.license(newLicense);
        Settings settings = Settings.builder().put("xpack.security.enabled", true).build();
        XPackLicenseState licenseState = new XPackLicenseState(settings);
        inetAddress = InetAddress.getLoopbackAddress();
        setInitialState(null, licenseState, settings);
        licenseService.start();
        PlainActionFuture<PutLicenseResponse> responseFuture = new PlainActionFuture<>();
        licenseService.registerLicense(request, responseFuture);
        verify(clusterService).submitStateUpdateTask(any(String.class), any(ClusterStateUpdateTask.class));
        inetAddress = TransportAddress.META_ADDRESS;
        settings = Settings.builder()
            .put("xpack.security.enabled", true)
            .put("discovery.type", "single-node")
            .build();
        licenseService.stop();
        licenseState = new XPackLicenseState(settings);
        setInitialState(null, licenseState, settings);
        licenseService.start();
        licenseService.registerLicense(request, responseFuture);
        verify(clusterService, times(2)).submitStateUpdateTask(any(String.class), any(ClusterStateUpdateTask.class));
    }

    public void testApplyLicenseInProdMode() throws Exception {
        final String licenseType = randomFrom("GOLD", "PLATINUM");
        License newLicense = TestUtils.generateSignedLicense(licenseType, TimeValue.timeValueHours(24L));
        PutLicenseRequest request = new PutLicenseRequest();
        request.acknowledge(true);
        request.license(newLicense);
        Settings settings = Settings.builder().put("xpack.security.enabled", true).build();
        XPackLicenseState licenseState = new XPackLicenseState(settings);
        inetAddress = TransportAddress.META_ADDRESS;
        settings = Settings.builder()
            .put("xpack.security.enabled", true)
            .put("discovery.type", "single-node")
            .build();
        licenseService.stop();
        licenseState = new XPackLicenseState(settings);
        setInitialState(null, licenseState, settings);
        licenseService.start();
        licenseService.registerLicense(request, responseFuture);
        verify(clusterService, times(2)).submitStateUpdateTask(any(String.class), any(ClusterStateUpdateTask.class));
    }

    public void testApplyLicenseInProdMode() throws Exception {
        final String licenseType = randomFrom("GOLD", "PLATINUM");
        License newLicense = TestUtils.generateSignedLicense(licenseType, TimeValue.timeValueHours(24L));
        PutLicenseRequest request = new PutLicenseRequest();
        request.acknowledge(true);
        request.license(newLicense);
        Settings settings = Settings.builder().put("xpack.security.enabled", true).build();
        XPackLicenseState licenseState = new XPackLicenseState(settings);
        inetAddress = TransportAddress.META_ADDRESS;
        settings = Settings.builder()
            .put("xpack.security.enabled", true)
            .put("discovery.type", "single-node")
            .build();
        licenseService.stop();
        licenseState = new XPackLicenseState(settings);
        setInitialState(null, licenseState, settings);
        licenseService.start();
        PlainActionFuture<PutLicenseResponse> responseFuture = new PlainActionFuture<>();
        IllegalStateException e = expectThrows(IllegalStateException.class, () ->
licenseService.registerLicense(request, responseFuture);
    assertThat(e.getMessage(),
            containsString("Cannot install a [" + licenseType + "] license unless TLS is configured or security is disabled");)

    settings = Settings.builder().put("xpack.security.enabled", false).build();
    licenseService.stop();
    licenseState = new XPackLicenseState(settings);
    setInitialState(null, licenseState, settings);
    licenseService.start();
    licenseService.registerLicense(request, responseFuture);
    verify(clusterService).submitStateUpdateTask(any(String.class), any(ClusterStateUpdateTask.class));

    settings = Settings.builder()
            .put("xpack.security.enabled", true)
            .put("xpack.security.transport.ssl.enabled", true)
            .build();
    licenseService.stop();
    licenseState = new XPackLicenseState(settings);
    setInitialState(null, licenseState, settings);
    licenseService.start();
    licenseService.registerLicense(request, responseFuture);
    verify(clusterService, times(2)).submitStateUpdateTask(any(String.class), any(ClusterStateUpdateTask.class));

    @Override
    protected DiscoveryNode getLocalNode() {
        return new DiscoveryNode("localnode", new TransportAddress(inetAddress, randomIntBetween(9300, 9399)),
                emptyMap(), emptySet(), Version.CURRENT);
    }
} /*
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 */
package org.elasticsearch.license;

import org.elasticsearch.Version;
import org.elasticsearch.cluster.ClusterName;
import org.elasticsearch.cluster.ClusterState;
import org.elasticsearch.cluster.block.ClusterBlocks;
import org.elasticsearch.cluster.metadata.MetaData;
import org.elasticsearch.cluster.node.DiscoveryNode;
import org.elasticsearch.cluster.node.DiscoveryNodes;
import org.elasticsearch.cluster.service.ClusterService;
import org.elasticsearch.common.component.Lifecycle;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.env.Environment;
import org.elasticsearch.test.ESTestCase;
import org.elasticsearch.watcher.ResourceWatcherService;
import org.elasticsearch.xpack.core.XPackPlugin;
import org.elasticsearch.xpack.core.watcher.watch.ClockMock;
import org.junit.After;
import org.junit.Before;
import java.nio.file.Path;
import java.util.Arrays;
import static java.util.Collections.emptySet;
import static java.util.Collections.singletonMap;
import static org.mockito.Mockito.mock;
import static org.mockito.Mockito.when;

public abstract class AbstractLicenseServiceTestCase extends ESTestCase {

    protected LicenseService licenseService;
    protected ClusterService clusterService;
    protected ResourceWatcherService resourceWatcherService;
    protected ClockMock clock;
    protected DiscoveryNodes discoveryNodes;
    protected Environment environment;
    protected String licenseType;

    @Before
    public void init() throws Exception {
        clusterService = mock(ClusterService.class);
        clock = ClockMock.frozen();
        discoveryNodes = mock(DiscoveryNodes.class);
        resourceWatcherService = mock(ResourceWatcherService.class);
        environment = mock(Environment.class);
    }

    protected void setInitialState(License license, XPackLicenseState licenseState, Settings settings) {
        setInitialState(license, licenseState, settings, randomBoolean() ? "trial" : "basic");
    }

    protected void setInitialState(License license, XPackLicenseState licenseState, Settings settings, String
selfGeneratedType) {
        Path tempDir = createTempDir();
        when(environment.configFile()).thenReturn(tempDir);
        licenseType = selfGeneratedType;
        settings =
Settings.builder().put(settings).put(LicenseService.SELF_GENERATED_LICENSE_TYPE.getKey(),
licenseType).build();
        licenseService = new LicenseService(settings, clusterService, clock, environment, resourceWatcherService,

licenseState);
    ClusterState state = mock(ClusterState.class);
    final ClusterBlocks noBlock = ClusterBlocks.builder().build();
    when(state.blocks()).thenReturn(noBlock);
    MetaData metaData = mock(MetaData.class);
    when(metaData.custom(LicensesMetaData.TYPE)).thenReturn(new LicensesMetaData(license, null));
    when(state.metaData()).thenReturn(metaData);
    final DiscoveryNode mockNode = getLocalNode();
    when(discoveryNodes.getMasterNode()).thenReturn(mockNode);
    when(discoveryNodes.getMasterNode()).thenReturn(mockNode);
    when(discoveryNodes.isLocalNodeElectedMaster()).thenReturn(false);
    when(state.nodes()).thenReturn(discoveryNodes);
    when(clusterService.state()).thenReturn(state);
    when(clusterService.lifecycleState()).thenReturn(Lifecycle.State.STARTED);
    when(clusterService.getClusterName()).thenReturn(new ClusterName("a"));
    when(clusterService.localNode()).thenReturn(mockNode);
    }

    protected DiscoveryNode getLocalNode() {
        return new DiscoveryNode("b", buildNewFakeTransportAddress(),
                        singletonMap(XPackPlugin.XPACK_INSTALLED_NODE_ATTR, "true"),
                        emptySet(), Version.CURRENT);
    }

    @After
    public void tearDown() throws Exception {
        super.tearDown();
        licenseService.stop();
    }
}

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 */
package org.elasticsearch.license;

import org.elasticsearch.common.bytes.BytesReference;
import org.elasticsearch.common.unit.TimeValue;
import org.elasticsearch.common.xcontent.ToXContent;
import org.elasticsearch.common.xcontent.XContentBuilder;
import org.elasticsearch.common.xcontent.XContentType;
import org.elasticsearch.test.ESTestCase;
import java.io.IOException;
import java.nio.ByteBuffer;

import java.io.IOException;
import java.nio.ByteBuffer;
import java.util.Base64;
import java.util.Collections;
import java.util.UUID;

import static org.elasticsearch.license.CryptUtils.encryptV3Format;
import static org.hamcrest.Matchers.equalTo;

public class SelfGeneratedLicenseTests extends ESTestCase {

    public void testBasic() throws Exception {
        long issueDate = System.currentTimeMillis();
        License.Builder specBuilder = License.builder()
            .uid(UUID.randomUUID().toString())
            .issuedTo("customer")
            .maxNodes(5)
            .type(randomBoolean() ? "trial" : "basic")
            .issueDate(issueDate)
            .expiryDate(issueDate + TimeValue.timeValueHours(2).getMillis());
        License trialLicense = SelfGeneratedLicense.create(specBuilder, License.VERSION_CURRENT);
        assertThat(SelfGeneratedLicense.verify(trialLicense), equalTo(true));
    }

    public void testTampered() throws Exception {
        long issueDate = System.currentTimeMillis();
        License.Builder specBuilder = License.builder()
            .uid(UUID.randomUUID().toString())
            .issuedTo("customer")
            .type(randomBoolean() ? "trial" : "basic")
            .maxNodes(5)
            .issueDate(issueDate)
            .expiryDate(issueDate + TimeValue.timeValueHours(2).getMillis());
        License trialLicense = SelfGeneratedLicense.create(specBuilder, License.VERSION_CURRENT);
        final String originalSignature = trialLicense.signature();
        License tamperedLicense = License.builder().fromLicenseSpec(trialLicense, originalSignature)
            .expiryDate(System.currentTimeMillis() + TimeValue.timeValueHours(5).getMillis())
            .build();
        assertThat(SelfGeneratedLicense.verify(trialLicense), equalTo(true));
        assertThat(SelfGeneratedLicense.verify(tamperedLicense), equalTo(false));
    }

    public void testFrom1x() throws Exception {
        long issueDate = System.currentTimeMillis();
        License.Builder specBuilder = License.builder()
            .uid(UUID.randomUUID().toString())
            .issuedTo("customer")
            .type("subscription")
            .subscriptionType("trial")
License pre20TrialLicense = specBuilder.build();
License license =
SelfGeneratedLicense.create(License.builder().fromPre20LicenseSpec(pre20TrialLicense).type("trial"),
License.VERSION_CURRENT);
assertThat(SelfGeneratedLicense.verify(license), equalTo(true));

public void testTrialLicenseVerifyWithOlderVersion() throws Exception {
    assumeFalse("Can't run in a FIPS JVM. We can't generate old licenses since PBEWithSHA1AndDESede is not
available", inFipsJvm());
    long issueDate = System.currentTimeMillis();
    License.Builder specBuilder = License.builder()
        .issuedTo("customer")
        .maxNodes(5)
        .issueDate(issueDate)
        .expiryDate(issueDate + TimeValue.timeValueHours(2).getMillis())
        .feature(""")
        .subscriptionType("trial")
        .version(1);
    License trialLicenseV1 = createTrialLicense(specBuilder);
    assertThat(SelfGeneratedLicense.verify(trialLicenseV1), equalTo(true));
}

private static License createTrialLicense(License.Builder specBuilder) {
    License spec = specBuilder
        .type(randomBoolean() ? "trial" : "basic")
        .issuer("elasticsearch")
        .uid(UUID.randomUUID().toString())
        .build();
    final String signature;
    try {
        XContentBuilder contentBuilder = XContentFactory.contentBuilder(XContentType.JSON);
        spec.toXContent(contentBuilder, new
ToXContent.MapParams(Collections.singletonMap(License.LICENSE_SPEC_VIEW_MODE, "true")));
        byte[] encrypt = encryptV3Format(BytesReference.toBytes(BytesReference.bytes(contentBuilder)));
        byte[] bytes = new byte[4 + 4 + encrypt.length];
        ByteBuffer byteBuffer = ByteBuffer.wrap(bytes);
        byteBuffer.putInt(-spec.version())
            .putInt(encrypt.length)
            .put(encrypt);
        signature = Base64.getEncoder().encodeToString(bytes);
    } catch (IOException e) {
throw new IllegalStateException(e);
    }
    return License.builder().fromLicenseSpec(spec, signature).build();
  }
}

/*
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 * or more contributor license agreements. Licensed under the Elastic License;
 * you may not use this file except in compliance with the Elastic License.
 */
package org.elasticsearch.license;

import org.elasticsearch.cluster.ClusterName;
import org.elasticsearch.cluster.ClusterState;
import org.elasticsearch.cluster.ClusterStateUpdateTask;
import org.elasticsearch.cluster.metadata.MetaData;
import org.elasticsearch.common.settings.Settings;
import org.mockito.ArgumentCaptor;
import org.mockito.Mockito;
import java.util.UUID;
import static org.elasticsearch.license.TestUtils.dateMath;
import static org.mockito.Matchers.any;
import static org.mockito.Mockito.verify;
import static org.mockito.Mockito.when;

public class LicenseRegistrationTests extends AbstractLicenseServiceTestCase {

  public void testSelfGeneratedTrialLicense() throws Exception {
    XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
    setInitialState(null, licenseState, Settings.EMPTY, "trial");
    when(discoveryNodes.isLocalNodeElectedMaster()).thenReturn(true);
    licenseService.start();
    ClusterState state = ClusterState.builder(new ClusterName("a")).build();
    ArgumentCaptor<ClusterStateUpdateTask> stateUpdater =
        ArgumentCaptor.forClass(ClusterStateUpdateTask.class);
    verify(clusterService, Mockito.times(1)).submitStateUpdateTask(any(), stateUpdater.capture());
    ClusterState stateWithLicense = stateUpdater.getValue().execute(state);
    LicensesMetaData licenseMetaData = stateWithLicense.metaData().custom(LicensesMetaData.TYPE);
    assertNotNull(licenseMetaData);
    assertNotNull(licenseMetaData.getLicense());
    assertFalse(licenseMetaData.isEligibleForTrial());
    assertEquals("trial", licenseMetaData.getLicense().type());
    assertEquals(clock.millis() +
        LicenseService.NON_BASIC_SELF_GENERATED_LICENSE_DURATION.millis(),
        licenseMetaData.getLicense().expiryDate());

  }
}
public void testSelfGeneratedBasicLicense() throws Exception {
    XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
    setInitialState(null, licenseState, Settings.EMPTY, "basic");
    when(discoveryNodes.isLocalNodeElectedMaster()).thenReturn(true);
    licenseService.start();

    ClusterState state = ClusterState.builder(new ClusterName("a")).build();
    ArgumentCaptor<ClusterStateUpdateTask> stateUpdater =
    ArgumentCaptor.forClass(ClusterStateUpdateTask.class);
    verify(clusterService, Mockito.times(1)).submitStateUpdateTask(any(), stateUpdater.capture());
    ClusterState stateWithLicense = stateUpdater.getValue().execute(state);
    LicensesMetaData licenseMetaData = stateWithLicense.metaData().custom(LicensesMetaData.TYPE);
    assertNotNull(licenseMetaData);
    assertNotNull(licenseMetaData.getLicense());
    assertTrue(licenseMetaData.isEligibleForTrial());
    assertEquals("basic", licenseMetaData.getLicense().type());
    assertEquals(LicenseService.BASIC_SELF_GENERATED_LICENSE_EXPIRATION_MILLIS,
                 licenseMetaData.getLicense().expiryDate());
}

public void testNonSelfGeneratedBasicLicenseIsReplaced() throws Exception {
    long now = System.currentTimeMillis();
    String uid = UUID.randomUUID().toString();
    final License.Builder builder = License.builder()
        .uid(uid)
        .version(License.VERSION_CURRENT)
        .expiryDate(dateMath("now+2h", now))
        .startDate(now)
        .issueDate(now)
        .type("basic")
        .issuedTo("customer")
        .issuer("elasticsearch")
        .maxNodes(5);
    License license = TestUtils.generateSignedLicense(builder);
    XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
    setInitialState(license, licenseState, Settings.EMPTY);
    when(discoveryNodes.isLocalNodeElectedMaster()).thenReturn(true);
    licenseService.start();
    Metadata.Builder mdBuilder = Metadata.builder();
    mdBuilder.putCustom(LicensesMetaData.TYPE, new LicensesMetaData(license, null));
    ClusterState state = ClusterState.builder(new ClusterName("a")).metaData(mdBuilder.build()).build();
    ArgumentCaptor<ClusterStateUpdateTask> stateUpdater =
    ArgumentCaptor.forClass(ClusterStateUpdateTask.class);
    verify(clusterService, Mockito.times(1)).submitStateUpdateTask(any(), stateUpdater.capture());

    XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
    setInitialState(null, licenseState, Settings.EMPTY, "basic");
    when(discoveryNodes.isLocalNodeElectedMaster()).thenReturn(true);
    licenseService.start();
    ClusterState state = ClusterState.builder(new ClusterName("a")).build();
    ArgumentCaptor<ClusterStateUpdateTask> stateUpdater =
    ArgumentCaptor.forClass(ClusterStateUpdateTask.class);
    verify(clusterService, Mockito.times(1)).submitStateUpdateTask(any(), stateUpdater.capture());
}
ClusterState stateWithLicense = stateUpdater.getValue().execute(state);
LicensesMetaData licenseMetaData = stateWithLicense.metaData().custom(LicensesMetaData.TYPE);
assertNotNull(licenseMetaData);
assertNotNull(licenseMetaData.getLicense());
assertTrue(licenseMetaData.isEligibleForTrial());
assertEquals("basic", licenseMetaData.getLicense().type());
assertEquals(LicenseService.BASIC_SELF_GENERATED_LICENSEExpiration_MILLIS,
licenseMetaData.getLicense().expiryDate());
assertEquals(uid, licenseMetaData.getLicense().uid());
}

public void testExpiredSelfGeneratedBasicLicenseIsExtended() throws Exception {
    long now = System.currentTimeMillis();
    String uid = UUID.randomUUID().toString();
    License.Builder builder = License.builder()
        .uid(uid)
        .issuedTo("name")
        .maxNodes(1000)
        .issueDate(dateMath("now-10h", now))
        .type("basic")
        .expiryDate(dateMath("now-2h", now));
    License license = SelfGeneratedLicense.create(builder, License.VERSION_CURRENT);
    XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
    setInitialState(license, licenseState, Settings.EMPTY);
    when(discoveryNodes.isLocalNodeElectedMaster()).thenReturn(true);
    licenseService.start();
    MetaData.Builder mdBuilder = MetaData.builder();
    mdBuilder.putCustom(LicensesMetaData.TYPE, new LicensesMetaData(license, null));
    ClusterState state = ClusterState.builder(new ClusterName("a")).metaData(mdBuilder.build()).build();
    ArgumentCaptor<ClusterStateUpdateTask> stateUpdater =
        ArgumentCaptor.forClass(ClusterStateUpdateTask.class);
    verify(clusterService, Mockito.times(1)).submitStateUpdateTask(any(), stateUpdater.capture());
    ClusterState stateWithLicense = stateUpdater.getValue().execute(state);
    LicensesMetaData licenseMetaData = stateWithLicense.metaData().custom(LicensesMetaData.TYPE);
    assertNotNull(licenseMetaData);
    assertNotNull(licenseMetaData.getLicense());
    assertTrue(licenseMetaData.isEligibleForTrial());
    assertEquals("basic", licenseMetaData.getLicense().type());
    assertEquals(LicenseService.BASIC_SELF_GENERATED_LICENSEExpiration_MILLIS,
        licenseMetaData.getLicense().expiryDate());
    assertEquals(uid, licenseMetaData.getLicense().uid());
}
/*
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* or more contributor license agreements. Licensed under the Elastic License;
*/
import com.carrotsearch.randomizedtesting.RandomizedTest;
import org.elasticsearch.Version;
import org.elasticsearch.action.ActionListener;
import org.elasticsearch.cluster.metadata.MetaData;
import org.elasticsearch.common.Strings;
import org.elasticsearch.common.joda.joda.DateTimeFormatter;
import org.elasticsearch.common.joda.joda.Joda;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.common.joda.DateMathParser;
import org.elasticsearch.common.time.TimeUnit;
import org.elasticsearch.common.xcontent.ToXContent;
import org.elasticsearch.common.xcontent.XContentBuilder;
import org.elasticsearch.common.xcontent.XContentType;
import org.elasticsearch.license.licensor.LicenseSigner;
import org.elasticsearch.protocol.xpack.license.LicensesStatus;
import org.elasticsearch.protocol.xpack.license.PutLicenseResponse;
import org.mockito.Mockito;
import org.junit.Assert;
import java.io.IOException;
import java.io.InputStream;
import java.nio.file.Files;
import java.nio.file.Path;
import java.nio.file.StandardCopyOption;
import java.util.ArrayList;
import java.util.List;
import java.util.UUID;
import java.util.concurrent.CountDownLatch;
import java.util.concurrent.atomic.AtomicReference;
import static com.carrotsearch.randomizedtesting.RandomizedTest.randomBoolean;
import static com.carrotsearch.randomizedtesting.RandomizedTest.randomInt;
import static org.apache.lucene.util.LuceneTestCase.createTempFile;
import static org.elasticsearch.common.xcontent.XContentFactory.jsonBuilder;
import static org.elasticsearch.test.ESTestCase.randomAlphaOfLength;
import static org.elasticsearch.test.ESTestCase.randomFrom;
import static org.elasticsearch.test.ESTestCase.randomIntBetween;
import static org.hamcrest.core.IsEqual.equalTo;
import static org.junit.Assert.assertThat;

public class TestUtils {

}
private static final FormatDateTimeFormatter formatDateTimeFormatter = Joda.forPattern("yyyy-MM-dd");
private static final DateMathParser dateMathParser = formatDateTimeFormatter.toDateMathParser();
private static final DateTimeFormatter dateTimeFormatter = formatDateTimeFormatter.printer();

public static String dateMathString(String time, final long now) {
    return dateTimeFormatter.print(dateMathParser.parse(time, () -> now));
}

public static long dateMath(String time, final long now) {
    return dateMathParser.parse(time, () -> now);
}

public static LicenseSpec generateRandomLicenseSpec(int version) {
    boolean datesInMillis = randomBoolean();
    long now = System.currentTimeMillis();
    String uid = UUID.randomUUID().toString();
    String feature = "feature__" + randomInt();
    String issuer = "issuer__" + randomInt();
    String issuedTo = "issuedTo__" + randomInt();
    final String type;
    final String subscriptionType;
    if (version < License.VERSION_NO_FEATURE_TYPE) {
        subscriptionType = randomFrom("gold", "silver", "platinum");
        type = "subscription";//randomFrom("subscription", "internal", "development");
    } else {
        subscriptionType = null;
        type = randomFrom("basic", "dev", "gold", "silver", "platinum");
    }
    int maxNodes = RandomizedTest.randomIntBetween(5, 100);
    if (datesInMillis) {
        long issueDateInMillis = dateMath("now", now);
        long expiryDateInMillis = dateMath("now+10d/d", now);
        return new LicenseSpec(version, uid, feature, issueDateInMillis, expiryDateInMillis, type, subscriptionType, issuedTo, issuer, maxNodes);
    } else {
        String issueDate = dateMathString("now", now);
        String expiryDate = dateMathString("now+10d/d", now);
        return new LicenseSpec(version, uid, feature, issueDate, expiryDate, type, subscriptionType, issuedTo, issuer, maxNodes);
    }
}

public static String generateLicenseSpecString(LicenseSpec licenseSpec) throws IOException {
    XContentBuilder licenses = jsonBuilder();
    licenses.startObject();
    licenses.startArray("licenses");
    licenses.startObject();
.field("uid", licenseSpec.uid)
.field("type", licenseSpec.type)
.field("subscription_type", licenseSpec.subscriptionType)
.field("issued_to", licenseSpec.issuedTo)
.field("issuer", licenseSpec.issuer)
.field("feature", licenseSpec.feature)
.field("max_nodes", licenseSpec.maxNodes);

if (licenseSpec.issueDate != null) {
    licenses.field("issue_date", licenseSpec.issueDate);
} else {
    licenses.field("issue_date_in_millis", licenseSpec.issueDateInMillis);
}

if (licenseSpec.expiryDate != null) {
    licenses.field("expiry_date", licenseSpec.expiryDate);
} else {
    licenses.field("expiry_date_in_millis", licenseSpec.expiryDateInMillis);
}

licenses.field("version", licenseSpec.version);
licenses.endObject();
licenses.endArray();
licenses.endObject();
return Strings.toString(licenses);
}

public static License generateLicenses(LicenseSpec spec) {
    License.Builder builder = License.builder()
        .uid(spec.uid)
        .feature(spec.feature)
        .type(spec.type)
        .subscriptionType(spec.subscriptionType)
        .issuedTo(spec.issuedTo)
        .issuer(spec.issuer)
        .maxNodes(spec.maxNodes);

    if (spec.expiryDate != null) {
        builder.expiryDate(DateUtils.endOfTheDay(spec.expiryDate));
    } else {
        builder.expiryDate(spec.expiryDateInMillis);
    }

    if (spec.issueDate != null) {
        builder.issueDate(DateUtils.beginningOfTheDay(spec.issueDate));
    } else {
        builder.issueDate(spec.issueDateInMillis);
    }

    return builder.build();
}
public static void assertLicenseSpec(LicenseSpec spec, License license) {
    MatcherAssert.assertThat(license.uid(), equalTo(spec.uid));
    MatcherAssert.assertThat(license.issuedTo(), equalTo(spec.issuedTo));
    MatcherAssert.assertThat(license.issuer(), equalTo(spec.issuer));
    MatcherAssert.assertThat(license.type(), equalTo(spec.type));
    MatcherAssert.assertThat(license.maxNodes(), equalTo(spec.maxNodes));
    if (spec.issueDate != null) {
        MatcherAssert.assertThat(license.issueDate(), equalTo(DateUtils.beginningOfTheDay(spec.issueDate)));
    } else {
        MatcherAssert.assertThat(license.issueDate(), equalTo(spec.issueDateInMillis));
    }
    if (spec.expiryDate != null) {
        MatcherAssert.assertThat(license.expiryDate(), equalTo(DateUtils.endOfTheDay(spec.expiryDate)));
    } else {
        MatcherAssert.assertThat(license.expiryDate(), equalTo(spec.expiryDateInMillis));
    }
}

public static class LicenseSpec {
    public final int version;
    public final String feature;
    public final String issueDate;
    public final long issueDateInMillis;
    public final String expiryDate;
    public final long expiryDateInMillis;
    public final String uid;
    public final String type;
    public final String subscriptionType;
    public final String issuedTo;
    public final String issuer;
    public final int maxNodes;

    public LicenseSpec(String issueDate, String expiryDate) {
        this(License.VERSION_CURRENT, UUID.randomUUID().toString(), "feature", issueDate, expiryDate,
            "trial", "none", "customer",
            "elasticsearch", 5);
    }

    public LicenseSpec(int version, String uid, String feature, long issueDateInMillis, long expiryDateInMillis,
        String type,
        String subscriptionType, String issuedTo, String issuer, int maxNodes) {
        this.version = version;
        this.feature = feature;
        this.issueDateInMillis = issueDateInMillis;
        this.issueDate = null;
        this.expiryDateInMillis = expiryDateInMillis;
        this.expiryDate = null;
        this.uid = uid;
    }
}
public LicenseSpec(int version, String uid, String feature, String issueDate, String expiryDate, String type,
        String subscriptionType, String issuedTo, String issuer, int maxNodes) {
    this.version = version;
    this.feature = feature;
    this.issueDate = issueDate;
    this.issueDateInMillis = -1;
    this.expiryDate = expiryDate;
    this.expiryDateInMillis = -1;
    this.uid = uid;
    this.type = type;
    this.subscriptionType = subscriptionType;
    this.issuedTo = issuedTo;
    this.issuer = issuer;
    this.maxNodes = maxNodes;
}

private static Path getTestPriKeyPath() throws Exception {
    return getResourcePath("/private.key");
}

private static Path getTestPubKeyPath() throws Exception {
    return getResourcePath("/public.key");
}

public static String dumpLicense(License license) throws Exception {
    XContentBuilder builder = XContentFactory.contentBuilder(XContentType.JSON);
    builder.startObject();
    builder.startObject("license");
    license.toInnerXContent(builder, ToXContent.EMPTY_PARAMS);
    builder.endObject();
    builder.endObject();
    return Strings.toString(builder);
}

public static License generateSignedLicense(TimeValue expiryDuration) throws Exception {
    return generateSignedLicense(null, -1, expiryDuration);
}

public static License generateSignedLicense(String type, TimeValue expiryDuration) throws Exception {
    return generateSignedLicense(type, -1, expiryDuration);
}
public static License generateSignedLicense(long issueDate, TimeValue expiryDuration) throws Exception {
    return generateSignedLicense(null, issueDate, expiryDuration);
}

public static License generateSignedLicense(String type, long issueDate, TimeValue expiryDuration) throws Exception {
    return generateSignedLicense(type, randomIntBetween(License.VERSION_START, License.VERSION_CURRENT), issueDate, expiryDuration);
}

public static License generateSignedLicenseOldSignature() {
    long issueDate = System.currentTimeMillis();
    License.Builder specBuilder = License.builder()
        .uid(UUID.randomUUID().toString())
        .version(License.VERSION_START_DATE)
        .issuedTo("customer")
        .maxNodes(5)
        .type("trial")
        .issueDate(issueDate)
        .expiryDate(issueDate + TimeValue.timeValueHours(24).getMillis());
    return SelfGeneratedLicense.create(specBuilder, License.VERSION_START_DATE);
}

/**
 * This method which chooses the license type randomly if the type is null. However, it will not randomly
 * choose trial or basic types as those types can only be self-generated.
 */
public static License generateSignedLicense(String type, int version, long issueDate, TimeValue expiryDuration) throws Exception {
    long issue = (issueDate != -1L) ? issueDate : System.currentTimeMillis() - TimeValue.timeValueHours(2).getMillis();
    final String licenseType;
    if (version < License.VERSION_NO_FEATURE_TYPE) {
        licenseType = randomFrom("subscription", "internal", "development");
    } else {
        licenseType = (type != null) ? type : randomFrom("silver", "dev", "gold", "platinum");
    }
    final License.Builder builder = License.builder()
        .uid(UUID.randomUUID().toString())
        .version(version)
        .expiryDate(System.currentTimeMillis() + expiryDuration.getMillis())
        .issueDate(issue)
        .type(licenseType)
        .issuedTo("customer")
        .issuer("elasticsearch")
        .maxNodes(5);
    if (version == License.VERSION_START) {
        return builder.build();
    } else {
        // Handle other versions
        return builder.build();
    }
}


builder.subscriptionType((type != null) ? type : randomFrom("dev", "gold", "platinum", "silver"));
builder.feature(randomAlphaOfLength(10));

final LicenseSigner signer = new LicenseSigner(getTestPriKeyPath(), getTestPubKeyPath());
return signer.sign(builder.build());

public static License generateSignedLicense(License.Builder builder) throws Exception {
    LicenseSigner signer = new LicenseSigner(getTestPriKeyPath(), getTestPubKeyPath());
    return signer.sign(builder.build());
}

public static License generateExpiredNonBasicLicense(long expiryDate) throws Exception {
    return generateExpiredNonBasicLicense(randomFrom("silver", "dev", "gold", "platinum"), expiryDate);
}

public static License generateExpiredNonBasicLicense() throws Exception {
    return generateExpiredNonBasicLicense(randomFrom("silver", "dev", "gold", "platinum"));
}

public static License generateExpiredNonBasicLicense(String type) throws Exception {
    return generateExpiredNonBasicLicense(type,
            System.currentTimeMillis() - TimeValue.timeValueHours(randomIntBetween(1, 10)).getMillis());
}

public static License generateExpiredNonBasicLicense(String type, long expiryDate) throws Exception {
    final License.Builder builder = License.builder()
            .uid(UUID.randomUUID().toString())
            .version(License.VERSION_CURRENT)
            .expiryDate(expiryDate)
            .issueDate(expiryDate - TimeValue.timeValueMinutes(10).getMillis())
            .type(type)
            .issuedTo("customer")
            .issuer("elasticsearch")
            .maxNodes(5);
    LicenseSigner signer = new LicenseSigner(getTestPriKeyPath(), getTestPubKeyPath());
    return signer.sign(builder.build());
}

private static Path getResourcePath(String resource) throws Exception {
    Path resourceFile = createTempFile();
    try (InputStream resourceInput = TestUtils.class.getResourceAsStream(resource)) {
        Files.copy(resourceInput, resourceFile, StandardCopyOption.REPLACE_EXISTING);
    }
    return resourceFile;
}

public static void registerAndAckSignedLicenses(final LicenseService licenseService, License license,
final LicensesStatus expectedStatus) {
PutLicenseRequest putLicenseRequest = new PutLicenseRequest().license(license).acknowledge(true);
final CountDownLatch latch = new CountDownLatch(1);
final AtomicReference<LicensesStatus> status = new AtomicReference<>();
licenseService.registerLicense(putLicenseRequest, new ActionListener<PutLicenseResponse>() {
    @Override
    public void onResponse(PutLicenseResponse licensesUpdateResponse) {
        status.set(licensesUpdateResponse.status());
        latch.countDown();
    }
    @Override
    public void onFailure(Exception e) {
        latch.countDown();
    }
}));
try {
    latch.await();
} catch (InterruptedException e) {
    Assert.fail(e.getMessage());
}
assertThat(status.get(), equalTo(expectedStatus));}

public static class AssertingLicenseState extends XPackLicenseState {
    public final List<License.OperationMode> modeUpdates = new ArrayList<>();
    public final List<Boolean> activeUpdates = new ArrayList<>();
    public final List<Version> trialVersionUpdates = new ArrayList<>();
    public AssertingLicenseState() {
        super(Settings.EMPTY);
    }
    @Override
    void update(License.OperationMode mode, boolean active, Version mostRecentTrialVersion) {
        modeUpdates.add(mode);
        activeUpdates.add(active);
        trialVersionUpdates.add(mostRecentTrialVersion);
    }
}

/**
 * A license state that makes the { @link #update(License.OperationMode, boolean, Version)}
 * method public for use in tests.
 */
public static class UpdatableLicenseState extends XPackLicenseState {
    public final List<License.OperationMode> modeUpdates = new ArrayList<>();
    public final List<Boolean> activeUpdates = new ArrayList<>();
    public final List<Version> trialVersionUpdates = new ArrayList<>();
    public UpdatableLicenseState() {
        this(Settings.EMPTY);
    }
}
public UpdatableLicenseState(Settings settings) {
    super(settings);
}

@Override
public void update(License.OperationMode mode, boolean active, Version mostRecentTrialVersion) {
    super.update(mode, active, mostRecentTrialVersion);
}

public static void putLicense(MetaData.Builder builder, License license) {
    builder.putCustom(LicensesMetaData.TYPE, new LicensesMetaData(license, null));
}

package org.elasticsearch.license;

import org.elasticsearch.action.ActionListener;
import org.elasticsearch.cluster.ack.ClusterStateUpdateResponse;
import org.elasticsearch.cluster.service.ClusterService;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.common.unit.TimeValue;
import org.elasticsearch.plugins.Plugin;
import org.elasticsearch.protocol.xpack.license.DeleteLicenseRequest;
import org.elasticsearch.protocol.xpack.license.LicensesStatus;
import org.elasticsearch.test.ESSingleNodeTestCase;
import org.elasticsearch.xpack.core.LocalStateCompositeXPackPlugin;
import org.elasticsearch.xpack.core.XPackSettings;
import java.util.Collection;
import java.util.Collections;
import java.util.concurrent.CountDownLatch;
import java.util.concurrent.atomic.AtomicBoolean;
import static org.hamcrest.Matchers.equalTo;
import static org.hamcrest.Matchers.not;

public class LicensesManagerServiceTests extends ESSingleNodeTestCase {

    @Override
    protected Collection<Class<? extends Plugin>> getPlugins() {

        import org.elasticsearch.action.ActionListener;
        import org.elasticsearch.cluster.ack.ClusterStateUpdateResponse;
        import org.elasticsearch.cluster.service.ClusterService;
        import org.elasticsearch.common.settings.Settings;
        import org.elasticsearch.common.unit.TimeValue;
        import org.elasticsearch.plugins.Plugin;
        import org.elasticsearch.protocol.xpack.license.DeleteLicenseRequest;
        import org.elasticsearch.protocol.xpack.license.LicensesStatus;
        import org.elasticsearch.test.ESSingleNodeTestCase;
        import org.elasticsearch.xpack.core.LocalStateCompositeXPackPlugin;
        import org.elasticsearch.xpack.core.XPackSettings;
        import java.util.Collection;
        import java.util.Collections;
        import java.util.concurrent.CountDownLatch;
        import java.util.concurrent.atomic.AtomicBoolean;

        import static org.hamcrest.Matchers.equalTo;
        import static org.hamcrest.Matchers.not;

        public class LicensesManagerServiceTests extends ESSingleNodeTestCase {

            @Override
            protected Collection<Class<? extends Plugin>> getPlugins() {

                }
return Collections.singletonList(LocalStateCompositeXPackPlugin.class);
}

@Override
protected Settings nodeSettings() {
    return Settings.builder()
        .put(super.nodeSettings())
        .put(XPackSettings.SECURITY_ENABLED.getKey(), false)
        .put(XPackSettings.MONITORING_ENABLED.getKey(), false)
        .put(XPackSettings.WATCHER_ENABLED.getKey(), false)
        .put(XPackSettings.GRAPH_ENABLED.getKey(), false)
        .put(XPackSettings.MACHINE_LEARNING_ENABLED.getKey(), false)
        .build();
}

@Override
protected boolean resetNodeAfterTest() {
    return true;
}

@Before
public void waitForTrialLicenseToBeGenerated() throws Exception {
    assertBusy(() ->
        assertNotNull(getInstanceFromNode(ClusterService.class).state().metaData().custom(LicensesMetaData.TYPE)));
}

public void testStoreAndGetLicenses() throws Exception {
    LicenseService licenseService = getInstanceFromNode(LicenseService.class);
    ClusterService clusterService = getInstanceFromNode(ClusterService.class);
    License goldLicense = TestUtils.generateSignedLicense("gold", TimeValue.timeValueHours(1));
    TestUtils.registerAndAckSignedLicenses(licenseService, goldLicense, LicensesStatus.VALID);
    License silverLicense = TestUtils.generateSignedLicense("silver", TimeValue.timeValueHours(2));
    TestUtils.registerAndAckSignedLicenses(licenseService, silverLicense, LicensesStatus.VALID);
    License platinumLicense = TestUtils.generateSignedLicense("platinum", TimeValue.timeValueHours(1));
    TestUtils.registerAndAckSignedLicenses(licenseService, platinumLicense, LicensesStatus.VALID);
    LicensesMetaData licensesMetaData = clusterService.state().metaData().custom(LicensesMetaData.TYPE);
    assertThat(licensesMetaData.getLicense(), equalTo(platinumLicense));
    final License getLicenses = licenseService.getLicense();
    assertThat(getLicenses, equalTo(platinumLicense));
}

// TODO: Add test/feature blocking the registration of basic license

public void testEffectiveLicenses() throws Exception {
    final LicenseService licenseService = getInstanceFromNode(LicenseService.class);
    final ClusterService clusterService = getInstanceFromNode(ClusterService.class);
    License goldLicense = TestUtils.generateSignedLicense("gold", TimeValue.timeValueSeconds(5));
    // put gold license
TestUtils.registerAndAckSignedLicenses(licenseService, goldLicense, LicensesStatus.VALID);
LicensesMetaData licensesMetaData = clusterService.state().metaData().custom(LicensesMetaData.TYPE);
assertThat(LicenseService.getLicense(licensesMetaData), equalTo(goldLicense));

License platinumLicense = TestUtils.generateSignedLicense("platinum", TimeValue.timeValueSeconds(3));
// put platinum license
TestUtils.registerAndAckSignedLicenses(licenseService, platinumLicense, LicensesStatus.VALID);
licensesMetaData = clusterService.state().metaData().custom(LicensesMetaData.TYPE);
assertThat(LicenseService.getLicense(licensesMetaData), equalTo(platinumLicense));

public void testInvalidLicenseStorage() throws Exception {
    LicenseService licenseService = getInstanceFromNode(LicenseService.class);
    ClusterService clusterService = getInstanceFromNode(ClusterService.class);
    License signedLicense = TestUtils.generateSignedLicense(TimeValue.timeValueMinutes(2));
    // modify content of signed license
    License tamperedLicense = License.builder()
        .fromLicenseSpec(signedLicense, signedLicense.signature())
        .expiryDate(signedLicense.expiryDate() + 10 * 24 * 60 * 60 * 1000L)
        .validate()
        .build();

    TestUtils.registerAndAckSignedLicenses(licenseService, tamperedLicense, LicensesStatus.INVALID);
    // ensure that the invalid license never made it to cluster state
    licensesMetaData = clusterService.state().metaData().custom(LicensesMetaData.TYPE);
    assertThat(licensesMetaData.getLicense(), not(equalTo(tamperedLicense)));
}

public void testRemoveLicenses() throws Exception {
    LicenseService licenseService = getInstanceFromNode(LicenseService.class);
    ClusterService clusterService = getInstanceFromNode(ClusterService.class);
    // generate signed licenses
    License license = TestUtils.generateSignedLicense(TimeValue.timeValueHours(1));
    TestUtils.registerAndAckSignedLicenses(licenseService, license, LicensesStatus.VALID);
    LicensesMetaData licensesMetaData = clusterService.state().metaData().custom(LicensesMetaData.TYPE);
    assertThat(licensesMetaData.getLicense(), not(equalTo(LicensesMetaData.LICENSE_TOMBSTONE)));
    // remove signed licenses
    removeAndAckSignedLicenses(licenseService);
    licensesMetaData = clusterService.state().metaData().custom(LicensesMetaData.TYPE);
    assertThat(licensesMetaData.getLicense(), equalTo(LicensesMetaData.LICENSE_TOMBSTONE));
}

private void removeAndAckSignedLicenses(final LicenseService licenseService) {
    final CountDownLatch latch = new CountDownLatch(1);
}
final AtomicBoolean success = new AtomicBoolean(false);
licenseService.removeLicense(new DeleteLicenseRequest(), new
ActionListener<ClusterStateUpdateResponse>() {
    @Override
    public void onResponse(ClusterStateUpdateResponse clusterStateUpdateResponse) {
        if (clusterStateUpdateResponse.isAcknowledged()) {
            success.set(true);
        }
        latch.countDown();
    }

    @Override
    public void onFailure(Exception throwable) {
        latch.countDown();
    }
});
try {
latch.await();
} catch (InterruptedException e) {
    fail(e.getMessage());
}
assertThat("remove license(s) failed", success.get(), equalTo(true));
*/

package org.elasticsearch.license;

import org.elasticsearch.analysis.common.CommonAnalysisPlugin;
import org.elasticsearch.common.network.NetworkModule;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.common.unit.TimeValue;
import org.elasticsearch.env.Environment;
import org.elasticsearch.plugins.Plugin;
import org.elasticsearch.test.ESIntegTestCase.ClusterScope;
import org.elasticsearch.transport.Netty4Plugin;
import org.elasticsearch.xpack.core.LocalStateCompositeXPackPlugin;
import org.elasticsearch.xpack.core.XPackPlugin;
import java.nio.charset.StandardCharsets;
import java.nio.file.Files;
import java.nio.file.Path;
import java.util.Arrays;
import java.util.Collection;
import static org.elasticsearch.test.ESIntegTestCase.Scope.TEST;
import static org.hamcrest.CoreMatchers.equalTo;
import static org.hamcrest.CoreMatchers.nullValue;

@ClusterScope(scope = TEST, numDataNodes = 0, numClientNodes = 0, maxNumDataNodes = 0,
transportClientRatio = 0)
public class LicenseServiceClusterTests extends AbstractLicensesIntegrationTests {

    @Override
    protected Settings nodeSettings(int nodeOrdinal) {
        return nodeSettingsBuilder(nodeOrdinal).build();
    }

    private Settings.Builder nodeSettingsBuilder(int nodeOrdinal) {
        return Settings.builder()
            .put(super.nodeSettings(nodeOrdinal))
            .put("node.data", true)
            .put("resource.reload.interval.high", "500ms") // for license mode file watcher
            .put(NetworkModule.HTTP_ENABLED.getKey(), true);
    }

    @Override
    protected Collection<Class<? extends Plugin>> nodePlugins() {
        return Arrays.asList(LocalStateCompositeXPackPlugin.class, CommonAnalysisPlugin.class,
Netty4Plugin.class);
    }

    @Override
    protected Collection<Class<? extends Plugin>> transportClientPlugins() {
        return nodePlugins();
    }

    public void testClusterRestartWithLicense() throws Exception {
        wipeAllLicenses();

        int numNodes = randomIntBetween(1, 5);
        logger.info("--> starting {} node(s)", numNodes);
        internalCluster().startNodes(numNodes);
        ensureGreen();

        logger.info("--> put signed license");
        LicensingClient licensingClient = new LicensingClient(client());
        License license = TestUtils.generateSignedLicense(TimeValue.timeValueMinutes(1));
        putLicense(license);
        assertThat(licensingClient.prepareGetLicense().get().license(), equalTo(license));
        assertOperationMode(license.operationMode());

        logger.info("--> restart all nodes");
    }
}
internalCluster().fullRestart();
ensureYellow();
licensingClient = new LicensingClient(client());
logger.info("--> get and check signed license");
assertThat(licensingClient.prepareGetLicense().get().license(), equalTo(license));
logger.info("--> remove licenses");
licensingClient.prepareDeleteLicense().get();
assertOperationMode(License.OperationMode.MISSING);

logger.info("--> restart all nodes");
internalCluster().fullRestart();
licensingClient = new LicensingClient(client());
ensureYellow();
assertThat(licensingClient.prepareGetLicense().get().license(), nullValue());
assertOperationMode(License.OperationMode.MISSING);

wipeAllLicenses();
}

public void testCloudInternalLicense() throws Exception {
  wipeAllLicenses();

  int numNodes = randomIntBetween(1, 5);
  logger.info("--> starting {} node(s)", numNodes);
  internalCluster().startNodes(numNodes);
  ensureGreen();

  logger.info("--> put signed license");
  LicensingClient licensingClient = new LicensingClient(client());
  License license = TestUtils.generateSignedLicense("cloud_internal", License.VERSION_CURRENT,
  System.currentTimeMillis(),
  TimeValue.timeValueMinutes(1));
  putLicense(license);
  assertThat(licensingClient.prepareGetLicense().get().license(), equalTo(license));
  assertOperationMode(License.OperationMode.PLATINUM);
  writeCloudInternalMode("gold");
  assertOperationMode(License.OperationMode.GOLD);
  writeCloudInternalMode("basic");
  assertOperationMode(License.OperationMode.BASIC);
}

public void testClusterRestartWhileEnabled() throws Exception {
  wipeAllLicenses();
  internalCluster().startNode();
  ensureGreen();
  assertLicenseActive(true);
  logger.info("--> restart node");
internalCluster().fullRestart();
ensureYellow();
logger.info("--> await node for enabled");
assertLicenseActive(true);
}

public void testClusterRestartWhileGrace() throws Exception {
    wipeAllLicenses();
    internalCluster().startNode();
    assertLicenseActive(true);
    putLicense(TestUtils.generateSignedLicense(TimeValue.timeValueMillis(0)));
    ensureGreen();
    assertLicenseActive(true);
    logger.info("--> restart node");
    internalCluster().fullRestart();
    ensureYellow();
    logger.info("--> await node for grace_period");
    assertLicenseActive(true);
}

public void testClusterRestartWhileExpired() throws Exception {
    wipeAllLicenses();
    internalCluster().startNode();
    ensureGreen();
    assertLicenseActive(true);
    putLicense(TestUtils.generateExpiredNonBasicLicense(System.currentTimeMillis() -
LicenseService.GRACE_PERIOD_DURATION.getMillis()));
    assertLicenseActive(false);
    logger.info("--> restart node");
    internalCluster().fullRestart();
    ensureYellow();
    logger.info("--> await node for disabled");
    assertLicenseActive(false);
}

public void testClusterRestartWithOldSignature() throws Exception {
    assumeFalse("Can't run in a FIPS JVM. We can't generate old licenses since PBEWithSHA1AndDESede is not available", inFipsJvm());
    wipeAllLicenses();
    internalCluster().startNode();
    ensureGreen();
    assertLicenseActive(true);
    putLicense(TestUtils.generateSignedLicenseOldSignature());
    LicensingClient licensingClient = new LicensingClient(client());
    assertThat(licensingClient.prepareGetLicense().get().license().version(),
equalTo(License.VERSION_START_DATE));
    logger.info("--> restart node");
    internalCluster().fullRestart(); // restart so that license is updated
ensureYellow();
logger.info("--> await node for enabled");
assertLicenseActive(true);
licensingClient = new LicensingClient(client());
assertThat(licensingClient.prepareGetLicense().get().license().version(),
equalTo(License.VERSION_CURRENT)); //license updated
internalCluster().fullRestart(); // restart once more and verify updated license is active
ensureYellow();
logger.info("--> await node for enabled");
assertLicenseActive(true);
}

private void assertOperationMode(License.OperationMode operationMode) throws InterruptedException {
    boolean success = awaitBusy(() -> {
        for (XPackLicenseState licenseState : internalCluster().getDataNodeInstances(XPackLicenseState.class)) {
            if (licenseState.getOperationMode() == operationMode) {
                return true;
            }
        }
        return false;
    });
    assertTrue(success);
}

private void writeCloudInternalMode(String mode) throws Exception {
    for (Environment environment : internalCluster().getDataOrMasterNodeInstances(Environment.class)) {
        Path licenseModePath = XPackPlugin.resolveConfigFile(environment, "license_mode");
        Files.createDirectories(licenseModePath.getParent());
        Files.write(licenseModePath, mode.getBytes(StandardCharsets.UTF_8));
    }
}

/*
 * Copyright Elasticsearch B.V. and/or licensed to Elasticsearch B.V. under one
 * or more contributor license agreements. Licensed under the Elastic License;
 * you may not use this file except in compliance with the Elastic License.
 */
package org.elasticsearch.license;

import org.elasticsearch.test.ESTestCase;
import java.util.Locale;
import static org.elasticsearch.license.License.OperationMode;
import static org.hamcrest.Matchers.equalTo;

import org.elasticsearch.test.ESTestCase;
import java.util.Locale;
import static org.elasticsearch.license.License.OperationMode;
import static org.hamcrest.Matchers.equalTo;
Tests \{ @link License.OperationMode \} for correctness.
* If you change the behavior of these tests, then it means that licensing changes across the products!
*/

```java
public class LicenseOperationModeTests extends ETestCase {
    public void testResolveTrial() {
        // assert 1.x BWC
        assertResolve(OperationMode.TRIAL, "nONE", "DEv", "deveLopment");
        // assert expected (2.x+) variant
        assertResolve(OperationMode.TRIAL, "tRiAl", "trial");
    }

    public void testResolveBasic() {
        // assert expected (2.x+) variant (note: no 1.x variant of BASIC)
        assertResolve(OperationMode.BASIC, "bAsIc", "basic");
    }

    public void testResolveStandard() {
        // assert expected (2.x+) variant (note: no 1.x variant of STANDARD)
        assertResolve(OperationMode.STANDARD, "StAnDARd", "standard");
    }

    public void testResolveGold() {
        // assert expected (2.x+) variant (note: no different 1.x variant of GOLD)
        assertResolve(OperationMode.GOLD, "SiLvEr", "gOlD", "silver", "gold");
    }

    public void testResolvePlatinum() {
        // assert 1.x BWC
        assertResolve(OperationMode.PLATINUM, "iNtErNaL");
        // assert expected (2.x+) variant
        assertResolve(OperationMode.PLATINUM, "PlAtINum", "platinum");
    }

    public void testResolveUnknown() {
        // 'enterprise' is a type that exists in cloud but should be rejected under normal operation
        // See https://github.com/elastic/x-plugins/issues/3371
        String[] types = { "unknown", "fake", "enterprise" };

        for (String type : types) {
            try {
                OperationMode.resolve(type);
                fail(String.format(Locale.ROOT, "{s} should not be recognized as an operation mode", type));
            } catch (IllegalArgumentException e) {
                assertThat(e.getMessage(), equalTo("unknown type "+type+"\")));
            }
        }
    }
}
```
private static void assertResolve(OperationMode expected, String... types) {
    for (String type : types) {
        assertThat(OperationMode.resolve(type), equalTo(expected));
    }
}

package org.elasticsearch.license;

import org.elasticsearch.action.support.PlainActionFuture;
import org.elasticsearch.cluster.ClusterStateUpdateTask;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.common.unit.TimeValue;
import org.elasticsearch.protocol.xpack.license.PutLicenseResponse;
import static org.hamcrest.Matchers.containsString;
import static org.mockito.Matchers.any;
import static org.mockito.Mockito.verify;

public class LicenseFIPSTests extends AbstractLicenseServiceTestCase {

    public void testFIPSCheckWithAllowedLicense() throws Exception {
        License newLicense = TestUtils.generateSignedLicense(randomFrom("trial", "platinum"),
            TimeValue.timeValueHours(24L));
        PutLicenseRequest request = new PutLicenseRequest();
        request.acknowledge(true);
        request.license(newLicense);
        Settings settings = Settings.builder()
                .put("xpack.security.enabled", true)
                .put("xpack.security.transport.ssl.enabled", true)
                .put("xpack.security.fips_mode.enabled", randomBoolean())
                .build();
        XPackLicenseState licenseState = new XPackLicenseState(settings);
        setInitialState(null, licenseState, settings);
        licenseService.start();
        PlainActionFuture<PutLicenseResponse> responseFuture = new PlainActionFuture<>();
        licenseService.registerLicense(request, responseFuture);
        verify(clusterService).submitStateUpdateTask(any(String.class), any(ClusterStateUpdateTask.class));
    }
}
public void testFIPSWithOutAllowedLicense() throws Exception {
    License newLicense = TestUtils.generateSignedLicense(randomFrom("gold", "standard"),
            TimeValue.timeValueHours(24L));
    PutLicenseRequest request = new PutLicenseRequest();
    request.acknowledge(true);
    request.license(newLicense);
    Settings settings = Settings.builder()
            .put("xpack.security.enabled", true)
            .put("xpack.security.transport.ssl.enabled", true)
            .put("xpack.security.fips_mode.enabled", true)
            .build();
    XPackLicenseState licenseState = new XPackLicenseState(settings);
    setInitialState(null, licenseState, settings);
    licenseService.start();
    PlainActionFuture<PutLicenseResponse> responseFuture = new PlainActionFuture<>();
    IllegalStateException e = expectThrows(IllegalStateException.class, () ->
            licenseService.registerLicense(request, responseFuture));
    assertThat(e.getMessage(), containsString("Cannot install a [" + newLicense.operationMode() + "] license unless FIPS mode is
disabled"));
    licenseService.stop();

    settings = Settings.builder()
            .put("xpack.security.enabled", true)
            .put("xpack.security.transport.ssl.enabled", true)
            .put("xpack.security.fips_mode.enabled", false)
            .build();
    licenseState = new XPackLicenseState(settings);
    setInitialState(null, licenseState, settings);
    licenseService.start();
    licenseService.registerLicense(request, responseFuture);  
    verify(clusterService).submitStateUpdateTask(any(String.class), any(ClusterStateUpdateTask.class));
}
*/

package org.elasticsearch.license;

import org.elasticsearch.Version;
import org.elasticsearch.cluster.ClusterModule;
import org.elasticsearch.cluster.metadata.MetaData;
import org.elasticsearch.cluster.metadata.RepositoriesMetaData;
import org.elasticsearch.cluster.metadata.RepositoryMetaData;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.common.unit.TimeValue;
import org.elasticsearch.common.xcontent.NamedXContentRegistry;
import org.elasticsearch.common.xcontent.ToXContent;
import org.elasticsearch.common.xcontent.ToXContent.Params;
import org.elasticsearch.common.xcontent.XContentBuilder;
import org.elasticsearch.common.xcontent.XContentFactory;
import org.elasticsearch.common.xcontent.XContentParser;
import org.elasticsearch.test.ESTestCase;

import java.util.Collections;
import java.util.UUID;
import java.util.stream.Collectors;
import java.util.stream.Stream;

import static org.hamcrest.Matchers.equalTo;
import static org.hamcrest.Matchers.notNullValue;
import static org.hamcrest.Matchers.nullValue;

public class LicensesMetaDataSerializationTests extends ESTestCase {

    public void testXContentSerializationOneSignedLicense() throws Exception {
        License license = TestUtils.generateSignedLicense(TimeValue.timeValueHours(2));
        LicensesMetaData licensesMetaData = new LicensesMetaData(license, null);
        XContentBuilder builder = XContentFactory.jsonBuilder();
        builder.startObject();
        builder.startObject("licenses");
        licensesMetaData.toXContent(builder, ToXContent.EMPTY_PARAMS);
        builder.endObject();
        builder.endObject();
        LicensesMetaData licensesMetaDataFromXContent =
        getLicensesMetaDataFromXContent(createParser(builder));
        assertThat(licensesMetaDataFromXContent.getLicense(), equalTo(license));
        assertNull(licensesMetaDataFromXContent.getMostRecentTrialVersion());
    }

    public void testXContentSerializationOneSignedLicenseWithUsedTrial() throws Exception {
        License license = TestUtils.generateSignedLicense(TimeValue.timeValueHours(2));
        LicensesMetaData licensesMetaData = new LicensesMetaData(license, Version.CURRENT);
        XContentBuilder builder = XContentFactory.jsonBuilder();
        builder.startObject();
        builder.startObject("licenses");
        licensesMetaData.toXContent(builder, ToXContent.EMPTY_PARAMS);
        builder.endObject();
        builder.endObject();
        LicensesMetaData licensesMetaDataFromXContent =
        getLicensesMetaDataFromXContent(createParser(builder));
        assertNotNull(licensesMetaDataFromXContent.getLicense());
        assertNull(licensesMetaDataFromXContent.getMostRecentTrialVersion());
    }
}
assertThat(licensesMetaDataFromXContent.getLicense(), equalTo(license));
assertEquals(licensesMetaDataFromXContent.getMostRecentTrialVersion(), Version.CURRENT);
}

public void testLicenseMetadataParsingDoesNotSwallowOtherMetaData() throws Exception {
    new Licensing(Settings.EMPTY); // makes sure LicensePlugin is registered in Custom Metadata
    License license = TestUtils.generateSignedLicense(TimeValue.timeValueHours(2));
    LicensesMetaData licensesMetaData = new LicensesMetaData(license, Version.CURRENT);
    RepositoryMetaData repositoryMetaData = new RepositoryMetaData("repo", "fs", Settings.EMPTY);
    RepositoriesMetaData repositoriesMetaData = new
    RepositoriesMetaData(Collections.singletonList(repositoryMetaData));
    final MetaData.Builder metaDataBuilder = MetaData.builder();
    if (randomBoolean()) { // random order of insertion
        metaDataBuilder.putCustom(licensesMetaData.getWriteableName(), licensesMetaData);
        metaDataBuilder.putCustom(repositoriesMetaData.getWriteableName(), repositoriesMetaData);
    } else {
        metaDataBuilder.putCustom(repositoriesMetaData.getWriteableName(), repositoriesMetaData);
        metaDataBuilder.putCustom(licensesMetaData.getWriteableName(), licensesMetaData);
    }
    // serialize metadata
    XContentBuilder builder = XContentFactory.jsonBuilder();
    params = new
    ToXContent.MapParams(Collections.singletonMap(MetaData.CONTEXT_MODE_PARAM,
    MetaData.CONTEXT_MODE_GATEWAY));
    builder.startObject();
    builder = metaDataBuilder.build().toXContent(builder, params);
    builder.endObject();
    // deserialize metadata again
    MetaData metaData = MetaData.Builder.fromXContent(createParser(builder));
    // check that custom metadata still present
    assertThat(metaData.custom(licensesMetaData.getWriteableName()), notNullValue());
    assertThat(metaData.custom(repositoriesMetaData.getWriteableName()), notNullValue());
}

public void testXContentSerializationOneTrial() throws Exception {
    long issueDate = System.currentTimeMillis();
    License.Builder specBuilder = License.builder()
    .uid(UUID.randomUUID().toString())
    .issuedTo("customer")
    .maxNodes(5)
    .issueDate(issueDate)
    .type(randomBoolean() ? "trial" : "basic")
    .expiryDate(issueDate + TimeValue.timeValueHours(2).getMillis());
    final License trialLicense = SelfGeneratedLicense.create(specBuilder, License.VERSION_CURRENT);
    LicensesMetaData licensesMetaData = new LicensesMetaData(trialLicense, Version.CURRENT);
    XContentBuilder builder = XContentFactory.jsonBuilder();
    builder.startObject();
    builder = metaDataBuilder.build().toXContent(builder, params);
    builder.endObject();
    // deserialize metadata again
    MetaData metaData = MetaData.Builder.fromXContent(createParser(builder));
    // check that custom metadata still present
    assertThat(metaData.custom(licensesMetaData.getWriteableName()), notNullValue());
    assertThat(metaData.custom(repositoriesMetaData.getWriteableName()), notNullValue());
}
licensesMetaData.toXContent(builder, ToXContent.EMPTY_PARAMS);
builder.endObject();
builtler.endObject();
LicensesMetaData licensesMetaDataFromXContent =
getLicensesMetaDataFromXContent(createParser(builder));
assertThat(licensesMetaDataFromXContent.getLicense(), equalTo(trialLicense));
assertEquals(licensesMetaDataFromXContent.getMostRecentTrialVersion(), Version.CURRENT);
}

public void testLicenseTombstoneFromXContext() throws Exception {
    final XContentBuilder builder = XContentFactory.jsonBuilder();
    builder.startObject();
    builder.startObject("licenses");
    builder.nullField("license");
    builder.endObject();
    builder.endObject();
    LicensesMetaData metaDataFromXContent = getLicensesMetaDataFromXContent(createParser(builder));
    assertThat(metaDataFromXContent.getLicense(), equalTo(LicensesMetaData.LICENSE_TOMBSTONE));
}

public void testLicenseTombstoneWithUsedTrialFromXContext() throws Exception {
    final XContentBuilder builder = XContentFactory.jsonBuilder();
    builder.startObject();
    builder.startObject("licenses");
    builder.nullField("license");
    builder.field("trial_license", Version.CURRENT.toString());
    builder.endObject();
    builder.endObject();
    LicensesMetaData metaDataFromXContent = getLicensesMetaDataFromXContent(createParser(builder));
    assertThat(metaDataFromXContent.getLicense(), equalTo(LicensesMetaData.LICENSE_TOMBSTONE));
    assertEquals(metaDataFromXContent.getMostRecentTrialVersion(), Version.CURRENT);
}

private static LicensesMetaData getLicensesMetaDataFromXContent(XContentParser parser) throws Exception {
    parser.nextToken(); // consume null
    parser.nextToken(); // consume "licenses"
    LicensesMetaData licensesMetaDataFromXContent = LicensesMetaData.fromXContent(parser);
    parser.nextToken(); // consume endObject
    assertThat(parser.nextToken(), nullValue());
    return licensesMetaDataFromXContent;
}

@override
protected NamedXContentRegistry xContentRegistry() {
    return new NamedXContentRegistry(Stream.concat(
        new Licensing(Settings.EMPTY).getNamedXContent().stream(),
        ClusterModule.getNamedXWriteables().stream()
    ).collect(Collectors.toList()));
}
import org.elasticsearch.action.ActionListener;
import org.elasticsearch.cluster.ClusterStateUpdateTask;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.common.unit.TimeValue;
import org.elasticsearch.protocol.xpack.license.LicensesStatus;
import org.elasticsearch.protocol.xpack.license.PutLicenseResponse;

import static org.elasticsearch.common.unit.TimeValue.timeValueHours;
import static org.hamcrest.Matchers.equalTo;
import static org.hamcrest.Matchers.not;
import static org.mockito.Matchers.any;
import static org.mockito.Mockito.times;
import static org.mockito.Mockito.verify;

public class LicensesAcknowledgementTests extends AbstractLicenseServiceTestCase {

    public void testAcknowledgment() throws Exception {
        XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
        setInitialState(TestUtils.generateSignedLicense("gold", timeValueHours(2)), licenseState, Settings.EMPTY);
        licenseService.start();
        // try installing a signed license
        long issueDate = System.currentTimeMillis() - TimeValue.timeValueHours(24 * 2).getMillis();
        License signedLicense = TestUtils.generateSignedLicense("trial", License.VERSION_CURRENT, issueDate,
            timeValueHours(10));
        PutLicenseRequest putLicenseRequest = new PutLicenseRequest().license(signedLicense);
        // ensure acknowledgement message was part of the response
        licenseService.registerLicense(putLicenseRequest, new AssertingLicensesUpdateResponse(false,
            LicensesStatus.VALID, true));
        verify(clusterService, times(0)).submitStateUpdateTask(any(String.class), any(ClusterStateUpdateTask.class));
        assertThat(licenseService.getLicense(), not(signedLicense));

        // try installing a signed license with acknowledgement
        putLicenseRequest = new PutLicenseRequest().license(signedLicense).acknowledge(true);
        // ensure license was installed and no acknowledgment message was returned
        licenseService.registerLicense(putLicenseRequest, new AssertingLicensesUpdateResponse(true,
            LicensesStatus.VALID, false));
        verify(clusterService, times(1)).submitStateUpdateTask(any(String.class), any(ClusterStateUpdateTask.class));
    }
}

}
public void testRejectUpgradeToProductionWithoutTLS() throws Exception {
    XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
    setInitialState(TestUtils.generateSignedLicense("trial", timeValueHours(2)), licenseState, Settings.EMPTY);
    licenseService.start();
    // try installing a signed license
    License signedLicense = TestUtils.generateSignedLicense("platinum", timeValueHours(10));
    PutLicenseRequest putLicenseRequest = new PutLicenseRequest().license(signedLicense);
    // ensure acknowledgement message was part of the response
    IllegalStateException ise = expectThrows(IllegalStateException.class, () ->
        licenseService.registerLicense(putLicenseRequest, new AssertingLicensesUpdateResponse(false,
            LicensesStatus.VALID, true)));
    assertEquals("Cannot install a [PLATINUM] license unless TLS is configured or security is disabled",
        ise.getMessage());
}

public void testUpgradeToProductionWithoutTLSAndSecurityDisabled() throws Exception {
    XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
    setInitialState(TestUtils.generateSignedLicense("trial", timeValueHours(2)), licenseState, Settings.builder()
        .put("xpack.security.enabled", false).build());
    licenseService.start();
    // try installing a signed license
    License signedLicense = TestUtils.generateSignedLicense("platinum", timeValueHours(10));
    PutLicenseRequest putLicenseRequest = new PutLicenseRequest().license(signedLicense);
    licenseService.registerLicense(putLicenseRequest, new AssertingLicensesUpdateResponse(false,
        LicensesStatus.VALID, true));
    assertThat(licenseService.getLicense(), not(signedLicense));
    verify(clusterService, times(1)).submitStateUpdateTask(any(String.class), any(ClusterStateUpdateTask.class));
    putLicenseRequest = new PutLicenseRequest().license(signedLicense).acknowledge(true);
    // ensure license was installed and no acknowledgment message was returned
    licenseService.registerLicense(putLicenseRequest, new AssertingLicensesUpdateResponse(true,
        LicensesStatus.VALID, false));
    verify(clusterService, times(2)).submitStateUpdateTask(any(String.class), any(ClusterStateUpdateTask.class));
}

public void testUpgradeToProductionWithTLSAndSecurity() throws Exception {
    XPackLicenseState licenseState = new XPackLicenseState(Settings.EMPTY);
    setInitialState(TestUtils.generateSignedLicense("trial", timeValueHours(2)), licenseState, Settings.builder()
        .put("xpack.security.enabled", true)
        .put("xpack.security.transport.ssl.enabled", true).build());
    licenseService.start();
    // try installing a signed license
    License signedLicense = TestUtils.generateSignedLicense("platinum", timeValueHours(10));
    PutLicenseRequest putLicenseRequest = new PutLicenseRequest().license(signedLicense);
    licenseService.registerLicense(putLicenseRequest, new AssertingLicensesUpdateResponse(false,
        LicensesStatus.VALID, true));
    assertThat(licenseService.getLicense(), not(signedLicense));
}
verify(clusterService, times(1)).submitStateUpdateTask(any(String.class), any(ClusterStateUpdateTask.class));

// try installing a signed license with acknowledgement
putLicenseRequest = new PutLicenseRequest().license(signedLicense).acknowledge(true);
// ensure license was installed and no acknowledgment message was returned
licenseService.registerLicense(putLicenseRequest, new AssertingLicensesUpdateResponse(true, LicensesStatus.VALID, false));
verify(clusterService, times(2)).submitStateUpdateTask(any(String.class), any(ClusterStateUpdateTask.class));
}

private static class AssertingLicensesUpdateResponse implements ActionListener<PutLicenseResponse> {
    private final boolean expectedAcknowledgement;
    private final LicensesStatus expectedStatus;
    private final boolean expectAckMessages;

    AssertingLicensesUpdateResponse(boolean expectedAcknowledgement, LicensesStatus expectedStatus, boolean expectAckMessages) {
        this.expectedAcknowledgement = expectedAcknowledgement;
        this.expectedStatus = expectedStatus;
        this.expectAckMessages = expectAckMessages;
    }

    @Override
    public void onResponse(PutLicenseResponse licensesUpdateResponse) {
        assertThat(licensesUpdateResponse.isAcknowledged(), equalTo(expectedAcknowledgement));
        assertThat(licensesUpdateResponse.status(), equalTo(expectedStatus));
        assertEquals(licensesUpdateResponse.acknowledgeMessages().isEmpty(), expectAckMessages == false);
    }

    @Override
    public void onFailure(Exception throwable) {
        throw new RuntimeException(throwable);
    }
}

package org.elasticsearch.license;
import org.elasticsearch.common.unit.TimeValue;
import org.elasticsearch.test.ESTestCase;
import static org.elasticsearch.common.unit.TimeValue.timeValueMillis;
import static org.hamcrest.Matchers.equalTo;
import static org.hamcrest.Matchers.nullValue;

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 */

import org.elasticsearch.common.unit.TimeValue;
import org.elasticsearch.test.ESTestCase;
import static org.elasticsearch.common.unit.TimeValue.timeValueMillis;
import static org.hamcrest.Matchers.equalTo;
import static org.hamcrest.Matchers.nullValue;
public class ExpirationCallbackTests extends ESTestCase {

    public void testPostExpirationDelay() throws Exception {
        TimeValue expiryDuration = TimeValue.timeValueSeconds(randomIntBetween(5, 10));
        TimeValue min = TimeValue.timeValueSeconds(1);
        TimeValue max = TimeValue.timeValueSeconds(4);
        TimeValue frequency = TimeValue.timeValueSeconds(1);
        NoopPostExpirationCallback post = new NoopPostExpirationCallback(min, max, frequency);
        long now = System.currentTimeMillis();
        long expiryDate = now + expiryDuration.getMillis();
        assertThat(post.delay(expiryDate, now), equalTo(TimeValue.timeValueMillis(expiryDuration.getMillis() + min.getMillis()))); // before license expiry
        assertThat(post.delay(expiryDate, expiryDate), equalTo(min)); // on license expiry
        int latestValidTriggerDelay = (int) (expiryDuration.getMillis() + max.getMillis());
        int earliestValidTriggerDelay = (int) (expiryDuration.getMillis() + min.getMillis());
        assertExpirationCallbackDelay(post, expiryDuration.millis(), latestValidTriggerDelay, earliestValidTriggerDelay);
    }

    public void testPreExpirationDelay() throws Exception {
        TimeValue expiryDuration = TimeValue.timeValueSeconds(randomIntBetween(5, 10));
        TimeValue min = TimeValue.timeValueSeconds(1);
        TimeValue max = TimeValue.timeValueSeconds(4);
        TimeValue frequency = TimeValue.timeValueSeconds(1);
        NoopPreExpirationCallback pre = new NoopPreExpirationCallback(min, max, frequency);
        long now = System.currentTimeMillis();
        long expiryDate = now + expiryDuration.getMillis();
        assertThat(pre.delay(expiryDate, expiryDate), nullValue()); // on license expiry
        int latestValidTriggerDelay = (int) (expiryDuration.getMillis() - min.getMillis());
        int earliestValidTriggerDelay = (int) (expiryDuration.getMillis() - max.getMillis());
        assertExpirationCallbackDelay(pre, expiryDuration.millis(), latestValidTriggerDelay, earliestValidTriggerDelay);
    }

    public void testPostExpirationWithNullMax() throws Exception {
        int postExpirySeconds = randomIntBetween(5, 10);
        TimeValue postExpiryDuration = TimeValue.timeValueSeconds(postExpirySeconds);
        TimeValue min = TimeValue.timeValueSeconds(postExpirySeconds - randomIntBetween(1, 3));
        final ExpirationCallback.Post post = new NoopPostExpirationCallback(min, null, timeValueMillis(10));
        long now = System.currentTimeMillis();
        assertThat(post.delay(now - postExpiryDuration.millis(), now), equalTo(TimeValue.timeValueMillis(0)));
    }

    public void testPreExpirationWithNullMin() throws Exception {
        int expirySeconds = randomIntBetween(5, 10);
        TimeValue expiryDuration = TimeValue.timeValueSeconds(expirySeconds);
        TimeValue min = TimeValue.timeValueSeconds(expirySeconds - randomIntBetween(1, 3));
        final ExpirationCallback.Post post = new NoopPostExpirationCallback(min, null, timeValueMillis(10));
        long now = System.currentTimeMillis();
        assertThat(post.delay(now - expiryDuration.millis(), now), equalTo(TimeValue.timeValueMillis(0)));
    }
}
TimeValue expiryDuration = TimeValue.timeValueSeconds(expirySeconds);
TimeValue max = TimeValue.timeValueSeconds(expirySeconds + randomIntBetween(1, 10));

final ExpirationCallback.Pre pre = new NoopPreExpirationCallback(null, max, timeValueMillis(10));
long now = System.currentTimeMillis();
assertThat(pre.delay(expiryDuration.millis() + now, now), equalTo(TimeValue.timeValueMillis(0)));
}

public void testPreExpirationScheduleTime() throws Exception {
    TimeValue expiryDuration = TimeValue.timeValueSeconds(randomIntBetween(5, 10));
    TimeValue min = TimeValue.timeValueSeconds(1);
    TimeValue max = TimeValue.timeValueSeconds(4);
    TimeValue frequency = TimeValue.timeValueSeconds(1);
    NoopPreExpirationCallback pre = new NoopPreExpirationCallback(min, max, frequency);
    int latestValidTriggerDelay = (int) (expiryDuration.getMillis() - min.getMillis());
    int earliestValidTriggerDelay = (int) (expiryDuration.getMillis() - max.getMillis());
    assertExpirationCallbackScheduleTime(pre, expiryDuration.millis(), latestValidTriggerDelay,
                                          earliestValidTriggerDelay);
}

public void testPostExpirationScheduleTime() throws Exception {
    TimeValue expiryDuration = TimeValue.timeValueSeconds(randomIntBetween(5, 10));
    TimeValue min = TimeValue.timeValueSeconds(1);
    TimeValue max = TimeValue.timeValueSeconds(4);
    TimeValue frequency = TimeValue.timeValueSeconds(1);
    NoopPostExpirationCallback pre = new NoopPostExpirationCallback(min, max, frequency);
    int latestValidTriggerDelay = (int) (expiryDuration.getMillis() + max.getMillis());
    int earliestValidTriggerDelay = (int) (expiryDuration.getMillis() + min.getMillis());
    assertExpirationCallbackScheduleTime(pre, expiryDuration.millis(), latestValidTriggerDelay,
                                          earliestValidTriggerDelay);
}

private void assertExpirationCallbackDelay(ExpirationCallback expirationCallback, long expiryDuration,
                                          int latestValidTriggerDelay, int earliestValidTriggerDelay) {
    long now = System.currentTimeMillis();
    long expiryDate = now + expiryDuration;

    // bounds
    assertThat(expirationCallback.delay(expiryDate, now + earliestValidTriggerDelay),
                equalTo(TimeValue.timeValueMillis(0)));
    assertThat(expirationCallback.delay(expiryDate, now + latestValidTriggerDelay),
                equalTo(TimeValue.timeValueMillis(0)));

    // in match
    assertThat(expirationCallback.delay(expiryDate, now + randomIntBetween(earliestValidTriggerDelay, latestValidTriggerDelay),
                equalTo(TimeValue.timeValueMillis(0)));
    // out of bounds
    int deltaBeforeEarliestMatch = between(1, earliestValidTriggerDelay);
    assertThat(expirationCallback.delay(expiryDate, now + deltaBeforeEarliestMatch),
equalTo(TimeValue.timeValueMillis(earliestValidTriggerDelay - deltaBeforeEarliestMatch)));  
int deltaAfterLatestMatch = between(latestValidTriggerDelay + 1, Integer.MAX_VALUE); // after expiry and  
after max  
assertThat(expirationCallback.delay(expiryDate, expiryDate + deltaAfterLatestMatch), nullValue());  
}

public void assertExpirationCallbackScheduleTime(ExpirationCallback expirationCallback, long expiryDuration,  
int latestValidTriggerDelay, int earliestValidTriggerDelay) {
    long now = System.currentTimeMillis();
    long expiryDate = now + expiryDuration;
    int validTriggerInterval = between(earliestValidTriggerDelay, latestValidTriggerDelay);
    assertThat(expirationCallback.nextScheduledTimeForExpiry(expiryDate,  
        now + validTriggerInterval, now + validTriggerInterval),
        equalTo(now + validTriggerInterval));
    assertThat(expirationCallback.nextScheduledTimeForExpiry(expiryDate, now, now + validTriggerInterval),
        equalTo(now + validTriggerInterval + expirationCallback.getFrequency()));

    int deltaBeforeEarliestMatch = between(1, earliestValidTriggerDelay - 1);  
    assertThat(expirationCallback.nextScheduledTimeForExpiry(expiryDate, now, now +  
deltaBeforeEarliestMatch),
        equalTo(now + deltaBeforeEarliestMatch +  
            expirationCallback.delay(expiryDate, now + deltaBeforeEarliestMatch).getMillis()));
    assertThat(expirationCallback.nextScheduledTimeForExpiry(expiryDate,  
        now + deltaBeforeEarliestMatch, now + deltaBeforeEarliestMatch),
        equalTo(now + deltaBeforeEarliestMatch +  
            expirationCallback.delay(expiryDate, now + deltaBeforeEarliestMatch).getMillis()));

    int deltaAfterLatestMatch = between(latestValidTriggerDelay + 1, Integer.MAX_VALUE); // after expiry and  
after max  
    assertThat(expirationCallback.nextScheduledTimeForExpiry(expiryDate, now, now + deltaAfterLatestMatch),
        equalTo(-1L));
    assertThat(expirationCallback.nextScheduledTimeForExpiry(expiryDate,  
        now + deltaAfterLatestMatch, now + deltaAfterLatestMatch),
        equalTo(-1L));
}

private static class NoopPostExpirationCallback extends ExpirationCallback.Post {

    NoopPostExpirationCallback(TimeValue min, TimeValue max, TimeValue frequency) {
        super(min, max, frequency);
    }

    @Override
    public void on(License license) {}
}

private static class NoopPreExpirationCallback extends ExpirationCallback.Pre {
NoopPreExpirationCallback(TimeValue min, TimeValue max, TimeValue frequency) {
  super(min, max, frequency);
}

@Override
public void on(License license) {}
}

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 */
package org.elasticsearch.license;

import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.test.ESTestCase;
import org.elasticsearch.threadpool.TestThreadPool;
import org.elasticsearch.watcher.ResourceWatcherService;
import org.junit.After;
import org.junit.Before;
import java.io.IOException;
import java.nio.charset.StandardCharsets;
import java.nio.file.Files;
import java.nio.file.Paths;
import java.util.concurrent.CountDownLatch;
import java.util.concurrent.TimeUnit;
import java.util.concurrent.atomic.AtomicReference;
import static org.hamcrest.Matchers.equalTo;

public class OperationModeFileWatcherTests extends ESTestCase {
  private ResourceWatcherService watcherService;
  private TestThreadPool threadPool;
  private Path licenseModePath;
  private OperationModeFileWatcher operationModeFileWatcher;
  private AtomicReference<CountDownLatch> onChangeCounter;

  @Before
  public void setup() throws Exception {
    threadPool = new TestThreadPool("license mode file watcher tests");
    Settings settings = Settings.builder()
      .put("resource.reload.interval.high", "10ms")
      .build();
    watcherService = new ResourceWatcherService(settings, threadPool);
  
  public class OperationModeFileWatcherTests extends ESTestCase {
      private ResourceWatcherService watcherService;
      private TestThreadPool threadPool;
      private Path licenseModePath;
      private OperationModeFileWatcher operationModeFileWatcher;
      private AtomicReference<CountDownLatch> onChangeCounter;

      @Before
      public void setup() throws Exception {
        threadPool = new TestThreadPool("license mode file watcher tests");
        Settings settings = Settings.builder()
          .put("resource.reload.interval.high", "10ms")
          .build();
        watcherService = new ResourceWatcherService(settings, threadPool);
      }
watcherService.start();
licenseModePath = createTempFile();
onChangeCounter = new AtomicReference<>(new CountDownLatch(1));
operationModeFileWatcher = new OperationModeFileWatcher(watcherService, licenseModePath, logger,
() -> onChangeCounter.get().countDown());
}

@After
public void shutdown() throws InterruptedException {
    terminate(threadPool);
    watcherService.stop();
}

public void testInit() throws Exception {
    onChangeCounter.set(new CountDownLatch(2));
    writeMode("gold");
    assertThat(operationModeFileWatcher.getCurrentOperationMode(),
        equalTo(License.OperationMode.PLATINUM));
    operationModeFileWatcher.init();
    assertTrue(onChangeCounter.get().await(5, TimeUnit.SECONDS));
    assertThat(operationModeFileWatcher.getCurrentOperationMode(), equalTo(License.OperationMode.GOLD));
}

public void testUpdateModeFromFile() throws Exception {
    Files.delete(licenseModePath);
    operationModeFileWatcher.init();
    assertThat(operationModeFileWatcher.getCurrentOperationMode(),
        equalTo(License.OperationMode.PLATINUM));
    writeMode("gold");
    assertTrue(onChangeCounter.get().await(5, TimeUnit.SECONDS));
    assertThat(operationModeFileWatcher.getCurrentOperationMode(),
        equalTo(License.OperationMode.GOLD));
    onChangeCounter.set(new CountDownLatch(1));
    writeMode("basic");
    assertTrue(onChangeCounter.get().await(5, TimeUnit.SECONDS));
    assertThat(operationModeFileWatcher.getCurrentOperationMode(),
        equalTo(License.OperationMode.BASIC));
}

public void testDeleteModeFromFile() throws Exception {
    Files.delete(licenseModePath);
    operationModeFileWatcher.init();
    writeMode("gold");
    assertTrue(onChangeCounter.get().await(5, TimeUnit.SECONDS));
    assertThat(operationModeFileWatcher.getCurrentOperationMode(),
        equalTo(License.OperationMode.GOLD));
    onChangeCounter.set(new CountDownLatch(1));
    Files.delete(licenseModePath);
    assertTrue(onChangeCounter.get().await(5, TimeUnit.SECONDS));
    assertThat(operationModeFileWatcher.getCurrentOperationMode(),
        equalTo(License.OperationMode.BASIC));
}
public void testInvalidModeFromFile() throws Exception {
    writeMode("invalid");
    operationModeFileWatcher.init();
    assertThat(operationModeFileWatcher.getCurrentOperationMode(), equalTo(License.OperationMode.PLATINUM));
   (operationModeFileWatcher.onFileChanged(licenseModePath);
    assertThat(operationModeFileWatcher.getCurrentOperationMode(), equalTo(License.OperationMode.PLATINUM));
}

public void testLicenseModeFileIsDirectory() throws Exception {
    licenseModePath = createTempDir();
    operationModeFileWatcher.init();
    assertThat(operationModeFileWatcher.getCurrentOperationMode(), equalTo(License.OperationMode.PLATINUM));
    operationModeFileWatcher.onFileChanged(licenseModePath);
    assertThat(operationModeFileWatcher.getCurrentOperationMode(), equalTo(License.OperationMode.PLATINUM));
}

public void testLicenseModeFileCreatedAfterInit() throws Exception {
    Files.delete(licenseModePath);
    operationModeFileWatcher.init();
    assertThat(operationModeFileWatcher.getCurrentOperationMode(), equalTo(License.OperationMode.PLATINUM));
    onChangeCounter.set(new CountDownLatch(1));
    Path tempFile = createTempFile();
    writeMode("gold", tempFile);
    licenseModePath = tempFile;
    assertTrue(onChangeCounter.get().await(5, TimeUnit.SECONDS));
    assertThat(operationModeFileWatcher.getCurrentOperationMode(), equalTo(License.OperationMode.GOLD));
}

private void writeMode(String mode) throws IOException {
    writeMode(mode, licenseModePath);
}

static void writeMode(String mode, Path file) throws IOException {
    Files.write(file, mode.getBytes(StandardCharsets.UTF_8), StandardOpenOption.CREATE);
}

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*/
package org.elasticsearch.license;

import org.elasticsearch.test.ESTestCase;
import org.elasticsearch.watcher.FileWatcher;
import org.elasticsearch.watcher.ResourceWatcherService;
import org.junit.Before;
import java.nio.file.Path;
import static org.hamcrest.Matchers.equalTo;
import static org.mockito.Matchers.any;
import static org.mockito.Matchers.eq;
import static org.mockito.Mockito.mock;
import static org.mockito.Mockito.times;
import static org.mockito.Mockito.verify;
import static org.mockito.Mockito.verifyZeroInteractions;

public class LicenseOperationModeUpdateTests extends ESTestCase {

private OperationModeFileWatcher operationModeFileWatcher;
private Path licenseModeFile;
private ResourceWatcherService resourceWatcherService;

@Before
public void init() throws Exception {
    licenseModeFile = createTempFile();
    resourceWatcherService = mock(ResourceWatcherService.class);
    operationModeFileWatcher = new OperationModeFileWatcher(resourceWatcherService, licenseModeFile,
logger, () -> {});
}

public void testLicenseOperationModeUpdate() throws Exception {
    String type = randomFrom("trial", "basic", "standard", "gold", "platinum");
    License license = License.builder()
        .uid("id")
        .expiryDate(0)
        .issueDate(0)
        .issuedTo("elasticsearch")
        .issuer("issuer")
        .type(type)
        .maxNodes(1)
        .build();

    assertThat(license.operationMode(), equalTo(License.OperationMode.resolve(type)));
    OperationModeFileWatcherTests.writeMode("gold", licenseModeFile);
    license.setOperationModeFileWatcher(operationModeFileWatcher);
    verifyZeroInteractions(resourceWatcherService);
}
assertThat(license.operationMode(), equalTo(License.OperationMode.resolve(type)));}

public void testCloudInternalLicenseOperationModeUpdate() throws Exception {
    License license = License.builder()
        .uid("id")
        .expiryDate(0)
        .issueDate(0)
        .issuedTo("elasticsearch")
        .issuer("issuer")
        .type("cloud_internal")
        .maxNodes(1)
        .build();

    assertThat(license.operationMode(), equalTo(License.OperationMode.PLATINUM));
    OperationModeFileWatcherTests.writeMode("gold", licenseModeFile);
    license.setOperationModeFileWatcher(operationModeFileWatcher);
    verify(resourceWatcherService, times(1)).add(any(FileWatcher.class), eq(ResourceWatcherService.Frequency.HIGH));
    assertThat(license.operationMode(), equalTo(License.OperationMode.GOLD));
}
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*/
package org.elasticsearch.license;

import org.elasticsearch.common.bytes.BytesArray;
import org.elasticsearch.common.bytes.BytesReference;
import org.elasticsearch.common.xcontent.ToXContent;
import org.elasticsearch.common.xcontent.XContentBuilder;
import org.elasticsearch.common.xcontent.XContentFactory;
import org.elasticsearch.common.xcontent.XContentHelper;
import org.elasticsearch.common.xcontent.XContentType;
import org.elasticsearch.test.ESTestCase;
import java.nio.charset.StandardCharsets;
import java.util.Collections;
import java.util.Map;
import java.util.UUID;
import static org.hamcrest.core.IsEqual.equalTo;
import static org.hamcrest.core.IsNull.notNullValue;
import static org.hamcrest.core.IsNull.nullValue;

public class LicenseSerializationTests extends ESTestCase {


public void testSimpleIssueExpiryDate() throws Exception {
    long now = System.currentTimeMillis();
    String issueDate = TestUtils.dateMathString("now", now);
    String expiryDate = TestUtils.dateMathString("now+10d", now);
    String licenseSpecs = TestUtils.generateLicenseSpecString(new TestUtils.LicenseSpec(issueDate, expiryDate));
    License generatedLicense = License.fromSource(new
    BytesArray(licenseSpecs.getBytes(StandardCharsets.UTF_8)), XContentType.JSON);
    assertThat(generatedLicense.issueDate(), equalTo(DateUtils.beginningOfTheDay(issueDate)));
    assertThat(generatedLicense.expiryDate(), equalTo(DateUtils.endOfTheDay(expiryDate)));
}

public void testLicensesFields() throws Exception {
    TestUtils.LicenseSpec randomLicenseSpec =
    TestUtils.generateRandomLicenseSpec(License.VERSION_START);
    String licenseSpecsSource = TestUtils.generateLicenseSpecString(randomLicenseSpec);
    final License fromSource =
        License.fromSource(new BytesArray(licenseSpecsSource.getBytes(StandardCharsets.UTF_8)), XContentType.JSON);
    TestUtils.assertLicenseSpec(randomLicenseSpec, fromSource);
}

public void testLicenseRestView() throws Exception {
    long now = System.currentTimeMillis();
    String expiredLicenseExpiryDate = TestUtils.dateMathString("now-1d", now);
    String validLicenseIssueDate = TestUtils.dateMathString("now-10d", now);
    String invalidLicenseIssueDate = TestUtils.dateMathString("now+1d", now);
    String validLicenseExpiryDate = TestUtils.dateMathString("now+2d", now);

    License license = TestUtils.generateLicenses(new TestUtils.LicenseSpec(validLicenseIssueDate,
        expiredLicenseExpiryDate));
    XContentBuilder builder = XContentFactory.contentBuilder(XContentType.JSON);
    license.toXContent(builder, new
    ToXContent.MapParams(Collections.singletonMap(License.REST_VIEW_MODE, "true")));
    builder.flush();
    Map<String, Object> map = XContentHelper.convertToMap(BytesReference.bytes(builder), false,
        builder.contentType()).v2();

    // should have an extra status field, human readable issue_data and expiry_date
    assertThat(map.get("status"), notNullValue());
    assertThat(map.get("issue_date"), notNullValue());
    assertThat(map.get("expiry_date"), notNullValue());
    assertThat(map.get("status"), equalTo("expired"));
    builder = XContentFactory.contentBuilder(XContentType.JSON);
    license.toXContent(builder, ToXContent.EMPTY_PARAMS);
    builder.flush();
    map = XContentHelper.convertToMap(BytesReference.bytes(builder), false, builder.contentType()).v2();
    assertThat(map.get("status"), nullValue());
}
license = TestUtils.generateLicenses(new TestUtils.LicenseSpec(validLicenseIssueDate, validLicenseExpiryDate));
builder = XContentFactory.contentBuilder(XContentType.JSON);
license.toXContent(builder, new ToXContent.MapParams(Collections.singletonMap(License.REST_VIEW_MODE, "true")));
builder.flush();
map = XContentHelper.convertToMap(BytesReference.bytes(builder), false, builder.contentType()).v2();

// should have an extra status field, human readable issue_data and expiry_date
assertThat(map.get("status"), notNullValue());
assertThat(map.get("issue_date"), notNullValue());
assertThat(map.get("expiry_date"), notNullValue());
assertThat(map.get("status"), equalTo("active"));
builder = XContentFactory.contentBuilder(XContentType.JSON);
license.toXContent(builder, ToXContent.EMPTY_PARAMS);
builder.flush();
map = XContentHelper.convertToMap(BytesReference.bytes(builder), false, builder.contentType()).v2();
assertThat(map.get("status"), nullValue());

license = TestUtils.generateLicenses(new TestUtils.LicenseSpec(invalidLicenseIssueDate, validLicenseExpiryDate));
builder = XContentFactory.contentBuilder(XContentType.JSON);
license.toXContent(builder, new ToXContent.MapParams(Collections.singletonMap(License.REST_VIEW_MODE, "true")));
builder.flush();
map = XContentHelper.convertToMap(BytesReference.bytes(builder), false, builder.contentType()).v2();

// should have an extra status field, human readable issue_data and expiry_date
assertThat(map.get("status"), notNullValue());
assertThat(map.get("issue_date"), notNullValue());
assertThat(map.get("expiry_date"), notNullValue());
assertThat(map.get("status"), equalTo("invalid"));
builder = XContentFactory.contentBuilder(XContentType.JSON);
license.toXContent(builder, ToXContent.EMPTY_PARAMS);
builder.flush();
map = XContentHelper.convertToMap(BytesReference.bytes(builder), false, builder.contentType()).v2();
assertThat(map.get("status"), nullValue());
}

// Open Source Used In Network Assurance Engine 4.0(1)
public void testLicenseRestViewNonExpiringBasic() throws Exception {
    long now = System.currentTimeMillis();

    License.Builder specBuilder = License.builder()
            .uid(UUID.randomUUID().toString())
            .issuedTo("test")
            .maxNodes(1000)
            .issueDate(now)
            .type("basic")
            .build();
    
    // ...
License license = SelfGeneratedLicense.create(specBuilder, License.VERSION_CURRENT);
XContentBuilder builder = XContentFactory.contentBuilder(XContentType.JSON);
license.toXContent(builder, new
ToXContent.MapParams(Collections.singletonMap(License REST_VIEW_MODE, "true")));
builder.flush();
Map<String, Object> map = XContentHelper.convertToMap(BytesReference.bytes(builder), false,
builder.contentType()).v2();

// should have an extra status field, human readable issue_data and no expiry_date
assertThat(map.get("status"), notNullValue());
assertThat(map.get("type"), equalTo("basic"));
assertThat(map.get("issue_date"), notNullValue());
assertThat(map.get("expiry_date"), nullValue());
assertThat(map.get("expiry_date_in_millis"), nullValue());
assertThat(map.get("status"), equalTo("active"));
builder = XContentFactory.contentBuilder(XContentType.JSON);
license.toXContent(builder, ToXContent.EMPTY_PARAMS);
builder.flush();
map = XContentHelper.convertToMap(BytesReference.bytes(builder), false, builder.contentType()).v2();
assertThat(map.get("status"), nullValue());
*/
package org.elasticsearch.license;

import org.elasticsearch.ElasticsearchSecurityException;
import org.elasticsearch.test.ESTestCase;
import java.util.Arrays;
import static org.hamcrest.Matchers.contains;
import static org.hamcrest.Matchers.equalTo;
import static org.hamcrest.Matchers.hasSize;

public class LicenseUtilsTests extends ESTestCase {

public void testNewExpirationException() {
for (String feature : Arrays.asList("feature", randomAlphaOfLength(5), null, "")) {
    ElasticsearchSecurityException exception = LicenseUtils.newComplianceException(feature);
    assertNotNull(exception);
    assertNotNull(exception);
    assertThat(exception.getMetadataKeys(), contains(LicenseUtils.EXPIRED_FEATURE_METADATA));
    assertThat(exception.getMetadata(LicenseUtils.EXPIRED_FEATURE_METADATA), hasSize(1));
    assertThat(exception.getMetadata(LicenseUtils.EXPIRED_FEATURE_METADATA).iterator().next(),

public void testIsLicenseExpiredException() {
    ElasticsearchSecurityException exception = LicenseUtils.newComplianceException("feature");
    assertTrue(LicenseUtils.isLicenseExpiredException(exception));

    exception = new ElasticsearchSecurityException("msg");
    assertFalse(LicenseUtils.isLicenseExpiredException(exception));
}

package org.elasticsearch.license;

import org.elasticsearch.analysis.common.CommonAnalysisPlugin;
import org.elasticsearch.cluster.ClusterState;
import org.elasticsearch.cluster.ClusterStateUpdateTask;
import org.elasticsearch.cluster.metadata.MetaData;
import org.elasticsearch.cluster.service.ClusterService;
import org.elasticsearch.common.Nullable;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.plugins.Plugin;
import org.elasticsearch.test.ESIntegTestCase;
import org.elasticsearch.xpack.core.LocalStateCompositeXPackPlugin;
import org.elasticsearch.xpack.core.XPackClientPlugin;
import org.elasticsearch.xpack.core.XPackSettings;
import java.util.Arrays;
import java.util.Collection;
import java.util.concurrent.CountDownLatch;

public abstract class AbstractLicensesIntegrationTestCase extends ESIntegTestCase {

    @Override
    protected Settings nodeSettings(int nodeOrdinal) {
        return Settings.builder().put(XPackSettings.SECURITY_ENABLED.getKey(), false).build();
    }

    @Override
    protected Collection<Class<? extends Plugin>> nodePlugins() {
        return Arrays.asList(LocalStateCompositeXPackPlugin.class, CommonAnalysisPlugin.class);
    }
}
@Override
protected Collection<Class<? extends Plugin>> transportClientPlugins() {
    return Arrays.asList(XPackClientPlugin.class, CommonAnalysisPlugin.class);
}

@Override
protected Settings transportClientSettings() {
    // Plugin should be loaded on the transport client as well
    return nodeSettings(0);
}

protected void putLicense(final License license) throws InterruptedException {
    final CountDownLatch latch = new CountDownLatch(1);
    ClusterService clusterService = internalCluster().getInstance(ClusterService.class,
    internalCluster().getMasterName());
    clusterService.submitStateUpdateTask("putting license", new ClusterStateUpdateTask() {
        @Override
        public void clusterStateProcessed(String source, ClusterState oldState, ClusterState newState) {
            latch.countDown();
        }
    });
    latch.await();
}

protected void putLicenseTombstone() throws InterruptedException {
    putLicense(LicensesMetaData.LICENSE_TOMBSTONE);
}

protected void wipeAllLicenses() throws InterruptedException {
    final CountDownLatch latch = new CountDownLatch(1);
    ClusterService clusterService = internalCluster().getInstance(ClusterService.class,
    internalCluster().getMasterName());
    clusterService.submitStateUpdateTask("delete licensing metadata", new ClusterStateUpdateTask() {
        @Override
        public void clusterStateProcessed(String source, ClusterState oldState, ClusterState newState) {
            latch.countDown();
        }
    });
    latch.await();
}

protected void putLicenseTombstone() throws InterruptedException {
    putLicense(LicensesMetaData.LICENSE_TOMBSTONE);
}

protected void wipeAllLicenses() throws InterruptedException {
    final CountDownLatch latch = new CountDownLatch(1);
    ClusterService clusterService = internalCluster().getInstance(ClusterService.class,
    internalCluster().getMasterName());
    clusterService.submitStateUpdateTask("delete licensing metadata", new ClusterStateUpdateTask() {
        @Override
        public void clusterStateProcessed(String source, ClusterState oldState, ClusterState newState) {
            latch.countDown();
        }
    });
    latch.await();
}
@Override
public ClusterState execute(ClusterState currentState) throws Exception {
    MetaData.Builder mdBuilder = MetaData.builder(currentState.metaData());
    mdBuilder.removeCustom(LicensesMetaData.TYPE);
    return ClusterState.builder(currentState).metaData(mdBuilder).build();
}

@Override
public void onFailure(String source, @Nullable Exception e) {
    logger.error("error on metaData cleanup after test", e);
}
);
latch.await();
}

protected void assertLicenseActive(boolean active) throws InterruptedException {
    boolean success = awaitBusy(() -> {
        for (XPackLicenseState licenseState : internalCluster().getDataNodeInstances(XPackLicenseState.class)) {
            if (licenseState.isActive() == active) {
                return true;
            }
        }
        return false;
    });
    assertTrue(success);
}

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* or more contributor license agreements. Licensed under the Elastic License;
* you may not use this file except in compliance with the Elastic License.
*/
package org.elasticsearch.license;

import org.elasticsearch.client.Request;
import org.elasticsearch.client.Response;
import org.elasticsearch.client.ResponseException;
import org.elasticsearch.client.RestClient;
import org.elasticsearch.common.io Streams;
import org.elasticsearch.common.network.NetworkModule;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.plugins.Plugin;
import org.elasticsearch.test.ESIntegTestCase;
import org.elasticsearch.transport.Netty4Plugin;
import org.elasticsearch.xpack.core.LocalStateCompositeXPackPlugin;
import org.elasticsearch.xpack.core.XPackClientPlugin;

import java.io.InputStreamReader;
import java.nio.charset.StandardCharsets;
import java.util.Arrays;
import java.util.Collection;
import static org.elasticsearch.test.ESIntegTestCase.Scope.SUITE;

@ESIntegTestCase.ClusterScope(scope = SUITE)
public class StartBasicLicenseTests extends AbstractLicensesIntegrationTestCase {

    @Override
    protected Settings nodeSettings(int nodeOrdinal) {
        return Settings.builder()
            .put(super.nodeSettings(nodeOrdinal))
            .put("node.data", true)
            .put(LicenseService.SELF_GENERATED_LICENSE_TYPE.getKey(), "basic")
            .put(NetworkModule.HTTP_ENABLED.getKey(), true).build();
    }

    @Override
    protected Collection<Class<? extends Plugin>> nodePlugins() {
        return Arrays.asList(LocalStateCompositeXPackPlugin.class, Netty4Plugin.class);
    }

    @Override
    protected Collection<Class<? extends Plugin>> transportClientPlugins() {
        return Arrays.asList(XPackClientPlugin.class, Netty4Plugin.class);
    }

    public void testStartBasicLicense() throws Exception {
        LicensingClient licensingClient = new LicensingClient(client());
        License license = TestUtils.generateSignedLicense("trial", License.VERSION_CURRENT, -1,
            TimeValue.timeValueHours(24));
        licensingClient.preparePutLicense(license).get();

        assertBusy(() -> {
            GetLicenseResponse getLicenseResponse = licensingClient.prepareGetLicense().get();
            assertEquals("trial", getLicenseResponse.license().type());
        });

        // Testing that you can start a basic license when you have no license
        if (randomBoolean()) {
            licensingClient.prepareDeleteLicense().get();
            assertNull(licensingClient.prepareGetLicense().get().license());
        }
    }
}
RestClient restClient = getRestClient();
Response response = restClient.performRequest(new Request("GET", "/_xpack/license/basic_status"));
String body = Streams.copyToString(new InputStreamReader(response.getEntity().getContent(),
StandardCharsets.UTF_8));
assertEquals(200, response.getStatusLine().getStatusCode());
assertEquals("{"eligible_to_start_basic":true}", body);

Request ackRequest = new Request("POST", "/_xpack/license/start_basic");
ackRequest.addParameter("acknowledge", "true");
Response response2 = restClient.performRequest(ackRequest);
String body2 = Streams.copyToString(new InputStreamReader(response2.getEntity().getContent(),
StandardCharsets.UTF_8));
assertEquals(200, response2.getStatusLine().getStatusCode());
assertTrue(body2.contains("\"acknowledged\":true\")
assertTrue(body2.contains("\"basic_was_started\":true\")

assertBusy(() -> {
    GetLicenseResponse currentLicense = licensingClient.prepareGetLicense().get();
    assertEquals("basic", currentLicense.license().type());
});

long expirationMillis = licensingClient.prepareGetLicense().get().license().expiryDate();
assertEquals(LicenseService.BASIC_SELF_GENERATED_LICENSE_EXPIRATION_MILLIS, expirationMillis);

Response response3 = restClient.performRequest(new Request("GET", "/_xpack/license"));
String body3 = Streams.copyToString(new InputStreamReader(response3.getEntity().getContent(),
StandardCharsets.UTF_8));
assertTrue(body3.contains("\"type\" : \"basic\"");
assertFalse(body3.contains("\"expiry_date\""));
assertFalse(body3.contains("\"expiry_date_in_millis\""));

Response response4 = restClient.performRequest(new Request("GET", "/_xpack/license/basic_status"));
String body4 = Streams.copyToString(new InputStreamReader(response4.getEntity().getContent(),
StandardCharsets.UTF_8));
assertEquals(200, response4.getStatusLine().getStatusCode());
assertEquals("{"eligible_to_start_basic":false}", body4);

ResponseException ex = expectThrows(ResponseException.class,
    () -> restClient.performRequest(new Request("POST", "/_xpack/license/start_basic")));
Response response5 = ex.getResponse();
String body5 = Streams.copyToString(new InputStreamReader(response5.getEntity().getContent(),
StandardCharsets.UTF_8));
assertEquals(403, response5.getStatusLine().getStatusCode());
assertTrue(body5.contains("\"basic_was_started\":false\")
assertTrue(body5.contains("\"acknowledged\":true\")
assertTrue(body5.contains("\"error_message":"Operation failed: Current license is basic.\""));
public void testUnacknowledgedStartBasicLicense() throws Exception {
    LicensingClient licensingClient = new LicensingClient(client());
    License license = TestUtils.generateSignedLicense("trial", License.VERSION_CURRENT, -1,
    TimeValue.timeValueHours(24));
    licensingClient.preparePutLicense(license).get();

    assertBusy(() -> {
        GetLicenseResponse getLicenseResponse = licensingClient.prepareGetLicense().get();
        assertEquals("trial", getLicenseResponse.license().type());
    });

    Response response2 = getRestClient().performRequest(new Request("POST", "/_xpack/license/start_basic"));
    String body2 = Streams.copyToString(new InputStreamReader(response2.getEntity().getContent(),
    StandardCharsets.UTF_8));
    assertEquals(200, response2.getStatusLine().getStatusCode());
    assertTrue(body2.contains("\"acknowledged\":false");
    assertTrue(body2.contains("\"basic_was_started\":false");
    assertTrue(body2.contains("\"error_message\":\"Operation failed: Needs acknowledgement.\"");
    assertTrue(body2.contains("\"message\":\"This license update requires acknowledgement. To acknowledge the license," +
        "please read the following messages and call /start_basic again, this time with the
        \"acknowledge=true\"\"");
    }
}

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 */
package org.elasticsearch.license;

import org.elasticsearch.Version;
import org.elasticsearch.cluster.ClusterChangedEvent;
import org.elasticsearch.cluster.ClusterName;
import org.elasticsearch.cluster.ClusterState;
import org.elasticsearch.cluster.ClusterStateUpdateTask;
import org.elasticsearch.cluster.metadata.MetaData;
import org.elasticsearch.cluster.node.DiscoveryNode;
import org.elasticsearch.cluster.node.DiscoveryNodes;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.common.unit.TimeValue;
import org.junit.After;
import org.junit.Before;
import org.mockito.ArgumentCaptor;
import static java.util.Collections.emptyMap;

import static java.util.Collections.emptyMap;
import static java.util.Collections.emptySet;
import static org.hamcrest.Matchers.equalTo;
import static org.mockito.Matchers.any;
import static org.mockito.Mockito.times;
import static org.mockito.Mockito.verify;
import static org.mockito.Mockito.when;

public class LicenseClusterChangeTests extends AbstractLicenseServiceTestCase {

    private TestUtils.AssertingLicenseState licenseState;

    @Before
    public void setup() {
        licenseState = new TestUtils.AssertingLicenseState();
        setInitialState(null, licenseState, Settings.EMPTY);
        licenseService.start();
    }

    @After
    public void teardown() {
        licenseService.stop();
    }

    public void testNotificationOnNewLicense() throws Exception {
        ClusterState oldState = ClusterState.builder(new ClusterName("a")).build();
        final License license = TestUtils.generateSignedLicense(TimeValue.timeValueHours(24));
        MetaData metaData = MetaData.builder().putCustom(LicensesMetaData.TYPE, new LicensesMetaData(license, null)).build();
        ClusterState newState = ClusterState.builder(new ClusterName("a")).metaData(metaData).build();
        licenseService.clusterChanged(new ClusterChangedEvent("simulated", newState, oldState));
        assertThat(licenseState.activeUpdates.size(), equalTo(1));
        assertTrue(licenseState.activeUpdates.get(0));
    }

    public void testNoNotificationOnExistingLicense() throws Exception {
        final License license = TestUtils.generateSignedLicense(TimeValue.timeValueHours(24));
        MetaData metaData = MetaData.builder().putCustom(LicensesMetaData.TYPE, new LicensesMetaData(license, null)).build();
        ClusterState newState = ClusterState.builder(new ClusterName("a")).metaData(metaData).build();
        ClusterState oldState = ClusterState.builder(newState).build();
        licenseService.clusterChanged(new ClusterChangedEvent("simulated", newState, oldState));
        assertThat(licenseState.activeUpdates.size(), equalTo(0));
    }

    public void testSelfGeneratedLicenseGeneration() throws Exception {
        DiscoveryNode master = new DiscoveryNode("b", buildNewFakeTransportAddress(), emptyMap(), emptySet(), Version.CURRENT);
    }
}
ClusterState oldState = ClusterState.builder(new ClusterName("a"))
    .nodes(DiscoveryNodes.builder().masterNodeId(master.getId()).add(master).build());
when(discoveryNodes.isLocalNodeElectedMaster()).thenReturn(true);
ClusterState newState = ClusterState.builder(oldState).nodes(discoveryNodes).build();

licenseService.clusterChanged(new ClusterChangedEvent("simulated", newState, oldState));
ArgumentCaptor<ClusterStateUpdateTask> stateUpdater =
    ArgumentCaptor.forClass(ClusterStateUpdateTask.class);
verify(clusterService, times(1)).submitStateUpdateTask(any(), stateUpdater.capture());
ClusterState stateWithLicense = stateUpdater.getValue().execute(newState);
LicensesMetaData licenseMetaData = stateWithLicense.metaData().custom(LicensesMetaData.TYPE);
assertNotNull(licenseMetaData);
assertNotNull(licenseMetaData.getLicense());
assertEquals(licenseType, licenseMetaData.getLicense().type());
long expiration;
if (licenseType.equals("basic")) {
    expiration = LicenseService.BASIC_SELF_GENERATED_LICENSE_EXPIRATION_MILLIS;
} else {
    expiration = LicenseService.NON_BASIC_SELF_GENERATED_LICENSE_DURATION.millis() +
        clock.millis();
}
assertEquals(expiration, licenseMetaData.getLicense().expiryDate());
}

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 * or more contributor license agreements. Licensed under the Elastic License;
 * you may not use this file except in compliance with the Elastic License.
 */
package org.elasticsearch.license;

import org.elasticsearch.client.Request;
import org.elasticsearch.client.Response;
import org.elasticsearch.client.ResponseException;
import org.elasticsearch.client.RestClient;
import org.elasticsearch.common.io.Streams;
import org.elasticsearch.common.network.NetworkModule;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.plugins.Plugin;
import org.elasticsearch.test.ESIntegTestCase;
import org.elasticsearch.transport.Netty4Plugin;
import org.elasticsearch.xpack.core.LocalStateCompositeXPackPlugin;
import org.elasticsearch.xpack.core.XPackClientPlugin;
import java.io.InputStreamReader;
import java.nio.charset.StandardCharsets;
import java.util.Arrays;
import java.util.Collection;
import static org.elasticsearch.test.ESIntegTestCase.Scope.SUITE;

@ESIntegTestCase.ClusterScope(scope = SUITE)
public class StartTrialLicenseTests extends AbstractLicensesIntegrationTestCase {

    @Override
    protected Settings nodeSettings(int nodeOrdinal) {
        return Settings.builder()
                .put(super.nodeSettings(nodeOrdinal))
                .put("node.data", true)
                .put(LicenseService.SELF_GENERATED_LICENSE_TYPE.getKey(), "basic")
                .put(NetworkModule.HTTP_ENABLED.getKey(), true).build();
    }

    @Override
    protected Collection<Class<? extends Plugin>> nodePlugins() {
        return Arrays.asList(LocalStateCompositeXPackPlugin.class, Netty4Plugin.class);
    }

    @Override
    protected Collection<Class<? extends Plugin>> transportClientPlugins() {
        return Arrays.asList(XPackClientPlugin.class, Netty4Plugin.class);
    }

    public void testStartTrial() throws Exception {
        LicensingClient licensingClient = new LicensingClient(client());
        ensureStartingWithBasic();

        RestClient restClient = getRestClient();
        Response response = restClient.performRequest(new Request("GET", "/_xpack/license/trial_status"));
        String body = Streams.copyToString(new InputStreamReader(response.getEntity().getContent(),
                StandardCharsets.UTF_8));
        assertEquals(200, response.getStatusLine().getStatusCode());
        assertEquals("{"eligible_to_start_trial":true}", body);

        // Test that starting will fail without acknowledgement
        Response response2 = restClient.performRequest(new Request("POST", "/_xpack/license/start_trial"));
        String body2 = Streams.copyToString(new InputStreamReader(response2.getEntity().getContent(),
                StandardCharsets.UTF_8));
        assertEquals(200, response2.getStatusLine().getStatusCode());
        assertTrue(body2.contains("{"trial_was_started":false}");
        assertTrue(body2.contains("{"error_message":"Operation failed: Needs acknowledgement.""));
        assertTrue(body2.contains("{"acknowledged":false}");

        assertBusy(() -> {
            GetLicenseResponse getLicenseResponse = licensingClient.prepareGetLicense().get();
            assertEquals("basic", getLicenseResponse.license().type());
        });
    }
}
String type = randomFrom(LicenseService.VALID_TRIAL_TYPES);

Request ackRequest = new Request("POST", "/_xpack/license/start_trial");
ackRequest.addParameter("acknowledge", "true");
ackRequest.addParameter("type", type);
Response response3 = restClient.performRequest(ackRequest);
String body3 = Streams.copyToString(new InputStreamReader(response3.getEntity().getContent(),
StandardCharsets.UTF_8));
assertEquals(200, response3.getStatusLine().getStatusCode());
assertTrue(body3.contains("trial_was_started":true"));
assertTrue(body3.contains("type":"" + type + ":"));
assertTrue(body3.contains("acknowledged":true"));

assertBusy(() -> {
    GetLicenseResponse postTrialLicenseResponse = licensingClient.prepareGetLicense().get();
    assertEquals(type, postTrialLicenseResponse.license().type());
});

Response response4 = restClient.performRequest(new Request("GET", "/_xpack/license/trial_status"));
String body4 = Streams.copyToString(new InputStreamReader(response4.getEntity().getContent(),
StandardCharsets.UTF_8));
assertEquals(200, response4.getStatusLine().getStatusCode());
assertEquals("{"eligible_to_start_trial":false}", body4);

String secondAttemptType = randomFrom(LicenseService.VALID_TRIAL_TYPES);

Request startTrialWhenStartedRequest = new Request("POST", "/_xpack/license/start_trial");
startTrialWhenStartedRequest.addParameter("acknowledge", "true");
startTrialWhenStartedRequest.addParameter("type", secondAttemptType);
ResponseException ex = expectThrows(ResponseException.class, () ->
restClient.performRequest(startTrialWhenStartedRequest));
Response response5 = ex.getResponse();
String body5 = Streams.copyToString(new InputStreamReader(response5.getEntity().getContent(),
StandardCharsets.UTF_8));
assertEquals(403, response5.getStatusLine().getStatusCode());
assertTrue(body5.contains("trial_was_started":false"));
assertTrue(body5.contains("error_message":"Operation failed: Trial was already activated."));
}

class LicenseTest {
    public void testInvalidType() throws Exception {
        ensureStartingWithBasic();

        Request request = new Request("POST", "/_xpack/license/start_trial");
        request.addParameter("type", "basic");
        ResponseException ex = expectThrows(ResponseException.class, () ->
getRestClient().performRequest(request));
    }
}
private void ensureStartingWithBasic() throws Exception {
    LicensingClient licensingClient = new LicensingClient(client());
    GetLicenseResponse getLicenseResponse = licensingClient.prepareGetLicense().get();
    if ("basic".equals(getLicenseResponse.license().type()) == false) {
        licensingClient.preparePostStartBasic().setAcknowledge(true).get();
    }

    assertBusy(() -> {
        GetLicenseResponse postTrialLicenseResponse = licensingClient.prepareGetLicense().get();
        assertEquals("basic", postTrialLicenseResponse.license().type());
    });
}

package org.elasticsearch.xpack.core.security.authz.permission;

import org.apache.lucene.index.DirectoryReader;
import org.apache.lucene.util.Accountable;
import org.apache.lucene.util.RamUsageEstimator;
import org.apache.lucene.util.automaton.Automata;
import org.apache.lucene.util.automaton.CharacterRunAutomaton;
import org.apache.lucene.util.automaton.MinimizationOperations;
import org.elasticsearch.ElasticsearchSecurityException;
import org.elasticsearch.common.Strings;
import org.elasticsearch.common.regex.Regex;
import org.elasticsearch.index.mapper.AllFieldMapper;
import org.elasticsearch.xpack.core.security.authz.FieldPermissionsDefinition.FieldGrantExcludeGroup;
import org.elasticsearch.xpack.core.security.authz.permission.FieldSubsetReader;
import org.elasticsearch.xpack.core.security.support.Automatons;
import java.io.IOException;
import java.util.Arrays;
import java.util.HashMap;
import java.util.HashSet;
import java.util.List;
import java.util.Set;
import java.util.stream.Collectors;
import static org.apache.lucene.util.automaton.Operations.subsetOf;

/**
 * Stores patterns to fields which access is granted or denied to and maintains an automaton that can be used to check
 * if permission is
 * allowed for a specific field.
 * Field permissions are configured via a list of strings that are patterns a field has to match. Two lists determine
 * whether or
 * not a field is granted access to:
 * 1. It has to match the patterns in grantedFieldsArray
 * 2. it must not match the patterns in deniedFieldsArray
 */

public final class FieldPermissions implements Accountable {

    public static final FieldPermissions DEFAULT = new FieldPermissions();

    private static final long BASE_FIELD_PERM_DEF_BYTES = RamUsageEstimator.shallowSizeOf(new FieldPermissionsDefinition(null, null));
    private static final long BASE_FIELD_GROUP_BYTES = RamUsageEstimator.shallowSizeOf(new FieldGrantExcludeGroup(null, null));
    private static final long BASE_HASHSET_SIZE = RamUsageEstimator.shallowSizeEstimator(HashSet.class);
    private static final long BASE_HASHSET_ENTRY_SIZE;

    static {
        HashMap<String, Object> map = new HashMap<>();
        map.put(FieldPermissions.class.getName(), new Object());
        long mapEntryShallowSize = RamUsageEstimator.shallowSizeOf(map.entrySet().iterator().next());
        // assume a load factor of 50%
        // for each entry, we need two object refs, one for the entry itself
        // and one for the free space that is due to the fact hash tables can
        // not be fully loaded
        BASE_HASHSET_ENTRY_SIZE = mapEntryShallowSize + 2 * RamUsageEstimator.NUM_BYTES_OBJECT_REF;
    }

    private final FieldPermissionsDefinition fieldPermissionsDefinition;
    // an automaton that represents a union of one more sets of permitted and denied fields
    private final CharacterRunAutomaton permittedFieldsAutomaton;
    private final boolean permittedFieldsAutomatonIsTotal;
    private final Automaton originalAutomaton;

    private final long ramBytesUsed;

    /** Constructor that does not enable field-level security: all fields are accepted. */
public FieldPermissions() {
    this(new FieldPermissionsDefinition(null, null), Automatons.MATCH_ALL);
}

/** Constructor that enables field-level security based on include/exclude rules. Exclude rules
* have precedence over include rules. */
public FieldPermissions(FieldPermissionsDefinition fieldPermissionsDefinition) {
    this(fieldPermissionsDefinition, initializePermittedFieldsAutomaton(fieldPermissionsDefinition));
}

/** Constructor that enables field-level security based on include/exclude rules. Exclude rules
* have precedence over include rules. */
FieldPermissions(FieldPermissionsDefinition fieldPermissionsDefinition, Automaton permittedFieldsAutomaton) {
    if (permittedFieldsAutomaton.isDeterministic() == false && permittedFieldsAutomaton.getNumStates() > 1) {
        // we only accept deterministic automata so that the CharacterRunAutomaton constructor
        // directly wraps the provided automaton
        throw new IllegalArgumentException("Only accepts deterministic automata");
    }
    this.fieldPermissionsDefinition = fieldPermissionsDefinition;
    this.originalAutomaton = permittedFieldsAutomaton;
    this.permittedFieldsAutomaton = new CharacterRunAutomaton(permittedFieldsAutomaton);
    // we cache the result of isTotal since this might be a costly operation
    this.permittedFieldsAutomatonIsTotal = Operations.isTotal(permittedFieldsAutomaton);
    long ramBytesUsed = BASE_FIELD_PERM_DEF_BYTES;
    for (FieldGrantExcludeGroup group : fieldPermissionsDefinition.getFieldGrantExcludeGroups()) {
        ramBytesUsed += BASE_FIELD_GROUP_BYTES + BASE_HASHSET_ENTRY_SIZE;
        if (group.getGrantedFields() != null) {
            ramBytesUsed += RamUsageEstimator.shallowSizeOf(group.getGrantedFields());
        }
        if (group.getExcludedFields() != null) {
            ramBytesUsed += RamUsageEstimator.shallowSizeOf(group.getExcludedFields());
        }
    }
    ramBytesUsed += permittedFieldsAutomaton.ramBytesUsed();
    ramBytesUsed += runAutomatonRamBytesUsed(permittedFieldsAutomaton);
    this.ramBytesUsed = ramBytesUsed;
}

/**
* Return an estimation of the ram bytes used by a CharacterRunAutomaton
*/
private static long runAutomatonRamBytesUsed(Automaton a) {
    return a.getNumStates() * 5; // wild guess, better than 0
}
public static Automaton initializePermittedFieldsAutomaton(FieldPermissionsDefinition fieldPermissionsDefinition) {
    Set<FieldGrantExcludeGroup> groups = fieldPermissionsDefinition.getFieldGrantExcludeGroups();
    assert groups.size() > 0 : "there must always be a single group for field inclusion/exclusion";
    List<Automaton> automatonList =
        groups.stream()
            .map(g -> FieldPermissions.initializePermittedFieldsAutomaton(g.getGrantedFields(), g.getExcludedFields()))
            .collect(Collectors.toList());
    return Automatons.unionAndMinimize(automatonList);
}

private static Automaton initializePermittedFieldsAutomaton(final String[] grantedFields, final String[] deniedFields) {

    Automaton grantedFieldsAutomaton;
    if (grantedFields == null || Arrays.stream(grantedFields).anyMatch(Regex::isMatchAllPattern)) {
        grantedFieldsAutomaton = Automatons.MATCH_ALL;
    } else {
        // an automaton that includes metadata fields, including join fields created by the _parent field such
        // as _parent#type
        Automaton metaFieldsAutomaton = Operations.concatenate(Automata.makeChar('_'),
                                                  Automata.makeAnyString());
        grantedFieldsAutomaton = Operations.union(Automatons.patterns(grantedFields), metaFieldsAutomaton);
    }
    Automaton deniedFieldsAutomaton;
    if (deniedFields == null || deniedFields.length == 0) {
        deniedFieldsAutomaton = Automatons.EMPTY;
    } else {
        deniedFieldsAutomaton = Automatons.patterns(deniedFields);
    }
    grantedFieldsAutomaton = MinimizationOperations.minimize(grantedFieldsAutomaton,
                                                              Operations.DEFAULT_MAX_DETERMINIZED_STATES);
    deniedFieldsAutomaton = MinimizationOperations.minimize(deniedFieldsAutomaton,
                                                             Operations.DEFAULT_MAX_DETERMINIZED_STATES);

    if (subsetOf(deniedFieldsAutomaton, grantedFieldsAutomaton) == false) {
        throw new ElasticsearchSecurityException("Exceptions for field permissions must be a subset of the " +
            "granted fields but " + Strings.arrayToCommaDelimitedString(deniedFields) + " is not a subset of " +
            Strings.arrayToCommaDelimitedString(grantedFields));
    }

    if (!containsAllField(grantedFields) && !containsAllField(deniedFields)) {
        // It is not explicitly stated whether _all should be allowed/denied
        // In that case we automatically disable _all, unless all fields would match
        if (Operations.isTotal(grantedFieldsAutomaton) && Operations.isEmpty(deniedFieldsAutomaton)) {
            // The _all patterns are included in the granted fields automaton
        }
    }
}
// all fields are accepted, so using _all is fine
}
}

deniedFieldsAutomaton = Operations.union(deniedFieldsAutomaton,
Automata.makeString(AllFieldMapper.NAME));

}

grantedFieldsAutomaton = Automatons.minusAndMinimize(grantedFieldsAutomaton,
deniedFieldsAutomaton);
return grantedFieldsAutomaton;

private static boolean containsAllField(String[] fields) {
  return fields != null && Arrays.stream(fields).anyMatch(AllFieldMapper.NAME::equals);
}

/**
 * Returns true if this field permission policy allows access to the field and false if not.
 * fieldName can be a wildcard.
 */
public boolean grantsAccessTo(String fieldName) {
  return permittedFieldsAutomatonIsTotal || permittedFieldsAutomaton.run(fieldName);
}

public FieldPermissionsDefinition getFieldPermissionsDefinition() {
  return fieldPermissionsDefinition;
}

/** Return whether field-level security is enabled, ie. whether any field might be filtered out. */
public boolean hasFieldLevelSecurity() {
  return permittedFieldsAutomatonIsTotal == false;
}

/** Return a wrapped reader that only exposes allowed fields. */
public DirectoryReader filter(DirectoryReader reader) throws IOException {
  if (hasFieldLevelSecurity() == false) {
    return reader;
  }
  return FieldSubsetReader.wrap(reader, permittedFieldsAutomaton);
}

// for testing only
Automaton getIncludeAutomaton() {
  return originalAutomaton;
}

@Override
public boolean equals(Object o) {

if (this == o) return true;
if (o == null || getClass() != o.getClass()) return false;

FieldPermissions that = (FieldPermissions) o;

if (permittedFieldsAutomatonIsTotal != that.permittedFieldsAutomatonIsTotal) return false;
return fieldPermissionsDefinition != null ?
fieldPermissionsDefinition.equals(that.fieldPermissionsDefinition) : that.fieldPermissionsDefinition ==
null;
}

@Override
public int hashCode() {
    int result = fieldPermissionsDefinition != null ? fieldPermissionsDefinition.hashCode() : 0;
    result = 31 * result + (permittedFieldsAutomatonIsTotal ? 1 : 0);
    return result;
}

@Override
public long ramBytesUsed() {
    return ramBytesUsed;
}

/*@Override
public int hashCode() {
    int result = fieldPermissionsDefinition != null ? fieldPermissionsDefinition.hashCode() : 0;
    result = 31 * result + (permittedFieldsAutomatonIsTotal ? 1 : 0);
    return result;
}

/*@Override
public long ramBytesUsed() {
    return ramBytesUsed;
}
*/

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 */
package org.elasticsearch.xpack.core.security.authz.permission;

import org.elasticsearch.xpack.core.security.authz.privilege.Privilege;
import java.util.function.Predicate;

/**
 * A permissions that is based on a general privilege that contains patterns of users that this
 * user can execute a request as
 */
public final class RunAsPermission {

    public static final RunAsPermission NONE = new RunAsPermission(Privilege.NONE);

    private final Privilege privilege;
    private final Predicate<String> predicate;

    RunAsPermission(Privilege privilege) {
        this.privilege = privilege;
        this.predicate = privilege.predicate();
    }
public Privilege getPrivilege() {
    return privilege;
}

/**
 * Checks if this permission grants run as to the specified user
 */
public boolean check(String username) {
    return predicate.test(username);
}

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 * you may not use this file except in compliance with the Elastic License.
 */
package org.elasticsearch.xpack.core.security.authz.permission;

import org.apache.lucene.util.automaton.Automaton;
import org.elasticsearch.ElasticsearchException;
import org.elasticsearch.common.cache.Cache;
import org.elasticsearch.common.cache.CacheBuilder;
import org.elasticsearch.CommonSettings.Setting;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.xpack.core.security.authz.permission.FieldPermissionsDefinition.FieldGrantExcludeGroup;
import org.elasticsearch.xpack.core.security.support.Automatons;
import java.util.Collection;
import java.util.List;
import java.util.Optional;
import java.util.Set;
import java.util.concurrent.ExecutionException;
import java.util.function.Predicate;
import java.util.stream.Collectors;
import static org.elasticsearch.xpack.core.security.SecurityField.setting;

/**
 * A service for managing the caching of {FieldPermissions} as these may often need to be combined or
 * created and internally they
 * use an {Automaton}, which can be costly to create once you account for
 * minimization
 */
public final class FieldPermissionsCache {


public static final Setting<Long> CACHE_SIZE_SETTING = Setting.longSetting(
    setting("authz.store.roles.field_permissions.cache.max_size_in_bytes"), 100 * 1024 * 1024, -1L,
    Property.NodeScope);
private final Cache<FieldPermissionsDefinition, FieldPermissions> cache;

public FieldPermissionsCache(Settings settings) {
    this.cache = CacheBuilder.<FieldPermissionsDefinition, FieldPermissions>builder()
        .setMaximumWeight(CACHE_SIZE_SETTING.get(settings))
        .weigher((key, fieldPermissions) -> fieldPermissions.ramBytesUsed())
        .build();
}

/**
 * Gets a {@link FieldPermissions} instance that corresponds to the granted and denied parameters. The instance
 * may come from the cache
 * or if it gets created, the instance will be cached
 */
FieldPermissions getFieldPermissions(String[] granted, String[] denied) {
    return getFieldPermissions(new FieldPermissionsDefinition(granted, denied));
}

/**
 * Gets a {@link FieldPermissions} instance that corresponds to the granted and denied parameters. The instance
 * may come from the cache
 * or if it gets created, the instance will be cached
 */
public FieldPermissions getFieldPermissions(FieldPermissionsDefinition fieldPermissionsDefinition) {
    try {
        return cache.computeIfAbsent(fieldPermissionsDefinition,
            (key) -> new FieldPermissions(key, FieldPermissions.initializePermittedFieldsAutomaton(key)));
    } catch (ExecutionException e) {
        throw new ElasticsearchException("unable to compute field permissions", e);
    }
}

/**
 * Returns a field permissions object that corresponds to the merging of the given field permissions and caches the
 * instance if one was
 * not found in the cache.
 */
FieldPermissions getFieldPermissions(Collection<FieldPermissions> fieldPermissionsCollection) {
    Optional<FieldPermissions> allowAllFieldPermissions = fieldPermissionsCollection.stream()
        .filter(((Predicate<FieldPermissions>) (FieldPermissions::hasFieldLevelSecurity)).negate())
        .findFirst();
    return allowAllFieldPermissions.orElseGet(() -> {
        final Set<FieldGrantExcludeGroup> fieldGrantExcludeGroups = fieldPermissionsCollection.stream()
            .flatMap(fieldPermission ->
                fieldPermission.getFieldPermissionsDefinition().getFieldGrantExcludeGroups().stream())
            .flatMap(fieldGrantExcludeGroup ->
                fieldPermission.getFieldPermissionsDefinition().getGrantFieldPermissions().stream())
            .flatMap(fieldPermissions ->
                fieldPermission.getFieldPermissionsDefinition().getGrantFieldPermissions().stream())
            .flatMap(fieldPermissions ->
                fieldPermission.getFieldPermissionsDefinition().getGrantFieldPermissions().stream())
            .stream());
}

public static final Setting<Long> CACHE_SIZE_SETTING = Setting.longSetting(
    setting("authz.store.roles.field_permissions.cache.max_size_in_bytes"), 100 * 1024 * 1024, -1L,
    Property.NodeScope);
private final Cache<FieldPermissionsDefinition, FieldPermissions> cache;

public FieldPermissionsCache(Settings settings) {
    this.cache = CacheBuilder.<FieldPermissionsDefinition, FieldPermissions>builder()
        .setMaximumWeight(CACHE_SIZE_SETTING.get(settings))
        .weigher((key, fieldPermissions) -> fieldPermissions.ramBytesUsed())
        .build();
}

/**
 * Gets a {@link FieldPermissions} instance that corresponds to the granted and denied parameters. The instance
 * may come from the cache
 * or if it gets created, the instance will be cached
 */
FieldPermissions getFieldPermissions(String[] granted, String[] denied) {
    return getFieldPermissions(new FieldPermissionsDefinition(granted, denied));
}

/**
 * Gets a {@link FieldPermissions} instance that corresponds to the granted and denied parameters. The instance
 * may come from the cache
 * or if it gets created, the instance will be cached
 */
public FieldPermissions getFieldPermissions(FieldPermissionsDefinition fieldPermissionsDefinition) {
    try {
        return cache.computeIfAbsent(fieldPermissionsDefinition,
            (key) -> new FieldPermissions(key, FieldPermissions.initializePermittedFieldsAutomaton(key)));
    } catch (ExecutionException e) {
        throw new ElasticsearchException("unable to compute field permissions", e);
    }
}

/**
 * Returns a field permissions object that corresponds to the merging of the given field permissions and caches the
 * instance if one was
 * not found in the cache.
 */
FieldPermissions getFieldPermissions(Collection<FieldPermissions> fieldPermissionsCollection) {
    Optional<FieldPermissions> allowAllFieldPermissions = fieldPermissionsCollection.stream()
        .filter(((Predicate<FieldPermissions>) (FieldPermissions::hasFieldLevelSecurity)).negate())
        .findFirst();
    return allowAllFieldPermissions.orElseGet(() -> {
        final Set<FieldGrantExcludeGroup> fieldGrantExcludeGroups = fieldPermissionsCollection.stream()
            .flatMap(fieldPermission ->
                fieldPermission.getFieldPermissionsDefinition().getFieldGrantExcludeGroups().stream())
            .flatMap(fieldGrantExcludeGroup ->
                fieldPermission.getFieldPermissionsDefinition().getGrantFieldPermissions().stream())
            .flatMap(fieldPermissions ->
                fieldPermission.getFieldPermissionsDefinition().getGrantFieldPermissions().stream())
            .flatMap(fieldPermissions ->
                fieldPermission.getFieldPermissionsDefinition().getGrantFieldPermissions().stream())
            .stream());
}
final FieldPermissionsDefinition combined = new FieldPermissionsDefinition(fieldGrantExcludeGroups);
try {
    return cache.computeIfAbsent(combined, (key) -> {
        List<Automaton> automatonList = fieldPermissionsCollection.stream()
            .map(FieldPermissions::getIncludeAutomaton)
            .collect(Collectors.toList());
        return new FieldPermissions(key, Automatons.unionAndMinimize(automatonList));
    });
} catch (ExecutionException e) {
    throw new ElasticsearchException("unable to compute field permissions", e);
}
*/

package org.elasticsearch.xpack.core.security.authz.permission;

import org.elasticsearch.common.collect.Tuple;
import org.elasticsearch.transport.TransportRequest;
import org.elasticsearch.xpack.core.security.authz.privilege.ClusterPrivilege;
import org.elasticsearch.xpack.core.security.authz.privilege.ConditionalClusterPrivilege;
import java.util.Collection;
import java.util.Collections;
import java.util.List;
import java.util.Set;
import java.util.function.Predicate;
import java.util.stream.Collectors;

public abstract class ClusterPermission {
    private final ClusterPrivilege privilege;

    ClusterPermission(ClusterPrivilege privilege) {
        this.privilege = privilege;
    }

    public ClusterPrivilege privilege() {
        return privilege;
    }

    public abstract class ClusterPermission {
    private final ClusterPrivilege privilege;

    ClusterPermission(ClusterPrivilege privilege) {
        this.privilege = privilege;
    }

    public ClusterPrivilege privilege() {
        return privilege;
    }
}
public abstract boolean check(String action, TransportRequest request);

public abstract List<Tuple<ClusterPrivilege, ConditionalClusterPrivilege>> privileges();

/**
 * A permission that is based solely on cluster privileges and does not consider request state
 */
public static class SimpleClusterPermission extends ClusterPermission {

    public static final SimpleClusterPermission NONE = new SimpleClusterPermission(ClusterPrivilege.NONE);

    private final Predicate<String> predicate;

    SimpleClusterPermission(ClusterPrivilege privilege) {
        super(privilege);
        this.predicate = privilege.predicate();
    }

    @Override
    public boolean check(String action, TransportRequest request) {
        return predicate.test(action);
    }

    @Override
    public List<Tuple<ClusterPrivilege, ConditionalClusterPrivilege>> privileges() {
        return Collections.singletonList(new Tuple<>(super.privilege, null));
    }
}

/**
 * A permission that makes use of both cluster privileges and request inspection
 */
public static class ConditionalClusterPermission extends ClusterPermission {

    private final ConditionalClusterPrivilege conditionalPrivilege;

    public ConditionalClusterPermission(ConditionalClusterPrivilege conditionalPrivilege) {
        super(conditionalPrivilege.getPrivilege());
        this.conditionalPrivilege = conditionalPrivilege;
    }

    @Override
    public boolean check(String action, TransportRequest request) {
        return super.privilege.predicate().test(action) && conditionalPrivilege.getRequestPredicate().test(request);
    }

    @Override
    public List<Tuple<ClusterPrivilege, ConditionalClusterPrivilege>> privileges() {
        return Collections.singletonList(new Tuple<>(super.privilege, null));
    }
}
public static class CompositeClusterPermission extends ClusterPermission {
    private final Collection<ClusterPermission> children;

    public CompositeClusterPermission(Collection<ClusterPermission> children) {
        super(buildPrivilege(children));
        this.children = children;
    }

    private static ClusterPrivilege buildPrivilege(Collection<ClusterPermission> children) {
        final Set<String> names = children.stream()
            .map(ClusterPermission::privilege)
            .map(ClusterPrivilege::name)
            .flatMap(Set::stream)
            .collect(Collectors.toSet());
        return ClusterPrivilege.get(names);
    }

    @Override
    public List<Tuple<ClusterPrivilege, ConditionalClusterPrivilege>> privileges() {
        return children.stream().map(ClusterPermission::privileges).flatMap(List::stream).collect(Collectors.toList());
    }

    @Override
    public boolean check(String action, TransportRequest request) {
        return children.stream().anyMatch(p -> p.check(action, request));
    }
}

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*/
package org.elasticsearch.xpack.core.security.authz.permission;

import org.elasticsearch.common.Strings;
import java.util.Arrays;
import java.util.Collections;
import java.util.Set;
/**
 * Represents the definition of a {@link FieldPermissions}. Field permissions are defined as a collection of grant and exclude definitions where the exclude definition must be a subset of the grant definition.
 */
public final class FieldPermissionsDefinition {

  private final Set<FieldGrantExcludeGroup> fieldGrantExcludeGroups;

  public FieldPermissionsDefinition(String[] grant, String[] exclude) {
    this(Collections.singleton(new FieldGrantExcludeGroup(grant, exclude)));
  }

  public FieldPermissionsDefinition(Set<FieldGrantExcludeGroup> fieldGrantExcludeGroups) {
    this.fieldGrantExcludeGroups = Collections.unmodifiableSet(fieldGrantExcludeGroups);
  }

  public Set<FieldGrantExcludeGroup> getFieldGrantExcludeGroups() {
    return fieldGrantExcludeGroups;
  }

  @Override
  public boolean equals(Object o) {
    if (this == o) return true;
    if (o == null || getClass() != o.getClass()) return false;
    FieldPermissionsDefinition that = (FieldPermissionsDefinition) o;
    return fieldGrantExcludeGroups != null ?
      fieldGrantExcludeGroups.equals(that.fieldGrantExcludeGroups) :
      that.fieldGrantExcludeGroups == null;
  }

  @Override
  public int hashCode() {
    return fieldGrantExcludeGroups != null ? fieldGrantExcludeGroups.hashCode() : 0;
  }

  public static final class FieldGrantExcludeGroup {
    private final String[] grantedFields;
    private final String[] excludedFields;

    public FieldGrantExcludeGroup(String[] grantedFields, String[] excludedFields) {
      this.grantedFields = grantedFields;
      this.excludedFields = excludedFields;
    }

    public String[] getGrantedFields() {
return grantedFields;
}

public String[] getExcludedFields() {
    return excludedFields;
}

@Override
public boolean equals(Object o) {
    if (this == o) return true;
    if (o == null || getClass() != o.getClass()) return false;
    FieldGrantExcludeGroup that = (FieldGrantExcludeGroup) o;

    if (!Arrays.equals(grantedFields, that.grantedFields)) return false;
    return Arrays.equals(excludedFields, that.excludedFields);
}

@Override
public int hashCode() {
    int result = Arrays.hashCode(grantedFields);
    result = 31 * result + Arrays.hashCode(excludedFields);
    return result;
}

@Override
public String toString() {
    return getClass().getSimpleName() + "[grant=" + Strings.arrayToCommaDelimitedString(grantedFields) + "; exclude=" + Strings.arrayToCommaDelimitedString(excludedFields) + "]";
}

/*@Override*/
package org.elasticsearch.xpack.core.security.authz.permission;

import org.elasticsearch.cluster.metadata.MetaData;
import org.elasticsearch.common.Nullable;
import org.elasticsearch.common.bytes.BytesReference;
import org.elasticsearch.common.collect.Tuple;
import org.elasticsearch.common.util.set.Sets;
import org.elasticsearch.xpack.core.security.authz.RoleDescriptor;
import org.elasticsearch.xpack.core.security.authz.accesscontrol.IndicesAccessControl;
import org.elasticsearch.xpack.core.security.authz.privilege.ApplicationPrivilege;
import org.elasticsearch.xpack.core.security.authz.privilege.ClusterPrivilege;
import org.elasticsearch.xpack.core.security.authz.privilege.ConditionalClusterPrivilege;
import org.elasticsearch.xpack.core.security.authz.privilege.IndexPrivilege;
import org.elasticsearch.xpack.core.security.authz.privilege.Privilege;
import java.util.ArrayList;
import java.util.Arrays;
import java.util.Collections;
import java.util.List;
import java.util.Map;
import java.util.Objects;
import java.util.Set;

public final class Role {

    public static final Role EMPTY = Role.builder("__empty").build();

    private final String[] names;
    private final ClusterPermission cluster;
    private final IndicesPermission indices;
    private final ApplicationPermission application;
    private final RunAsPermission runAs;

    Role(String[] names, ClusterPermission cluster, IndicesPermission indices, ApplicationPermission application,
         RunAsPermission runAs) {
        this.names = names;
        this.cluster = Objects.requireNonNull(cluster);
        this.indices = Objects.requireNonNull(indices);
        this.application = Objects.requireNonNull(application);
        this.runAs = Objects.requireNonNull(runAs);
    }

    public String[] names() {
        return names;
    }

    public ClusterPermission cluster() {
        return cluster;
    }

    public IndicesPermission indices() {
        return indices;
    }

    public ApplicationPermission application() {
        return application;
    }

    public final class Builder {
        private String[] names = new String[0];
        private ClusterPermission cluster;
        private IndicesPermission indices;
        private ApplicationPermission application;
        private RunAsPermission runAs;

        public Builder(String[] names) {
            this.names = names;
        }

        public Builder(String[] names, ClusterPermission cluster) {
            this.names = names;
            this.cluster = cluster;
        }

        public Builder(String[] names, ClusterPermission cluster, IndicesPermission indices) {
            this.names = names;
            this.cluster = cluster;
            this.indices = indices;
        }

        public Builder(String[] names, ClusterPermission cluster, IndicesPermission indices,
                        ApplicationPermission application) {
            this.names = names;
            this.cluster = cluster;
            this.indices = indices;
            this.application = application;
        }

        public Builder(String[] names, ClusterPermission cluster, IndicesPermission indices,
                        ApplicationPermission application, RunAsPermission runAs) {
            this.names = names;
            this.cluster = cluster;
            this.indices = indices;
            this.application = application;
            this.runAs = runAs;
        }

        public Builder withNames(String[] names) {
            this.names = names;
            return this;
        }

        public Builder withCluster(ClusterPermission cluster) {
            this.cluster = cluster;
            return this;
        }

        public Builder withIndices(IndicesPermission indices) {
            this.indices = indices;
            return this;
        }

        public Builder withApplication(ApplicationPermission application) {
            this.application = application;
            return this;
        }

        public Builder withRunAs(RunAsPermission runAs) {
            this.runAs = runAs;
            return this;
        }

        public Role build() {
            return new Role(names, cluster, indices, application, runAs);
        }
    }
}
public RunAsPermission runAs() {
    return runAs;
}

public static Builder builder(String... names) {
    return new Builder(names, null);
}

public static Builder builder(String[] names, FieldPermissionsCache fieldPermissionsCache) {
    return new Builder(names, fieldPermissionsCache);
}

public static Builder builder(RoleDescriptor rd, FieldPermissionsCache fieldPermissionsCache) {
    return new Builder(rd, fieldPermissionsCache);
}

/**
 * Returns whether at least one group encapsulated by this indices permissions is authorized to execute the
 * specified action with the requested indices/aliases. At the same time if field and/or document level security
 * is configured for any group also the allowed fields and role queries are resolved.
 */
public IndicesAccessControl authorize(String action, Set<String> requestedIndicesOrAliases, MetaData metaData,
                                      FieldPermissionsCache fieldPermissionsCache) {
    Map<String, IndicesAccessControl.IndexAccessControl> indexPermissions = indices.authorize(
        action, requestedIndicesOrAliases, metaData, fieldPermissionsCache
    );

    // At least one role / indices permission set need to match with all the requested indices/aliases:
    boolean granted = true;
    for (Map.Entry<String, IndicesAccessControl.IndexAccessControl> entry : indexPermissions.entrySet()) {
        if (!entry.getValue().isGranted()) {
            granted = false;
            break;
        }
    }

    return new IndicesAccessControl(granted, indexPermissions);
}

public static class Builder {

    private final String[] names;
    private ClusterPermission cluster = ClusterPermission.SimpleClusterPermission.NONE;
    private RunAsPermission runAs = RunAsPermission.NONE;
    private List<IndicesPermission.Group> groups = new ArrayList<>();
    private FieldPermissionsCache fieldPermissionsCache = null;
    private List<Tuple<ApplicationPrivilege, Set<String>>> applicationPrivs = new ArrayList<>();

    // ...
}
private Builder(String[] names, FieldPermissionsCache fieldPermissionsCache) {
    this.names = names;
    this.fieldPermissionsCache = fieldPermissionsCache;
}

private Builder(RoleDescriptor rd, @Nullable FieldPermissionsCache fieldPermissionsCache) {
    this.names = new String[] { rd.getName() };
    this.fieldPermissionsCache = fieldPermissionsCache;
    cluster(Sets.newHashSet(rd.getClusterPrivileges()), Arrays.asList(rd.getConditionalClusterPrivileges()));
    groups.addAll(convertFromIndicesPrivileges(rd.getIndicesPrivileges(), fieldPermissionsCache));
    final RoleDescriptor.ApplicationResourcePrivileges[] applicationPrivileges = rd.getApplicationPrivileges();
    for (int i = 0; i < applicationPrivileges.length; i++) {
        applicationPrivs.add(convertApplicationPrivilege(rd.getName(), i, applicationPrivileges[i]));
    }
    String[] rdRunAs = rd.getRunAs();
    if (rdRunAs != null && rdRunAs.length > 0) {
        this.runAs(new Privilege(Sets.newHashSet(rdRunAs), rdRunAs));
    }
}

public Builder cluster(Set<String> privilegeNames, Iterable<ConditionalClusterPrivilege> conditionalClusterPrivileges) {
    List<ClusterPermission> clusterPermissions = new ArrayList<>();
    if (privilegeNames.isEmpty() == false) {
        clusterPermissions.add(new ClusterPermission.SimpleClusterPermission(ClusterPrivilege.get(privilegeNames)));
    }
    for (ConditionalClusterPrivilege ccp : conditionalClusterPrivileges) {
        clusterPermissions.add(new ClusterPermission.ConditionalClusterPermission(ccp));
    }
    if (clusterPermissions.isEmpty()) {
        this.cluster = ClusterPermission.SimpleClusterPermission.NONE;
    } else if (clusterPermissions.size() == 1) {
        this.cluster = clusterPermissions.get(0);
    } else {
        this.cluster = new ClusterPermission.CompositeClusterPermission(clusterPermissions);
    }
    return this;
}

/**
 * @deprecated Use {@link #cluster(Set, Iterable)}
 */
@Deprecated
public Builder cluster(ClusterPrivilege privilege) {
    this.
}
cluster = new ClusterPermission.SimpleClusterPermission(privilege);
return this;
}

public Builder runAs(Privilege privilege) {
    runAs = new RunAsPermission(privilege);
    return this;
}

public Builder add(IndexPrivilege privilege, String... indices) {
    groups.add(new IndicesPermission.Group(privilege, FieldPermissions.DEFAULT, null, indices));
    return this;
}

public Builder add(FieldPermissions fieldPermissions, Set<BytesReference> query, IndexPrivilege privilege,
        String... indices) {
    groups.add(new IndicesPermission.Group(privilege, fieldPermissions, query, indices));
    return this;
}

public Builder addApplicationPrivilege(ApplicationPrivilege privilege, Set<String> resources) {
    applicationPrivs.add(new Tuple<>(privilege, resources));
    return this;
}

public Role build() {
    IndicesPermission indices = groups.isEmpty() ? IndicesPermission.NONE :
        new IndicesPermission(groups.toArray(new IndicesPermission.Group[groups.size()]));
    final ApplicationPermission applicationPermission
        = applicationPrivs.isEmpty() ? ApplicationPermission.NONE : new ApplicationPermission(applicationPrivs);
    return new Role(names, cluster, indices, applicationPermission, runAs);
}

static List<IndicesPermission.Group> convertFromIndicesPrivileges(RoleDescriptor.IndicesPrivileges[]
        indicesPrivileges, @Nullable FieldPermissionsCache fieldPermissionsCache) {
    List<IndicesPermission.Group> list = new ArrayList<>(indicesPrivileges.length);
    for (RoleDescriptor.IndicesPrivileges privilege : indicesPrivileges) {
        final FieldPermissions fieldPermissions;
        if (fieldPermissionsCache != null) {
            fieldPermissions = fieldPermissionsCache.getFieldPermissions(privilege.getGrantedFields(),
                    privilege.getDeniedFields());
        } else {
            fieldPermissions = new FieldPermissions(  
                    new FieldPermissionsDefinition(privilege.getGrantedFields(), privilege.getDeniedFields()));
        }
        final Set<BytesReference> query = privilege.getQuery() == null ? null :
Collections.singleton(privilege.getQuery());
    list.add(new IndicesPermission.Group(IndexPrivilege.get(Sets.newHashSet(privilege.getPrivileges())),
            fieldPermissions,
            query,
            privilege.getIndices()));

} return list;
}

static Tuple<ApplicationPrivilege, Set<String>> convertApplicationPrivilege(String role, int index,
    RoleDescriptor.ApplicationResourcePrivileges arp) {
    return new Tuple<>(new ApplicationPrivilege(arp.getApplication(),
        Sets.newHashSet(arp.getPrivileges()),
        arp.getPrivileges()),
        Sets.newHashSet(arp.getResources()));
}

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*/
package org.elasticsearch.xpack.core.security.authz.permission;

import org.apache.lucene.util.automaton.Automaton;
import org.apache.lucene.util.automaton.TooComplexToDetermineException;
import org.elasticsearch.ElasticsearchSecurityException;
import org.elasticsearch.cluster.metadata.AliasOrIndex;
import org.elasticsearch.cluster.metadata.MetaData;
import org.elasticsearch.common.Nullable;
import org.elasticsearch.common.Strings;
import org.elasticsearch.common.bytes.BytesReference;
import org.elasticsearch.common.logging.Loggers;
import org.elasticsearch.xpack.core.security.authz.accesscontrol.IndicesAccessControl;
import org.elasticsearch.xpack.core.security.authz.privilege.IndexPrivilege;
import org.elasticsearch.xpack.core.security.support.Automatons;

import java.util.ArrayList;
import java.util.Arrays;
import java.util.HashMap;
import java.util.HashSet;
import java.util.Iterator;
import java.util.List;
import java.util.Map;
import java.util.Objects;
import java.util.Set;
import java.util.SortedMap;
import java.util.concurrent.ConcurrentHashMap;
import java.util.function.Function;
import java.util.function.Predicate;
import static java.util.Collections.unmodifiableMap;
import static java.util.Collections.unmodifiableSet;

/**
 * A permission that is based on privileges for index related actions executed
 * on specific indices
 */
public final class IndicesPermission implements Iterable<IndicesPermission.Group> {

    public static final IndicesPermission NONE = new IndicesPermission();

    private final Function<String, Predicate<String>> loadingFunction;
    private final ConcurrentHashMap<String, Predicate<String>> allowedIndicesMatchersForAction =
            new ConcurrentHashMap<>();
    private final Group[] groups;

    public IndicesPermission(Group... groups) {
        this.groups = groups;
        loadingFunction = (action) -> {
            List<String> indices = new ArrayList<>();
            for (Group group : groups) {
                if (group.actionMatcher.test(action)) {
                    indices.addAll(Arrays.asList(group.indices));
                }
            }
            return indexMatcher(indices);
        };
    }

    static Predicate<String> indexMatcher(List<String> indices) {
        try {
            return Automatons.predicate(indices);
        } catch (TooComplexToDeterminizeException e) {
            Loggers.getLogger(IndicesPermission.class).debug("Index pattern automaton [{ }] is too complex", indices);
            String description = Strings.collectionToCommaDelimitedString(indices);
            if (description.length() > 80) {
                description = Strings.cleanTruncate(description, 80) + "...";
            }
            throw new ElasticsearchSecurityException("The set of permitted index patterns [{ }] is too complex to evaluate", e, description);
        }
    }
}
@Override
public Iterator<Group> iterator() {
    return Arrays.asList(groups).iterator();
}

public Group[] groups() {
    return groups;
}

/**
 * @return A predicate that will match all the indices that this permission
 * has the privilege for executing the given action on.
 */
public Predicate<String> allowedIndicesMatcher(String action) {
    return allowedIndicesMatchersForAction.computeIfAbsent(action, loadingFunction);
}

/**
 * Checks if the permission matches the provided action, without looking at indices.
 * To be used in very specific cases where indices actions need to be authorized regardless of their indices.
 * The usecase for this is composite actions that are initially only authorized based on the action name (indices are
 * not
 * checked on the coordinating node), and properly authorized later at the shard level checking their indices as
 * well.
 */
public boolean check(String action) {
    for (Group group : groups) {
        if (group.check(action)) {
            return true;
        }
    }
    return false;
}

public Automaton allowedActionsMatcher(String index) {
    List<Automaton> automatonList = new ArrayList<>();
    for (Group group : groups) {
        if (group.indexNameMatcher.test(index)) {
            automatonList.add(group.privilege.getAutomaton());
        }
    }
    return automatonList.isEmpty() ? Automatons.EMPTY : Automatons.unionAndMinimize(automatonList);
}
public Map<String, IndicesAccessControl.IndexAccessControl> authorize(String action, Set<String> requestedIndicesOrAliases, MetaData metaData, FieldPermissionsCache fieldPermissionsCache) {
    // now... every index that is associated with the request, must be granted
    // by at least one indices permission group

    SortedMap<String, AliasOrIndex> allAliasesAndIndices = metaData.getAliasAndIndexLookup();
    Map<String, Set<FieldPermissions>> fieldPermissionsByIndex = new HashMap<>();
    Map<String, DocumentLevelPermissions> roleQueriesByIndex = new HashMap<>();
    Map<String, Boolean> grantedBuilder = new HashMap<>();

    for (String indexOrAlias : requestedIndicesOrAliases) {
        boolean granted = false;
        Set<String> concreteIndices = new HashSet<>();
        AliasOrIndex aliasOrIndex = allAliasesAndIndices.get(indexOrAlias);
        if (aliasOrIndex != null) {
            for (IndexMetaData indexMetaData : aliasOrIndex.getIndices()) {
                concreteIndices.add(indexMetaData.getIndex().getName());
            }
        }

        for (Group group : groups) {
            if (group.check(action, indexOrAlias)) {
                granted = true;
                for (String index : concreteIndices) {
                    Set<FieldPermissions> fieldPermissions = fieldPermissionsByIndex.computeIfAbsent(index, (k) ->
                        new HashSet<>());
                    fieldPermissions.add(group.getFieldPermissions());
                    DocumentLevelPermissions permissions =
                        roleQueriesByIndex.computeIfAbsent(index, (k) -> new DocumentLevelPermissions());
                    roleQueriesByIndex.putIfAbsent(indexOrAlias, permissions);
                    if (group.hasQuery()) {
                        permissions.addAll(group.getQuery());
                    } else {
                        // if more than one permission matches for a concrete index here and if
                        // a single permission doesn't have a role query then DLS will not be
                        // applied even when other permissions do have a role query
                        permissions.setAllowAll(true);
                    }
                }
            }
        }
    }

    if (concreteIndices.isEmpty()) {
        grantedBuilder.put(indexOrAlias, granted);
    }
    }
}
```java
Map<String, IndicesAccessControl.IndexAccessControl> indexPermissions = new HashMap<>();
for (Map.Entry<String, Boolean> entry : grantedBuilder.entrySet()) {
    String index = entry.getKey();
    DocumentLevelPermissions permissions = roleQueriesByIndex.get(index);
    final Set<BytesReference> roleQueries;
    if (permissions != null && permissions.isAllowAll() == false) {
        roleQueries = unmodifiableSet(permissions.queries);
    } else {
        roleQueries = null;
    }
    final FieldPermissions fieldPermissions;
    final Set<FieldPermissions> indexFieldPermissions = fieldPermissionsByIndex.get(index);
    if (indexFieldPermissions != null && indexFieldPermissions.isEmpty() == false) {
        fieldPermissions = indexFieldPermissions.size() == 1 ? indexFieldPermissions.iterator().next() :
            fieldPermissionsCache.getFieldPermissions(indexFieldPermissions);
    } else {
        fieldPermissions = FieldPermissions.DEFAULT;
    }
    indexPermissions.put(index, new IndicesAccessControl.IndexAccessControl(entry.getValue(),
        fieldPermissions, roleQueries));
}
return unmodifiableMap(indexPermissions);
}

public static class Group {
    private final IndexPrivilege privilege;
    private final Predicate<String> actionMatcher;
    private final String[] indices;
    private final Predicate<String> indexNameMatcher;

    public FieldPermissions getFieldPermissions() {
        return fieldPermissions;
    }

    private final FieldPermissions fieldPermissions;
    private final Set<BytesReference> query;

    public Group(IndexPrivilege privilege, FieldPermissions fieldPermissions, @Nullable Set<BytesReference>
    query, String... indices) {
```
assert indices.length != 0;
this.privilege = privilege;
this.actionMatcher = privilege.predicate();
this.indices = indices;
this.indexNameMatcher = indexMatcher(Arrays.asList(indices));
this.fieldPermissions = Objects.requireNonNull(fieldPermissions);
this.query = query;
}

public IndexPrivilege privilege() {
    return privilege;
}

public String[] indices() {
    return indices;
}

@Nullable
public Set<BytesReference> getQuery() {
    return query;
}

private boolean check(String action) {
    return actionMatcher.test(action);
}

private boolean check(String action, String index) {
    assert index != null;
    return check(action) && indexNameMatcher.test(index);
}

boolean hasQuery() {
    return query != null;
}
}

private static class DocumentLevelPermissions {
    private Set<BytesReference> queries = null;
    private boolean allowAll = false;

    private void addAll(Set<BytesReference> query) {
        if (allowAll == false) {
            if (queries == null) {
                queries = new HashSet<>();
            }
            queries.addAll(query);
        }
    }
private boolean isAllowAll() {
    return allowAll;
}

private void setAllowAll(boolean allowAll) {
    this.allowAll = allowAll;
}

package org.elasticsearch.xpack.core.security.authz.permission;

import org.apache.logging.log4j.LogManager;
import org.apache.logging.log4j.Logger;
import org.apache.lucene.util.automaton.Automaton;
import org.apache.lucene.util.automaton.Operations;
import org.elasticsearch.common.collect.Tuple;
import org.elasticsearch.common.util.set.Sets;
import org.elasticsearch.xpack.core.security.authz.privilege.ApplicationPrivilege;
import org.elasticsearch.xpack.core.security.support.Automatons;
import java.util.ArrayList;
import java.util.Arrays;
import java.util.Collections;
import java.util.HashMap;
import java.util.List;
import java.util.Map;
import java.util.Set;
import java.util.function.Predicate;
import java.util.stream.Collectors;

/**
 * A permission that is based on privileges for application (non elasticsearch) capabilities
 */

public final class ApplicationPermission {

    public static final ApplicationPermission NONE = new ApplicationPermission(Collections.emptyList());

    private final Logger logger;
    private final List<PermissionEntry> permissions;

    /**
     * A permission that is based on privileges for application (non elasticsearch) capabilities
     */
    public final class ApplicationPermission {

        public static final ApplicationPermission NONE = new ApplicationPermission(Collections.emptyList());

        private final Logger logger;
        private final List<PermissionEntry> permissions;

        /**
         * A permission that is based on privileges for application (non elasticsearch) capabilities
         */


* @param privilegesAndResources A list of (privilege, resources). Each element in the [@link List] is a [@link Tuple] containing
* a single [@link ApplicationPrivilege] and the [@link Set] of resources to which that privilege is
* applied. The resources are treated as a wildcard [@link Automatons#pattern].
*/

ApplicationPermission(List<Tuple<ApplicationPrivilege, Set<String>>> privilegesAndResources) {
    this.logger = LogManager.getLogger(getClass());
    Map<ApplicationPrivilege, PermissionEntry> permissionsByPrivilege = new HashMap<>();
    privilegesAndResources.forEach(tup -> permissionsByPrivilege.compute(tup.v1(), (appPriv, existing) -> {
        final Set<String> resourceNames = tup.v2();
        final Automaton patterns = Automatons.patterns(resourceNames);
        if (existing == null) {
            return new PermissionEntry(appPriv, resourceNames, patterns);
        } else {
            return new PermissionEntry(appPriv, Sets.union(existing.resourceNames, resourceNames),
                Automatons.unionAndMinimize(Arrays.asList(existing.resourceAutomaton, patterns)));
        }
    }));
    this.permissions = Collections.unmodifiableList(new ArrayList<>(permissionsByPrivilege.values()));
}

/**
 * Determines whether this permission grants the specified privilege on the given resource.
 * <p>
 * An [@link ApplicationPermission] consists of a sequence of permission entries, where each entry contains a single
 * [@link ApplicationPrivilege] and one or more resource patterns.
 * </p>
 * <p>
 * This method returns [@code true] if, one or more of those entries meet the following criteria
 * </p>
 * <ul>
 * <li>The entry's application, when interpreted as an [@link Automaton] [@link Automatons#pattern(String) pattern] matches the
 * application given in the argument (interpreted as a raw string)
 * </li>
 * <li>The [@link ApplicationPrivilege#getAutomaton automaton that defines the entry's actions] entirely covers the
 * automaton given in the argument (that is, the argument is a subset of the entry's automaton)
 * </li>
 * <li>The entry's resources, when interpreted as an [@link Automaton] [@link Automatons#patterns(String...)] set of patterns] entirely
 * covers the resource given in the argument (also interpreted as an [@link Automaton] [@link Automatons#pattern(String) pattern].
 * </li>
 * </ul>
 */
public boolean grants(ApplicationPrivilege other, String resource) {
    Automaton resourceAutomaton = Automatons.patterns(resource);
    final boolean matched = permissions.stream().anyMatch(e -> e.grants(other, resourceAutomaton));
    logger.trace("Permission [{} ] {} grant [{} , {}]", this, matched ? "does" : "does not", other, resource);
    return matched;
}

@Override
public String toString() {
    return getClass().getSimpleName() + "{privileges=" + permissions + "}";
}

public Set<String> getApplicationNames() {
    return permissions.stream()
        .map(e -> e.privilege.getApplication())
        .collect(Collectors.toSet());
}

public Set<ApplicationPrivilege> getPrivileges(String application) {
    return permissions.stream()
        .filter(e -> application.equals(e.privilege.getApplication()))
        .map(e -> e.privilege)
        .collect(Collectors.toSet());
}

/**
 * Returns a set of resource patterns that are permitted for the provided privilege.
 * The returned set may include patterns that overlap (e.g. "object/*" and "object/1") and may
 * also include patterns that are defined again a more permissive privilege.
 * e.g. If a permission grants
 *      <ul>
 *          <li>"my-app", "read", [ "user/*" ]</li>
 *          <li>"my-app", "all", [ "user/kimchy", "config/*" ]</li>
 *      </ul>
 * Then <code>getResourcePatterns( myAppRead )</code> would return <code>"user/*", "user/kimchy", "config/*""></code>.
 */
public Set<String> getResourcePatterns(ApplicationPrivilege privilege) {
    return permissions.stream()
        .filter(e -> e.matchesPrivilege(privilege))
        .map(e -> e.resourceNames)
        .flatMap(Set::stream)
        .collect(Collectors.toSet());
}

private static class PermissionEntry {
    private final ApplicationPrivilege privilege;
    private final Predicate<String> application;
}
private final Set<String> resourceNames;
private final Automaton resourceAutomaton;

private PermissionEntry(ApplicationPrivilege privilege, Set<String> resourceNames, Automaton resourceAutomaton) {
    this.privilege = privilege;
    this.application = Automatons.predicate(privilege.getApplication());
    this.resourceNames = resourceNames;
    this.resourceAutomaton = resourceAutomaton;
}

private boolean grants(ApplicationPrivilege other, Automaton resource) {
    return matchesPrivilege(other) && Operations.subsetOf(resource, this.resourceAutomaton);
}

private boolean matchesPrivilege(ApplicationPrivilege other) {
    if (this.privilege.equals(other)) {
        return true;
    }
    if (this.application.test(other.getApplication()) == false) {
        return false;
    }
    if (Operations.isTotal(privilege.getAutomaton())) {
        return true;
    }
    return Operations.isEmpty(privilege.getAutomaton()) == false
        && Operations.isEmpty(other.getAutomaton()) == false
        && Operations.subsetOf(other.getAutomaton(), privilege.getAutomaton());
}

@Override
public String toString() {
    return privilege.toString() + ":" + resourceNames;
}

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 */
package org.elasticsearch.protocol.xpack.license;

import org.elasticsearch.action.ActionRequestValidationException;
import org.elasticsearch.action.support.master.MasterNodeReadRequest;

public class GetLicenseRequest extends MasterNodeReadRequest<GetLicenseRequest> {

public GetLicenseRequest() {
}

@Override
public ActionRequestValidationException validate() {
    return null;
}
}

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*/

/**
* Request and Response objects for the default distribution's License
* APIs.
*/
package org.elasticsearch.protocol.xpack.license;

import org.elasticsearch.action.ActionRequestValidationException;
import org.elasticsearch.action.support.master.AcknowledgedRequest;

public class PutLicenseRequest extends AcknowledgedRequest<PutLicenseRequest> {

    private String licenseDefinition;
    private boolean acknowledge = false;

    public PutLicenseRequest() {
    }

    @Override
    public ActionRequestValidationException validate() {
        return null;
    }
}

public void setLicenseDefinition(String licenseDefinition) {
    this.licenseDefinition = licenseDefinition;
}
public String getLicenseDefinition() {
    return licenseDefinition;
}

public void setAcknowledge(boolean acknowledge) {
    this.acknowledge = acknowledge;
}

public boolean isAcknowledge() {
    return acknowledge;
}

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*/

package org.elasticsearch.protocol.xpack.license;

import org.elasticsearch.action.support.master.AcknowledgedResponse;
import org.elasticsearch.common.ParseField;
import org.elasticsearch.common.Strings;
import org.elasticsearch.common.collect.Tuple;
import org.elasticsearch.common.io.stream.StreamInput;
import org.elasticsearch.common.io.stream.StreamOutput;
import org.elasticsearch.common.xcontent.ConstructingObjectParser;
import org.elasticsearch.common.xcontent.XContentBuilder;
import org.elasticsearch.common.xcontent.XContentParseException;
import org.elasticsearch.common.xcontent.XContentParser;
import org.elasticsearch.protocol.xpack.common.ProtocolUtils;

import java.io.IOException;
import java.util.ArrayList;
import java.util.Collections;
import java.util.HashMap;
import java.util.List;
import java.util.Map;
import java.util.Objects;

import static org.elasticsearch.common.xcontent.ConstructingObjectParser.constructorArg;
import static org.elasticsearch.common.xcontent.ConstructingObjectParser.optionalConstructorArg;

public class PutLicenseResponse extends AcknowledgedResponse {

    private static final ConstructingObjectParser<PutLicenseResponse, Void> PARSER = new ConstructingObjectParser<>
            ("put_license_response", true, (a, v) -> {
                boolean acknowledged = (Boolean) a[0];

                return new PutLicenseResponse(acknowledged, (Map<String, String>) a[1],
                        (List<Map<String, String>>) a[2]);
            },
            constructorArg(0, optionalConstructorArg("acknowledged", Boolean.class)),
            constructorArg(1, optionalConstructorArg("license_definition", Map.class)),
            constructorArg(2, optionalConstructorArg("license_expires", List.class)));

    public static ConstructingObjectParser<PutLicenseResponse, Void> PARSER() {
        return PARSER;
    }

    public PutLicenseResponse(boolean acknowledged, Map<String, String> licenseDefinition, List<Map<String, String>> licenseExpiry) {
        this.acknowledged = acknowledged;
        this.licenseDefinition = licenseDefinition;
        this.licenseExpiry = licenseExpiry;
    }

    public boolean isAcknowledged() {
        return acknowledged;
    }

    public Map<String, String> getLicenseDefinition() {
        return licenseDefinition;
    }

    public List<Map<String, String>> getLicenseExpiry() {
        return licenseExpiry;
    }

    public static void main(String[] args) {
        PutLicenseResponse putLicenseResponse = PARSER.parse(PARSER);
        System.out.println(putLicenseResponse.toString());
    }
}

Open Source Used In Network Assurance Engine 4.0(1)
LicensesStatus licensesStatus = LicensesStatus.fromString((String) a[1]);
@SuppressWarnings("unchecked") Tuple<String, Map<String, String[]>> acknowledgements = (Tuple<String,
Map<String, String[]>>) a[2];
if (acknowledgements == null) {
    return new PutLicenseResponse(acknowledged, licensesStatus);
} else {
    return new PutLicenseResponse(acknowledged, licensesStatus, acknowledgements.v1(),
    acknowledgements.v2());
}

static {
    PARSER.declareBoolean(constructorArg(), new ParseField("acknowledged"));
    PARSER.declareString(constructorArg(), new ParseField("license_status"));
    PARSER.declareObject(optionalConstructorArg(), (parser, v) -> {
        Map<String, String[]> acknowledgeMessages = new HashMap<>();
        String message = null;
        XContentParser.Token token;
        String currentFieldName = null;
        while ((token = parser.nextToken()) != XContentParser.Token.END_OBJECT) {
            if (token == XContentParser.Token.FIELD_NAME) {
                currentFieldName = parser.currentName();
            } else {
                    if (currentFieldName == null) {
                throw new XContentParseException(parser.getTokenLocation(), "expected message header or
    acknowledgement");
            } if ("message".equals(currentFieldName)) {
                if (token != XContentParser.Token.VALUE_STRING) {
                    throw new XContentParseException(parser.getTokenLocation(), "unexpected message header
type");
                } message = parser.text();
            } else {
                if (token != XContentParser.Token.START_ARRAY) {
                    throw new XContentParseException(parser.getTokenLocation(), "unexpected acknowledgement
type");
                } List<String> acknowledgeMessagesList = new ArrayList<>();
                while ((token = parser.nextToken()) != XContentParser.Token.END_ARRAY) {
                    if (token != XContentParser.Token.VALUE_STRING) {
                        throw new XContentParseException(parser.getTokenLocation(), "unexpected acknowledgement
text");
                    } acknowledgeMessagesList.add(parser.text());
                } acknowledgeMessages.put(currentFieldName, acknowledgeMessagesList.toArray(new String[0]));
            }
        }
    });
}
public PutLicenseResponse(boolean acknowledged, LicensesStatus status, String acknowledgeHeader, Map<String, String[]> acknowledgeMessages) {
    super(acknowledged);
    this.status = status;
    this.acknowledgeHeader = acknowledgeHeader;
    this.acknowledgeMessages = acknowledgeMessages;
}

public LicensesStatus status() {
    return status;
}

public Map<String, String[]> acknowledgeMessages() {
    return acknowledgeMessages;
}

public String acknowledgeHeader() {
    return acknowledgeHeader;
}

@Override
public void readFrom(StreamInput in) throws IOException {
    super.readFrom(in);
    status = LicensesStatus.fromId(in.readVInt());
    acknowledgeHeader = in.readOptionalString();
    int size = in.readVInt();
    Map<String, String[]> acknowledgeMessages = new HashMap<>(size);
    for (int i = 0; i < size; i++) {
        String feature = in.readString();
        acknowledgeMessages.put(feature, in.readStringArray());
    }
}
int nMessages = in.readVInt();
String[] messages = new String[nMessages];
for (int j = 0; j < nMessages; j++) {
    messages[j] = in.readString();
}
acknowledgeMessages.put(feature, messages);
}
this.acknowledgeMessages = acknowledgeMessages;
}

@Override
public void writeTo(StreamOutput out) throws IOException {
    super.writeTo(out);
    out.writeVInt(status.id());
    out.writeOptionalString(acknowledgeHeader);
    out.writeVInt(acknowledgeMessages.size());
    for (Map.Entry<String, String[]> entry : acknowledgeMessages.entrySet()) {
        out.writeString(entry.getKey());
        out.writeVInt(entry.getValue().length);
        for (String message : entry.getValue()) {
            out.writeString(message);
        }
    }
}

@Override
protected void addCustomFields(XContentBuilder builder, Params params) throws IOException {
    builder.field("license_status", status.toString());
    if (!acknowledgeMessages.isEmpty()) {
        builder.startObject("acknowledge");
        builder.field("message", acknowledgeHeader);
        for (Map.Entry<String, String[]> entry : acknowledgeMessages.entrySet()) {
            builder.startArray(entry.getKey());
            for (String message : entry.getValue()) {
                builder.value(message);
            }
            builder.endArray();
        }
        builder.endObject();
    }
}

@Override
public String toString() {
    return Strings.toString(this, true, true);
}

public static PutLicenseResponse fromXContent(XContentParser parser) throws IOException {
@Override
public boolean equals(Object o) {
if (this == o) return true;
if (o == null || getClass() != o.getClass()) return false;
if (!super.equals(o)) return false;
PutLicenseResponse that = (PutLicenseResponse) o;

return status == that.status &&
ProtocolUtils.equals(acknowledgeMessages, that.acknowledgeMessages) &&
Objects.equals(acknowledgeHeader, that.acknowledgeHeader);
}

@Override
public int hashCode() {
return Objects.hash(super.hashCode(), status, ProtocolUtils.hashCode(acknowledgeMessages),
acknowledgeHeader);
}

/*
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 */
package org.elasticsearch.protocol.xpack.license;

import org.elasticsearch.action.ActionResponse;

public class GetLicenseResponse extends ActionResponse {

private String license;

GetLicenseResponse() {
}

public GetLicenseResponse(String license) {
this.license = license;
}

public String getLicenseDefinition() {
return license;
}
}
package org.elasticsearch.protocol.xpack.license;

import java.io.IOException;
import org.elasticsearch.common.io.stream.StreamInput;
import org.elasticsearch.common.io.stream.StreamOutput;
import org.elasticsearch.common.io.stream.Writeable;

/**
 * Status of an X-Pack license.
 */
public enum LicenseStatus implements Writeable {

    ACTIVE("active"),
    INVALID("invalid"),
    EXPIRED("expired"),

    private final String label;

    LicenseStatus(String label) {
        this.label = label;
    }

    public String label() {
        return label;
    }

    @Override
    public void writeTo(StreamOutput out) throws IOException {
        out.writeString(label);
    }

    public static LicenseStatus readFrom(StreamInput in) throws IOException {
        return fromString(in.readString());
    }

    public static LicenseStatus fromString(String value) {
        switch (value) {
            case "active":
                return ACTIVE;
            case "invalid":
                return INVALID;
            case "expired":
                return EXPIRED;
        }
        throw new IllegalArgumentException("Invalid license status: "+value);
    }
}
import org.elasticsearch.action.ActionRequestValidationException;
import org.elasticsearch.action.support.master.AcknowledgedRequest;

public class DeleteLicenseRequest extends AcknowledgedRequest<DeleteLicenseRequest> {

    @Override
    public ActionRequestValidationException validate() {
        return null;
    }
}

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 */
package org.elasticsearch.protocol.xpack.license;

import java.util.Locale;

public enum LicensesStatus {
    VALID((byte) 0),
    INVALID((byte) 1),
    EXPIRED((byte) 2);

    private final byte id;

    LicensesStatus(byte id) {
        this.id = id;
    }

    public int id() {
        return id;
    }

    return EXPIRED;
    default:
        throw new IllegalArgumentException("unknown license status [" + value + "]");
    }
}

*/
package org.elasticsearch.protocol.xpack.license;

import org.elasticsearch.action.ActionRequestValidationException;
import org.elasticsearch.action.support.master.AcknowledgedRequest;

public class DeleteLicenseRequest extends AcknowledgedRequest<DeleteLicenseRequest> {

    @Override
    public ActionRequestValidationException validate() {
        return null;
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 */
package org.elasticsearch.protocol.xpack.license;

import java.util.Locale;

public enum LicensesStatus {
    VALID((byte) 0),
    INVALID((byte) 1),
    EXPIRED((byte) 2);

    private final byte id;

    LicensesStatus(byte id) {
        this.id = id;
    }

    public int id() {
        return id;
    }

    return EXPIRED;
    default:
        throw new IllegalArgumentException("unknown license status [" + value + "]");
    }
}
public static LicensesStatus fromId(int id) {
    if (id == 0) {
        return VALID;
    } else if (id == 1) {
        return INVALID;
    } else if (id == 2) {
        return EXPIRED;
    } else {
        throw new IllegalStateException("no valid LicensesStatus for id=" + id);
    }
}

@Override
public String toString() {
    return this.name().toLowerCase(Locale.ROOT);
}

public static LicensesStatus fromString(String value) {
    switch (value) {
    case "valid":
        return VALID;
    case "invalid":
        return INVALID;
    case "expired":
        return EXPIRED;
    default:
        throw new IllegalArgumentException("unknown licenses status [" + value + "]");
    }
}

package org.elasticsearch.license;

import org.elasticsearch.action.support.master.AcknowledgedRequestBuilder;
import org.elasticsearch.action.support.master.AcknowledgedResponse;
import org.elasticsearch.client.ElasticsearchClient;
import org.elasticsearch.protocol.xpack.license.DeleteLicenseRequest;

public class DeleteLicenseRequestBuilder extends AcknowledgedRequestBuilder<DeleteLicenseRequest, AcknowledgedResponse, DeleteLicenseRequestBuilder> {

    public DeleteLicenseRequestBuilder(ElasticsearchClient client) {

    }
}

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 */
this(client, DeleteLicenseAction.INSTANCE);
}
/**
 * Creates new get licenses request builder
 * @param client elasticsearch client
 */
public DeleteLicenseRequestBuilder(ElasticsearchClient client, DeleteLicenseAction action) {
   super(client, action, new DeleteLicenseRequest());
}
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 */
package org.elasticsearch.license;

import org.apache.logging.log4j.Logger;
import org.apache.logging.log4j.message.ParameterizedMessage;
import org.apache.logging.log4j.util.Supplier;
import org.apache.lucene.util.BytesRef;
import org.elasticsearch.license.License.OperationMode;
import org.elasticsearch.watcher.FileChangesListener;
import org.elasticsearch.watcher.FileWatcher;
import org.elasticsearch.watcher.ResourceWatcherService;

import java.io.IOException;
import java.nio.file.Files;
import java.nio.file.Path;
import java.util.concurrent.atomic.AtomicBoolean;

/**
 * File based watcher for license {@link OperationMode}
 * Watches for changes in <code>licenseModePath</code>, use
 * {@link #getCurrentOperationMode()} to access the latest mode
 * In case of failure to read a valid operation mode from <code>licenseModePath</code>,
 * the operation mode will default to PLATINUM
 */
public final class OperationModeFileWatcher implements FileChangesListener {
   private final ResourceWatcherService resourceWatcherService;
   private final Path licenseModePath;
   private final AtomicBoolean initialized = new AtomicBoolean();
   private final OperationMode defaultOperationMode = OperationMode.PLATINUM;
   private volatile OperationMode currentOperationMode = defaultOperationMode;
private final Logger logger;
private final Runnable onChange;

public OperationModeFileWatcher(ResourceWatcherService resourceWatcherService, Path licenseModePath,
        Logger logger, Runnable onChange) {
    this.resourceWatcherService = resourceWatcherService;
    this.licenseModePath = licenseModePath;
    this.logger = logger;
    this.onChange = onChange;
}

public void init() {
    if (initialized.compareAndSet(false, true)) {
        final FileWatcher watcher = new FileWatcher(licenseModePath);
        watcher.addListener(this);
        try {
            resourceWatcherService.add(watcher, ResourceWatcherService.Frequency.HIGH);
            if (Files.exists(licenseModePath)) {
                onChange(licenseModePath);
            }
        } catch (IOException e) {
            logger.error("couldn't initialize watching license mode file", e);
        }
    }
}

/**
 * Returns the current operation mode based on license mode file.
 * Defaults to @link OperationMode#PLATINUM
 */
public OperationMode getCurrentOperationMode() {
    return currentOperationMode;
}

@Override
public void onFileInit(Path file) {
    onChange(file);
}

@Override
public void onFileCreated(Path file) {
    onChange(file);
}

@Override
public void onFileDeleted(Path file) {
    onChange(file);
}
@Override
public void onFileChanged(Path file) {
    onChange(file);
}

private synchronized void onChange(Path file) {
    if (file.equals(licenseModePath)) {
        OperationMode newOperationMode = defaultOperationMode;
        try {
            if (Files.exists(licenseModePath)
                && Files.isReadable(licenseModePath)) {
                final byte[] content;
                try {
                    content = Files.readAllBytes(licenseModePath);
                } catch (IOException e) {
                    logger.error(
                        (Supplier<?>) () -> new ParameterizedMessage(
                            "couldn't read operation mode from [[]]", licenseModePath.toAbsolutePath()), e);
                    return;
                }
            // this UTF-8 conversion is much pickier than java String
            final String operationMode = new BytesRef(content).utf8ToString();
            try {
                newOperationMode = OperationMode.resolve(operationMode);
            } catch (IllegalArgumentException e) {
                logger.error(
                    (Supplier<?>) () -> new ParameterizedMessage(
                        "invalid operation mode in [[]]", licenseModePath.toAbsolutePath()), e);
                return;
            }
        } finally {
            // set this after the fact to prevent that we are jumping back and forth first setting to default and then
            // actual op mode resetting it.
            this.currentOperationMode = newOperationMode;
        }
    }
    onChange.run();
}
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*/
package org.elasticsearch.license;
import org.elasticsearch.action.ActionRequest;
import org.elasticsearch.action.ActionResponse;
import org.elasticsearch.cluster.NamedDiff;
import org.elasticsearch.cluster.metadata.IndexNameExpressionResolver;
import org.elasticsearch.cluster.metadata.MetaData;
import org.elasticsearch.cluster.node.DiscoveryNodes;
import org.elasticsearch.common.ParseField;
import org.elasticsearch.common.io.stream.NamedWriteableRegistry;
import org.elasticsearch.common.settings.ClusterSettings;
import org.elasticsearch.common.settings.IndexScopedSettings;
import org.elasticsearch.common.settings.Setting;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.common.settings.SettingsFilter;
import org.elasticsearch.common.xcontent.NamedXContentRegistry;
import org.elasticsearch.plugins.ActionPlugin;
import org.elasticsearch.rest.RestController;
import org.elasticsearch.rest.RestHandler;

import java.util.ArrayList;
import java.util.Arrays;
import java.util.Collections;
import java.util.List;
import java.util.function.Supplier;
import static org.elasticsearch.xpack.core.XPackClientActionPlugin.isTribeNode;
import static org.elasticsearch.xpack.core.XPackPlugin.transportClientMode;

public class Licensing implements ActionPlugin {

    public static final String NAME = "license";
    protected final Settings settings;
    private final boolean isTransportClient;
    private final boolean isTribeNode;

    // Until this is moved out to its own plugin (its currently in XPackPlugin.java, we need to make sure that any edits
to this file
    // are also carried out in XPackClientPlugin.java
    public List<NamedWriteableRegistry.Entry> getNamedWriteables() {
        List<NamedWriteableRegistry.Entry> entries = new ArrayList<>();
        entries.add(new NamedWriteableRegistry.Entry(MetaData.Custom.class, LicensesMetaData.TYPE,
            LicensesMetaData::new));
        entries.add(new NamedWriteableRegistry.Entry(NamedDiff.class, LicensesMetaData.TYPE,
            LicensesMetaData::readDiffFrom));
        return entries;
    }

    // Until this is moved out to its own plugin (its currently in XPackPlugin.java, we need to make sure that any edits
to this file
// are also carried out in XPackClientPlugin.java
public List<NamedXContentRegistry.Entry> getNamedXContent() {
    List<NamedXContentRegistry.Entry> entries = new ArrayList<>();
    // Metadata
    entries.add(new NamedXContentRegistry.Entry(MetaData.Custom.class, new
    ParseField(LicensesMetaData.TYPE),
    LicensesMetaData::fromXContent));
    return entries;
}

public Licensing(Settings settings) {
    this.settings = settings;
    isTransportClient = transportClientMode(settings);
    isTribeNode = isTribeNode(settings);
}

@Override
public List<ActionHandler<? extends ActionRequest, ? extends ActionResponse>> getActions() {
    if (isTribeNode) {
        return Collections.singletonList(new ActionHandler<>(GetLicenseAction.INSTANCE,
        TransportGetLicenseAction.class));
    }
    return Arrays.asList(new ActionHandler<>(PutLicenseAction.INSTANCE, TransportPutLicenseAction.class),
    new ActionHandler<>(GetLicenseAction.INSTANCE, TransportGetLicenseAction.class),
    new ActionHandler<>(DeleteLicenseAction.INSTANCE, TransportDeleteLicenseAction.class),
    new ActionHandler<>(PostStartTrialAction.INSTANCE, TransportPostStartTrialAction.class),
    new ActionHandler<>(GetTrialStatusAction.INSTANCE, TransportGetTrialStatusAction.class),
    new ActionHandler<>(PostStartBasicAction.INSTANCE, TransportPostStartBasicAction.class),
    new ActionHandler<>(GetBasicStatusAction.INSTANCE, TransportGetBasicStatusAction.class));
}

@Override
public List<RestHandler> getRestHandlers(Settings settings, RestController restController, ClusterSettings
clusterSettings, IndexScopedSettings indexScopedSettings, SettingsFilter settingsFilter, IndexNameExpressionResolver
indexNameExpressionResolver,
Supplier<DiscoveryNodes> nodesInCluster) {
    List<RestHandler> handlers = new ArrayList<>();
    handlers.add(new RestGetLicenseAction(settings, restController));
    if (false == isTribeNode) {
        handlers.add(new RestPutLicenseAction(settings, restController));
        handlers.add(new RestDeleteLicenseAction(settings, restController));
        handlers.add(new RestGetTrialStatus(settings, restController));
        handlers.add(new RestGetBasicStatus(settings, restController));
        handlers.add(new RestPostStartTrialLicense(settings, restController));
        handlers.add(new RestPostStartBasicLicense(settings, restController));
    }
return handlers;
}

// Until this is moved out to its own plugin (its currently in XPackPlugin.java, we need to make sure that any edits
to this file
// are also carried out in XPackClientPlugin.java
public List<Setting<?>> getSettings() {
    // TODO convert this wildcard to a real setting
    return Collections.singletonList(Setting.groupSetting("license.", Setting.Property.NodeScope));
}

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 */
package org.elasticsearch.license;

import org.elasticsearch.action.ActionRequestBuilder;
import org.elasticsearch.client.ElasticsearchClient;

class PostStartBasicRequestBuilder extends ActionRequestBuilder<PostStartBasicRequest,
PostStartBasicResponse, PostStartBasicRequestBuilder> {
    PostStartBasicRequestBuilder(ElasticsearchClient client, PostStartBasicAction action) {
        super(client, action, new PostStartBasicRequest());
    }

    public PostStartBasicRequestBuilder setAcknowledge(boolean acknowledge) {
        request.acknowledge(acknowledge);
        return this;
    }
}

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 */
package org.elasticsearch.license;

import org.elasticsearch.cluster.node.DiscoveryNodes;
import org.elasticsearch.common.bytes.BytesReference;
import org.elasticsearch.common.xcontent.LoggingDeprecationHandler;
import org.elasticsearch.common.xcontent.NamedXContentRegistry;
import org.elasticsearch.common.xcontent.ToXContent;
import org.elasticsearch.common.xcontent.XContentBuilder;
import org.elasticsearch.common.xcontent.XContentFactory;
import org.elasticsearch.common.xcontent.XContentParser;
import org.elasticsearch.common.xcontent.XContentType;
import java.io.IOException;
import java.nio.ByteBuffer;
import java.util.Base64;
import java.util.Collections;
import static org.elasticsearch.license.CryptUtils.encryptV3Format;
import static org.elasticsearch.license.CryptUtils.encrypt;
import static org.elasticsearch.license.CryptUtils.decryptV3Format;
import static org.elasticsearch.license.CryptUtils.decrypt;

class SelfGeneratedLicense {

    public static License create(License.Builder specBuilder, DiscoveryNodes currentNodes) {
        return create(specBuilder, LicenseUtils.compatibleLicenseVersion(currentNodes));
    }

    public static License create(License.Builder specBuilder, int version) {
        License spec = specBuilder
                .issuer("elasticsearch")
                .version(version)
                .build();
        final String signature;
        try {
            XContentBuilder contentBuilder = XContentFactory.contentBuilder(XContentType.JSON);
            spec.toXContent(contentBuilder, new ToXContent.MapParams(Collections.singletonMap(License.LICENSE_SPEC_VIEW_MODE, "true")));
            byte[] encrypt;
            if (version < License.VERSION_CRYPTO_ALGORITHMS) {
                encrypt = encryptV3Format(BytesReference.toBytes(BytesReference.bytes(contentBuilder)));
            } else {
                encrypt = encrypt(BytesReference.toBytes(BytesReference.bytes(contentBuilder)));
            }
            byte[] bytes = new byte[4 + 4 + encrypt.length];
            ByteBuffer byteBuffer = ByteBuffer.wrap(bytes);
            // Set -version in signature
            byteBuffer.putInt(-version)
                    .putInt(encrypt.length)
                    .put(encrypt);
            signature = Base64.getEncoder().encodeToString(bytes);
        } catch (IOException e) {
            throw new IllegalStateException(e);
        }
        return License.builder().fromLicenseSpec(spec, signature).build();
    }
}
public static boolean verify(final License license) {
    try {
        byte[] signatureBytes = Base64.getDecoder().decode(license.signature());
        ByteBuffer byteBuffer = ByteBuffer.wrap(signatureBytes);
        int version = byteBuffer.getInt();
        int contentLen = byteBuffer.getInt();
        byte[] content = new byte[contentLen];
        byteBuffer.get(content);
        final License expectedLicense;
        // Version in signature is -version, so check for -(version) < 4
        byte[] decryptedContent = (-version < License.VERSION_CRYPTO_ALGORITHMS) ?
                decryptV3Format(content) : decrypt(content);
        // EMPTY is safe here because we don't call namedObject
        try (XContentParser parser = XContentFactory.xContent(XContentType.JSON)
                .createParser(NamedXContentRegistry.EMPTY, LoggingDeprecationHandler.INSTANCE,
                decryptedContent)) {
            parser.nextToken();
            expectedLicense = License.builder().fromLicenseSpec(License.fromXContent(parser),
                    license.signature()).version(-version).build();
        }
        return license.equals(expectedLicense);
    } catch (IOException e) {
        throw new IllegalStateException(e);
    }
}

public static boolean validSelfGeneratedType(String type) {
    return "basic".equals(type) || "trial".equals(type);
}

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 */
package org.elasticsearch.license;

import java.crypto.BadPaddingException;
import java.crypto.Cipher;
import java.crypto.IllegalBlockSizeException;
import java.crypto.NoSuchPaddingException;
import java.crypto.SecretKey;
import java.crypto.SecretKeyFactory;
import java.crypto.spec.PBEKeySpec;
import java.crypto.spec.SecretKeySpec;
import java.nio.charset.StandardCharsets;
import java.security.GeneralSecurityException;
import java.security.KeyFactory;
import java.security.MessageDigest;
import java.security.PrivateKey;
import java.security.PublicKey;
import java.security.SecureRandom;
import java.security.NoSuchAlgorithmException;
import java.security.InvalidKeyException;
import java.security.spec.InvalidKeySpecException;
import java.security.spec.PKCS8EncodedKeySpec;
import java.security.spec.X509EncodedKeySpec;
import java.security.spec.X509EncodedKeySpec;
import java.util.Base64;

public class CryptUtils {

    // SALT must be at least 128bits for FIPS 140-2 compliance
    private static final byte[] SALT = {
        (byte) 0x74, (byte) 0x68, (byte) 0x69, (byte) 0x73,
        (byte) 0x69, (byte) 0x73, (byte) 0x74, (byte) 0x68,
        (byte) 0x65, (byte) 0x73, (byte) 0x61, (byte) 0x6C,
        (byte) 0x74, (byte) 0x77, (byte) 0x65, (byte) 0x75
    };
    private static final String KEY_ALGORITHM = "RSA";
    private static final char[] DEFAULT_PASS_PHRASE = "elasticsearch-license".toCharArray();
    private static final String KDF_ALGORITHM = "PBKDF2WithHmacSHA512";
    private static final int KDF_ITERATION_COUNT = 10000;
    private static final String CIPHER_ALGORITHM = "AES";
    // This can be changed to 256 once Java 9 is the minimum version
    // http://www.oracle.com/technetwork/java/javase/terms/readme/jdk9-readme-3852447.html#jce
    private static final int ENCRYPTION_KEY_LENGTH = 128;
    private static final SecureRandom RANDOM = new SecureRandom();

    /**
     * Read encrypted private key file content with default pass phrase
     */
    public static PrivateKey readEncryptedPrivateKey(byte[] fileContents) {
        return readEncryptedPrivateKey(fileContents, DEFAULT_PASS_PHRASE, false);
    }

    /**
     * Returns encrypted private key file content with default pass phrase
     */
    public static byte[] writeEncryptedPrivateKey(PrivateKey privateKey) {
        return writeEncryptedPrivateKey(privateKey, DEFAULT_PASS_PHRASE);
    }

    /**
     * Read encrypted private key file content with provided <code>passPhrase</code>
     */
    public static PrivateKey readEncryptedPrivateKey(byte[] fileContents, char[] passPhrase, boolean preV4) {
        return readEncryptedPrivateKey(fileContents, passPhrase, preV4);
    }
}
byte[] keyBytes = preV4 ? decryptV3Format(fileContents) : decrypt(fileContents, passPhrase);
PKCS8EncodedKeySpec privateKeySpec = new PKCS8EncodedKeySpec(keyBytes);
try {
    return KeyFactory.getInstance(KEY_ALGORITHM).generatePrivate(privateKeySpec);
} catch (NoSuchAlgorithmException | InvalidKeySpecException e) {
    throw new IllegalStateException(e);
}

/**
 * Read public key file content
 */
public static PublicKey readPublicKey(byte[] fileContents) {
    X509EncodedKeySpec publicKeySpec = new X509EncodedKeySpec(fileContents);
    try {
        return KeyFactory.getInstance(CryptUtils.KEY_ALGORITHM).generatePublic(publicKeySpec);
    } catch (NoSuchAlgorithmException | InvalidKeySpecException e) {
        throw new IllegalStateException(e);
    }
}

/**
 * Returns encrypted public key file content with provided <code>passPhrase</code>
 */
public static byte[] writeEncryptedPublicKey(PublicKey publicKey) {
    X509EncodedKeySpec encodedKeySpec = new X509EncodedKeySpec(publicKey.getEncoded());
    return encrypt(encodedKeySpec.getEncoded(), DEFAULT_PASS_PHRASE);
}

/**
 * Returns encrypted private key file content with provided <code>passPhrase</code>
 */
public static byte[] writeEncryptedPrivateKey(PrivateKey privateKey, char[] passPhrase) {
    PKCS8EncodedKeySpec encodedKeySpec = new PKCS8EncodedKeySpec(privateKey.getEncoded());
    return encrypt(encodedKeySpec.getEncoded(), passPhrase);
}

/**
 * Encrypts provided <code>data</code> with <code>DEFAULT_PASS_PHRASE</code>
 */
static byte[] encrypt(byte[] data) {
    return encrypt(data, DEFAULT_PASS_PHRASE);
}

/**
 * Decrypts provided <code>encryptedData</code> with <code>DEFAULT_PASS_PHRASE</code>
 */
static byte[] decrypt(byte[] encryptedData) {

return decrypt(encryptedData, DEFAULT_PASS_PHRASE);
}

/**
 * Encrypts provided <code>data</code> with <code>passPhrase</code>
 */
private static byte[] encrypt(byte[] data, char[] passPhrase) {
    try {
        final Cipher encryptionCipher = getEncryptionCipher(deriveSecretKey(passPhrase));
        return encryptionCipher.doFinal(data);
    } catch (IllegalBlockSizeException | BadPaddingException e) {
        throw new IllegalStateException(e);
    }
}

/**
 * Decrypts provided <code>encryptedData</code> with <code>passPhrase</code>
 */
private static byte[] decrypt(byte[] encryptedData, char[] passPhrase) {
    try {
        final Cipher cipher = getDecryptionCipher(deriveSecretKey(passPhrase));
        return cipher.doFinal(encryptedData);
    } catch (IllegalBlockSizeException | BadPaddingException e) {
        throw new IllegalStateException(e);
    }
}

static byte[] encryptV3Format(byte[] data) {
    try {
        SecretKey encryptionKey = getV3Key();
        final Cipher encryptionCipher = getEncryptionCipher(encryptionKey);
        return encryptionCipher.doFinal(pad(data, 20));
    } catch (GeneralSecurityException e) {
        throw new IllegalStateException(e);
    }
}

static byte[] decryptV3Format(byte[] data) {
    try {
        SecretKey decryptionKey = getV3Key();
        final Cipher decryptionCipher = getDecryptionCipher(decryptionKey);
        return unPad(decryptionCipher.doFinal(data));
    } catch (GeneralSecurityException e) {
        throw new IllegalStateException(e);
    }
}

private static SecretKey getV3Key() throws NoSuchAlgorithmException, InvalidKeySpecException {


final byte[] salt = {
    (byte) 0xA9, (byte) 0xA2, (byte) 0xB5, (byte) 0xDE,
    (byte) 0x2A, (byte) 0x8A, (byte) 0x9A, (byte) 0xE6
};
final byte[] passBytes = "elasticsearch-license".getBytes(StandardCharsets.UTF_8);
final byte[] digest = MessageDigest.getInstance("SHA-512").digest(passBytes);
final char[] hashedPassphrase = Base64.getEncoder().encodeToChars(digest).toCharArray();
PBEKeySpec keySpec = new PBEKeySpec(hashedPassphrase, salt, 1024, 128);
byte[] shortKey = SecretKeyFactory.getInstance("PBEWithSHA1AndDESede").
generateSecret(keySpec).getEncoded();
byte[] intermediaryKey = new byte[16];
for (int i = 0, j = 0; i < 16; i++) {
    intermediaryKey[i] = shortKey[j];
    if (++j == shortKey.length)
        j = 0;
}
return new SecretKeySpec(intermediaryKey, "AES");

private static SecretKey deriveSecretKey(char[] passPhrase) {
    try {
        PBEKeySpec keySpec = new PBEKeySpec(passPhrase, SALT, KDF_ITERATION_COUNT,
            ENCRYPTION_KEY_LENGTH);
        SecretKey secretKey = SecretKeyFactory.getInstance(KDF_ALGORITHM).
generateSecret(keySpec);
        return new SecretKeySpec(secretKey.getEncoded(), CIPHER_ALGORITHM);
    } catch (NoSuchAlgorithmException | InvalidKeySpecException e) {
        throw new IllegalStateException(e);
    }
}

private static Cipher getEncryptionCipher(SecretKey secretKey) {
    return getCipher(Cipher.ENCRYPT_MODE, secretKey);
}

private static Cipher getDecryptionCipher(SecretKey secretKey) {
    return getCipher(Cipher.DECRYPT_MODE, secretKey);
}

private static Cipher getCipher(int mode, SecretKey secretKey) {
    try {
        Cipher cipher = Cipher.getInstance(CIPHER_ALGORITHM);
        cipher.init(mode, secretKey, RANDOM);
        return cipher;
    } catch (NoSuchAlgorithmException | InvalidKeyException | NoSuchPaddingException e) {
        throw new IllegalStateException(e);
    }
private static byte[] pad(byte[] bytes, int length) {
    if (bytes.length >= length) {
        byte[] out = new byte[bytes.length + 1];
        System.arraycopy(bytes, 0, out, 0, bytes.length);
        out[bytes.length] = (byte) 1;
        return out;
    }

    byte[] out = new byte[length + 1];
    int i = 0;
    for (; i < bytes.length; i++)
        out[i] = bytes[i];

    int padded = length - i;

    // fill the rest with random bytes
    byte[] fill = new byte[padded - 1];
    RANDOM.nextBytes(fill);
    System.arraycopy(fill, 0, out, i, padded - 1);
    out[length] = (byte) (padded + 1);

    return out;
}

private static byte[] unPad(byte[] bytes) {
    int padded = (int) bytes[bytes.length - 1];
    int targetLength = bytes.length - padded;

    byte[] out = new byte[targetLength];

    System.arraycopy(bytes, 0, out, 0, targetLength);

    return out;
}

package org.elasticsearch.license;

import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.common.xcontent.XContentBuilder;

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 */

import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.common.xcontent.XContentBuilder;
import java.io.IOException;
import java.util.Map;

import static org.elasticsearch.rest.RestRequest.Method.POST;

public class RestPostStartTrialLicense extends XPackRestHandler {

    RestPostStartTrialLicense(Settings settings, RestController controller) {
        super(settings);
        controller.registerHandler(POST, URI_BASE + "/license/start_trial", this);
    }

    @Override
    protected RestChannelConsumer doPrepareRequest(RestRequest request, XPackClient client) throws IOException {
        PostStartTrialRequest startTrialRequest = new PostStartTrialRequest();
        startTrialRequest.setType(request.param("type", "trial"));
        startTrialRequest.acknowledge(request.paramAsBoolean("acknowledge", false));
        return channel -> client.licensing().postStartTrial(startTrialRequest,
                new RestBuilderListener<PostStartTrialResponse>(channel) {
                    @Override
                    public RestResponse buildResponse(PostStartTrialResponse response, XContentBuilder builder) throws Exception {
                        PostStartTrialResponse.Status status = response.getStatus();
                        builder.startObject();
                        builder.field("acknowledged", startTrialRequest.isAcknowledged());
                        if (status.isTrialStarted()) {
                            builder.field("trial_was_started", true);
                            builder.field("type", startTrialRequest.getType());
                        } else {
                            builder.field("trial_was_started", false);
                            builder.field("error_message", status.getErrorMessage());
                        }
                        Map<String, String[]> acknowledgementMessages = response.getAcknowledgementMessages();
                        if (acknowledgementMessages.isEmpty() == false) {
                            builder.startObject("acknowledge");
                            for (Map.Entry<String, String[]> entry : acknowledgementMessages.entrySet()) {
                                builder.startArray(entry.getKey());
                                for (String message : entry.getValue()) {
                                    builder.field(message);
                                }
                            }
                            builder.endObject();
                        }
                        return builder.build();
                    }
                });
    }
}

for (String message : entry.getValue()) {
    builder.value(message);
}
builder.endArray();
}
builder.endObject();
}
builder.endObject();
return new BytesRestResponse(status.getRestStatus(), builder);
}
});

@Override
public String getName() {
    return "xpack_upgrade_to_trial_action";
}
}

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*/
package org.elasticsearch.license;

import org.apache.logging.log4j.Logger;
import org.apache.logging.log4j.LogManager;
import org.apache.logging.log4j.message.ParameterizedMessage;
import org.apache.logging.log4j.util.Supplier;
import org.elasticsearch.Version;
import org.elasticsearch.cluster.ClusterState;
import org.elasticsearch.cluster.ClusterStateUpdateTask;
import org.elasticsearch.cluster.metadata.MetaData;
import org.elasticsearch.cluster.service.ClusterService;
import org.elasticsearch.common.Nullable;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.xpack.core.XPackPlugin;
import java.time.Clock;
import java.util.UUID;

public class StartupSelfGeneratedLicenseTask extends ClusterStateUpdateTask {
    private static final Logger logger = LogManager.getLogger(StartupSelfGeneratedLicenseTask.class);

    /**
     * Max number of nodes licensed by generated trial license
     */
    private int selfGeneratedLicenseMaxNodes = 1000;
private final Settings settings;
private final Clock clock;
private final ClusterService clusterService;

public StartupSelfGeneratedLicenseTask(Settings settings, Clock clock, ClusterService clusterService) {
    this.settings = settings;
    this.clock = clock;
    this.clusterService = clusterService;
}

@Override
public void clusterStateProcessed(String source, ClusterState oldState, ClusterState newState) {
    LicensesMetaData licensesMetaData = newState.metaData().custom(LicensesMetaData.TYPE);
    if (logger.isDebugEnabled()) {
        logger.debug("registered self generated license: {}", licensesMetaData);
    }
}

@Override
public ClusterState execute(ClusterState currentState) throws Exception {
    XPackPlugin.checkReadyForXPackCustomMetadata(currentState);
    final MetaData metaData = currentState.metaData();
    final LicensesMetaData currentLicensesMetaData = metaData.custom(LicensesMetaData.TYPE);
    // do not generate a license if any license is present
    if (currentLicensesMetaData == null) {
        String type = LicenseService.SELF_GENERATED_LICENSE_TYPE.get(settings);
        if (SelfGeneratedLicense.validSelfGeneratedType(type) == false) {
            throw new IllegalArgumentException("Illegal self generated license type ".
        ]
    } else if (LicenseUtils.signatureNeedsUpdate(currentLicensesMetaData.getLicense(), currentState.nodes())
    ) {
        return updateLicenseSignature(currentState, currentLicensesMetaData);
    } else if (LicenseUtils.licenseNeedsExtended(currentLicensesMetaData.getLicense()))
    ) {
        return extendBasic(currentState, currentLicensesMetaData);
    } else {
        return currentState;
    }
}

private ClusterState updateLicenseSignature(ClusterState currentState, LicensesMetaData
currentLicenseMetaData) {
    License license = currentLicenseMetaData.getLicense();
   MetaData.Builder mdBuilder = MetaData.builder(currentState.metaData());
    String type = license.type();
    long issueDate = license.issueDate();
    long expiryDate = license.expiryDate();
    }

private final Settings settings;
private final Clock clock;
private final ClusterService clusterService;

public StartupSelfGeneratedLicenseTask(Settings settings, Clock clock, ClusterService clusterService) {
    this.settings = settings;
    this.clock = clock;
    this.clusterService = clusterService;
}

@Override
public void clusterStateProcessed(String source, ClusterState oldState, ClusterState newState) {
    LicensesMetaD
// extend the basic license expiration date if needed since extendBasic will not be called now
if ("basic".equals(type) && expiryDate !=
LicenseService.BASIC_SELF_GENERATED_LICENSE_EXPIRATION_MILLIS) {
    expiryDate = LicenseService.BASIC_SELF_GENERATED_LICENSE_EXPIRATION_MILLIS;
}
License.Builder specBuilder = License.builder()
    .uid(license.uid())
    .issuedTo(license.issuedTo())
    .maxNodes(selfGeneratedLicenseMaxNodes)
    .issueDate(issueDate)
    .type(type)
    .expiryDate(expiryDate);
License selfGeneratedLicense = SelfGeneratedLicense.create(specBuilder, currentState.nodes());
Version trialVersion = currentLicenseMetaData.getMostRecentTrialVersion();
LicensesMetaData newLicenseMetadata = new LicensesMetaData(selfGeneratedLicense, trialVersion);
mdBuilder.putCustom(LicensesMetaData.TYPE, newLicenseMetadata);
logger.info("Updating existing license to the new version.\n\nOld license:\n \n New license:\n\n",
    license, newLicenseMetadata.getLicense());
return ClusterState.builder(currentState).metaData(mdBuilder).build();
}

@Override
public void onFailure(String source, @Nullable Exception e) {
    logger.error((Supplier<?>) () -> new ParameterizedMessage("unexpected failure during [{}]", source), e);
}

private ClusterState extendBasic(ClusterState currentState, LicensesMetaData currentLicenseMetadata) {
    License license = currentLicenseMetadata.getLicense();
    MetaData.Builder mdBuilder = MetaData.builder(currentState.metaData());
    LicensesMetaData newLicenseMetadata = createBasicLicenseFromExistingLicense(currentLicenseMetadata);
    mdBuilder.putCustom(LicensesMetaData.TYPE, newLicenseMetadata);
    logger.info("Existing basic license has an expiration. Basic licenses no longer expire." +
            " Regenerating license.\n\nOld license:\n \n New license:\n\n",
        license, newLicenseMetadata.getLicense());
    return ClusterState.builder(currentState).metaData(mdBuilder).build();
}

private LicensesMetaData createBasicLicenseFromExistingLicense(LicensesMetaData currentLicenseMetadata) {
    License currentLicense = currentLicenseMetadata.getLicense();
    License.Builder specBuilder = License.builder()
        .uid(currentLicense.uid())
        .issuedTo(currentLicense.issuedTo())
        .maxNodes(selfGeneratedLicenseMaxNodes)
        .issueDate(currentLicense.issueDate())
        .type("basic")
        .expiryDate(LicenseService.BASIC_SELF_GENERATED_LICENSE_EXPIRATION_MILLIS);
    License selfGeneratedLicense = SelfGeneratedLicense.create(specBuilder, currentLicense.version());
    Version trialVersion = currentLicenseMetadata.getMostRecentTrialVersion();
}
return new LicensesMetaData(selfGeneratedLicense, trialVersion);
}

private ClusterState updateWithLicense(ClusterState currentState, String type) {
    long issueDate = clock.millis();
    MetaData.Builder mdBuilder = MetaData.builder(currentState.metaData());
    long expiryDate;
    if ("basic".equals(type)) {
        expiryDate = LicenseService.BASIC_SELF_GENERATED_LICENSE_EXPIRATION_MILLIS;
    } else {
        expiryDate = issueDate +
        LicenseService.NON_BASIC_SELF_GENERATED_LICENSE_DURATION.getMillis();
    }
    License.Builder specBuilder = License.builder()
        .uid(UUID.randomUUID().toString())
        .issuedTo(clusterService.getClusterName().value())
        .maxNodes(selfGeneratedLicenseMaxNodes)
        .issueDate(issueDate)
        .type(type)
        .expiryDate(expiryDate);
    License selfGeneratedLicense = SelfGeneratedLicense.create(specBuilder, currentState.nodes());
    LicensesMetaData licensesMetaData;
    if ("trial".equals(type)) {
        licensesMetaData = new LicensesMetaData(selfGeneratedLicense, Version.CURRENT);
    } else {
        licensesMetaData = new LicensesMetaData(selfGeneratedLicense, null);
    }
    mdBuilder.putCustom(LicensesMetaData.TYPE, licensesMetaData);
    return ClusterState.builder(currentState).metaData(mdBuilder).build();
}

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 */
package org.elasticsearch.license;

import org.elasticsearch.Version;
import org.elasticsearch.cluster.AbstractNamedDiffable;
import org.elasticsearch.cluster.MergableCustomMetaData;
import org.elasticsearch.cluster.NamedDiff;
import org.elasticsearch.cluster.metadata.MetaData;
import org.elasticsearch.common.Nullable;
import org.elasticsearch.common.io.stream.StreamInput;
import org.elasticsearch.common.io.stream.StreamOutput;
import org.elasticsearch.common.xcontent.XContentBuilder;
import org.elasticsearch.common.xcontent.XContentParser;
import org.elasticsearch.license.License.OperationMode;
import org.elasticsearch.xpack.core.XPackPlugin;
import java.io.IOException;
import java.util.EnumSet;

/**
 * Contains metadata about registered licenses
 */
public class LicensesMetaData extends AbstractNamedDiffable<MetaData Custom> implements XPackPlugin.XPackMetaDataCustom,
    MergableCustomMetaData<LicensesMetaData> {

    public static final String TYPE = "licenses";

    /**
     * When license is explicitly removed by a user, LICENSE_TOMBSTONE
     * is used as a placeholder in the license metadata. This enables
     * us to distinguish between the scenario when a cluster never
     * had a license (null) and when a license was removed explicitly
     * (LICENSE_TOMBSTONE).
     * We rely on this to decide whether to generate a unsigned trial
     * license or not. we should only generate a license if no license
     * ever existed in the cluster state
     */
    public static final License LICENSE_TOMBSTONE = License.builder()
        .type("trial")
        .issuer("elasticsearch")
        .uid("TOMBSTONE")
        .issuedTo("")
        .maxNodes(0)
        .issueDate(0)
        .expiryDate(0)
        .build();

    private License license;
    private Version trialVersion;

    // This field describes the version of x-pack for which this cluster has exercised a trial. If the field
    // is null, then no trial has been exercised. We keep the version to leave open the possibility that we
    // may eventually allow a cluster to exercise a trial every time they upgrade to a new major version.
    private Version trialVersion;

    LicensesMetaData(License license, Version trialVersion) {
        this.license = license;
        this.trialVersion = trialVersion;
    }
public License getLicense() {
return license;
}
boolean isEligibleForTrial() {
if (trialVersion == null) {
return true;
}
return Version.CURRENT.major > trialVersion.major;
}
Version getMostRecentTrialVersion() {
return trialVersion;
}
@Override
public String toString() {
return "LicensesMetaData{" +
"license=" + license +
", trialVersion=" + trialVersion +
'}';
}
@Override
public boolean equals(Object o) {
if (this == o) return true;
if (o == null || getClass() != o.getClass()) return false;
LicensesMetaData that = (LicensesMetaData) o;
if (license != null ? !license.equals(that.license) : that.license != null) return false;
return trialVersion != null ? trialVersion.equals(that.trialVersion) : that.trialVersion == null;
}
@Override
public int hashCode() {
int result = license != null ? license.hashCode() : 0;
result = 31 * result + (trialVersion != null ? trialVersion.hashCode() : 0);
return result;
}
@Override
public String getWriteableName() {
return TYPE;
}
@Override
public Version getMinimalSupportedVersion() {

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return Version.CURRENT.minimumCompatibilityVersion();
}

@Override
public EnumSet<MetaData.XContentContext> context() {
    return EnumSet.of(MetaData.XContentContext.GATEWAY);
}

public static LicensesMetaData fromXContent(XContentParser parser) throws IOException {
    License license = LICENSE_TOMBSTONE;
    Version trialLicense = null;
    XContentParser.Token token;
    while ((token = parser.nextToken()) != XContentParser.Token.END_OBJECT) {
        if (token == XContentParser.Token.FIELD_NAME) {
            String fieldName = parser.currentName();
            if (fieldName != null) {
                if (fieldName.equals(Fields.LICENSE)) {
                    token = parser.nextToken();
                    if (token == XContentParser.Token.START_OBJECT) {
                        license = License.fromXContent(parser);
                    } else if (token == XContentParser.Token.VALUE_NULL) {
                        license = LICENSE_TOMBSTONE;
                    }
                } else if (fieldName.equals(Fields.TRIAL_LICENSE)) {
                    parser.nextToken();
                    trialLicense = Version.fromString(parser.text());
                }
            }
        }
    }
    return new LicensesMetaData(license, trialLicense);
}

@Override
public XContentBuilder toXContent(XContentBuilder builder, Params params) throws IOException {
    if (license == LICENSE_TOMBSTONE) {
        builder.nullField(Fields.LICENSE);
    } else {
        builder.startObject(Fields.LICENSE);
        license.toInnerXContent(builder, params);
        builder.endObject();
    }
    if (trialVersion != null) {
        builder.field(Fields.TRIAL_LICENSE, trialVersion.toString());
    }
    return builder;
}
@Override
public void writeTo(StreamOutput streamOutput) throws IOException {
    if (license == LICENSE_TOMBSTONE) {
        streamOutput.writeBoolean(false); // no license
    } else {
        streamOutput.writeBoolean(true); // has a license
        license.writeTo(streamOutput);
    }
    if (streamOutput.getVersion().onOrAfter(Version.V_6_1_0)) {
        if (trialVersion == null) {
            streamOutput.writeBoolean(false);
        } else {
            streamOutput.writeBoolean(true);
            Version.writeVersion(trialVersion, streamOutput);
        }
    }
}

public LicensesMetaData(StreamInput streamInput) throws IOException {
    if (streamInput.readBoolean()) {
        license = License.readLicense(streamInput);
    } else {
        license = LICENSE_TOMBSTONE;
    }
    if (streamInput.getVersion().onOrAfter(Version.V_6_1_0)) {
        boolean hasExercisedTrial = streamInput.readBoolean();
        if (hasExercisedTrial) {
            this.trialVersion = Version.readVersion(streamInput);
        }
    }
}

public static NamedDiff<MetaData.Custom> readDiffFrom(StreamInput streamInput) throws IOException {
    return readDiffFrom(MetaData.Custom.class, TYPE, streamInput);
}

public static License extractLicense(LicensesMetaData licensesMetaData) {
    if (licensesMetaData != null) {
        License license = licensesMetaData.getLicense();
        if (license == LicensesMetaData.LICENSE_TOMBSTONE) {
            return null;
        } else {
            return license;
        }
    }
    return null;
}
@Override
public LicensesMetaData merge(LicensesMetaData other) {
    if (other.license == null) {
        return this;
    } else if (license == null
            || OperationMode.compare(other.license.operationMode(), license.operationMode()) > 0) {
        return other;
    }
    return this;
}

private static final class Fields {
    private static final String LICENSE = "license";
    private static final String TRIAL_LICENSE = "trial_license";
}

package org.elasticsearch.license;

import org.elasticsearch.common.inject.Inject;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.common.xcontent.ToXContent;
import org.elasticsearch.common.xcontent.XContentBuilder;
import org.elasticsearch.protocol.xpack.license.GetLicenseRequest;
import org.elasticsearch.rest.BytesRestResponse;
import org.elasticsearch.rest.RestController;
import org.elasticsearch.rest.RestRequest;
import org.elasticsearch.rest.RestResponse;
import org.elasticsearch.rest.action.RestBuilderListener;
import org.elasticsearch.xpack.core.XPackClient;
import org.elasticsearch.xpack.core.rest.XPackRestHandler;
import java.io.IOException;
import java.util.HashMap;
import java.util.Map;
import static org.elasticsearch.rest.RestRequest.Method.GET;
import static org.elasticsearch.rest.RestStatus.NOT_FOUND;
import static org.elasticsearch.rest.RestStatus.OK;

public class RestGetLicenseAction extends XPackRestHandler {

    @Inject
    public RestGetLicenseAction(Settings settings, RestController controller) {

super(settings);
// @deprecated Remove deprecations in 6.0
controller.registerWithDeprecatedHandler(GET, URI_BASE + "/license", this,
        GET, "/_license", deprecationLogger);

// Remove _licenses support entirely in 6.0
controller.registerAsDeprecatedHandler(GET, "/_licenses", this,
        "[GET /_licenses] is deprecated! Use " +
        "[GET /_xpack/license] instead.",
        deprecationLogger);
}

@Override
public String getName() {
    return "xpack_get_license_action";
}

/**
 * There will be only one license displayed per feature, the selected license will have the latest expiry_date
 * out of all other licenses for the feature.
 * <p>
 * The licenses are sorted by latest issue_date
 */
@Override
public RestChannelConsumer doPrepareRequest(final RestRequest request, final XPackClient client) throws IOException {
    final Map<String, String> overrideParams = new HashMap<>(2);
    overrideParams.put(License.REST_VIEW_MODE, "true");
    overrideParams.put(License.LICENSE_VERSION_MODE, String.valueOf(License.VERSION_CURRENT));
    final ToXContent.Params params = new ToXContent.DelegatingMapParams(overrideParams, request);
    GetLicenseRequest getLicenseRequest = new GetLicenseRequest();
    getLicenseRequest.local(request.paramAsBoolean("local", getLicenseRequest.local()));
    return channel -> client.es().admin().cluster().execute(GetLicenseAction.INSTANCE, getLicenseRequest,
            new RestBuilderListener<GetLicenseResponse>(channel) {
                @Override
                public RestResponse buildResponse(GetLicenseResponse response, XContentBuilder builder) throws Exception {
                    // Default to pretty printing, but allow ?pretty=false to disable
                    if (!request.hasParam("pretty")) {
                        builder.prettyPrint().ifAtEnd();
                    }
                    boolean hasLicense = response.license() != null;
                    builder.startObject();
                    if (hasLicense) {
                        builder.startObject("license");
                        response.license().toInnerXContent(builder, params);
                        builder.endObject();
                    }
                }
            });
}

@Exception
public RestResponse buildResponse(GetLicenseResponse response, XContentBuilder builder) throws IOException {
    // Default to pretty printing, but allow ?pretty=false to disable
    if (!request.hasParam("pretty")) {
        builder.prettyPrint().ifAtEnd();
    }
    boolean hasLicense = response.license() != null;
    builder.startObject();
    if (hasLicense) {
        builder.startObject("license");
        response.license().toInnerXContent(builder, params);
        builder.endObject();
    }
builder.endObject();
return new BytesRestResponse(hasLicense ? OK : NOT_FOUND, builder);
}
});
}

/**
 * Licensing for xpack.
 *
 * A {@link org.elasticsearch.license.License} is a signed set of json properties that determine what features
 * are available in a running cluster. Licenses are registered through a
 * {@link org.elasticsearch.license.PutLicenseRequest}. This action is handled by the master node, which places
 * the signed license into the cluster state. Each node listens for cluster state updates via the
 * {@link org.elasticsearch.license.LicenseService}, and updates its local copy of the license when it detects
 * changes in the cluster state.
 *
 * The logic for which features are available given the current license is handled by
 * {@link org.elasticsearch.license.XPackLicenseState}, which is updated by the
 * {@link org.elasticsearch.license.LicenseService} when the license changes.
 *
 */
package org.elasticsearch.license;

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 */
package org.elasticsearch.license;

import org.elasticsearch.action.support.master.AcknowledgedResponse;
import org.elasticsearch.common.io.stream.StreamInput;
import org.elasticsearch.common.io.stream.StreamOutput;
import org.elasticsearch.common.xcontent.XContentBuilder;
import org.elasticsearch.rest.RestStatus;
import java.io.IOException;
import java.util.Collections;
import java.util.HashMap;
import java.util.Map;
import static org.elasticsearch.license.PostStartBasicResponse.Status.NEED_ACKNOWLEDGEMENT;

import java.io.IOException;
import java.util.Collections;
import java.util.HashMap;
import java.util.Map;
import static org.elasticsearch.license.PostStartBasicResponse.Status.NEED_ACKNOWLEDGEMENT;
class PostStartBasicResponse extends AcknowledgedResponse {

    private Map<String, String[]> acknowledgeMessages;
    private String acknowledgeMessage;

    enum Status {
        GENERATED_BASIC(true, null, RestStatus.OK),
        ALREADY_USING_BASIC(false, "Operation failed: Current license is basic.", RestStatus.FORBIDDEN),
        NEED_ACKNOWLEDGEMENT(false, "Operation failed: Needs acknowledgement.", RestStatus.OK);
    
    private final boolean isBasicStarted;
    private final String errorMessage;
    private final RestStatus restStatus;

    Status(boolean isBasicStarted, String errorMessage, RestStatus restStatus) {
        this.isBasicStarted = isBasicStarted;
        this.errorMessage = errorMessage;
        this.restStatus = restStatus;
    }

    boolean isBasicStarted() {
        return isBasicStarted;
    }

    String getErrorMessage() {
        return errorMessage;
    }

    RestStatus getRestStatus() {
        return restStatus;
    }
}

private final boolean isBasicStarted;
private final String errorMessage;
private final RestStatus restStatus;

Status(boolean isBasicStarted, String errorMessage, RestStatus restStatus) {
    this.isBasicStarted = isBasicStarted;
    this.errorMessage = errorMessage;
    this.restStatus = restStatus;
}

boolean isBasicStarted() {
    return isBasicStarted;
}

String getErrorMessage() {
    return errorMessage;
}

RestStatus getRestStatus() {
    return restStatus;
}

PostStartBasicResponse() {
}

PostStartBasicResponse(Status status) {
    this(status, Collections.emptyMap(), null);
}

PostStartBasicResponse(Status status, Map<String, String[]> acknowledgeMessages, String acknowledgeMessage) {
    super(status != NEED_ACKNOWLEDGEMENT);
    this.status = status;
    this.acknowledgeMessages = acknowledgeMessages;
    this.acknowledgeMessage = acknowledgeMessage;
}
public Status getStatus() {
    return status;
}

@Override
public void readFrom(StreamInput in) throws IOException {
    super.readFrom(in);
    status = in.readEnum(Status.class);
    acknowledgeMessage = in.readOptionalString();
    int size = in.readVInt();
    Map<String, String[]> acknowledgeMessages = new HashMap<>(size);
    for (int i = 0; i < size; i++) {
        String feature = in.readString();
        int nMessages = in.readVInt();
        String[] messages = new String[nMessages];
        for (int j = 0; j < nMessages; j++) {
            messages[j] = in.readString();
        }
        acknowledgeMessages.put(feature, messages);
    }
    this.acknowledgeMessages = acknowledgeMessages;
}

@Override
public void writeTo(StreamOutput out) throws IOException {
    super.writeTo(out);
    out.writeEnum(status);
    out.writeOptionalString(acknowledgeMessage);
    out.writeVInt(acknowledgeMessages.size());
    for (Map.Entry<String, String[]> entry : acknowledgeMessages.entrySet()) {
        out.writeString(entry.getKey());
        out.writeVInt(entry.getValue().length);
        for (String message : entry.getValue()) {
            out.writeString(message);
        }
    }
}

@Override
protected void addCustomFields(XContentBuilder builder, Params params) throws IOException {
    if (status.isBasicStarted()) {
        builder.field("basic_was_started", true);
    } else {
        builder.field("basic_was_started", false);
        builder.field("error_message", status.getErrorMessage());
    }
}
if (acknowledgeMessages.isEmpty() == false) {
    builder.startObject("acknowledge");
    builder.field("message", acknowledgeMessage);
    for (Map.Entry<String, String[]> entry : acknowledgeMessages.entrySet()) {
        builder.startArray(entry.getKey());
        for (String message : entry.getValue()) {
            builder.value(message);
        }
        builder.endArray();
    }
    builder.endObject();
}
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* you may not use this file except in compliance with the Elastic License.
*/
package org.elasticsearch.license;

import org.elasticsearch.action.ActionListener;
import org.elasticsearch.action.support.ActionFilters;
import org.elasticsearch.action.support.master.TransportMasterNodeAction;
import org.elasticsearch.cluster.ClusterState;
import org.elasticsearch.cluster.block.ClusterBlockException;
import org.elasticsearch.cluster.block.ClusterBlockLevel;
import org.elasticsearch.cluster.metadata.IndexNameExpressionResolver;
import org.elasticsearch.cluster.service.ClusterService;
import org.elasticsearch.common.inject.Inject;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.threadpool.ThreadPool;
import org.elasticsearch.transport.TransportService;

public class TransportPostStartBasicAction extends TransportMasterNodeAction<PostStartBasicRequest,
PostStartBasicResponse> {

    private final LicenseService licenseService;

    @Inject
    public TransportPostStartBasicAction(Settings settings, TransportService transportService, ClusterService
clusterService,
                                          LicenseService licenseService, ThreadPool threadPool, ActionFilters actionFilters,
                                          IndexNameExpressionResolver indexNameExpressionResolver) {
        super(settings, PostStartBasicAction.NAME, transportService, clusterService, threadPool, actionFilters,
indexNameExpressionResolver, PostStartBasicRequest::new);
        this.licenseService = licenseService;
    }
@Override
protected String executor() {
    return ThreadPool.Names.SAME;
}

@Override
protected PostStartBasicResponse newResponse() {
    return new PostStartBasicResponse();
}

@Override
protected void masterOperation(PostStartBasicRequest request, ClusterState state,
                                ActionListener<PostStartBasicResponse> listener) throws Exception {
    licenseService.startBasicLicense(request, listener);
}

@Override
protected ClusterBlockException checkBlock(PostStartBasicRequest request, ClusterState state) {
    return state.blocks().globalBlockedException(ClusterBlockLevel.METADATA_WRITE);
}

/*@*/
package org.elasticsearch.license;

import org.elasticsearch.action.Action;
import org.elasticsearch.client.ElasticsearchClient;
import org.elasticsearch.protocol.xpack.license.GetLicenseRequest;

public class GetLicenseAction extends Action<GetLicenseRequest, GetLicenseResponse,
GetLicenseRequestBuilder> {

    public static final GetLicenseAction INSTANCE = new GetLicenseAction();
    public static final String NAME = "cluster:monitor/xpack/license/get";

    private GetLicenseAction() {
        super(NAME);
    }

    @Override
    public GetLicenseResponse newResponse() {
        return new GetLicenseResponse();
    }

    public static final GetLicenseAction INSTANCE = new GetLicenseAction();
    public static final String NAME = "cluster:monitor/xpack/license/get";

    private GetLicenseAction() {
        super(NAME);
    }

    @Override
    public GetLicenseResponse newResponse() {
        return new GetLicenseResponse();
    }
@Override
public GetLicenseRequestBuilder newRequestBuilder(ElasticsearchClient client) {
    return new GetLicenseRequestBuilder(client, this);
}

package org.elasticsearch.license;

import org.elasticsearch.action.Action;
import org.elasticsearch.client.ElasticsearchClient;
import org.elasticsearch.protocol.xpack.license.DeleteLicenseRequest;
public class DeleteLicenseAction extends Action<DeleteLicenseRequest, AcknowledgedResponse,
DeleteLicenseRequestBuilder> {

    public static final DeleteLicenseAction INSTANCE = new DeleteLicenseAction();
    public static final String NAME = "cluster:admin/xpack/license/delete";

    private DeleteLicenseAction() {
        super(NAME);
    }

    @Override
    public AcknowledgedResponse newResponse() {
        return new AcknowledgedResponse();
    }

    @Override
    public DeleteLicenseRequestBuilder newRequestBuilder(ElasticsearchClient client) {
        return new DeleteLicenseRequestBuilder(client, this);
    }
}

package org.elasticsearch.license;

import org.elasticsearch.Version;
import org.elasticsearch.action.ActionRequestValidationException;
import org.elasticsearch.action.support.master.MasterNodeRequest;
import org.elasticsearch.common.io.stream.StreamInput;
import org.elasticsearch.common.io.stream.StreamOutput;

import java.io.IOException;

public class PostStartTrialRequest extends MasterNodeRequest<PostStartTrialRequest> {

    private boolean acknowledge = false;
    private String type;

    @Override
    public ActionRequestValidationException validate() {
        return null;
    }

    public PostStartTrialRequest setType(String type) {
        this.type = type;
        return this;
    }

    public String getType() {
        return type;
    }

    public PostStartTrialRequest acknowledge(boolean acknowledge) {
        this.acknowledge = acknowledge;
        return this;
    }

    public boolean isAcknowledged() {
        return acknowledge;
    }

    @Override
    public void readFrom(StreamInput in) throws IOException {
        super.readFrom(in);
        if (in.getVersion().onOrAfter(Version.V_6_3_0)) {
            type = in.readString();
            acknowledge = in.readBoolean();
        } else {
            type = "trial";
            acknowledge = true;
        }
    }

    @Override
    public void writeTo(StreamOutput out) throws IOException {
        Version version = Version.V_6_3_0;
        if (out.getVersion().onOrAfter(version)) {
            
        }
    }
}
super.writeTo(out);
out.writeString(type);
out.writeBoolean(acknowledge);
} else {
    if ("trial".equals(type) == false) {
        throw new IllegalArgumentException("All nodes in cluster must be version ":[" + version
            + "] or newer to start trial with a different type than 'trial'. Attempting to write to " +
            "a node with version ":[" + out.getVersion() + "] with trial type [" + type + "]");
    } else if (acknowledge == false) {
        throw new IllegalArgumentException("Request must be acknowledged to send to a node with a version " +
            "prior to [" + version + "]. Attempting to send request to node with version [" + out.getVersion() + "] "
            +
            "without acknowledgement.");
    } else {
        super.writeTo(out);
    }
}
/*
 * Copyright Elasticsearch B.V. and/or licensed to Elasticsearch B.V. under one
 * or more contributor license agreements. Licensed under the Elastic License;
 * you may not use this file except in compliance with the Elastic License.
 */
package org.elasticsearch.license;

import java.io.IOException;
import java.io.InputStream;
import java.nio.ByteBuffer;
import java.util.ArrayList;
import java.util.Base64;
import java.util.Comparator;
import java.util.List;
import java.util.Locale;
import org.apache.lucene.util.CollectionUtil;
import org.elasticsearch.ElasticsearchException;
import org.elasticsearch.ElasticsearchParseException;
import org.elasticsearch.common.Strings;
import org.elasticsearch.common.bytes.BytesReference;
import org.elasticsearch.common.io.stream.StreamInput;
import org.elasticsearch.common.io.stream.StreamOutput;
import org.elasticsearch.common.xcontent.LoggingDeprecationHandler;
import org.elasticsearch.common.xcontent.NamedXContentRegistry;
import org.elasticsearch.common.xcontent.ToXContent;
import org.elasticsearch.common.xcontent.ToXContentObject;
import org.elasticsearch.common.xcontent.XContentBuilder;
import org.elasticsearch.common.xcontent.XContentFactory;
import org.elasticsearch.common.xcontent.XContentParser;
import org.elasticsearch.common.xcontent.XContentType;
import org.elasticsearch.protocol.xpack.license.LicenseStatus;

/**
 * Data structure for license. Use {@link Builder} to build a license.
 * Provides serialization/deserialization & validation methods for license object
 */
public class License implements ToXContentObject {
    public static final int VERSION_START = 1;
    public static final int VERSION_NO_FEATURE_TYPE = 2;
    public static final int VERSION_START_DATE = 3;
    public static final int VERSION_CRYPTO_ALGORITHMS = 4;
    public static final int VERSION_CURRENT = VERSION_CRYPTO_ALGORITHMS;

    /**
     * XContent param name to deserialize license(s) with
     * an additional <code>status</code> field, indicating whether a
     * particular license is 'active' or 'expired' and no signature
     * and in a human readable format
     */
    public static final String REST_VIEW_MODE = "rest_view";

    /**
     * XContent param name to deserialize license(s) with
     * no signature
     */
    public static final String LICENSE_SPEC_VIEW_MODE = "license_spec_view";

    /**
     * XContent param name to deserialize licenses according
     * to a specific license version
     */
    public static final String LICENSE_VERSION_MODE = "license_version";

    public static final Comparator<License> LATEST_ISSUE_DATE_FIRST = Comparator.comparing(License::issueDate).reversed();

    private final int version;
    private final String uid;
    private final String issuer;
    private final String issuedTo;
    private final long issueDate;
    private final String type;
    private final String subscriptionType;
    private final String feature;
    private final String signature;
    private final long expiryDate;
    private final long startDate;
    private final int maxNodes;
private final OperationMode operationMode;

/**
 * Decouples operation mode of a license from the license type value.
 * <p>
 * Note: The mode indicates features that should be made available, but it does not indicate whether the license is
 * active!
 * <p>
 * The id byte is used for ordering operation modes (used for merging license md in tribe node)
 */

public enum OperationMode {
    MISSING((byte) 0),
    TRIAL((byte) 1),
    BASIC((byte) 2),
    STANDARD((byte) 3),
    GOLD((byte) 4),
    PLATINUM((byte) 5);

    private final byte id;
    OperationMode(byte id) {
        this.id = id;
    }

    /** Returns non-zero positive number when <code>opMode1</code> is greater than <code>opMode2</code> */
    public static int compare(OperationMode opMode1, OperationMode opMode2) {
        return Integer.compare(opMode1.id, opMode2.id);
    }

    public static OperationMode resolve(String type) {
        switch (type.toLowerCase(Locale.ROOT)) {
            case "missing":
                return MISSING;
            case "trial":
            case "none": // bwc for 1.x subscription_type field
            case "dev": // bwc for 1.x subscription_type field
            case "development": // bwc for 1.x subscription_type field
                return TRIAL;
            case "basic":
                return BASIC;
            case "standard":
                return STANDARD;
            case "silver":
            case "gold":
                return GOLD;
            case "platinum":
            case "cloud_internal":
        }
        return MISSING;
    }
}
case "internal":  // bwc for 1.x subscription_type field
    return PLATINUM;
default:
    throw new IllegalArgumentException("unknown type [" + type + "]");
}
}

private License(int version, String uid, String issuer, String issuedTo, long issueDate, String type,
              String subscriptionType, String feature, String signature, long expiryDate, int maxNodes, long startDate)
{
    this.version = version;
    this.uid = uid;
    this.issuer = issuer;
    this.issuedTo = issuedTo;
    this.issueDate = issueDate;
    this.type = type;
    this.subscriptionType = subscriptionType;
    this.feature = feature;
    this.signature = signature;
    // We will validate that only a basic license can have the
    BASIC_SELF_GENERATED_LICENSE_EXPIRATION_MILLIS
    // in the validate() method.
    if (expiryDate == -1) {
        this.expiryDate = LicenseService.BASIC_SELF_GENERATED_LICENSE_EXPIRATION_MILLIS;
    } else {
        this.expiryDate = expiryDate;
    }
    this.maxNodes = maxNodes;
    this.startDate = startDate;
    if (version == VERSION_START) {
        // in 1.x: the acceptable values for 'subscription_type': none | dev | silver | gold | platinum
        this.operationMode = OperationMode.resolve(subscriptionType);
    } else {
        // in 2.x: the acceptable values for 'type': trial | basic | silver | dev | gold | platinum
        this.operationMode = OperationMode.resolve(type);
    }
    validate();
}

/**
 * @return version of the license
 */
public int version() {
    return version;
}

/**
* @return a unique identifier for a license
*
public String uid() {
    return uid;
}

/**
 * @return type of the license [trial, subscription, internal]
 */
public String type() {
    return type;
}

/**
 * @return the issueDate in milliseconds
 */
public long issueDate() {
    return issueDate;
}

/**
 * @return the startDate in milliseconds
 */
public long startDate() {
    return startDate;
}

/**
 * @return the expiry date in milliseconds
 */
public long expiryDate() {
    return expiryDate;
}

/**
 * @return the maximum number of nodes this license has been issued for
 */
public int maxNodes() {
    return maxNodes;
}

/**
 * @return a string representing the entity this licenses has been issued to
 */
public String issuedTo() {
    return issuedTo;
}
/**
* @return a string representing the entity responsible for issuing this license (internal)
*/
public String issuer() {
    return issuer;
}

/**
* @return a string representing the signature of the license used for license verification
*/
public String signature() {
    return signature;
}

/**
* @return the operation mode of the license as computed from the license type or from
* the license mode file
*/
public OperationMode operationMode() {
    synchronized (this) {
        if (canReadOperationModeFromFile() && operationModeFileWatcher != null) {
            return operationModeFileWatcher.getCurrentOperationMode();
        }
    }
    return operationMode;
}

private boolean canReadOperationModeFromFile() {
    return type.equals("cloud_internal");
}

private volatile OperationModeFileWatcher operationModeFileWatcher;

/**
* Sets the operation mode file watcher for the license and initializes the
* file watcher when the license type allows to override operation mode from file
*/
public synchronized void setOperationModeFileWatcher(final OperationModeFileWatcher
operationModeFileWatcher) {
    this.operationModeFileWatcher = operationModeFileWatcher;
    if (canReadOperationModeFromFile()) {
        this.operationModeFileWatcher.init();
    }
}

/**
* Removes operation mode file watcher, so unused license objects can be gc'ed
*/
public synchronized void removeOperationModeFileWatcher() {
    this.operationModeFileWatcher = null;
}

/**
 * @return the current license's status
 */
public LicenseStatus status() {
    long now = System.currentTimeMillis();
    if (issueDate > now) {
        return LicenseStatus.INVALID;
    } else if (expiryDate < now) {
        return LicenseStatus.EXPIRED;
    }
    return LicenseStatus.ACTIVE;
}

private void validate() {
    if (issuer == null) {
        throw new IllegalStateException("issuer can not be null");
    } else if (issuedTo == null) {
        throw new IllegalStateException("issuedTo can not be null");
    } else if (issueDate == -1) {
        throw new IllegalStateException("issueDate has to be set");
    } else if (type == null) {
        throw new IllegalStateException("type can not be null");
    } else if (subscriptionType == null && version == VERSION_START) {
        throw new IllegalStateException("subscriptionType can not be null");
    } else if (uid == null) {
        throw new IllegalStateException("uid can not be null");
    } else if (feature == null && version == VERSION_START) {
        throw new IllegalStateException("feature can not be null");
    } else if (maxNodes == -1) {
        throw new IllegalStateException("maxNodes has to be set");
    } else if (expiryDate == -1) {
        throw new IllegalStateException("expiryDate has to be set");
    } else if (expiryDate == LicenseService.BASIC_SELF_GENERATED_LICENSE_EXPIRATION_MILLIS && "basic".equals(type) == false) {
        throw new IllegalStateException("only basic licenses are allowed to have no expiration");
    }
}

public static License readLicense(StreamInput in) throws IOException {
    int version = in.readVInt(); // Version for future extensibility
    if (version > VERSION_CURRENT) {
        throw new ElasticsearchException("Unknown license version found, please upgrade all nodes to the latest
elasticsearch-license" +
        " plugin");
    }
}
Builder builder = builder();
builder.version(version);
builder.uid(in.readString());
builder.type(in.readString());
if (version == VERSION_START) {
builder.subscriptionType(in.readString());
}
builder.issueDate(in.readLong());
if (version == VERSION_START) {
builder.feature(in.readString());
}
builder.expiryDate(in.readLong());
builder.maxNodes(in.readInt());
builder.issuedTo(in.readString());
builder.issuer(in.readString());
builder.signature(in.readOptionalString());
if (version >= VERSION_START_DATE) {
builder.startDate(in.readLong());
}
return builder.build();

public void writeTo(StreamOutput out) throws IOException {
    out.writeVInt(version);
    out.writeString(uid);
    out.writeString(type);
    if (version == VERSION_START) {
        out.writeString(subscriptionType);
    }
    out.writeLong(issueDate);
    if (version == VERSION_START) {
        out.writeString(feature);
    }
    out.writeLong(expiryDate);
    out.writeInt(maxNodes);
    out.writeString(issuedTo);
    out.writeString(issuer);
    out.writeOptionalString(signature);
    if (version >= VERSION_START_DATE) {
        out.writeLong(startDate);
    }
}

@Override
public String toString() {
    try {
        final XContentBuilder builder = XContentFactory.jsonBuilder();
toXContent(builder, ToXContent.EMPTY_PARAMS);
return Strings.toString(builder);
} catch (IOException e) {
    return "";
}
}

@Override
public XContentBuilder toXContent(XContentBuilder builder, Params params) throws IOException {
    builder.startObject();
toInnerXContent(builder, params);
    builder.endObject();
    return builder;
}

public XContentBuilder toInnerXContent(XContentBuilder builder, Params params) throws IOException {
    boolean licenseSpecMode = params.paramAsBoolean(LICENSE_SPEC_VIEW_MODE, false);
    boolean restViewMode = params.paramAsBoolean(REST_VIEW_MODE, false);
    boolean previouslyHumanReadable = builder.humanReadable();
    if (licenseSpecMode && restViewMode) {
        throw new IllegalArgumentException("can have either "+ REST_VIEW_MODE + " or "+ LICENSE_SPEC_VIEW_MODE);
    } else if (restViewMode) {
        if (!previouslyHumanReadable) {
            builder.humanReadable(true);
        }
    }

    final int version;
    if (params.param(LICENSE_VERSION_MODE) != null && restViewMode) {
        version = Integer.parseInt(params.param(LICENSE_VERSION_MODE));
    } else {
        version = this.version;
    }
    if (restViewMode) {
        builder.field(Fields.STATUS, status().label());
    }
    builder.field(Fields.UID, uid);
    builder.field(Fields.TYPE, type);
    if (version == VERSION_START) {
        builder.field(Fields.SUBSCRIPTION_TYPE, subscriptionType);
    }
    builder.timeField(Fields.ISSUE_DATE_IN_MILLIS, Fields.ISSUE_DATE, issueDate);
    if (version == VERSION_START) {
        builder.field(Fields.FEATURE, feature);
    }
    if (expiryDate != LicenseService.BASIC_SELF_GENERATED_LICENSE_EXPIRATION_MILLIS) {
        builder.timeField(Fields.EXPIRY_DATE_IN_MILLIS, Fields.EXPIRY_DATE, expiryDate);
    }
builder.field(Fields.MAX_NODES, maxNodes);
builder.field(Fields.ISSUED_TO, issuedTo);
builder.field(Fields.ISSUER, issuer);
if (!licenseSpecMode && !restViewMode && signature != null) {
    builder.field(Fields.SIGNATURE, signature);
}
if (restViewMode) {
    builder.humanReadable(PreviouslyHumanReadable);
}
if (version >= VERSION_START_DATE) {
    builder.timeField(Fields.START_DATE_IN_MILLIS, Fields.START_DATE, startDate);
}
return builder;

public static License fromXContent(XContentParser parser) throws IOException {
    Builder builder = new Builder();
    XContentParser.Token token;
    while ((token = parser.nextToken()) != XContentParser.Token.END_OBJECT) {
        if (token == XContentParser.Token.FIELD_NAME) {
            String currentFieldName = parser.currentName();
            token = parser.nextToken();
            if (token.isValue()) {
                if (Fields.UID.equals(currentFieldName)) {
                    builder.uid(parser.text());
                } else if (Fields.TYPE.equals(currentFieldName)) {
                    builder.type(parser.text());
                } else if (Fields.SUBSCRIPTION_TYPE.equals(currentFieldName)) {
                    builder.subscriptionType(parser.text());
                } else if (Fields.ISSUE_DATE.equals(currentFieldName)) {
                    builder.issueDate(parseDate(parser, "issue", false));
                } else if (Fields.ISSUE_DATE_IN_MILLIS.equals(currentFieldName)) {
                    builder.issueDate(parser.longValue());
                } else if (Fields.FEATURE.equals(currentFieldName)) {
                    builder.feature(parser.text());
                } else if (Fields.EXPIRY_DATE.equals(currentFieldName)) {
                    builder.expiryDate(parseDate(parser, "expiration", true));
                } else if (Fields.EXPIRY_DATE_IN_MILLIS.equals(currentFieldName)) {
                    builder.expiryDate(parser.longValue());
                } else if (Fields.START_DATE.equals(currentFieldName)) {
                    builder.startDate(parseDate(parser, "start", false));
                } else if (Fields.START_DATE_IN_MILLIS.equals(currentFieldName)) {
                    builder.startDate(parser.longValue());
                } else if (Fields.MAX_NODES.equals(currentFieldName)) {
                    builder.maxNodes(parser.intValue());
                } else if (Fields.ISSUED_TO.equals(currentFieldName)) {
                    builder.issuedTo(parser.text());
                }
            }
        }
    }
    return builder;
}
if (token == XContentParser.Token.START_ARRAY) {
    // It was probably created by newer version - ignoring
    parser.skipChildren();
} else if (token == XContentParser.Token.START_OBJECT) {
    // It was probably created by newer version - ignoring
    parser.skipChildren();
}
}
// not a license spec
if (builder.signature != null) {
    byte[] signatureBytes = Base64.getDecoder().decode(builder.signature);
    ByteBuffer byteBuffer = ByteBuffer.wrap(signatureBytes);
    int version = byteBuffer.getInt();
    // we take the absolute version, because negative versions
    // mean that the license was generated by the cluster (see TrialLicense)
    // and positive version means that the license was signed
    if (version < 0) {
        version *= -1;
    }
    if (version == 0) {
        throw new ElasticsearchException("malformed signature for license [" + builder.uid + "]");
    } else if (version > VERSION_CURRENT) {
        throw new ElasticsearchException("Unknown license version found, please upgrade all nodes to the latest
        " +
        "elasticsearch-license plugin");
    }
    // signature version is the source of truth
    builder.version(version);
}
return builder.build();

/**
 * Returns true if the license was auto-generated (by license plugin),
 * false otherwise
 */
public static boolean isAutoGeneratedLicense(String signature) {
    try {
        byte[] signatureBytes = Base64.getDecoder().decode(signature);
ByteBuffer byteBuffer = ByteBuffer.wrap(signatureBytes);
return byteBuffer.getInt() < 0;
} catch (IllegalArgumentException e) {
    throw new IllegalStateException(e);
}
}

public static License fromSource(BytesReference bytes, XContentType xContentType) throws IOException {
    if (bytes == null || bytes.length() == 0) {
        throw new ElasticsearchParseException("failed to parse license - no content provided");
    }
    if (xContentType == null) {
        throw new ElasticsearchParseException("failed to parse license - no content-type provided");
    }
    // EMPTY is safe here because we don't call namedObject
    try (InputStream byteStream = bytes.streamInput();
         XContentParser parser = xContentType.xContent()
             .createParser(NamedXContentRegistry.EMPTY, LoggingDeprecationHandler.INSTANCE, byteStream)) {
        License license = null;
        if (parser.nextToken() == XContentParser.Token.START_OBJECT) {
            if (parser.nextToken() == XContentParser.Token.FIELD_NAME) {
                String currentFieldName = parser.currentName();
                if (Fields.LICENSES.equals(currentFieldName)) {
                    final List<License> pre20Licenses = new ArrayList<>();
                    if (parser.nextToken() == XContentParser.Token.START_ARRAY) {
                        while (parser.nextToken() != XContentParser.Token.END_ARRAY) {
                            pre20Licenses.add(License.fromXContent(parser));
                        }
                    // take the latest issued unexpired license
                    CollectionUtil.timSort(pre20Licenses, LATEST_ISSUE_DATE_FIRST);
                    long now = System.currentTimeMillis();
                    for (License oldLicense : pre20Licenses) {
                        if (oldLicense.expiryDate() > now) {
                            license = oldLicense;
                            break;
                        }
                    }
                } else if (Fields.LICENSE.equals(currentFieldName)) {
                    license = License.fromXContent(parser);
                }
            } else {
                throw new ElasticsearchParseException("failed to parse licenses expected an array of licenses");
            }
        } else if (Fields.LICENSE.equals(currentFieldName)) {
            license = License.fromXContent(parser);
        }
        // Ignore all other fields - might be created with new version
} else
    throw new ElasticsearchParseException("failed to parse licenses expected field");

} else {
    throw new ElasticsearchParseException("failed to parse licenses expected start object");
}
return license;
}

@override
equals(Object o) {
    if (this == o) return true;
    if (o == null || getClass() != o.getClass()) return false;
    License license = (License) o;

    if (issueDate != license.issueDate) return false;
    if (expiryDate != license.expiryDate) return false;
    if (startDate != license.startDate) return false;
    if (maxNodes != license.maxNodes) return false;
    if (version != license.version) return false;
    if (uid != null ? !uid.equals(license.uid) : license.uid != null) return false;
    if (issuer != null ? !issuer.equals(license.issuer) : license.issuer != null) return false;
    if (issuedTo != null ? !issuedTo.equals(license.issuedTo) : license.issuedTo != null) return false;
    if (type != null ? !type.equals(license.type) : license.type != null) return false;
    if (subscriptionType != null ? !subscriptionType.equals(license.subscriptionType) : license.subscriptionType != null)
        return false;
    if (feature != null ? !feature.equals(license.feature) : license.feature != null) return false;

    return !(signature != null ? !signature.equals(license.signature) : license.signature != null);

}

@override
hashCode() {
    int result = uid != null ? uid.hashCode() : 0;
    result = 31 * result + (issuer != null ? issuer.hashCode() : 0);
    result = 31 * result + (issuedTo != null ? issuedTo.hashCode() : 0);
    result = 31 * result + (int) (issueDate ^ (issueDate >>> 32));
    result = 31 * result + (type != null ? type.hashCode() : 0);
    result = 31 * result + (subscriptionType != null ? subscriptionType.hashCode() : 0);
    result = 31 * result + (feature != null ? feature.hashCode() : 0);
    result = 31 * result + (signature != null ? signature.hashCode() : 0);
    result = 31 * result + (expiryDate ^ (expiryDate >>> 32));
    result = 31 * result + (int) (startDate ^ (startDate >>> 32));
    result = 31 * result + maxNodes;
    result = 31 * result + version;
private static long parseDate(XContentParser parser, String description, boolean endOfTheDay) throws IOException {
    if (parser.currentToken() == XContentParser.Token.VALUE_NUMBER) {
        return parser.longValue();
    } else {
        try {
            if (endOfTheDay) {
                return DateUtils.endOfTheDay(parser.text());
            } else {
                return DateUtils.beginningOfTheDay(parser.text());
            }
        } catch (IllegalArgumentException ex) {
            throw new ElasticsearchParseException("invalid " + description + ": date format " + parser.text());
        }
    }
}

public static Builder builder() {
    return new Builder();
}

public static class Builder {
private int version = License.VERSION_CURRENT;
private String uid;
private String issuer;
private String issuedTo;
private long issueDate = -1;
private String type;
private String subscriptionType;
private String feature;
private String signature;
private long expiryDate = -1;
private long startDate = -1;
private int maxNodes = -1;

public Builder uid(String uid) {
    this.uid = uid;
    return this;
}

public Builder version(int version) {
    this.version = version;
    return this;
}

public Builder issuer(String issuer) {
    this.issuer = issuer;
    return this;
}

public Builder issuedTo(String issuedTo) {
    this.issuedTo = issuedTo;
    return this;
}

public Builder issueDate(long issueDate) {
    this.issueDate = issueDate;
    return this;
}

public Builder type(String type) {
    this.type = type;
    return this;
}

public Builder subscriptionType(String subscriptionType) {
    this.subscriptionType = subscriptionType;
    return this;
}
public Builder feature(String feature) {
    this.feature = feature;
    return this;
}

public Builder expiryDate(long expiryDate) {
    this.expiryDate = expiryDate;
    return this;
}

public Builder maxNodes(int maxNodes) {
    this.maxNodes = maxNodes;
    return this;
}

public Builder signature(String signature) {
    if (signature != null) {
        this.signature = signature;
    }
    return this;
}

public Builder startDate(long startDate) {
    this.startDate = startDate;
    return this;
}

public Builder fromLicenseSpec(License license, String signature) {
    return uid(license.uid())
        .version(license.version())
        .issuedTo(license.issuedTo())
        .issueDate(license.issueDate())
        .startDate(license.startDate())
        .type(license.type())
        .subscriptionType(license.subscriptionType)
        .feature(license.feature)
        .maxNodes(license.maxNodes())
        .expiryDate(license.expiryDate())
        .issuer(license.issuer())
        .signature(signature);
}

/**
 * Returns a builder that converts pre 2.0 licenses
 * to the new license format
 */
public Builder fromPre20LicenseSpec(License pre20License) {
    return uid(pre20License.uid())
```java
public License build() {
    return new License(version, uid, issuer, issuedTo, issueDate, type,
                        subscriptionType, feature, signature, expiryDate, maxNodes, startDate);
}

public Builder validate() {
    if (issuer == null) {
        throw new IllegalStateException("issuer can not be null");
    } else if (issuedTo == null) {
        throw new IllegalStateException("issuedTo can not be null");
    } else if (issueDate == -1) {
        throw new IllegalStateException("issueDate has to be set");
    } else if (type == null) {
        throw new IllegalStateException("type can not be null");
    } else if (uid == null) {
        throw new IllegalStateException("uid can not be null");
    } else if (signature == null) {
        throw new IllegalStateException("signature can not be null");
    } else if (maxNodes == -1) {
        throw new IllegalStateException("maxNodes has to be set");
    } else if (expiryDate == -1) {
        throw new IllegalStateException("expiryDate has to be set");
    }
    return this;
}

/**
 * Returns <code>true</code> iff the license is a production license
 */
public boolean isProductionLicense() {
    switch (operationMode()) {
    case MISSING:
    case TRIAL:
    case BASIC:
        return false;
    case STANDARD:
    case GOLD:
    case PLATINUM:
        return true;
    default:
        throw new AssertionError("unknown operation mode: "+operationMode());
    }
}
package org.elasticsearch.license;

import org.elasticsearch.Version;
import org.elasticsearch.common.Nullable;
import org.elasticsearch.common.Strings;
import org.elasticsearch.common.logging.LoggerMessageFormat;
import org.elasticsearch.common.logging.Loggers;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.license.License.OperationMode;
import org.elasticsearch.xpack.core.XPackField;
import org.elasticsearch.xpack.core.XPackSettings;
import org.elasticsearch.xpack.core.monitoring.MonitoringField;

import java.util.Collections;
import java.util.LinkedHashMap;
import java.util.List;
import java.util.Map;
import java.util.Objects;
import java.util.concurrent.CopyOnWriteArrayList;
import java.util.function.BiFunction;

/**
 * A holder for the current state of the license for all xpack features.
 */
public class XPackLicenseState {

    /** Messages for each feature which are printed when the license expires. */
    static final Map<String, String[]> EXPIRATION_MESSAGES;
    static {
        Map<String, String[]> messages = new LinkedHashMap<>();
        messages.put(XPackField.SECURITY, new String[] {
            "Cluster health, cluster stats and indices stats operations are blocked",
            "All data operations (read and write) continue to work"
        });
        messages.put(XPackField.WATCHER, new String[] {
            "PUT / GET watch APIs are disabled, DELETE watch API continues to work",
            "Watches execute and write to the history",
            "The actions of the watches don't execute"
        });
    }
}
messages.put(XPackField.MONITORING, new String[] {
    "The agent will stop collecting cluster and indices metrics",
    "The agent will stop automatically cleaning indices older than [xpack.monitoring.history.duration]"
});
messages.put(XPackField.GRAPH, new String[] {
    "Graph explore APIs are disabled"
});
messages.put(XPackField.MACHINE_LEARNING, new String[] {
    "Machine learning APIs are disabled"
});
messages.put(XPackField.LOGSTASH, new String[] {
    "Logstash will continue to poll centrally-managed pipelines"
});
messages.put(XPackField.BEATS, new String[] {
    "Beats will continue to poll centrally-managed configuration"
});
messages.put(XPackField.DEPRECIATION, new String[] {
    "Deprecation APIs are disabled"
});
messages.put(XPackField.UPGRADE, new String[] {
    "Upgrade API is disabled"
});
messages.put(XPackField.SQL, new String[] {
    "SQL support is disabled"
});
messages.put(XPackField.ROLLUP, new String[] {
    "Creating and Starting rollup jobs will no longer be allowed.",
    "Stopping/Deleting existing jobs, RollupCaps API and RollupSearch continue to function."
});
EXPIRATION_MESSAGES = Collections.unmodifiableMap(messages);

/**
 * Messages for each feature which are printed when the license type changes.
 * The value is a function taking the old and new license type, and returns the messages for that feature.
 */
static final Map<String, BiFunction<OperationMode, OperationMode, String[]>> ACKNOWLEDGMENT_MESSAGES;
static {
    Map<String, BiFunction<OperationMode, OperationMode, String[]>> messages = new LinkedHashMap<>();
    messages.put(XPackField.SECURITY, XPackLicenseState::securityAcknowledgementMessages);
    messages.put(XPackField.WATCHER, XPackLicenseState::watcherAcknowledgementMessages);
    messages.put(XPackField.MONITORING, XPackLicenseState::monitoringAcknowledgementMessages);
    messages.put(XPackField.GRAPH, XPackLicenseState::graphAcknowledgementMessages);
    messages.put(XPackField.MACHINE_LEARNING, XPackLicenseState::machineLearningAcknowledgementMessages);
    messages.put(XPackField.LOGSTASH, XPackLicenseState::logstashAcknowledgementMessages);
    messages.put(XPackField.BEATS, XPackLicenseState::beatsAcknowledgementMessages);
    ACKNOWLEDGMENT_MESSAGES = Collections.unmodifiableMap(messages);
}
messages.put(XPackField.SQL, XPackLicenseState::sqlAcknowledgementMessages);
ACKNOWLEDGMENT_MESSAGES = Collections.unmodifiableMap(messages);
}

private static String[] securityAcknowledgementMessages(OperationMode currentMode, OperationMode newMode) {
    switch (newMode) {
        case BASIC:
            switch (currentMode) {
                case TRIAL:
                case STANDARD:
                case GOLD:
                case PLATINUM:
                    return new String[] {
                        "The following X-Pack security functionality will be disabled: authentication, authorization, " +
                        "ip filtering, and auditing. Please restart your node after applying the license.",
                        "Field and document level access control will be disabled.",
                        "Custom realms will be ignored."
                    };
            }
            break;
        case GOLD:
            switch (currentMode) {
                case BASIC:
                case STANDARD:
                // ^^ though technically it was already disabled, it's not bad to remind them
                case TRIAL:
                case PLATINUM:
                    return new String[] {
                        "Field and document level access control will be disabled.",
                        "Custom realms will be ignored."
                    };
            }
            break;
        case STANDARD:
            switch (currentMode) {
                case BASIC:
                // ^^ though technically it was already disabled, it's not bad to remind them
                case GOLD:
                case PLATINUM:
                case TRIAL:
                    return new String[] {
                        "Authentication will be limited to the native realms.",
                        "IP filtering and auditing will be disabled.",
                        "Field and document level access control will be disabled.",
                        "Custom realms will be ignored."
                    };
            }
            break;
private static String[] watcherAcknowledgementMessages(OperationMode currentMode, OperationMode newMode) {
    switch (newMode) {
    case BASIC:
        switch (currentMode) {
        case TRIAL:
            case STANDARD:
            case GOLD:
            case PLATINUM:
                return new String[] { "Watcher will be disabled" };
        }
        break;
    }
    return Strings.EMPTY_ARRAY;
}

private static String[] monitoringAcknowledgementMessages(OperationMode currentMode, OperationMode newMode) {
    switch (newMode) {
    case BASIC:
        switch (currentMode) {
        case TRIAL:
            case STANDARD:
            case GOLD:
            case PLATINUM:
                return new String[] {
                    LoggerMessageFormat.format("Multi-cluster support is disabled for clusters with [{}] license. If you are not running multiple clusters, users won't be able to access the clusters with [{}]").
                    " licenses from within a single X-Pack Kibana instance. You will have to deploy a [{}]
                    " separate and dedicated X-pack Kibana instance for each [{}] cluster you wish to monitor.",
                    newMode, newMode, newMode,
                    LoggerMessageFormat.format("Automatic index cleanup is locked to [{} days for clusters with [{}]").
                    MonitoringField.HISTORY_DURATION.getDefault(Settings.EMPTY).days(), newMode)
                };
        }
        break;
    }
    return Strings.EMPTY_ARRAY;
}

private static String[] graphAcknowledgementMessages(OperationMode currentMode, OperationMode newMode) {

switch (newMode) {
    case BASIC:
    case STANDARD:
    case GOLD:
        switch (currentMode) {
            case TRIAL:
            case PLATINUM:
                return new String[] { "Graph will be disabled" };
        }
        break;
    }
    return Strings.EMPTY_ARRAY;
}

private static String[] machineLearningAcknowledgementMessages(OperationMode currentMode, OperationMode newMode) {
    switch (newMode) {
        case BASIC:
        case STANDARD:
        case GOLD:
            switch (currentMode) {
                case TRIAL:
                case PLATINUM:
                    return new String[] { "Machine learning will be disabled" };
            }
            break;
        }
        return Strings.EMPTY_ARRAY;
    }

private static String[] logstashAcknowledgementMessages(OperationMode currentMode, OperationMode newMode) {
    switch (newMode) {
        case BASIC:
            if (isBasic(currentMode) == false) {
                return new String[] { "Logstash will no longer poll for centrally-managed pipelines" };
            }
            break;
        }
        return Strings.EMPTY_ARRAY;
    }

private static String[] beatsAcknowledgementMessages(OperationMode currentMode, OperationMode newMode) {
    switch (newMode) {
        case BASIC:
            if (isBasic(currentMode) == false) {
                return new String[] { "Beats will no longer be able to use centrally-managed configuration" };
            }
            break;
    }
    return Strings.EMPTY_ARRAY;
}
private static String[] sqlAcknowledgementMessages(OperationMode currentMode, OperationMode newMode) {
    switch (newMode) {
        case BASIC:
            case STANDARD:
                case GOLD:
                    switch (currentMode) {
                        case TRIAL:
                            case PLATINUM:
                                return new String[] {
                                    "JDBC and ODBC support will be disabled, but you can continue to use SQL CLI and REST endpoint"
                                };
                    }
        }
    }
    return Strings.EMPTY_ARRAY;
}

private static boolean isBasic(OperationMode mode) {
    return mode == OperationMode.BASIC;
}

/** A wrapper for the license mode and state, to allow atomically swapping. */
private static class Status {
    /** The current "mode" of the license (ie license type). */
    final OperationMode mode;

    /** True if the license is active, or false if it is expired. */
    final boolean active;

    Status(OperationMode mode, boolean active) {
        this.mode = mode;
        this.active = active;
    }
}

private final List<LicenseStateListener> listeners;
private final boolean isSecurityEnabled;
private final boolean isSecurityExplicitlyEnabled;

private Status status = new Status(OperationMode.TRIAL, true);
private boolean isSecurityEnabledByTrialVersion;
public XPackLicenseState(Settings settings) {
    this.listeners = new CopyOnWriteArrayList<>();
    this.isSecurityEnabled = XPackSettings.SECURITY_ENABLED.get(settings);
    // 6.0+ requires TLS for production licenses, so if TLS is enabled and security is enabled
    // we can interpret this as an explicit enabling of security if the security enabled
    // setting is not explicitly set
    this.isSecurityExplicitlyEnabled = isSecurityEnabled &&
    (settings.hasValue(XPackSettings.SECURITY_ENABLED.getKey()) ||
     XPackSettings.TRANSPORT_SSL_ENABLED.get(settings));
    this.isSecurityEnabledByTrialVersion = false;
}

private XPackLicenseState(XPackLicenseState xPackLicenseState) {
    this.listeners = xPackLicenseState.listeners;
    this.isSecurityEnabled = xPackLicenseState.isSecurityEnabled;
    this.isSecurityExplicitlyEnabled = xPackLicenseState.isSecurityExplicitlyEnabled;
    this.status = xPackLicenseState.status;
    this.isSecurityEnabledByTrialVersion = xPackLicenseState.isSecurityEnabledByTrialVersion;
}

/**
 * Updates the current state of the license, which will change what features are available.
 *
 * @param mode   The mode (type) of the current license.
 * @param active True if the current license exists and is within its allowed usage period; false if it is expired or
 * missing.
 * @param mostRecentTrialVersion If this cluster has, at some point commenced a trial, the most recent version
 * on which they did that.
 *      May be [@code null] if they have never generated a trial license on this cluster, or the most
 * recent
 * trial was prior to this metadata being tracked (6.1)
 */
void update(OperationMode mode, boolean active, @Nullable Version mostRecentTrialVersion) {
    synchronized (this) {
        status = new Status(mode, active);
        if (isSecurityEnabled == true && isSecurityExplicitlyEnabled == false && mode == OperationMode.TRIAL
        && isSecurityEnabledByTrialVersion == false) {
            // Before 6.3, Trial licenses would default having security enabled.
            // If this license was generated before that version, then treat it as if security is explicitly enabled
            if (mostRecentTrialVersion == null || mostRecentTrialVersion.before(Version.V_6_3_0)) {
                Loggers.getLogger(getClass()).info("Automatically enabling security for older trial license ({}")",
                mostRecentTrialVersion == null ? "[pre 6.1.0]" : mostRecentTrialVersion.toString());
                isSecurityEnabledByTrialVersion = true;
            }
        }
    }
    listeners.forEach(LicenseStateListener::licenseStateChanged);
/** Add a listener to be notified on license change */
public void addListener(final LicenseStateListener listener) {
    listeners.add(Objects.requireNonNull(listener));
}

/** Remove a listener */
public void removeListener(final LicenseStateListener listener) {
    listeners.remove(Objects.requireNonNull(listener));
}

/** Return the current license type. */
public synchronized OperationMode getOperationMode() {
    return status.mode;
}

/** Return true if the license is currently within its time boundaries, false otherwise. */
public synchronized boolean isActive() {
    return status.active;
}

/**
 * @return true if authentication and authorization should be enabled. this does not indicate what realms are available
 * @see #allowedRealmType() for the enabled realms
 */
public synchronized boolean isAuthAllowed() {
    OperationMode mode = status.mode;
    final boolean isSecurityCurrentlyEnabled =
        isSecurityEnabled(mode, isSecurityExplicitlyEnabled, isSecurityEnabledByTrialVersion, isSecurityEnabled);
    return isSecurityCurrentlyEnabled && (mode == OperationMode.STANDARD || mode == OperationMode.GOLD
        || mode == OperationMode.PLATINUM || mode == OperationMode.TRIAL);
}

/**
 * @return true if IP filtering should be enabled
 */
public synchronized boolean isIpFilteringAllowed() {
    OperationMode mode = status.mode;
    final boolean isSecurityCurrentlyEnabled =
        isSecurityEnabled(mode, isSecurityExplicitlyEnabled, isSecurityEnabledByTrialVersion, isSecurityEnabled);
    return isSecurityCurrentlyEnabled && (mode == OperationMode.GOLD || mode == OperationMode.PLATINUM || mode == OperationMode.TRIAL);
}
* @return true if auditing should be enabled
*/
public synchronized boolean isAuditingAllowed() {
    OperationMode mode = status.mode;
    final boolean isSecurityCurrentlyEnabled =
        isSecurityEnabled(mode, isSecurityExplicitlyEnabled, isSecurityEnabledByTrialVersion, isSecurityEnabled);
    return isSecurityCurrentlyEnabled && (mode == OperationMode.GOLD || mode == OperationMode.PLATINUM || mode == OperationMode.TRIAL);
}

/**
* Indicates whether the stats and health API calls should be allowed. If a license is expired and past the grace
* period then we deny these calls.
*
* @return true if the license allows for the stats and health APIs to be used.
*/
public synchronized boolean isStatsAndHealthAllowed() {
    return status.active;
}

/**
* Determine if Document Level Security (DLS) and Field Level Security (FLS) should be enabled.
* <p>
* DLS and FLS are only disabled when the mode is not:
* <ul>
* <li>{@link OperationMode#PLATINUM}</li>
* <li>{@link OperationMode#TRIAL}</li>
* </ul>
* Note: This does not consider the <em>state</em> of the license so that Security does not suddenly leak
* information!
*
* @return [@code true] to enable DLS and FLS. Otherwise [@code false].
*/
public synchronized boolean isDocumentAndFieldLevelSecurityAllowed() {
    OperationMode mode = status.mode;
    final boolean isSecurityCurrentlyEnabled =
        isSecurityEnabled(mode, isSecurityExplicitlyEnabled, isSecurityEnabledByTrialVersion, isSecurityEnabled);
    return isSecurityCurrentlyEnabled && (mode == OperationMode.TRIAL || mode == OperationMode.PLATINUM);
}

/** Classes of realms that may be available based on the license type. */
public enum AllowedRealmType {
    NONE,
    NATIVE,
    DEFAULT,
    ALL,
}
public synchronized AllowedRealmType allowedRealmType() {
    final boolean isSecurityCurrentlyEnabled = isSecurityEnabled(status.mode, isSecurityExplicitlyEnabled, isSecurityEnabledByTrialVersion, isSecurityEnabled);
    if (isSecurityCurrentlyEnabled) {
        switch (status.mode) {
            case PLATINUM:
            case TRIAL:
                return AllowedRealmType.ALL;
            case GOLD:
                return AllowedRealmType.DEFAULT;
            case STANDARD:
                return AllowedRealmType.NATIVE;
            default:
                return AllowedRealmType.NONE;
        }
    } else {
        return AllowedRealmType.NONE;
    }
}

/**
 * @return whether custom role providers are allowed based on the license [ @link OperationMode]
 */
public synchronized boolean isCustomRoleProvidersAllowed() {
    final boolean isSecurityCurrentlyEnabled = isSecurityEnabled(status.mode, isSecurityExplicitlyEnabled, isSecurityEnabledByTrialVersion, isSecurityEnabled);
    return isSecurityCurrentlyEnabled && (status.mode == OperationMode.PLATINUM || status.mode == OperationMode.TRIAL) && status.active;
}

/**
 * @return whether "authorization_realms" are allowed based on the license [ @link OperationMode]
 * @see org.elasticsearch.xpack.core.security.authc.support.DelegatedAuthorizationSettings
 */
public boolean isAuthorizationRealmAllowed() {
    final Status localStatus = status;
    return (localStatus.mode == OperationMode.PLATINUM || localStatus.mode == OperationMode.TRIAL) && localStatus.active;
}
* Determine if Watcher is available based on the current license.
* <p>
* Watcher is available if the license is active (hasn't expired) and of one of the following types:
* <ul>
* <li>{@link OperationMode#STANDARD}</li>
* <li>{@link OperationMode#PLATINUM}</li>
* <li>{@link OperationMode#GOLD}</li>
* <li>{@link OperationMode#TRIAL}</li>
* </ul>
* <p>
* @return {@code true} as long as the license is valid. Otherwise {@code false}.
* /
public synchronized boolean isWatcherAllowed() {
    Status localStatus = status;

    if (localStatus.active == false) {
        return false;
    }

    switch (localStatus.mode) {
        case TRIAL:
        case GOLD:
        case PLATINUM:
        case STANDARD:
            return true;
        default:
            return false;
    }
}

/**
 * Monitoring is always available as long as there is a valid license
 * <p>
 * @return true if the license is active
 * /
public synchronized boolean isMonitoringAllowed() {
    return status.active;
}

/**
 * Monitoring Cluster Alerts requires the equivalent license to use Watcher.
 * <p>
 * @return [ @link #isWatcherAllowed()]
 * @see #isWatcherAllowed()
 * /
public synchronized boolean isMonitoringClusterAlertsAllowed() {
    return isWatcherAllowed();
}
/**
 * Determine if the current license allows the retention of indices to be modified.
 * <p>
 * Only users with a non-[@link OperationMode#BASIC] license can update the retention period.
 * <p>
 * Note: This does not consider the <em>state</em> of the license so that any change is remembered for when
 * they fix their license.
 * <p>
 * @return {@code true} if the user is allowed to modify the retention. Otherwise {@code false}.
 */
public synchronized boolean isUpdateRetentionAllowed() {
    final OperationMode mode = status.mode;
    return mode != OperationMode.BASIC && mode != OperationMode.MISSING;
}

/**
 * Determine if Graph Exploration should be enabled.
 * <p>
 * Exploration is only disabled when the license has expired or if the mode is not:
 * <ul>
 * <li>{@link OperationMode#PLATINUM}</li>
 * <li>{@link OperationMode#TRIAL}</li>
 * </ul>
 * <p>
 * @return {@code true} as long as the license is valid. Otherwise {@code false}.
 */
public synchronized boolean isGraphAllowed() {
    Status localStatus = status;
    OperationMode operationMode = localStatus.mode;

    boolean licensed = operationMode == OperationMode.TRIAL || operationMode ==
    OperationMode.PLATINUM;

    return licensed && localStatus.active;
}

/**
 * Determine if Machine Learning should be enabled.
 * <p>
 * Machine Learning is only disabled when the license has expired or if the
 * mode is not:
 * <ul>
 * <li>{@link OperationMode#PLATINUM}</li>
 * <li>{@link OperationMode#TRIAL}</li>
 * </ul>
 * <p>
 * @return {@code true} as long as the license is valid. Otherwise
public synchronized boolean isMachineLearningAllowed() {
    final Status currentStatus = status;
    return currentStatus.active && isMachineLearningAllowedForOperationMode(currentStatus.mode);
}

public static boolean isMachineLearningAllowedForOperationMode(final OperationMode operationMode) {
    return isPlatinumOrTrialOperationMode(operationMode);
}

/**
 * Rollup is always available as long as there is a valid license
 * @return true if the license is active
 */
public synchronized boolean isRollupAllowed() {
    return status.active;
}

/**
 * Logstash is allowed as long as there is an active license of type TRIAL, STANDARD, GOLD or PLATINUM
 * @return [@code true] as long as there is a valid license
 */
public synchronized boolean isLogstashAllowed() {
    Status localStatus = status;
    return localStatus.active && (isBasic(localStatus.mode) == false);
}

/**
 * Beats is allowed as long as there is an active license of type TRIAL, STANDARD, GOLD or PLATINUM
 * @return [@code true] as long as there is a valid license
 */
public boolean isBeatsAllowed() {
    Status localStatus = status;
    return localStatus.active && (isBasic(localStatus.mode) == false);
}

/**
 * Deprecation APIs are always allowed as long as there is an active license
 * @return [@code true] as long as there is a valid license
 */
public synchronized boolean isDeprecationAllowed() {
    return status.active;
}

/**
 * [code false].
 */
* Determine if Upgrade API should be enabled.
*  
*  Upgrade API is not available in for all license types except \{@link OperationMode#MISSING\}
*  
*  @return [ @code true ] as long as the license is valid. Otherwise
*  [ @code false ].
*  
public synchronized boolean isUpgradeAllowed() {
    // Should work on all active licenses
    return status.active;
}

/**
* Determine if SQL support should be enabled.
*  
*  SQL is available for all license types except \{@link OperationMode#MISSING\}
*/

cleanup synchronized boolean isSqlAllowed() {
    return status.active;
}

/**
* Determine if JDBC support should be enabled.
*  
*  JDBC is available only in for \{@link OperationMode#PLATINUM\} and \{@link OperationMode#TRIAL\}
licences
*/

cleanup synchronized boolean isJdbcAllowed() {
    Status localStatus = status;
    OperationMode operationMode = localStatus.mode;

    boolean licensed = operationMode == OperationMode.TRIAL || operationMode ==
OperationMode.PLATINUM;

    return licensed && localStatus.active;
}

/**
* Determine if ODBC support should be enabled.
*  
*  ODBC is available only in for \{@link OperationMode#PLATINUM\} and \{@link OperationMode#TRIAL\}
licences
*/

cleanup synchronized boolean isOdbcAllowed() {
    Status localStatus = status;
    OperationMode operationMode = localStatus.mode;

    boolean licensed = operationMode == OperationMode.TRIAL || operationMode ==

public synchronized boolean isTrialLicense() {
    return status.mode == OperationMode.TRIAL;
}

/**
 * @return true if security is available to be used with the current license type
 */
public synchronized boolean isSecurityAvailable() {
    OperationMode mode = status.mode;
    return mode == OperationMode.GOLD || mode == OperationMode.PLATINUM || mode == OperationMode.STANDARD ||
            mode == OperationMode.TRIAL;
}

/**
 * @return true if security has been disabled by a trial license which is the case of the default distribution post 6.3.0. The conditions necessary for this are:
 * <ul>
 *     <li>A trial license generated in 6.3.0+</li>
 *     <li>xpack.security.enabled not specified as a setting</li>
 * </ul>
 */
public synchronized boolean isSecurityDisabledByTrialLicense() {
    return status.mode == OperationMode.TRIAL && isSecurityEnabled && isSecurityExplicitlyEnabled == false &&
            isSecurityEnabledByTrialVersion == false;
}

private static boolean isSecurityEnabled(final OperationMode mode, final boolean isSecurityExplicitlyEnabled, final boolean isSecurityEnabledByTrialVersion, final boolean isSecurityEnabled) {
    return mode == OperationMode.TRIAL ? (isSecurityExplicitlyEnabled || isSecurityEnabledByTrialVersion) :
            isSecurityEnabled;
}

/**
 * Determine if cross-cluster replication should be enabled.
 * <p>
 * Cross-cluster replication is only disabled when the license has expired or if the mode is not:
 * <ul>
 *     <li>{@link OperationMode#PLATINUM}</li>
 *     <li>{@link OperationMode#TRIAL}</li>
 * </ul>
 */
}
public synchronized boolean isCcrAllowed() {
    final Status currentStatus = status;
    return currentStatus.active && isCcrAllowedForOperationMode(currentStatus.mode);
}

public static boolean isCcrAllowedForOperationMode(final OperationMode operationMode) {
    return isPlatinumOrTrialOperationMode(operationMode);
}

public static boolean isPlatinumOrTrialOperationMode(final OperationMode operationMode) {
    return operationMode == OperationMode.PLATINUM || operationMode == OperationMode.TRIAL;
}

/**
 * Creates a copy of this object based on the state at the time the method was called. The
 * returned object will not be modified by a license update/expiration so it can be used to
 * make multiple method calls on the license state safely. This object should not be long
 * lived but instead used within a method when a consistent view of the license state
 * is needed for multiple interactions with the license state.
 */
public synchronized XPackLicenseState copyCurrentLicenseState() {
    return new XPackLicenseState(this);
}

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 */
package org.elasticsearch.license;

import org.elasticsearch.action.ActionRequestValidationException;
import org.elasticsearch.action.ValidateActions;
import org.elasticsearch.action.support.master.AcknowledgedRequest;
import org.elasticsearch.common.bytes.BytesReference;
import org.elasticsearch.common.io.stream.StreamInput;
import org.elasticsearch.common.io.stream.StreamOutput;
import org.elasticsearch.common.xcontent.XContentType;
import java.io.IOException;

public class PutLicenseRequest extends AcknowledgedRequest<PutLicenseRequest> {

    private License license;
    private boolean acknowledge = false;

    public PutLicenseRequest(License license) {
        this.license = license;
    }

    public PutLicenseRequest() {
        // Constructor...
    }

    @Override
    public void readFrom(StreamInput in) throws IOException {
        // Read from stream...
    }

    @Override
    public void writeTo(StreamOutput out) throws IOException {
        // Write to stream...
    }

    @Override
    public ActionRequestValidationException validate() {
        // Validate request...
    }
}

public enum OperationMode {
    FREE, DEMO, TRIAL, PLATINUM
}
public PutLicenseRequest() {
}

@Override
public ActionRequestValidationException validate() {
    return (license == null) ? ValidateActions.addValidationException("license is missing", null) : null;
}

/**
 * Parses license from json format to an instance of { @link License}
 * @param licenseDefinition licenses definition
 * @param xContentType the content type of the license
 */
public PutLicenseRequest license(BytesReference licenseDefinition, XContentType xContentType) {
    try {
        return license(License.fromSource(licenseDefinition, xContentType));
    } catch (IOException e) {
        throw new IllegalArgumentException("failed to parse license source", e);
    }
}

public PutLicenseRequest license(License license) {
    this.license = license;
    return this;
}

public License license() {
    return license;
}

public PutLicenseRequest acknowledge(boolean acknowledge) {
    this.acknowledge = acknowledge;
    return this;
}

public boolean acknowledged() {
    return acknowledge;
}

@Override
public void readFrom(StreamInput in) throws IOException {
    super.readFrom(in);
    license = License.readLicense(in);
    acknowledge = in.readBoolean();
}
@Override
public void writeTo(StreamOutput out) throws IOException {
    super.writeTo(out);
    license.writeTo(out);
    out.writeBoolean(acknowledge);
}

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 */
package org.elasticsearch.license;

import org.elasticsearch.action.support.master.AcknowledgedRequestBuilder;
import org.elasticsearch.client.ElasticsearchClient;
import org.elasticsearch.common.bytes.BytesReference;
import org.elasticsearch.common.xcontent.XContentType;
import org.elasticsearch.protocol.xpack.license.PutLicenseResponse;

/**
 * Register license request builder
 */
public class PutLicenseRequestBuilder extends AcknowledgedRequestBuilder<PutLicenseRequest,
PutLicenseResponse, PutLicenseRequestBuilder> {

    public PutLicenseRequestBuilder(ElasticsearchClient client) {
        this(client, PutLicenseAction.INSTANCE);
    }

    /**
     * Constructs register license request
     *
     * @param client elasticsearch client
     */
    public PutLicenseRequestBuilder(ElasticsearchClient client, PutLicenseAction action) {
        super(client, action, new PutLicenseRequest());
    }

    /**
     * Sets the license
     *
     * @param license license
     * @return this builder
     */
    public PutLicenseRequestBuilder setLicense(License license) {
        request.license(license);
        return this;
    }
}
public PutLicenseRequestBuilder setLicense(BytesReference licenseSource, XContentType xContentType) {
    request.license(licenseSource, xContentType);
    return this;
}

public PutLicenseRequestBuilder setAcknowledge(boolean acknowledge) {
    request.acknowledge(acknowledge);
    return this;
}

import org.elasticsearch.ElasticsearchSecurityException;
import org.elasticsearch.Version;
import org.elasticsearch.cluster.node.DiscoveryNodes;
import org.elasticsearch.rest.RestStatus;
import java.util.stream.StreamSupport;

public class LicenseUtils {

    public static final String EXPIRED_FEATURE_METADATA = "es.license.expired.feature";

    /**
     * Exception to be thrown when a feature action requires a valid license, but license
     * has expired
     * *
     * \<code>feature</code> accessible through \{@link #EXPIRED_FEATURE_METADATA\} in the
     * exception's rest header
     */
    public static ElasticsearchSecurityException newComplianceException(String feature) {
        ElasticsearchSecurityException e = new ElasticsearchSecurityException("current license is non-compliant for
        \[[{}]\]",
            RestStatus.FORBIDDEN, feature);
        e.addMetadata(EXPIRED_FEATURE_METADATA, feature);
        return e;
    }

    /**
     * Checks if a given \{@link ElasticsearchSecurityException\} refers to a feature that
     * requires a valid license, but the license has expired.
     */

public static boolean isLicenseExpiredException(ElasticsearchSecurityException exception) {
    return (exception != null) && (exception.getMetadata(EXPIRED_FEATURE_METADATA) != null);
}

public static boolean licenseNeedsExtended(License license) {
    return "basic".equals(license.type()) && license.expiryDate() !=
    LicenseService.BASIC_SELF_GENERATED_LICENSE_EXPIRATION_MILLIS;
}

/**
 * Checks if the signature of a self generated license with older version needs to be
 * recreated with the new key
 */
public static boolean signatureNeedsUpdate(License license, DiscoveryNodes currentNodes) {
    assert License.VERSION_CRYPTO_ALGORITHMS == License.VERSION_CURRENT : "update this method
    when adding a new version";

    return ("basic".equals(license.type()) || "trial".equals(license.type())) &&
    // only upgrade signature when all nodes are ready to deserialize the new signature
    license.version() < License.VERSION_CRYPTO_ALGORITHMS &&
    compatibleLicenseVersion(currentNodes) == License.VERSION_CRYPTO_ALGORITHMS
    );
}

public static int compatibleLicenseVersion(DiscoveryNodes currentNodes) {
    assert License.VERSION_CRYPTO_ALGORITHMS == License.VERSION_CURRENT : "update this method
    when adding a new version";

    if (StreamSupport.stream(currentNodes.spliterator(), false)
        .allMatch(node -> node.getVersion().onOrAfter(Version.V_6_4_0))) {
        // License.VERSION_CRYPTO_ALGORITHMS was introduced in 6.4.0
        return License.VERSION_CRYPTO_ALGORITHMS;
    } else {
        return License.VERSION_START_DATE;
    }
}

package org.elasticsearch.license;

import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.common.xcontent.XContentBuilder;
import org.elasticsearch.rest.BytesRestResponse;
import org.elasticsearch.rest.RestController;
import org.elasticsearch.rest.RestRequest;
import org.elasticsearch.rest.RestResponse;
import org.elasticsearch.rest.RestStatus;
import org.elasticsearch.rest.action.RestBuilderListener;
import org.elasticsearch.xpack.core.XPackClient;
import org.elasticsearch.xpack.core.rest.XPackRestHandler;
import java.io.IOException;
import static org.elasticsearch.rest.RestRequest.Method.GET;

public class RestGetBasicStatus extends XPackRestHandler {

    RestGetBasicStatus(Settings settings, RestController controller) {
        super(settings);
        controller.registerHandler(GET, URI_BASE + "/license/basic_status", this);
    }

    @Override
    protected RestChannelConsumer doPrepareRequest(RestRequest request, XPackClient client) throws IOException {
        return channel -> client.licensing().prepareGetStartBasic().execute(new RestBuilderListener<GetBasicStatusResponse>(channel) {
            @Override
            public RestResponse buildResponse(GetBasicStatusResponse response, XContentBuilder builder) throws Exception {
                builder.startObject();
                builder.field("eligible_to_start_basic", response.isEligibleToStartBasic());
                builder.endObject();
                return new BytesRestResponse(RestStatus.OK, builder);
            }
        });
    }

    @Override
    public String getName() {
        return "xpack_basic_status_action";
    }

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     */
}

package org.elasticsearch.license;
import org.elasticsearch.protocol.xpack.license.DeleteLicenseRequest;
import org.elasticsearch.rest.RestController;
import org.elasticsearch.rest.RestRequest;
import org.elasticsearch.rest.action.RestToXContentListener;
import org.elasticsearch.xpack.core.XPackClient;
import org.elasticsearch.xpack.core.rest.XPackRestHandler;

import java.io.IOException;
import static org.elasticsearch.rest.RestRequest.Method.DELETE;

public class RestDeleteLicenseAction extends XPackRestHandler {
    public RestDeleteLicenseAction(Settings settings, RestController controller) {
        super(settings);
        // @deprecated Remove deprecations in 6.0
        controller.registerWithDeprecatedHandler(DELETE, URI_BASE + "/license", this,
                DELETE, "/_license", deprecationLogger);

        // Remove _licenses support entirely in 6.0
        controller.registerAsDeprecatedHandler(DELETE, "/_licenses", this,
                
                `[DELETE /_licenses] is deprecated! Use ` +
                `[DELETE /_xpack/license] instead.`,
                deprecationLogger);
    }

    @Override
    public String getName() {
        return "xpack_delete_license_action";
    }

    @Override
    public RestChannelConsumer doPrepareRequest(final RestRequest request, final XPackClient client) throws IOException {
        DeleteLicenseRequest deleteLicenseRequest = new DeleteLicenseRequest();
        deleteLicenseRequest.timeout(request.paramAsTime("timeout", deleteLicenseRequest.timeout()));
        deleteLicenseRequest.masterNodeTimeout(request.paramAsTime("master_timeout",
                deleteLicenseRequest.masterNodeTimeout()));

        return channel -> client.es().admin().cluster().execute(DeleteLicenseAction.INSTANCE, deleteLicenseRequest,
                new RestToXContentListener<>(channel));
    }
}

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  */
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.common.xcontent.XContentBuilder;
import org.elasticsearch.rest.BytesRestResponse;
import org.elasticsearch.rest.RestController;
import org.elasticsearch.rest.RestRequest;
import org.elasticsearch.rest.RestResponse;
import org.elasticsearch.rest.action.RestBuilderListener;
import org.elasticsearch.xpack.core.XPackClient;
import org.elasticsearch.xpack.core.rest.XPackRestHandler;

import java.io.IOException;
import static org.elasticsearch.rest.RestRequest.Method.GET;

public class RestGetTrialStatus extends XPackRestHandler {

    RestGetTrialStatus(Settings settings, RestController controller) {
        super(settings);
        controller.registerHandler(GET, URI_BASE + "/license/trial_status", this);
    }

    @Override
    protected RestChannelConsumer doPrepareRequest(RestRequest request, XPackClient client) throws IOException {
        return channel -> client.licensing().prepareGetStartTrial().execute(
            new RestBuilderListener<GetTrialStatusResponse>(channel) {
                @Override
                public RestResponse buildResponse(GetTrialStatusResponse response, XContentBuilder builder) throws Exception {
                    builder.startObject();
                    builder.field("eligible_to_start_trial", response.isEligibleToStartTrial());
                    builder.endObject();
                    return new BytesRestResponse(RestStatus.OK, builder);
                }
            });
    }

    @Override
    public String getName() {
        return "xpack_trial_status_action";
    }
}

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 */
package org.elasticsearch.license;

import org.elasticsearch.common.logging.LoggerMessageFormat;
import org.elasticsearch.common.unit.TimeValue;

import java.util.UUID;

abstract class ExpirationCallback {

    static final String EXPIRATION_JOB_PREFIX = ".license_expiration_job_";

    public enum Orientation {PRE, POST}

    /**
     * Callback that is triggered every <code>frequency</code> when
     * current time is between <code>max</code> and <code>min</code>
     * before license expiry.
     */
    public abstract static class Pre extends ExpirationCallback {

        /**
         * Callback schedule prior to license expiry
         *
         * @param min latest relative time to execute before license expiry
         * @param max earliest relative time to execute before license expiry
         * @param frequency interval between execution
         */
        Pre(TimeValue min, TimeValue max, TimeValue frequency) {

            super(Orientation.PRE, min, max, frequency);
        }
    }

    /**
     * Callback that is triggered every <code>frequency</code> when
     * current time is between <code>min</code> and <code>max</code>
     * after license expiry.
     */
    public abstract static class Post extends ExpirationCallback {

        /**
         * Callback schedule after license expiry
         *
         * @param min earliest relative time to execute after license expiry
         * @param max latest relative time to execute after license expiry
         * @param frequency interval between execution
         */
        Post(TimeValue min, TimeValue max, TimeValue frequency) {

        }
    }
}
private final String id;
private final Orientation orientation;
private final long min;
private final long max;
private final long frequency;

private ExpirationCallback(Orientation orientation, TimeValue min, TimeValue max, TimeValue frequency) {
    this.orientation = orientation;
    this.min = (min == null) ? 0 : min.getMillis();
    this.max = (max == null) ? Long.MAX_VALUE : max.getMillis();
    this.frequency = frequency.getMillis();
    this.id = String.join("", EXPIRATION_JOB_PREFIX, UUID.randomUUID().toString());
}

public final String getId() {
    return id;
}

public final long getFrequency() {
    return frequency;
}

/**
 * Calculates the delay for the next trigger time. When <code>now</code> is in a
 * valid time bracket with respect to <code>expirationDate</code>, the delay is 0.
 * When <code>now</code> is before the time bracket, than delay to the start of the
 * time bracket and when <code>now</code> is passed the valid time bracket, the delay
 * is <code>null</code>
 * @param expirationDate license expiry date in milliseconds
 * @param now current time in milliseconds
 * @return time delay
 */
final TimeValue delay(long expirationDate, long now) {
    final TimeValue delay;
    switch (orientation) {
        case PRE:
            if (expirationDate >= now) {
                // license not yet expired
                long preExpiryDuration = expirationDate - now;
                if (preExpiryDuration > max) {
                    // license duration is longer than maximum duration, delay it to the first match time
delay = TimeValue.timeValueMillis(preExpiryDuration - max);
                } else if (preExpiryDuration <= max && preExpiryDuration >= min) {
                    // no delay in valid time bracket
                }
            }
    }
    return delay;
}
delay = TimeValue.timeValueMillis(0);
) else {
    // passed last match time
    delay = null;
}
} else {
    // invalid after license expiry
    delay = null;
}
break;

case POST:
    if (expirationDate >= now) {
        // license not yet expired, delay it to the first match time
        delay = TimeValue.timeValueMillis(expirationDate - now + min);
    } else {
        // license has expired
        long expiredDuration = now - expirationDate;
        if (expiredDuration < min) {
            // license expiry duration is shorter than minimum duration, delay it to the first match time
            delay = TimeValue.timeValueMillis(min - expiredDuration);
        } else if (expiredDuration >= min && expiredDuration <= max) {
            // no delay in valid time bracket
            delay = TimeValue.timeValueMillis(0);
        } else {
            // passed last match time
            delay = null;
        }
    }
break;

default:
    throw new IllegalStateException("orientation [" + orientation + "] unknown");

return delay;

/**
 * @link org.elasticsearch.xpack.core.scheduler.SchedulerEngine.Schedule#nextScheduledTimeAfter(long, long)
 * with respect to license expiry date
 */

public final long nextScheduledTimeForExpiry(long expiryDate, long startTime, long time) {
    TimeValue delay = delay(expiryDate, time);
    if (delay != null) {
        long delayInMillis = delay.getMillis();
        if (delayInMillis == 0L) {
            if (startTime == time) {
                // initial trigger and in time bracket, schedule immediately
                return time;
            } else {
                // passed last match time
                delay = null;
            }
        } else {
            // license not yet expired, delay it to the first match time
            delay = TimeValue.timeValueMillis(expirationDate - now + min);
        }
    }
    return delayInMillis;
}
} else {  
    // in time bracket, add frequency  
    return time + frequency;
 }
}
} else {
    // not in time bracket  
    return time + delayInMillis;
}
}
return -1;
}

/**  
* Code to execute when the expiry callback is triggered in a valid  
* time bracket  
* @param license license to operate on  
*/
public abstract void on(License license);

public final String toString() {
    return LoggerMessageFormat.format(null, "ExpirationCallback:(orientation [{ }], min [{ }], max [{ }], freq
[ { }])",
        orientation.name(), TimeValue.timeValueMillis(min), TimeValue.timeValueMillis(max),
        TimeValue.timeValueMillis(frequency));
}
}

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*/
package org.elasticsearch.license;

import org.elasticsearch.common.joda.FormatDateTimeFormatter;
import org.elasticsearch.common.joda.Joda;
import org.joda.time.MutableDateTime;
import org.joda.time.format.DateTimeFormatter;
import org.joda.time.format.ISODateTimeFormat;

public class DateUtils {

    private static final FormatDateTimeFormatter formatDateOnlyFormatter = Joda.forPattern("yyyy-MM-dd");

    private static final DateTimeFormatter dateOnlyFormatter = formatDateOnlyFormatter.parser().withZoneUTC();

    private static final DateTimeFormatter dateTimeFormatter = ISODateTimeFormat.dateTime().withZoneUTC();

    public static long endOfTheDay(String date) {

    }
}


try {
    // Try parsing using complete date/time format
    return dateTimeFormatter.parseDateTime(date).getMillis();
} catch (IllegalArgumentException ex) {
    // Fall back to the date only format
    MutableDateTime dateTime = dateOnlyFormatter.parseMutableDateTime(date);
    dateTime.millisOfDay().set(dateTime.millisOfDay().getMaximumValue());
    return dateTime.getMillis();
}

public static long beginningOfTheDay(String date) {
    try {
        // Try parsing using complete date/time format
        return dateTimeFormatter.parseDateTime(date).getMillis();
    } catch (IllegalArgumentException ex) {
        // Fall back to the date only format
        return dateOnlyFormatter.parseDateTime(date).getMillis();
    }
}

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*/
package org.elasticsearch.license;

import org.elasticsearch.action.ActionListener;
import org.elasticsearch.action.support.ActionFilters;
import org.elasticsearch.action.support.master.TransportMasterNodeAction;
import org.elasticsearch.cluster.ClusterState;
import org.elasticsearch.cluster.block.ClusterBlockException;
import org.elasticsearch.cluster.block.ClusterBlockLevel;
import org.elasticsearch.cluster.metadata.IndexNameExpressionResolver;
import org.elasticsearch.cluster.service.ClusterService;
import org.elasticsearch.common.inject.Inject;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.threadpool.ThreadPool;
import org.elasticsearch.transport.TransportService;

public class TransportPostStartTrialAction extends TransportMasterNodeAction<PostStartTrialRequest,
                        PostStartTrialResponse> {  

    private final LicenseService licenseService;

    @Inject
public TransportPostStartTrialAction(Settings settings, TransportService transportService, ClusterService clusterService,
        LicenseService licenseService, ThreadPool threadPool, ActionFilters actionFilters,
        IndexNameExpressionResolver indexNameExpressionResolver) {
    super(settings, PostStartTrialAction.NAME, transportService, clusterService, threadPool, actionFilters,
        indexNameExpressionResolver, PostStartTrialRequest::new);
    this.licenseService = licenseService;
}

@Override
protected String executor() {
    return ThreadPool.Names.SAME;
}

@Override
protected PostStartTrialResponse newResponse() {
    return new PostStartTrialResponse();
}

@Override
protected void masterOperation(PostStartTrialRequest request, ClusterState state,
        ActionListener<PostStartTrialResponse> listener) throws Exception {
    licenseService.startTrialLicense(request, listener);
}

@Override
protected ClusterBlockException checkBlock(PostStartTrialRequest request, ClusterState state) {
    return state.blocks().globalBlockedException(ClusterBlockLevel.METADATA_WRITE);
}

package org.elasticsearch.license;
import org.elasticsearch.action.ActionResponse;
import org.elasticsearch.common.io.stream.StreamInput;
import org.elasticsearch.common.io.stream.StreamOutput;
import java.io.IOException;

public class GetLicenseResponse extends ActionResponse {
    private License license;

    GetLicenseResponse() {

    }

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    */

    import org.elasticsearch.action.ActionResponse;
    import org.elasticsearch.common.io.stream.StreamInput;
    import org.elasticsearch.common.io.stream.StreamOutput;

    import java.io.IOException;

    public class GetLicenseResponse extends ActionResponse {
        private License license;

        GetLicenseResponse() {

    }
GetLicenseResponse(License license) {
    this.license = license;
}

custom License license() {
    return license;
}

@Override
public License license() {
    return license;
}

@Override
public void readFrom(StreamInput in) throws IOException {
    super.readFrom(in);
    if (in.readBoolean()) {
        license = License.readLicense(in);
    }
}

@Override
public void writeTo(StreamOutput out) throws IOException {
    super.writeTo(out);
    if (license == null) {
        out.writeBoolean(false);
    } else {
        out.writeBoolean(true);
        license.writeTo(out);
    }
}

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 */
package org.elasticsearch.license;

import org.elasticsearch.action.ActionResponse;
import org.elasticsearch.common.io.stream.StreamInput;
import org.elasticsearch.common.io.stream.StreamOutput;
import java.io.IOException;

import java.io.IOException;

class GetBasicStatusResponse extends ActionResponse {
    private boolean eligibleToStartBasic;

    GetBasicStatusResponse() {

GetBasicStatusResponse(boolean eligibleToStartBasic) {
    this.eligibleToStartBasic = eligibleToStartBasic;
}

boolean isEligibleToStartBasic() {
    return eligibleToStartBasic;
}

@Override
public void readFrom(StreamInput in) throws IOException {
    eligibleToStartBasic = in.readBoolean();
}

@Override
public void writeTo(StreamOutput out) throws IOException {
    out.writeBoolean(eligibleToStartBasic);
}

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*/
package org.elasticsearch.license;

import org.elasticsearch.action.ActionRequestBuilder;
import org.elasticsearch.client.ElasticsearchClient;

class GetTrialStatusRequestBuilder extends ActionRequestBuilder<GetTrialStatusRequest,
    GetTrialStatusResponse, GetTrialStatusRequestBuilder> {

    GetTrialStatusRequestBuilder(ElasticsearchClient client, GetTrialStatusAction action) {
        super(client, action, new GetTrialStatusRequest());
    }
}

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*/
package org.elasticsearch.license;

import org.elasticsearch.action.ActionResponse;
import org.elasticsearch.common.io.stream.StreamInput;
import org.elasticsearch.common.io.stream.StreamOutput;
```java
import java.io.IOException;

class GetTrialStatusResponse extends ActionResponse {

    private boolean eligibleToStartTrial;

    GetTrialStatusResponse() {
    }

    GetTrialStatusResponse(boolean eligibleToStartTrial) {
        this.eligibleToStartTrial = eligibleToStartTrial;
    }

    boolean isEligibleToStartTrial() {
        return eligibleToStartTrial;
    }

    @Override
    public void readFrom(StreamInput in) throws IOException {
        eligibleToStartTrial = in.readBoolean();
    }

    @Override
    public void writeTo(StreamOutput out) throws IOException {
        out.writeBoolean(eligibleToStartTrial);
    }
}
```

```
package org.elasticsearch.license;

import org.elasticsearch.action.ActionListener;
import org.elasticsearch.action.support.ActionFilters;
import org.elasticsearch.action.support.master.TransportMasterNodeReadAction;
import org.elasticsearch.cluster.ClusterState;
import org.elasticsearch.cluster.block.ClusterBlockException;
import org.elasticsearch.cluster.block.ClusterBlockLevel;
import org.elasticsearch.cluster.metadata.IndexNameExpressionResolver;
import org.elasticsearch.cluster.service.ClusterService;
import org.elasticsearch.common.inject.Inject;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.threadpool.ThreadPool;
import org.elasticsearch.transport.TransportService;

public class TransportGetBasicStatusAction extends TransportMasterNodeReadAction<GetBasicStatusRequest,
```
GetBasicStatusResponse> { 

@Inject
public TransportGetBasicStatusAction(Settings settings, TransportService transportService, ClusterService clusterService,
        ThreadPool threadPool, ActionFilters actionFilters,
        IndexNameExpressionResolver indexNameExpressionResolver) {
    super(settings, GetBasicStatusAction.NAME, transportService, clusterService, threadPool, actionFilters,
        indexNameExpressionResolver, GetBasicStatusRequest::new);
}

@Override
protected String executor() {
    return ThreadPool.Names.SAME;
}

@Override
protected GetBasicStatusResponse newResponse() {
    return new GetBasicStatusResponse();
}

@Override
protected void masterOperation(GetBasicStatusRequest request, ClusterState state,
    ActionListener<GetBasicStatusResponse> listener) throws Exception {
    LicensesMetaData licensesMetaData = state.metaData().custom(LicensesMetaData.TYPE);
    if (licensesMetaData == null) {
        listener.onResponse(new GetBasicStatusResponse(true));
    } else {
        License license = licensesMetaData.getLicense();
        listener.onResponse(new GetBasicStatusResponse(license == null || license.type().equals("basic") == false));
    }
}

@Override
protected ClusterBlockException checkBlock(GetBasicStatusRequest request, ClusterState state) {
    return state.blocks().globalBlockedException(ClusterBlockLevel.METADATA_READ);
}

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 */
package org.elasticsearch.license;
import org.elasticsearch.action.Action;
import org.elasticsearch.client.ElasticsearchClient;
public class GetTrialStatusAction extends Action<GetTrialStatusRequest, GetTrialStatusResponse, GetTrialStatusRequestBuilder> {

    public static final GetTrialStatusAction INSTANCE = new GetTrialStatusAction();
    public static final String NAME = "cluster:admin/xpack/license/trial_status";

    private GetTrialStatusAction() {
        super(NAME);
    }

    @Override
    public GetTrialStatusRequestBuilder newRequestBuilder(ElasticsearchClient client) {
        return new GetTrialStatusRequestBuilder(client, this);
    }

    @Override
    public GetTrialStatusResponse newResponse() {
        return new GetTrialStatusResponse();
    }

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     */
    package org.elasticsearch.license;

    import org.elasticsearch.action.support.master.MasterNodeReadOperationRequestBuilder;
    import org.elasticsearch.client.ElasticsearchClient;
    import org.elasticsearch.protocol.xpack.license.GetLicenseRequest;

    public class GetLicenseRequestBuilder extends MasterNodeReadOperationRequestBuilder<GetLicenseRequest, GetLicenseResponse, GetLicenseRequestBuilder> {

        public GetLicenseRequestBuilder(ElasticsearchClient client) {
            this(client, GetLicenseAction.INSTANCE);
        }

        /**
         * Creates new get licenses request builder
         * @param client elasticsearch client
         */
        public GetLicenseRequestBuilder(ElasticsearchClient client, GetLicenseAction action) {
            super(client, action, new GetLicenseRequest());
        }
    }
package org.elasticsearch.license;

import org.elasticsearch.action.ActionRequestBuilder;
import org.elasticsearch.client.ElasticsearchClient;

class GetBasicStatusRequestBuilder extends ActionRequestBuilder<GetBasicStatusRequest,
GetBasicStatusResponse,
    GetBasicStatusRequestBuilder> {

    GetBasicStatusRequestBuilder(ElasticsearchClient client, GetBasicStatusAction action) {
        super(client, action, new GetBasicStatusRequest());
    }
}

class PostStartBasicRequest extends AcknowledgedRequest<PostStartBasicRequest> {

    private boolean acknowledge = false;

    @Override
    public ActionRequestValidationException validate() {
        return null;
    }

    public PostStartBasicRequest acknowledge(boolean acknowledge) {
        this.acknowledge = acknowledge;
        return this;
    }

    public boolean isAcknowledged() {
        return acknowledge;
    }
}
return acknowledge;
}

@Override
public void readFrom(StreamInput in) throws IOException {
    super.readFrom(in);
    acknowledge = in.readBoolean();
}

@Override
public void writeTo(StreamOutput out) throws IOException {
    super.writeTo(out);
    out.writeBoolean(acknowledge);
}

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 */
package org.elasticsearch.license;

import org.elasticsearch.action.Action;
import org.elasticsearch.client.ElasticsearchClient;

public class GetBasicStatusAction extends Action<GetBasicStatusRequest, GetBasicStatusResponse, GetBasicStatusRequestBuilder> {

    public static final GetBasicStatusAction INSTANCE = new GetBasicStatusAction();
    public static final String NAME = "cluster:admin/xpack/license/basic_status";

    private GetBasicStatusAction() {
        super(NAME);
    }

    @Override
    public GetBasicStatusRequestBuilder newRequestBuilder(ElasticsearchClient client) {
        return new GetBasicStatusRequestBuilder(client, this);
    }

    @Override
    public GetBasicStatusResponse newResponse() {
        return new GetBasicStatusResponse();
    }

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     */


package org.elasticsearch.license;

import org.elasticsearch.ElasticsearchException;
import org.elasticsearch.action.ActionListener;
import org.elasticsearch.action.support.ActionFilters;
import org.elasticsearch.action.support.master.TransportMasterNodeAction;
import org.elasticsearch.cluster.service.ClusterService;
import org.elasticsearch.cluster.ClusterState;
import org.elasticsearch.cluster.block.ClusterBlockException;
import org.elasticsearch.cluster.block.ClusterBlockLevel;
import org.elasticsearch.cluster.block.ClusterBlockMetadataExpressionResolver;
import org.elasticsearch.cluster.block.ClusterBlockExpressionResolver;
import org.elasticsearch.cluster.metadata.IndexNameExpressionResolver;
import org.elasticsearch.common.inject.Inject;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.common.inject.Inject;
import org.elasticsearch.common.inject.Inject;
import org.elasticsearch.protocol.xpack.license.PutLicenseResponse;
import org.elasticsearch.threadpool.ThreadPool;
import org.elasticsearch.transport.TransportService;

public class TransportPutLicenseAction extends TransportMasterNodeAction<PutLicenseRequest,
PutLicenseResponse> {

private final LicenseService licenseService;

@Inject
public TransportPutLicenseAction(Settings settings, TransportService transportService,
ClusterService clusterService,
LicenseService licenseService, ThreadPool threadPool, ActionFilters actionFilters,
IndexNameExpressionResolver indexNameExpressionResolver) {
    super(settings, PutLicenseAction.NAME, transportService, clusterService,
PutLicenseRequest::new);
    this.licenseService = licenseService;
}

@Override
protected String executor() {
    return ThreadPool.Names.MANAGEMENT;
}

@Override
protected PutLicenseResponse newResponse() {
    return new PutLicenseResponse();
}

@Override
protected ClusterBlockException checkBlock(PutLicenseRequest request, ClusterState state) {
    return state.blocks().globalBlockedException(ClusterBlockLevel.METADATA_WRITE);
}
@Override
protected void masterOperation(final PutLicenseRequest request, ClusterState state, final ActionListener<PutLicenseResponse> listener) throws ElasticsearchException {
    licenseService.registerLicense(request, listener);
}

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 */
package org.elasticsearch.license;

import org.elasticsearch.Version;
import org.elasticsearch.action.ActionResponse;
import org.elasticsearch.common.io.stream.StreamInput;
import org.elasticsearch.common.io.stream.StreamOutput;
import org.elasticsearch.rest.RestStatus;
import java.io.IOException;
import java.util.Collections;
import java.util.HashMap;
import java.util.Map;

class PostStartTrialResponse extends ActionResponse {

    // Nodes Prior to 6.3 did not have NEED_ACKNOWLEDGEMENT as part of status
    enum Pre63Status {
        UPGRADED_TO_TRIAL,
        TRIAL_ALREADY_ACTIVATED;
    }

    enum Status {
        UPGRADED_TO_TRIAL(true, null, RestStatus.OK),
        TRIAL_ALREADY_ACTIVATED(false, "Operation failed: Trial was already activated.",
        RestStatus.FORBIDDEN),
        NEED_ACKNOWLEDGEMENT(false,"Operation failed: Needs acknowledgement.", RestStatus.OK);

        private final boolean isTrialStarted;
        private final String errorMessage;
        private final RestStatus restStatus;

        Status(boolean isTrialStarted, String errorMessage, RestStatus restStatus) {
            this.isTrialStarted = isTrialStarted;
            this.errorMessage = errorMessage;
            this.restStatus = restStatus;
        }

        public boolean isTrialStarted() {
            return isTrialStarted;
        }

        public String errorMessage() {
            return errorMessage;
        }

        public RestStatus restStatus() {
            return restStatus;
        }
    }

    private final boolean isTrialStarted;
    private final String errorMessage;
    private final RestStatus restStatus;
    private final Status status;

    PostStartTrialResponse(boolean isTrialStarted, String errorMessage, RestStatus restStatus, Status status) {
        this.isTrialStarted = isTrialStarted;
        this.errorMessage = errorMessage;
        this.restStatus = restStatus;
        this.status = status;
    }

    public boolean isTrialStarted() {
        return isTrialStarted;
    }

    public String errorMessage() {
        return errorMessage;
    }

    public RestStatus restStatus() {
        return restStatus;
    }

    public Status status() {
        return status;
    }

    public boolean isTrialStarted() {
        return isTrialStarted;
    }

    public String errorMessage() {
        return errorMessage;
    }

    public RestStatus restStatus() {
        return restStatus;
    }

    public Status status() {
        return status;
    }
}

}
this.restStatus = restStatus;
}

boolean isTrialStarted() {
    return isTrialStarted;
}

String getErrorMessage() {
    return errorMessage;
}

RestStatus getRestStatus() {
    return restStatus;
}

private Status status;
private Map<String, String[]> acknowledgeMessages;
private String acknowledgeMessage;

PostStartTrialResponse() {
}

PostStartTrialResponse(Status status) {
    this(status, Collections.emptyMap(), null);
}

PostStartTrialResponse(Status status, Map<String, String[]> acknowledgeMessages, String acknowledgeMessage) {
    this.status = status;
    this.acknowledgeMessages = acknowledgeMessages;
    this.acknowledgeMessage = acknowledgeMessage;
}

public Status getStatus() {
    return status;
}

@Override
public void readFrom(StreamInput in) throws IOException {
    status = in.readEnum(Status.class);
    if (in.getVersion().onOrAfter(Version.V_6_3_0)) {
        acknowledgeMessage = in.readOptionalString();
        int size = in.readVInt();
        Map<String, String[]> acknowledgeMessages = new HashMap<>(size);
        for (int i = 0; i < size; i++) {
            String feature = in.readString();
            acknowledgeMessages.put(feature, new String[] {});
        }
    } else {
        acknowledgeMessages = in.readMapStringString();
    }
    acknowledgeMessage = in.readString();

int nMessages = in.readVInt();
String[] messages = new String[nMessages];
for (int j = 0; j < nMessages; j++) {
    messages[j] = in.readString();
}
acknowledgeMessages.put(feature, messages);
}
this.acknowledgeMessages = acknowledgeMessages;
} else {
    this.acknowledgeMessages = Collections.emptyMap();
}

@Override
public void writeTo(StreamOutput out) throws IOException {
    Version version = Version.V_6_3_0;
    if (out.getVersion().onOrAfter(version)) {
        out.writeEnum(status);
        out.writeOptionalString(acknowledgeMessage);
        out.writeVInt(acknowledgeMessages.size());
        for (Map.Entry<String, String[]> entry : acknowledgeMessages.entrySet()) {
            out.writeString(entry.getKey());
            out.writeVInt(entry.getValue().length);
            for (String message : entry.getValue()) {
                out.writeString(message);
            }
        }
    } else {
        if (status == Status.UPGRADED_TO_TRIAL) {
            out.writeEnum(Pre63Status.UPGRADED_TO_TRIAL);
        } else if (status == Status.TRIAL_ALREADY_ACTIVATED) {
            out.writeEnum(Pre63Status.TRIAL_ALREADY_ACTIVATED);
        } else {
            throw new IllegalArgumentException("Starting trial on node with version ["] + Version.CURRENT + "] requires "+
                "acknowledgement parameter.");
        }
    }
}

Map<String, String[]> getAcknowledgementMessages() {
    return acknowledgeMessages;
}

String getAcknowledgementMessage() {
    return acknowledgeMessage;
}


package org.elasticsearch.license;

import org.apache.lucene.util.BytesRef;
import org.apache.lucene.util.BytesRefIterator;
import org.elasticsearch.common.bytes.BytesReference;
import org.elasticsearch.common.xcontent.ToXContent;
import org.elasticsearch.common.xcontent.XContentBuilder;
import org.elasticsearch.common.xcontent.XContentType;
import org.elasticsearch.core.internal.io.Streams;
import java.io.ByteArrayOutputStream;
import java.io.IOException;
import java.io.InputStream;
import java.nio.ByteBuffer;
import java.security.InvalidKeyException;
import java.security.NoSuchAlgorithmException;
import java.security.Signature;
import java.security.SignatureException;
import java.util.Arrays;
import java.util.Base64;
import java.util.Collections;

public class LicenseVerifier {

    /*
    * Responsible for verifying signed licenses
    */
    public class LicenseVerifier {

        /**
        * verifies the license content with the signature using the packaged
        * public key
        * @param license to verify
        * @return true if valid, false otherwise
        */
        public static boolean verifyLicense(final License license, byte[] publicKeyData) {
            byte[] signedContent = null;
            byte[] publicKeyFingerprint = null;
            try {
                byte[] signatureBytes = Base64.getDecoder().decode(license.signature());
                ByteBuffer byteBuffer = ByteBuffer.wrap(signatureBytes);
                int version = byteBuffer.getInt();
                int magicLen = byteBuffer.getInt();
                byte[] magic = new byte[magicLen];
byteBuffer.get(magic);
    int hashLen = byteBuffer.getInt();
    publicKeyFingerprint = new byte[hashLen];
    byteBuffer.get(publicKeyFingerprint);
    int signedContentLen = byteBuffer.getInt();
    signedContent = new byte[signedContentLen];
    byteBuffer.get(signedContent);
    XContentBuilder contentBuilder = XContentFactory.contentBuilder(XContentType.JSON);
    license.toXContent(contentBuilder, new ToXContent.MapParams(Collections.singletonMap(License.LICENSE_SPEC_VIEW_MODE, "true")));
    Signature rsa = Signature.getInstance("SHA512withRSA");
    rsa.initVerify(CryptUtils.readPublicKey(publicKeyData));
    BytesRefIterator iterator = BytesReference.bytes(contentBuilder).iterator();
    BytesRef ref;
    while((ref = iterator.next()) != null) {
        rsa.update(ref.bytes, ref.offset, ref.length);
    }
    return rsa.verify(signedContent);
} catch (IOException | NoSuchAlgorithmException | SignatureException | InvalidKeyException e) {
    throw new IllegalStateException(e);
} finally {
    if (signedContent != null) {
        Arrays.fill(signedContent, (byte) 0);
    }
}

public static boolean verifyLicense(final License license) {
    final byte[] publicKeyBytes;
    try (InputStream is = LicenseVerifier.class.getResourceAsStream("/public.key")) {
        ByteArrayOutputStream out = new ByteArrayOutputStream();
        Streams.copy(is, out);
        publicKeyBytes = out.toByteArray();
    } catch (IOException ex) {
        throw new IllegalStateException(ex);
    }
    return verifyLicense(license, publicKeyBytes);
}

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 */
package org.elasticsearch.license;

import org.elasticsearch.action.ActionRequestValidationException;
import org.elasticsearch.action.support.master.MasternodeReadRequest;
public class GetTrialStatusRequest extends MasterNodeReadRequest<GetTrialStatusRequest> {

    public GetTrialStatusRequest() {
    }

    @Override
    public ActionRequestValidationException validate() {
        return null;
    }
}

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*/
package org.elasticsearch.license;

import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.rest.RestController;
import org.elasticsearch.rest.RestRequest;
import org.elasticsearch.rest.action.RestToXContentListener;
import org.elasticsearch.xpack.core.XPackClient;
import org.elasticsearch.xpack.core.rest.XPackRestHandler;
import java.io.IOException;
import static org.elasticsearch.rest.RestRequest.Method.POST;
import static org.elasticsearch.rest.RestRequest.Method.PUT;

public class RestPutLicenseAction extends XPackRestHandler {
    public RestPutLicenseAction(Settings settings, RestController controller) {
        super(settings);
        // @deprecated Remove deprecations in 6.0
        controller.registerWithDeprecatedHandler(POST, URI_BASE + "/_license", this,
            POST, "/_license", deprecationLogger);
        controller.registerWithDeprecatedHandler(PUT, URI_BASE + "/_license", this,
            PUT, "/_license", deprecationLogger);

        // Remove _licenses support entirely in 6.0
        controller.registerAsDeprecatedHandler(POST, "/_licenses", this,
            "[POST /_licenses] is deprecated! Use " +
            "[POST /_xpack/license] instead.",
            deprecationLogger);
        controller.registerAsDeprecatedHandler(PUT, "/_licenses", this,
            "[PUT /_licenses] is deprecated! Use " +
            "[PUT /_xpack/license] instead.",
            deprecationLogger);
    }
}
```java
@Override
public String getName() {
    return "xpack_put_license_action";
}

@Override
public RestChannelConsumer doPrepareRequest(final RestRequest request, final XPackClient client) throws IOException {
    if (request.hasContent() == false) {
        throw new IllegalArgumentException("The license must be provided in the request body");
    }
    PutLicenseRequest putLicenseRequest = new PutLicenseRequest();
    putLicenseRequest.license(request.content(), request.getXContentType());
    putLicenseRequest.acknowledge(request.paramAsBoolean("acknowledge", false));
    putLicenseRequest.timeout(request.paramAsTime("timeout", putLicenseRequest.timeout()));
    putLicenseRequest.masterNodeTimeout(request.paramAsTime("master_timeout", putLicenseRequest.masterNodeTimeout()));

    if ("basic".equals(putLicenseRequest.license().type())) {
        throw new IllegalArgumentException("Installing basic licenses is no longer allowed. Use the POST "+
            "/_xpack/license/start_basic API to install a basic license that does not expire.");
    }

    return channel -> client.es().admin().cluster().execute(PutLicenseAction.INSTANCE, putLicenseRequest,
        new RestToXContentListener<>(channel));
}

import org.elasticsearch.action.ActionRequestValidationException;
import org.elasticsearch.action.support.master.MasterNodeReadRequest;

public class GetBasicStatusRequest extends MasterNodeReadRequest<GetBasicStatusRequest> {

    public GetBasicStatusRequest() {
    }

    @Override
    public ActionRequestValidationException validate() {
        return null;
    }

    public GetBasicStatusRequestRequest() {
    }

    @Override
    public ActionRequestValidationException validate() {
        return null;
    }

}*/
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 */
package org.elasticsearch.license;

import org.elasticsearch.action.ActionRequestValidationException;
import org.elasticsearch.action.support.master.MasterNodeReadRequest;

public class GetBasicStatusRequest extends MasterNodeReadRequest<GetBasicStatusRequest> {

    public GetBasicStatusRequest() {
    }

    @Override
    public ActionRequestValidationException validate() {
        return null;
    }
```

package org.elasticsearch.license;

import org.elasticsearch.action.ActionListener;
import org.elasticsearch.action.support.master.AcknowledgedResponse;
import org.elasticsearch.client.ElasticsearchClient;
import org.elasticsearch.protocol.xpack.license.DeleteLicenseRequest;
import org.elasticsearch.protocol.xpack.license.GetLicenseRequest;
import org.elasticsearch.protocol.xpack.license.PutLicenseResponse;

public class LicensingClient {

    private final ElasticsearchClient client;

    public LicensingClient(ElasticsearchClient client) {
        this.client = client;
    }

    public PutLicenseRequestBuilder preparePutLicense(License license) {
        return new PutLicenseRequestBuilder(client).setLicense(license);
    }

    public void putLicense(PutLicenseRequest request, ActionListener<PutLicenseResponse> listener) {
        client.execute(PutLicenseAction.INSTANCE, request, listener);
    }

    public GetLicenseRequestBuilder prepareGetLicense() {
        return new GetLicenseRequestBuilder(client);
    }

    public void getLicense(GetLicenseRequest request, ActionListener<GetLicenseResponse> listener) {
        client.execute(GetLicenseAction.INSTANCE, request, listener);
    }

    public DeleteLicenseRequestBuilder prepareDeleteLicense() {
        return new DeleteLicenseRequestBuilder(client);
    }

    public void deleteLicense(DeleteLicenseRequest request, ActionListener<AcknowledgedResponse> listener) {
        client.execute(DeleteLicenseAction.INSTANCE, request, listener);
    }

    public PostStartTrialRequestBuilder preparePostStartTrial() {

}
return new PostStartTrialRequestBuilder(client, PostStartTrialAction.INSTANCE);

public GetTrialStatusRequestBuilder prepareGetStartTrial() {
    return new GetTrialStatusRequestBuilder(client, GetTrialStatusAction.INSTANCE);
}

public void postStartTrial(PostStartTrialRequest request, ActionListener<PostStartTrialResponse> listener) {
    client.execute(PostStartTrialAction.INSTANCE, request, listener);
}

public void postStartBasic(PostStartBasicRequest request, ActionListener<PostStartBasicResponse> listener) {
    client.execute(PostStartBasicAction.INSTANCE, request, listener);
}

public PostStartBasicRequestBuilder preparePostStartBasic() {
    return new PostStartBasicRequestBuilder(client, PostStartBasicAction.INSTANCE);
}

public GetBasicStatusRequestBuilder prepareGetStartBasic() {
    return new GetBasicStatusRequestBuilder(client, GetBasicStatusAction.INSTANCE);
}
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 */

package org.elasticsearch.license;

import org.elasticsearch.ElasticsearchException;
import org.elasticsearch.action.ActionListener;
import org.elasticsearch.action.support.ContextPreservingActionListener;
import org.elasticsearch.client.Client;
import org.elasticsearch.common.util.concurrent.ThreadContext;
import org.elasticsearch.protocol.xpack.XPackInfoRequest;
import org.elasticsearch.protocol.xpack.XPackInfoResponse;
import org.elasticsearch.protocol.xpack.license.LicenseStatus;
import org.elasticsearch.transport.RemoteClusterAware;
import org.elasticsearch.xpack.core.action.XPackInfoAction;
import java.util.EnumSet;
import java.util.Iterator;
import java.util.List;
import java.util.Locale;
import java.util.concurrent.atomic.AtomicReference;
import java.util.function.Predicate;
import java.util.stream.Collectors;

/**
 * Checks remote clusters for license compatibility with a specified license predicate.
 */
private static final class RemoteClusterLicenseChecker {

/**
 * Encapsulates the license info of a remote cluster.
 */
private static final class RemoteClusterLicenseInfo {

private final String clusterAlias;

/**
 * The alias of the remote cluster.
 * @return the cluster alias
 */
public String clusterAlias() {
    return clusterAlias;
}

private final XPackInfoResponse.LicenseInfo licenseInfo;

/**
 * The license info of the remote cluster.
 * @return the license info
 */
public XPackInfoResponse.LicenseInfo licenseInfo() {
    return licenseInfo;
}

RemoteClusterLicenseInfo(final String clusterAlias, final XPackInfoResponse.LicenseInfo licenseInfo) {
    this.clusterAlias = clusterAlias;
    this.licenseInfo = licenseInfo;
}

/**
 * Encapsulates a remote cluster license check. The check is either successful if the license of the remote cluster is compatible with
 * the predicate used to check license compatibility, or the check is a failure.
 */
private static final class LicenseCheck {


private final RemoteClusterLicenseInfo remoteClusterLicenseInfo;

/**
 * The remote cluster license info. This method should only be invoked if this instance represents a failing license check.
 */
* @return the remote cluster license info
*/
public RemoteClusterLicenseInfo remoteClusterLicenseInfo() {
    assert isSuccess() == false;
    return remoteClusterLicenseInfo;
}

private static final LicenseCheck SUCCESS = new LicenseCheck(null);

/**
 * A successful license check.
 */
* @return a successful license check instance
*/
public static LicenseCheck success() {
    return SUCCESS;
}

/**
 * Test if this instance represents a successful license check.
 */
* @return true if this instance represents a successful license check, otherwise false
*/
public boolean isSuccess() {
    return this == SUCCESS;
}

/**
 * Creates a failing license check encapsulating the specified remote cluster license info.
 */
* @param remoteClusterLicenseInfo the remote cluster license info
* @return a failing license check
*/
public static LicenseCheck failure(final RemoteClusterLicenseInfo remoteClusterLicenseInfo) {
    return new LicenseCheck(remoteClusterLicenseInfo);
}

private LicenseCheck(final RemoteClusterLicenseInfo remoteClusterLicenseInfo) {
    this.remoteClusterLicenseInfo = remoteClusterLicenseInfo;
}
private final Client client;
private final Predicate<License.OperationMode> predicate;

/**
 * Constructs a remote cluster license checker with the specified license predicate for checking license compatibility. The predicate does not need to check for the active license state as this is handled by the remote cluster license checker.
 * @param client    the client
 * @param predicate the license predicate
 */
public RemoteClusterLicenseChecker(final Client client, final Predicate<License.OperationMode> predicate) {
    this.client = client;
    this.predicate = predicate;
}

public static boolean isLicensePlatinumOrTrial(final XPackInfoResponse.LicenseInfo licenseInfo) {
    final License.OperationMode mode = License.OperationMode.resolve(licenseInfo.getMode());
    return mode == License.OperationMode.PLATINUM || mode == License.OperationMode.TRIAL;
}

/**
 * Checks the specified clusters for license compatibility. The specified callback will be invoked once if all clusters are license-compatible, otherwise the specified callback will be invoked once on the first cluster that is not license-compatible.
 * @param clusterAliases the cluster aliases to check
 * @param listener       a callback
 */
public void checkRemoteClusterLicenses(final List<String> clusterAliases, final ActionListener<LicenseCheck> listener) {
    final Iterator<String> clusterAliasesIterator = clusterAliases.iterator();
    if (clusterAliasesIterator.hasNext() == false) {
        listener.onResponse(LicenseCheck.success());
        return;
    }
    final AtomicReference<String> clusterAlias = new AtomicReference<>();

    final ActionListener<XPackInfoResponse> infoListener = new ActionListener<XPackInfoResponse>() {
        @Override
        public void onResponse(final XPackInfoResponse xPackInfoResponse) {
            final XPackInfoResponse.LicenseInfo licenseInfo = xPackInfoResponse.getLicenseInfo();
            if ((licenseInfo.getStatus() == LicenseStatus.ACTIVE) == false ||
                predicate.test(License.OperationMode.resolve(licenseInfo.getMode())) == false) {

            }
        }
    }

    final ActionListener<XPackInfoResponse> infoListener = new ActionListener<XPackInfoResponse>() {

        @Override
        public void onResponse(final XPackInfoResponse xPackInfoResponse) {
            final XPackInfoResponse.LicenseInfo licenseInfo = xPackInfoResponse.getLicenseInfo();
            if ((licenseInfo.getStatus() == LicenseStatus.ACTIVE) == false ||
                predicate.test(License.OperationMode.resolve(licenseInfo.getMode())) == false) {

            }
        }
    }

    final ActionListener<XPackInfoResponse> infoListener = new ActionListener<XPackInfoResponse>() {

        @Override
        public void onResponse(final XPackInfoResponse xPackInfoResponse) {
            final XPackInfoResponse.LicenseInfo licenseInfo = xPackInfoResponse.getLicenseInfo();
            if ((licenseInfo.getStatus() == LicenseStatus.ACTIVE) == false ||
                predicate.test(License.OperationMode.resolve(licenseInfo.getMode())) == false) {

            }
        }
    }

    final ActionListener<XPackInfoResponse> infoListener = new ActionListener<XPackInfoResponse>() {

        @Override
        public void onResponse(final XPackInfoResponse xPackInfoResponse) {
            final XPackInfoResponse.LicenseInfo licenseInfo = xPackInfoResponse.getLicenseInfo();
            if ((licenseInfo.getStatus() == LicenseStatus.ACTIVE) == false ||
                predicate.test(License.OperationMode.resolve(licenseInfo.getMode())) == false) {

            }
        }
    }
listener.onResponse(LicenseCheck.failure(new RemoteClusterLicenseInfo(clusterAlias.get(), licenseInfo))); return;

if (clusterAliasesIterator.hasNext()) {
    clusterAlias.set(clusterAliasesIterator.next());
    // recurse to the next cluster
    remoteClusterLicense(clusterAlias.get(), this);
} else {
    listener.onResponse(LicenseCheck.success());
}

@Override
public void onFailure(final Exception e) {
    final String message = "could not determine the license type for cluster \" + clusterAlias.get() + \"]\";
    listener.onFailure(new ElasticsearchException(message, e));
}

private void remoteClusterLicense(final String clusterAlias, final ActionListener<XPackInfoResponse> listener) {
    final ThreadContext threadContext = client.threadPool().getThreadContext();
    final ContextPreservingActionListener<XPackInfoResponse> contextPreservingActionListener =
        new ContextPreservingActionListener<>(threadContext.newRestorableContext(false), listener);
    try (ThreadContext.StoredContext ignore = threadContext.stashContext()) {
        // we stash any context here since this is an internal execution and should not leak any existing context
        // check the license on the first cluster, and then we recursively check licenses on the remaining clusters
        clusterAlias.set(clusterAliasesIterator.next());
        remoteClusterLicense(clusterAlias.get(), infoListener);
    } catch (final Exception e) {
        contextPreservingActionListener.onFailure(e);
    }
}

/**
* Predicate to test if the index name represents the name of a remote index.
* @param index the index name
* @return true if the collection of indices contains a remote index, otherwise false
*/
public static boolean isRemoteIndex(final String index) {
    return index.indexOf(RemoteClusterAware.REMOTE_CLUSTER_INDEX_SEPARATOR) != -1;
}

/**
* Predicate to test if the collection of index names contains any that represent the name of a remote index.
* @param indices the collection of index names
* @return true if the collection of index names contains a name that represents a remote index, otherwise false
*/
public static boolean containsRemoteIndex(final List<String> indices) {
    return indices.stream().anyMatch(RemoteClusterLicenseChecker::isRemoteIndex);
}

/**
* Filters the collection of index names for names that represent a remote index. Remote index names are of the
* form
* { @code cluster_name:index_name}.
* @param indices the collection of index names
* @return list of index names that represent remote index names
*/
public static List<String> remoteIndices(final List<String> indices) {
    return indices.stream().filter(RemoteClusterLicenseChecker::isRemoteIndex).collect(Collectors.toList());
}

/**
* Extract the list of remote cluster aliases from the list of index names. Remote index names are of the form
* { @code cluster_alias:index_name} and the cluster_alias is extracted for each index name that represents a
* remote index.
* @param indices the collection of index names
* @return the remote cluster names
*/
public static List<String> remoteClusterAliases(final List<String> indices) {
    return indices.stream()
        .filter(RemoteClusterLicenseChecker::isRemoteIndex)
        .map(index -> index.substring(0,
                index.indexOf(RemoteClusterAware.REMOTE_CLUSTER_INDEX_SEPARATOR)))
        .distinct()
        .collect(Collectors.toList());
}
** Constructs an error message for license incompatibility.
*
* @param feature the name of the feature that initiated the remote cluster license check.
* @param remoteClusterLicenseInfo the remote cluster license info of the cluster that failed the license check
* @return an error message representing license incompatibility
*/

public static String buildErrorMessage(
    final String feature,
    final RemoteClusterLicenseInfo remoteClusterLicenseInfo,
    final Predicate<XPackInfoResponse.LicenseInfo> predicate) {
    final StringBuilder error = new StringBuilder();
    if (remoteClusterLicenseInfo.licenseInfo().getStatus() != LicenseStatus.ACTIVE) {
        error.append(String.format(Locale.ROOT, "the license on cluster [%s] is not active", remoteClusterLicenseInfo.clusterAlias()));
    } else {
        assert predicate.test(remoteClusterLicenseInfo.licenseInfo()) == false : "license must be incompatible to build error message";
        final String message = String.format(Locale.ROOT,
            "the license mode [%s] on cluster [%s] does not enable [%s]",
            License.OperationMode.resolve(remoteClusterLicenseInfo.licenseInfo().getMode()),
            remoteClusterLicenseInfo.clusterAlias(),
            feature);
        error.append(message);
    }
    return error.toString();
}

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 */

package org.elasticsearch.license;

import org.elasticsearch.Version;

/**
 * Marker interface for callbacks that are invoked when the license state changes.
 */
@FunctionalInterface
public interface LicenseStateListener {

/**
void licenseStateChanged();

package org.elasticsearch.license;

import org.elasticsearch.action.Action;
import org.elasticsearch.client.ElasticsearchClient;
import org.elasticsearch.protocol.xpack.license.PutLicenseResponse;

public class PutLicenseAction extends Action<PutLicenseRequest, PutLicenseResponse, PutLicenseRequestBuilder> {

    public static final PutLicenseAction INSTANCE = new PutLicenseAction();
    public static final String NAME = "cluster:admin/xpack/license/put";

    private PutLicenseAction() {
        super(NAME);
    }

    @Override
    public PutLicenseResponse newResponse() {
        return new PutLicenseResponse();
    }

    @Override
    public PutLicenseRequestBuilder newRequestBuilder(ElasticsearchClient client) {
        return new PutLicenseRequestBuilder(client, this);
    }

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    //
    import org.apache.logging.log4j.Logger;
    import org.apache.logging.log4j.message.ParameterizedMessage;
    import org.elasticsearch.Version;
    import org.elasticsearch.action.ActionListener;


import org.elasticsearch.cluster.ClusterState;
import org.elasticsearch.cluster.ClusterStateUpdateTask;
import org.elasticsearch.cluster.metadata.MetaData;
import org.elasticsearch.common.Nullable;
import org.elasticsearch.xpack.core.XPackPlugin;
import java.time.Clock;
import java.util.Collections;
import java.util.Map;
import java.util.UUID;

public class StartTrialClusterTask extends ClusterStateUpdateTask {
    private static final String ACKNOWLEDGEMENT_HEADER = "This API initiates a free 30-day trial for all platinum features. " +
            "By starting this trial, you agree that it is subject to the terms and conditions at" +
            "https://www.elastic.co/legal/trial_license/. To begin your free trial, call /start_trial again and specify " +
            "the \'\'acknowledge=true\'\' parameter."
            ;
    
    private static final Map<String, String[]> ACK_MESSAGES = Collections.singletonMap("security",
            new String[] {"With a trial license, X-Pack security features are available, but are not enabled by default."});

    private final Logger logger;
    private final String clusterName;
    private final PostStartTrialRequest request;
    private final ActionListener<PostStartTrialResponse> listener;
    private final Clock clock;

    StartTrialClusterTask(Logger logger, String clusterName, Clock clock, PostStartTrialRequest request,
            ActionListener<PostStartTrialResponse> listener) {
        this.logger = logger;
        this.clusterName = clusterName;
        this.request = request;
        this.listener = listener;
        this.clock = clock;
    }

    @Override
    public void clusterStateProcessed(String source, ClusterState oldState, ClusterState newState) {
        LicensesMetaData oldLicensesMetaData = oldState.metaData().custom(LicensesMetaData.TYPE);
        logger.debug("started self generated trial license: {}", oldLicensesMetaData);

        if (request.isAcknowledged() == false) {
            listener.onResponse(new PostStartTrialResponse(PostStartTrialResponse.Status.NEED_ACKNOWLEDGEMENT,
                    ACK_MESSAGES, ACKNOWLEDGEMENT_HEADER));
        } else if (oldLicensesMetaData == null || oldLicensesMetaData.isEligibleForTrial()) {
            listener.onResponse(new PostStartTrialResponse(PostStartTrialResponse.Status.UPGRADED_TO_TRIAL));
        }
    }
}
@Override
public void onFailure(String source, @Nullable Exception e) {
    logger.error(new ParameterizedMessage("unexpected failure during [{}]", source), e);
    listener.onFailure(e);
}

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 */
package org.elasticsearch.license;
import org.elasticsearch.action.ActionRequestBuilder;
import org.elasticsearch.client.ElasticsearchClient;

class PostStartTrialRequestBuilder extends ActionRequestBuilder<PostStartTrialRequest,
PostStartTrialResponse, PostStartTrialRequestBuilder> {

    PostStartTrialRequestBuilder(ElasticsearchClient client, PostStartTrialAction action) {
        super(client, action, new PostStartTrialRequest());
    }

    public PostStartTrialRequestBuilder setAcknowledge(boolean acknowledge) {
        request.acknowledge(acknowledge);
        return this;
    }
}

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 */
package org.elasticsearch.license;

import org.elasticsearch.ElasticsearchException;
import org.elasticsearch.action.ActionListener;
import org.elasticsearch.action.support.ActionFilters;
import org.elasticsearch.action.support.master.TransportMasterNodeReadAction;
import org.elasticsearch.cluster.ClusterState;
import org.elasticsearch.cluster.block.ClusterBlockException;
import org.elasticsearch.cluster.block.ClusterBlockLevel;
import org.elasticsearch.cluster.metadata.IndexNameExpressionResolver;
import org.elasticsearch.cluster.service.ClusterService;
import org.elasticsearch.common.inject.Inject;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.protocol.xpack.license.GetLicenseRequest;
import org.elasticsearch.threadpool.ThreadPool;
import org.elasticsearch.transport.TransportService;

public class TransportGetLicenseAction extends TransportMasterNodeReadAction<GetLicenseRequest,
GetLicenseResponse> {

    private final LicenseService licenseService;

    @Inject
    public TransportGetLicenseAction(Settings settings, TransportService transportService, ClusterService
clusterService,
            LicenseService licenseService, ThreadPool threadPool, ActionFilters actionFilters,
IndexNameExpressionResolver indexNameExpressionResolver) {
super(settings, GetLicenseAction.NAME, transportService, clusterService, threadPool, actionFilters, indexNameExpressionResolver,
    GetLicenseRequest::new);
this.licenseService = licenseService;
}

@Override
protected String executor() {
    return ThreadPool.Names.MANAGEMENT;
}

@Override
protected GetLicenseResponse newResponse() {
    return new GetLicenseResponse();
}

protected ClusterBlockException checkBlock(GetLicenseRequest request, ClusterState state) {
    return state.blocks().globalBlockedException(ClusterBlockLevel.METADATA_READ);
}

@Override
protected void masterOperation(final GetLicenseRequest request, ClusterState state,
    final ActionListener<GetLicenseResponse> listener) throws ElasticsearchException {
    listener.onResponse(new GetLicenseResponse(licenseService.getLicense()));
}

package org.elasticsearch.license;

import org.elasticsearch.action.Action;
import org.elasticsearch.client.ElasticsearchClient;

public class PostStartTrialAction extends Action<PostStartTrialRequest, PostStartTrialResponse,
    PostStartTrialRequestBuilder> {

    public static final PostStartTrialAction INSTANCE = new PostStartTrialAction();
    public static final String NAME = "cluster:admin/xpack/license/start_trial";

    private PostStartTrialAction() {
        super(NAME);
    }

    @Override
public PostStartTrialRequestBuilder newRequestBuilder(ElasticsearchClient client) {
    return new PostStartTrialRequestBuilder(client, this);
}

@Override
public PostStartTrialResponse newResponse() {
    return new PostStartTrialResponse();
}
}

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 */

package org.elasticsearch.license;

import org.elasticsearch.action.Action;
import org.elasticsearch.client.ElasticsearchClient;

public class PostStartBasicAction extends Action<PostStartBasicRequest, PostStartBasicResponse, PostStartBasicRequestBuilder> {

    public static final PostStartBasicAction INSTANCE = new PostStartBasicAction();
    public static final String NAME = "cluster:admin/xpack/license/start_basic";

    private PostStartBasicAction() {
        super(NAME);
    }

    @Override
    public PostStartBasicRequestBuilder newRequestBuilder(ElasticsearchClient client) {
        return new PostStartBasicRequestBuilder(client, this);
    }

    @Override
    public PostStartBasicResponse newResponse() {
        return new PostStartBasicResponse();
    }
}

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 * you may not use this file except in compliance with the Elastic License.
 */

package org.elasticsearch.license;

import org.elasticsearch.ElasticsearchException;
import org.elasticsearch.Version;
import org.elasticsearch.action.ActionListener;
import org.elasticsearch.cluster.AckedClusterStateUpdateTask;
import org.elasticsearch.cluster.ClusterChangedEvent;
import org.elasticsearch.cluster.ClusterState;
import org.elasticsearch.cluster.ClusterStateListener;
import org.elasticsearch.cluster.ack.ClusterStateUpdateResponse;
import org.elasticsearch.cluster.metadata.MetaData;
import org.elasticsearch.cluster.node.DiscoveryNode;
import org.elasticsearch.cluster.service.ClusterService;
import org.elasticsearch.common.component.AbstractLifecycleComponent;
import org.elasticsearch.common.component.Lifecycle;
import org.elasticsearch.common.joda.FormatDateTimeFormatter;
import org.elasticsearch.common.joda.Joda;
import org.elasticsearch.common.logging.LoggerMessageFormat;
import org.elasticsearch.common.settings.Setting;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.common.unit.TimeValue;
import org.elasticsearch.discovery.DiscoveryModule;
import org.elasticsearch.env.Environment;
import org.elasticsearch.gateway.GatewayService;
import org.elasticsearch.protocol.xpack.XPackInfoResponse;
import org.elasticsearch.protocol.xpack.license.DeleteLicenseRequest;
import org.elasticsearch.protocol.xpack.license.LicensesStatus;
import org.elasticsearch.protocol.xpack.license.PutLicenseResponse;
import org.elasticsearch.watcher.ResourceWatcherService;
import org.elasticsearch.xpack.core.XPackPlugin;
import org.elasticsearch.xpack.core.XPackSettings;
import org.elasticsearch.xpack.core.scheduler.SchedulerEngine;

import java.time.Clock;
import java.util.ArrayList;
import java.util.Arrays;
import java.util.Collections;
import java.util.HashMap;
import java.util.HashSet;
import java.util.List;
import java.util.Locale;
import java.util.Map;
import java.util.Set;
import java.util.concurrent.atomic.AtomicReference;

/**
 * Service responsible for managing LicensesMetaData.
 * <p>
 * On the master node, the service handles updating the cluster state when a new license is registered.
 * It also listens on all nodes for cluster state updates, and updates XPackLicenseState when
 * the license changes are detected in the cluster state.
 */
public class LicenseService extends AbstractLifecycleComponent implements ClusterStateListener,
SchedulerEngine.Listener {

    public static final Setting<String> SELF_GENERATED_LICENSE_TYPE = new
Setting<>("xpack.license.self_generated.type",
        (s) -> "basic", (s) -> {
            if (SelfGeneratedLicense.validSelfGeneratedType(s)) {
                return s;
            } else {
                throw new IllegalArgumentException("Illegal self generated license type [" + s + "]. Must be trial or basic.");
            }
        }, Setting.Property.NodeScope);

    // pkg private for tests
    static final TimeValue NON_BASIC_SELF_GENERATED_LICENSE_DURATION =
    TimeValue.timeValueHours(30 * 24);

    static final Set<String> VALID_TRIAL_TYPES = new HashSet<>(Arrays.asList("trial", "platinum", "gold"));

    /**
     * Duration of grace period after a license has expired
     */
    static final TimeValue GRACE_PERIOD_DURATION = days(7);

    public static final long BASIC_SELF_GENERATED_LICENSE_EXPIRATION_MILLIS =
    XPackInfoResponse.BASIC_SELF_GENERATED_LICENSE_EXPIRATION_MILLIS;

    private final ClusterService clusterService;

    /**
     * The xpack feature state to update when license changes are made.
     */
    private final XPackLicenseState licenseState;

    /**
     * Currently active license
     */
    private final AtomicReference<License> currentLicense = new AtomicReference<>();

    private SchedulerEngine scheduler;

    private final Clock clock;

    /**
     * File watcher for operation mode changes
     */
    private final OperationModeFileWatcher operationModeFileWatcher;

    /**
     * Callbacks to notify relative to license expiry
     */
private List<ExpirationCallback> expirationCallbacks = new ArrayList<>();

/**
 * Max number of nodes licensed by generated trial license
 */
static final int SELF_GENERATED_LICENSE_MAX_NODES = 1000;

public static final String LICENSE_JOB = "licenseJob";

private static final DateFormatTimeFormatter DATE_FORMATTER = Joda.forPattern("EEEE, MMMMM dd, yyyy", Locale.ROOT);

private static final String ACKNOWLEDGEMENT_HEADER = "This license update requires acknowledgement. To acknowledge the license, " +
    "please read the following messages and update the license again, this time with the \"acknowledge=true\" parameter:";

public LicenseService(Settings settings, ClusterService clusterService, Clock clock, Environment env,
    ResourceWatcherService resourceWatcherService, XPackLicenseState licenseState) {
    super(settings);
    this.clusterService = clusterService;
    this.clock = clock;
    this.scheduler = new SchedulerEngine(settings, clock);
    this.licenseState = licenseState;
    this.operationModeFileWatcher = new OperationModeFileWatcher(resourceWatcherService,
        XPackPlugin.resolveConfigFile(env, "license_mode"), logger,
        () -> updateLicenseState(getLicensesMetaData()));
    this.scheduler.register(this);
    populateExpirationCallbacks();
}

private void logExpirationWarning(long expirationMillis, boolean expired) {
    String expiredMsg = expired ? "expired" : "will expire";
    String general = LoggerMessageFormat.format(null, "License [{}] on [{}].
" +
    "# If you have a new license, please update it. Otherwise, please reach out to
" +
    "# your support contact.\n" +
    "# ", expiredMsg, DATE_FORMATTER.printer().print(expirationMillis));
    if (expired) {
        general = general.toUpperCase(Locale.ROOT);
    }
    StringBuilder builder = new StringBuilder(general);
    builder.append(System.lineSeparator());
    if (expired) {
        builder.append("# COMMERCIAL PLUGINS OPERATING WITH REDUCED FUNCTIONALITY\n");
    } else {
        builder.append("# Commercial plugins operate with reduced functionality on license expiration:\n");
    }
}
XPackLicenseState.EXPIRATION_MESSAGES.forEach((feature, messages) -> {
    if (messages.length > 0) {
        builder.append(System.lineSeparator());
        builder.append("# - ");
        builder.append(feature);
        for (String message : messages) {
            builder.append(System.lineSeparator());
            builder.append("#  - ");
            builder.append(message);
        }
    }
});
logger.warn("{}", builder);

private void populateExpirationCallbacks() {
    expirationCallbacks.add(new ExpirationCallback.Pre(days(7), days(25), days(1)) {
        @Override
        public void on(License license) {
            logExpirationWarning(license.expiryDate(), false);
        }
    });
    expirationCallbacks.add(new ExpirationCallback.Pre(days(0), days(7), TimeValue.timeValueMinutes(10)) {
        @Override
        public void on(License license) {
            logExpirationWarning(license.expiryDate(), false);
        }
    });
    expirationCallbacks.add(new ExpirationCallback.Post(days(0), null, TimeValue.timeValueMinutes(10)) {
        @Override
        public void on(License license) {
            // logged when grace period begins
            logExpirationWarning(license.expiryDate(), true);
        }
    });
}

/**
 * Registers new license in the cluster
 * Master only operation. Installs a new license on the master provided it is VALID
 */
public void registerLicense(final PutLicenseRequest request, final ActionListener<PutLicenseResponse> listener) {
    final License newLicense = request.license();
    final long now = clock.millis();
    if (!LicenseVerifier.verifyLicense(newLicense) || newLicense.issueDate() > now || newLicense.startDate() > now) {
        listener.onResponse(new PutLicenseResponse(true, LicensesStatus.INVALID));
    }
}
else if (newLicense.type().equals("basic")) {
    listener.onFailure(new IllegalArgumentException("Registering basic licenses is not allowed.")));  
} else if (newLicense.expiryDate() < now) {
    listener.onResponse(new PutLicenseResponse(true, LicensesStatus.EXPIRED));
} else {
    if (!request.acknowledged()) {
        // TODO: ack messages should be generated on the master, since another node's cluster state may be
    
    final License currentLicense = getLicense();
    if (currentLicense != null) {
        Map<String, String[]> acknowledgeMessages = getAckMessages(newLicense, currentLicense);
        if (acknowledgeMessages.isEmpty() == false) {
            // needs acknowledgement
            listener.onResponse(new PutLicenseResponse(false, LicensesStatus.VALID,

ACKNOWLEDGEMENT_HEADER,

            acknowledgeMessages));
            return;
        }
    }
}

if (XPackSettings.SECURITY_ENABLED.get(settings)) {
    // TODO we should really validate that all nodes have xpack installed and are consistently configured but
    this
    // should happen on a different level and not in this code
    if (newLicense.isProductionLicense() &&
        XPackSettings.TRANSPORT_SSL_ENABLED.get(settings) == false &&
        isProductionMode(settings, clusterService.localNode())) {  
        // security is on but TLS is not configured we gonna fail the entire request and throw an exception
    throw new IllegalStateException("Cannot install a [" + newLicense.operationMode() +
            "] license unless TLS is configured or security is disabled");
    } else if (XPackSettings.FIPS_MODE_ENABLED.get(settings) &&
        newLicense.operationMode() != License.OperationMode.PLATINUM &&
        newLicense.operationMode() != License.OperationMode.TRIAL) {
    throw new IllegalStateException("Cannot install a [" + newLicense.operationMode() +
            "] license unless FIPS mode is disabled");
    }
}

clusterService.submitStateUpdateTask("register license [" + newLicense.uid() + "]", new
AckedClusterStateUpdateTask<PutLicenseResponse>(request, listener) {
    @Override
    protected PutLicenseResponse newResponse(boolean acknowledged) {
        return new PutLicenseResponse(acknowledged, LicensesStatus.VALID);
    }

    @Override
    public ClusterState execute(ClusterState currentState) throws Exception {

        // execute code here
    }
}

// execute code here

XPackPlugin.checkReadyForXPackCustomMetadata(currentState);
MetaData currentMetadata = currentState.metaData();
LicensesMetaData licensesMetaData = currentMetadata.custom(LicensesMetaData.TYPE);
Version trialVersion = null;
if (licensesMetaData != null) {
    trialVersion = licensesMetaData.getMostRecentTrialVersion();
}
MetaData.Builder mdBuilder = MetaData.builder(currentMetadata);
mdBuilder.putCustom(LicensesMetaData.TYPE, new LicensesMetaData(newLicense,
    trialVersion));
return ClusterState.builder(currentState).metaData(mdBuilder).build();

public static Map<String, String[]> getAckMessages(License newLicense, License currentLicense) {
    Map<String, String[]> acknowledgeMessages = new HashMap<>();
    if (!License.isAutoGeneratedLicense(currentLicense.signature()) // current license is not auto-generated
        && currentLicense.issueDate() > newLicense.issueDate()) { // and has a later issue date
        acknowledgeMessages.put("license", new String[]{
            "The new license is older than the currently installed license. " +
            "Are you sure you want to override the current license?");
    }
    XPackLicenseState.ACKNOWLEDGMENT_MESSAGES.forEach((feature, ackMessages) -> {
        String[] messages = ackMessages.apply(currentLicense.operationMode(), newLicense.operationMode());
        if (messages.length > 0) {
            acknowledgeMessages.put(feature, messages);
        }
    });
    return acknowledgeMessages;
}

private static TimeValue days(int days) {
    return TimeValue.timeValueHours(days * 24);
}

@Override
public void triggered(SchedulerEngine.Event event) {
    final LicensesMetaData licensesMetaData = getLicensesMetaData();
    if (licensesMetaData != null) {
        final License license = licensesMetaData.getLicense();
        if (event.getJobName().equals(LICENSE_JOB)) {
            updateLicenseState(license, licensesMetaData.getMostRecentTrialVersion());
        } else if (event.getJobName().startsWith(ExpirationCallback.EXPIRATION_JOB_PREFIX)) {
            expirationCallbacks.stream() .filter(expirationCallback -> expirationCallback.getId().equals(event.getJobName()))
            .forEach(expirationCallback ->
            expirationCallback.execute());
        } else {
            throw new IllegalStateException("Unknown job name: ", event.getJobName()));
        }
    }
}
forEach(expirationCallback -> expirationCallback.on(license));
}
}

/**
 * Remove license from the cluster state metadata
 */
public void removeLicense(final DeleteLicenseRequest request, final ActionListener<ClusterStateUpdateResponse> listener) {
    clusterService.submitStateUpdateTask("delete license",
            new AckedClusterStateUpdateTask<ClusterStateUpdateResponse>(request, listener) {
                @Override
                protected ClusterStateUpdateResponse newResponse(boolean acknowledged) {
                    return new ClusterStateUpdateResponse(acknowledged);
                }

                @Override
                public ClusterState execute(ClusterState currentState) throws Exception {
                    MetaData metaData = currentState.metaData();
                    final LicensesMetaData currentLicenses = metaData.custom(LicensesMetaData.TYPE);
                    if (currentLicenses.getLicense() != LicensesMetaData.LICENSE_TOMBSTONE) {
                        MetaData.Builder mdBuilder = MetaData.builder(currentState.metaData());
                        LicensesMetaData newMetadata = new LicensesMetaData(LicensesMetaData.LICENSE_TOMBSTONE,
                                currentLicenses.getMostRecentTrialVersion());
                        mdBuilder.putCustom(LicensesMetaData.TYPE, newMetadata);
                        return ClusterState.builder(currentState).metaData(mdBuilder).build();
                    } else {
                        return currentState;
                    }
            });
}

public License getLicense() {
    final License license = getLicense(clusterService.state().metaData());
    return license == LicensesMetaData.LICENSE_TOMBSTONE ? null : license;
}

private LicensesMetaData getLicensesMetaData() {
    return this.clusterService.state().metaData().custom(LicensesMetaData.TYPE);
}

void startTrialLicense(PostStartTrialRequest request, final ActionListener<PostStartTrialResponse> listener) {
    if (VALID_TRIAL_TYPES.contains(request.getType()) == false) {
        throw new IllegalArgumentException("Cannot start trial of type "] + request.getType() + "]"). Valid trial types are ",
    }
}
+ VALID_TRIAL_TYPES + ",");
}
StartTrialClusterTask task = new StartTrialClusterTask(logger, clusterService.getClusterName().value(), clock, request, listener);
clusterService.submitStateUpdateTask("started trial license", task);
}

void startBasicLicense(PostStartBasicRequest request, final ActionListener<PostStartBasicResponse> listener) {
    StartBasicClusterTask task = new StartBasicClusterTask(logger, clusterService.getClusterName().value(),
clock, request, listener);
    clusterService.submitStateUpdateTask("start basic license", task);
}

/**
 * Master-only operation to generate a one-time global self generated license.
 * The self generated license is only generated and stored if the current cluster state metadata
 * has no existing license. If the cluster currently has a basic license that has an expiration date,
 * a new basic license with no expiration date is generated.
 */
private void registerOrUpdateSelfGeneratedLicense() {
    clusterService.submitStateUpdateTask("maybe generate license for cluster",
            new StartupSelfGeneratedLicenseTask(settings, clock, clusterService));
}

@override
protected void doStart() throws ElasticsearchException {
    clusterService.addListener(this);
    scheduler.start(Collections.emptyList());
    logger.debug("initializing license state");
    if (clusterService.lifecycleState() == Lifecycle.State.STARTED) {
        final ClusterState clusterState = clusterService.state();
        if (clusterState.blocks().hasGlobalBlock(GatewayService.STATE_NOT_RECOVERED_BLOCK) == false
                &&
            clusterState.nodes().getMasterNode() != null &&
            XPackPlugin.isReadyForXPackCustomMetadata(clusterState)) {
            final LicensesMetaData currentMetaData = clusterState.metaData().custom(LicensesMetaData.TYPE);
            boolean noLicense = currentMetaData == null || currentMetaData.getLicense() == null;
            if (clusterState.getNodes().isLocalNodeElectedMaster() &&
                (noLicense || LicenseUtils.licenseNeedsExtended(currentMetaData.getLicense()))) {
                // triggers a cluster changed event eventually notifying the current licensee
                registerOrUpdateSelfGeneratedLicense();
            }
        }
    }
}

@override
protected void doStop() throws ElasticsearchException {
clusterService.removeListener(this);
scheduler.stop();
// clear current license
currentLicense.set(null);
}

@Override
protected void doClose() throws ElasticsearchException {
}

/**
 * When there is no global block on
 * org.elasticsearch.gateway.GatewayService#STATE_NOT_RECOVERED_BLOCK
 * notify licensees and issue auto-generated license if no license has been installed/issued yet.
 */
@Override
public void clusterChanged(ClusterChangedEvent event) {
    final ClusterState previousClusterState = event.previousState();
    final ClusterState currentClusterState = event.state();
    if (!currentClusterState.blocks().hasGlobalBlock(GatewayService.STATE_NOT_RECOVERED_BLOCK)) {
        if (XPackPlugin.isReadyForXPackCustomMetadata(currentClusterState) == false) {
            logger.debug("cannot add license to cluster as the following nodes might not understand the license metadata: 
() -> XPackPlugin.nodesNotReadyForXPackCustomMetadata(currentClusterState));
            return;
        }
        final LicensesMetaData prevLicensesMetaData =
previousClusterState.getMetaData().custom(LicensesMetaData.TYPE);
        final LicensesMetaData currentLicensesMetaData =
currentClusterState.getMetaData().custom(LicensesMetaData.TYPE);
        if (logger.isDebugEnabled()) {
            logger.debug("previous [{}]", prevLicensesMetaData);
            logger.debug("current [{}]", currentLicensesMetaData);
        }
        // notify all interested plugins
        if (previousClusterState.blocks().hasGlobalBlock(GatewayService.STATE_NOT_RECOVERED_BLOCK)
        || prevLicensesMetaData == null) {
            if (currentLicensesMetaData != null) {
                onUpdate(currentLicensesMetaData);
            }
        } else if (!prevLicensesMetaData.equals(currentLicensesMetaData)) {
            onUpdate(currentLicensesMetaData);
        }
    } else if (!prevLicensesMetaData.equals(currentLicensesMetaData)) {
        onUpdate(currentLicensesMetaData);
    }
}

License currentLicense = null;
boolean noLicenseInPrevMetadata = prevLicensesMetaData == null || prevLicensesMetaData.getLicense() == null;
if (noLicenseInPrevMetadata == false) {
    currentLicense = prevLicensesMetaData.getLicense();
}

boolean noLicenseInCurrentMetadata = (currentLicensesMetaData == null ||
    currentLicensesMetaData.getLicense() == null);
if (noLicenseInCurrentMetadata == false) {
    currentLicense = currentLicensesMetaData.getLicense();
}

boolean noLicense = noLicenseInPrevMetadata && noLicenseInCurrentMetadata;
// auto-generate license if no licenses ever existed or if the current license is basic and
// needs extended or if the license signature needs to be updated. this will trigger a subsequent cluster changed
// event
if (currentClusterState.getNodes().isLocalNodeElectedMaster() &&
    (noLicense || LicenseUtils.licenseNeedsExtended(currentLicense) ||
        LicenseUtils.signatureNeedsUpdate(currentLicense, currentClusterState.nodes()))) {
    registerOrUpdateSelfGeneratedLicense();
}
}

private void updateLicenseState(LicensesMetaData licensesMetaData) {
    if (licensesMetaData != null) {
        updateLicenseState(getLicense(licensesMetaData), licensesMetaData.getMostRecentTrialVersion());
    }
}

protected void updateLicenseState(final License license, Version mostRecentTrialVersion) {
    if (license == LicensesMetaData.LICENSE_TOMBSTONE) {
        // implies license has been explicitly deleted
        licenseState.update(License.OperationMode.MISSING, false, mostRecentTrialVersion);
        return;
    }
    if (license != null) {
        long time = clock.millis();
        boolean active;
        if (license.expiryDate() == BASIC_SELF_GENERATED_LICENSE_EXPIRATION_MILLIS) {
            active = true;
        } else {
            // We subtract the grace period from the current time to avoid overflowing on an expiration
            // date that is near Long.MAX_VALUE
            active = time >= license.issueDate() &&
                    time - GRACE_PERIOD_DURATION.getMillis() < license.expiryDate();
        }
        licenseState.update(license.operationMode(), active, mostRecentTrialVersion);
    }
}
if (active) {
    if (time < license.expiryDate()) {
        logger.debug("license \[\{}\] - valid", license.uid());
    } else {
        logger.warn("license \[\{}\] - grace", license.uid());
    }
} else {
    logger.warn("license \[\{}\] - expired", license.uid());
}
}

/**
 * Notifies registered licensees of license state change and/or new active license
 * based on the license in <code>currentLicensesMetaData</code>
 * Additionally schedules license expiry notifications and event callbacks
 * relative to the current license's expiry
 */
private void onUpdate(final LicensesMetaData currentLicensesMetaData) {
    final License license = getLicense(currentLicensesMetaData);
    // license can be null if the trial license is yet to be auto-generated
    // in this case, it is a no-op
    if (license != null) {
        final License previousLicense = currentLicense.get();
        if (license.equals(previousLicense) == false) {
            currentLicense.set(license);
            license.setOperationModeFileWatcher(operationModeFileWatcher);
            scheduler.add(new SchedulerEngine.Job(LICENSE_JOB, nextLicenseCheck(license)));
            for (ExpirationCallback expirationCallback : expirationCallbacks) {
                scheduler.add(new SchedulerEngine.Job(expirationCallback.getId(),
                    (startTime, now) ->
                        expirationCallback.nextScheduledTimeForExpiry(license.expiryDate(), startTime, now)));
            }
            if (previousLicense != null) {
                // remove operationModeFileWatcher to gc the old license object
                previousLicense.removeOperationModeFileWatcher();
            }
            logger.info("license \[\{}\] mode \[\{}\] - valid", license.uid(),
                license.operationMode().name().toLowerCase(Locale.ROOT));
        }
    updateLicenseState(license, currentLicensesMetaData.getMostRecentTrialVersion());
    }
}

// pkg private for tests
static SchedulerEngine.Schedule nextLicenseCheck(License license) {
    return (startTime, time) -> {
if (time < license.issueDate()) {
    // when we encounter a license with a future issue date
    // which can happen with autogenerated license,
    // we want to schedule a notification on the license issue date
    // so the license is notified once it is valid
    // see https://github.com/elastic/x-plugins/issues/983
    return license.issueDate();
} else if (time < license.expiryDate()) {
    return license.expiryDate();
} else if (time < license.expiryDate() + GRACE_PERIOD_DURATION.getMillis()) {
    return license.expiryDate() + GRACE_PERIOD_DURATION.getMillis();
}
return -1; // license is expired, no need to check again
;
}

public static License getLicense(final MetaData metaData) {
    final LicensesMetaData licensesMetaData = metaData.custom(LicensesMetaData.TYPE);
    return getLicense(licensesMetaData);
}

static License getLicense(final LicensesMetaData metaData) {
    if (metaData != null) {
        License license = metaData.getLicense();
        if (license == LicensesMetaData.LICENSE_TOMBSTONE) {
            return license;
        } else if (license != null) {
            boolean autoGeneratedLicense = License.isAutoGeneratedLicense(license.signature());
            if ((autoGeneratedLicense && SelfGeneratedLicense.verify(license))
                || (!autoGeneratedLicense && LicenseVerifier.verifyLicense(license))) {
                return license;
            }
        }
    }
    return null;
}

private static boolean isProductionMode(Settings settings, DiscoveryNode localNode) {
    final boolean singleNodeDisco = "single-node".equals(DiscoveryModule.DISCOVERY_TYPE_SETTING.get(settings));
    return singleNodeDisco == false && isBoundToLoopback(localNode) == false;
}

private static boolean isBoundToLoopback(DiscoveryNode localNode) {
    return localNode.getAddress().address().getAddress().isLoopbackAddress();
}


package org.elasticsearch.license;

import org.elasticsearch.action.ActionListener;
import org.elasticsearch.action.support.ActionFilters;
import org.elasticsearch.action.support.master.TransportMasterNodeReadAction;
import org.elasticsearch.cluster.ClusterState;
import org.elasticsearch.cluster.block.ClusterBlockException;
import org.elasticsearch.cluster.block.ClusterBlockLevel;
import org.elasticsearch.cluster.metadata.IndexNameExpressionResolver;
import org.elasticsearch.cluster.service.ClusterService;
import org.elasticsearch.common.inject.Inject;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.threadpool.ThreadPool;
import org.elasticsearch.transport.TransportService;

public class TransportGetTrialStatusAction extends TransportMasterNodeReadAction<GetTrialStatusRequest,
GetTrialStatusResponse> {

@Inject
public TransportGetTrialStatusAction(Settings settings, TransportService transportService, ClusterService
clusterService,
        ThreadPool threadPool, ActionFilters actionFilters,
        IndexNameExpressionResolver indexNameExpressionResolver) {
    super(settings, GetTrialStatusAction.NAME, transportService, clusterService, threadPool, actionFilters,
            indexNameExpressionResolver, GetTrialStatusRequest::new);
}

@Override
protected String executor() {
    return ThreadPool.Names.SAME;
}

@Override
protected GetTrialStatusResponse newResponse() {
    return new GetTrialStatusResponse();
}

@Override
protected void masterOperation(GetTrialStatusRequest request, ClusterState state,
        ActionListener<GetTrialStatusResponse> listener) throws Exception {
    LicensesMetaData licensesMetaData = state.metaData().custom(LicensesMetaData.TYPE);
    listener.onResponse(new GetTrialStatusResponse(licensesMetaData == null || licensesMetaData.isEligibleForTrial()));
}
package org.elasticsearch.license;

import org.apache.logging.log4j.Logger;
import org.apache.logging.log4j.message.ParameterizedMessage;
import org.elasticsearch.Version;
import org.elasticsearch.action.ActionListener;
import org.elasticsearch.cluster.ClusterState;
import org.elasticsearch.cluster.ClusterStateUpdateTask;
import org.elasticsearch.cluster.metadata.MetaData;
import org.elasticsearch.common.Nullable;
import org.elasticsearch.xpack.core.XPackPlugin;
import java.time.Clock;
import java.util.Collections;
import java.util.Map;
import java.util.UUID;
import java.util.concurrent.atomic.AtomicReference;

public class StartBasicClusterTask extends ClusterStateUpdateTask {

    private static final String ACKNOWLEDGEMENT_HEADER = "This license update requires acknowledgement. To acknowledge the license, " + "please read the following messages and call /start_basic again, this time with the \"acknowledge=true\" parameter:";

    private final Logger logger;
    private final String clusterName;
    private final PostStartBasicRequest request;
    private final ActionListener<PostStartBasicResponse> listener;
    private final Clock clock;
    private AtomicReference<Map<String, String[]>> ackMessages = new AtomicReference<>(Collections.emptyMap());

    StartBasicClusterTask(Logger logger, String clusterName, Clock clock, PostStartBasicRequest request,
            ActionListener<PostStartBasicResponse> listener) {

        @Override
        protected ClusterBlockException checkBlock(GetTrialStatusRequest request, ClusterState state) {
            return state.blocks().globalBlockedException(ClusterBlockLevel.METADATA_READ);
        }
    }

    /*
     * Copyright Elasticsearch B.V. and/or licensed to Elasticsearch B.V. under one
     * or more contributor license agreements. Licensed under the Elastic License;
     * you may not use this file except in compliance with the Elastic License.
     */

    import org.apache.logging.log4j.Logger;
    import org.apache.logging.log4j.message.ParameterizedMessage;
    import org.elasticsearch.Version;
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                return state.blocks().globalBlockedException(ClusterBlockLevel.METADATA_READ);
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        private final String clusterName;
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            @Override
            protected ClusterBlockException checkBlock(GetTrialStatusRequest request, ClusterState state) {
                return state.blocks().globalBlockedException(ClusterBlockLevel.METADATA_READ);
            }
        }
    }

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        private static final String ACKNOWLEDGEMENT_HEADER = "This license update requires acknowledgement. To acknowledge the license, " + "please read the following messages and call /start_basic again, this time with the \"acknowledge=true\" parameter:";

        private final Logger logger;
        private final String clusterName;
        private final PostStartBasicRequest request;
        private final ActionListener<PostStartBasicResponse> listener;
        private final Clock clock;
        private AtomicReference<Map<String, String[]>> ackMessages = new AtomicReference<>(Collections.emptyMap());

        StartBasicClusterTask(Logger logger, String clusterName, Clock clock, PostStartBasicRequest request,
                ActionListener<PostStartBasicResponse> listener) {

            @Override
            protected ClusterBlockException checkBlock(GetTrialStatusRequest request, ClusterState state) {
                return state.blocks().globalBlockedException(ClusterBlockLevel.METADATA_READ);
            }
        }
    }

    */

    import org.apache.logging.log4j.Logger;
    import org.apache.logging.log4j.message.ParameterizedMessage;
    import org.elasticsearch.Version;
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    import java.time.Clock;
    import java.util.Collections;
    import java.util.Map;
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    public class StartBasicClusterTask extends ClusterStateUpdateTask {

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        private final Logger logger;
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                return state.blocks().globalBlockedException(ClusterBlockLevel.METADATA_READ);
            }
        }
    }

    */

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    import org.elasticsearch.Version;
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    import org.elasticsearch.cluster.ClusterState;
    import org.elasticsearch.cluster.ClusterStateUpdateTask;
    import org.elasticsearch.cluster.metadata.MetaData;
    import org.elasticsearch.common.Nullable;
    import org.elasticsearch.xpack.core.XPackPlugin;
    import java.time.Clock;
    import java.util.Collections;
    import java.util.Map;
    import java.util.UUID;
    import java.util.concurrent.atomic.AtomicReference;

    public class StartBasicClusterTask extends ClusterStateUpdateTask {

        private static final String ACKNOWLEDGEMENT_HEADER = "This license update requires acknowledgement. To acknowledge the license, " + "please read the following messages and call /start_basic again, this time with the \"acknowledge=true\" parameter:";

        private final Logger logger;
        private final String clusterName;
        private final PostStartBasicRequest request;
        private final ActionListener<PostStartBasicResponse> listener;
        private final Clock clock;
        private AtomicReference<Map<String, String[]>> ackMessages = new AtomicReference<>(Collections.emptyMap());

        StartBasicClusterTask(Logger logger, String clusterName, Clock clock, PostStartBasicRequest request,
                ActionListener<PostStartBasicResponse> listener) {

            @Override
            protected ClusterBlockException checkBlock(GetTrialStatusRequest request, ClusterState state) {
                return state.blocks().globalBlockedException(ClusterBlockLevel.METADATA_READ);
            }
        }
    }

    */
this.logger = logger;
this.clusterName = clusterName;
this.request = request;
this.listener = listener;
this.clock = clock;
}

@Override
public void clusterStateProcessed(String source, ClusterState oldState, ClusterState newState) {
    LicensesMetaData oldLicensesMetaData = oldState.metaData().custom(LicensesMetaData.TYPE);
    logger.debug("license prior to starting basic license: ", oldLicensesMetaData);
    License oldLicense = LicensesMetaData.extractLicense(oldLicensesMetaData);
    Map<String, String[]> acknowledgeMessages = ackMessages.get();
    if (acknowledgeMessages.isEmpty() == false) {
        listener.onResponse(new
            PostStartBasicResponse(PostStartBasicResponse.Status.NEED_ACKNOWLEDGEMENT, acknowledgeMessages,
            ACKNOWLEDGEMENT_HEADER));
    } else if (oldLicense != null && oldLicense.type().equals("basic")) {
        listener.onResponse(new
            PostStartBasicResponse(PostStartBasicResponse.Status.ALREADY_USING_BASIC));
    } else {
        listener.onResponse(new PostStartBasicResponse(PostStartBasicResponse.Status.GENERATED_BASIC));
    }
}

@Override
public ClusterState execute(ClusterState currentState) throws Exception {
    XPackPlugin.checkReadyForXPackCustomMetadata(currentState);
    LicensesMetaData licensesMetaData = currentState.metaData().custom(LicensesMetaData.TYPE);
    License currentLicense = LicensesMetaData.extractLicense(licensesMetaData);
    if (currentLicense == null || currentLicense.type().equals("basic") == false) {
        long issueDate = clock.millis();
        MetaData.Builder mdBuilder = MetaData.builder(currentState.metaData());
        License.Builder specBuilder = License.builder()
            .uid(UUID.randomUUID().toString())
            .issuedTo(clusterName)
            .maxNodes(LicenseService.SELF_GENERATED_LICENSE_MAX_NODES)
            .issueDate(issueDate)
            .type("basic")
            .expiryDate(LicenseService.BASIC_SELF_GENERATED_LICENSE_EXPIRATION_MILLIS);
        License selfGeneratedLicense = SelfGeneratedLicense.create(specBuilder, currentState.nodes());
        if (request.isAcknowledged() == false && currentLicense != null) {
            Map<String, String[]> ackMessages = LicenseService.getAckMessages(selfGeneratedLicense,
                currentLicense);
            if (ackMessages.isEmpty() == false) {
                this.ackMessages.set(ackMessages);
                return currentState;
            }
        }
    }
}
Version trialVersion = null;
if (licensesMetaData != null) {
    trialVersion = licensesMetaData.getMostRecentTrialVersion();
}
LicensesMetaData newLicensesMetaData = new LicensesMetaData(selfGeneratedLicense, trialVersion);
mdBuilder.putCustom(LicensesMetaData.TYPE, newLicensesMetaData);
return ClusterState.builder(currentState).metaData(mdBuilder).build();
} else {
    return currentState;
}
}

@Override
public void onFailure(String source, @Nullable Exception e) {
    logger.error(new ParameterizedMessage("unexpected failure during [{}]", source), e);
    listener.onFailure(e);
}

package org.elasticsearch.license;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.common.xcontent.ToXContent;
import org.elasticsearch.common.xcontent.XContentBuilder;
import org.elasticsearch.rest.BytesRestResponse;
import org.elasticsearch.rest.RestController;
import org.elasticsearch.rest.RestRequest;
import org.elasticsearch.rest.RestResponse;
import org.elasticsearch.rest.action.RestBuilderListener;
import org.elasticsearch.xpack.core.XPackClient;
import org.elasticsearch.xpack.core.rest.XPackRestHandler;
import java.io.IOException;
import static org.elasticsearch.rest.RestRequest.Method.POST;

public class RestPostStartBasicLicense extends XPackRestHandler {

    RestPostStartBasicLicense(Settings settings, RestController controller) {
        super(settings);
        controller.registerHandler(POST, URI_BASE + "/license/start_basic", this);
    }
}
@Override
protected RestChannelConsumer doPrepareRequest(RestRequest request, XPackClient client) throws IOException {
    PostStartBasicRequest startBasicRequest = new PostStartBasicRequest();
    startBasicRequest.acknowledge(request.paramAsBoolean("acknowledge", false));
    startBasicRequest.timeout(request.paramAsTime("timeout", startBasicRequest.timeout()));
    startBasicRequest.masterNodeTimeout(request.paramAsTime("master_timeout", startBasicRequest.masterNodeTimeout()));
    return channel -> client.licensing().postStartBasic(startBasicRequest, new 
    RestBuilderListener<PostStartBasicResponse>(channel) {
        @Override
        public RestResponse buildResponse(PostStartBasicResponse response, XContentBuilder builder) throws Exception {
            PostStartBasicResponse.Status status = response.getStatus();
            response.toXContent(builder, ToXContent.EMPTY_PARAMS);
            return new BytesRestResponse(status.getRestStatus(), builder);
        }
    });
}

@Override
public String getName() {
    return "xpack_start_basic_action";
}
*/

package org.elasticsearch.license;

import org.elasticsearch.ElasticsearchException;
import org.elasticsearch.action.ActionListener;
import org.elasticsearch.action.support.ActionFilters;
import org.elasticsearch.action.support.master.AcknowledgedResponse;
import org.elasticsearch.action.support.master.TransportMasterNodeAction;
import org.elasticsearch.cluster.ClusterState;
import org.elasticsearch.cluster.ack.ClusterStateUpdateResponse;
import org.elasticsearch.cluster.block.ClusterBlockException;
import org.elasticsearch.cluster.block.ClusterBlockLevel;
import org.elasticsearch.cluster.metadata.IndexNameExpressionResolver;
import org.elasticsearch.cluster.service.ClusterService;
import org.elasticsearch.common.inject.Inject;
import org.elasticsearch.common.settings.Settings;
import org.elasticsearch.protocol.xpack.license.DeleteLicenseRequest;
import org.elasticsearch.threadpool.ThreadPool;
import org.elasticsearch.transport.TransportService;
public class TransportDeleteLicenseAction extends TransportMasterNodeAction<DeleteLicenseRequest, AcknowledgedResponse> {

    private final LicenseService licenseService;

    @Inject
    public TransportDeleteLicenseAction(Settings settings, TransportService transportService, ClusterService clusterService,
        LicenseService licenseService, ThreadPool threadPool, ActionFilters actionFilters,
        IndexNameExpressionResolver indexNameExpressionResolver) {
        super(settings, DeleteLicenseAction.NAME, transportService, clusterService, threadPool, actionFilters,
            indexNameExpressionResolver, DeleteLicenseRequest::new);
        this.licenseService = licenseService;
    }

    @Override
    protected String executor() {
        return ThreadPool.Names.MANAGEMENT;
    }

    @Override
    protected AcknowledgedResponse newResponse() {
        return new AcknowledgedResponse();
    }

    @Override
    protected ClusterBlockException checkBlock(DeleteLicenseRequest request, ClusterState state) {
        return state.blocks().globalBlockedException(ClusterBlockLevel.METADATA_WRITE);
    }

    @Override
    protected void masterOperation(final DeleteLicenseRequest request, ClusterState state, final ActionListener<AcknowledgedResponse> listener) throws ElasticsearchException {
        licenseService.removeLicense(request, new ActionListener<ClusterStateUpdateResponse>() {
            @Override
            public void onResponse(ClusterStateUpdateResponse clusterStateUpdateResponse) {
                listener.onResponse(new AcknowledgedResponse(clusterStateUpdateResponse.isAcknowledged()));
            }

            @Override
            public void onFailure(Exception e) {
                listener.onFailure(e);
            }
        });
    }
}
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JUnRAR (https://github.com/edmund-wagner/junrar/)

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The 35 level includes frequency classes 2-6 and words appearing in at least 11 of 12 dictionaries as indicated in the 12Dicts package. All words from the 12Dicts package have had likely inflections added via my inflection database.

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**1.68 findutils 4.5.11 :6.el7**

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1.75 gcc 4.8.5 :28.el7
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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.

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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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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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GCC RUNTIME LIBRARY EXCEPTION

Version 3.1, 31 March 2009

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Developed by:

LLVM Team

University of Illinois at Urbana-Champaign

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<table>
<thead>
<tr>
<th>Program</th>
<th>Directory</th>
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<tr>
<td>mach_override</td>
<td>lib/interception/mach_override</td>
</tr>
</tbody>
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/* Definitions for BSD assembler syntax for Intel 386
   (actually AT&T syntax for insns and operands,
   adapted to BSD conventions for symbol names and debugging.)
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<http://www.gnu.org/licenses/>. */

/* Use the Sequent Symmetry assembler syntax. */

/* Define the syntax of pseudo-ops, labels and comments. */

/* Prefix for internally generated assembler labels. If we aren't using
   underscores, we are using prefix "."s to identify labels that should
   be ignored, as in `.i386/gas.h' --karl@cs.umb.edu */

#define LPREFIX "L"

/* Assembler pseudos to introduce constants of various size. */

#define ASM_BYTE "\t.byte\t"
#define ASM_SHORT "\t.word\t"
#define ASM_LONG "\t.long\t"
#define ASM_QUAD "\t.quad\t" /* Should not be used for 32bit compilation. */

/* This was suggested, but it shouldn’t be right for DBX output. -- RMS */
#define ASM_OUTPUT_SOURCE_FILENAME(FILE, NAME) */

/* Define the syntax of labels and symbol definitions/declarations. */
/* This is how to output an assembler line that says to advance the location counter by SIZE bytes. */

#define ASM_OUTPUT_SKIP(FILE,SIZE)  
fprintf (FILE, "\t.space \n", (SIZE))

/* Define the syntax of labels and symbol definitions/declarations. */
/* This says how to output an assembler line to define a global common symbol. */

#define ASM_OUTPUT_COMMON(FILE, NAME, SIZE, ROUNDED)  
( fputs (".comm ", (FILE)),
 assemble_name ((FILE), (NAME)),
 fprintf ((FILE), ",%u\n", (int)(ROUNDED)))

/* This says how to output an assembler line to define a local common symbol. */

#define ASM_OUTPUT_LOCAL(FILE, NAME, SIZE, ROUNDED)  
( fputs (".lcomm ", (FILE)),
 assemble_name ((FILE), (NAME)),
 fprintf ((FILE), ",%u\n", (int)(ROUNDED)))

#ifndef HAVE_GAS_LCOMM_WITH_ALIGNMENT
#define ASM_OUTPUT_ALIGNED_LOCAL(FILE, NAME, SIZE, ALIGNMENT)  
( fputs (".lcomm ", (FILE)),
 assemble_name ((FILE), (NAME)),
 fprintf ((FILE), ",%u,%u\n", (int)(SIZE), (int)(ALIGNMENT) / BITS_PER_UNIT))
#endif

/* This is how to output an assembler line that says to advance the location counter to a multiple of 2**LOG bytes. */

#define ASM_OUTPUT_ALIGN(FILE,LOG)  
if ((LOG)\n) fprintf ((FILE), "\t.align %d\n", (LOG))
/* This is how to store into the string BUF
the symbol_ref name of an internal numbered label where
PREFIX is the class of label and NUM is the number within the class.
This is suitable for output with `assemble_name'. */

#define ASM_GENERATE_INTERNAL_LABEL(BUF,PREFIX,NUMBER)\
    sprintf ((BUF), "*%s%ld", (PREFIX), (long)(NUMBER))

/* The prefix to add to user-visible assembler symbols. */
#define USER_LABEL_PREFIX "_

/* Sequent has some changes in the format of DBX symbols. */
#define DBX_NO_XREFS 1

/* Don't split DBX symbols into continuations. */
#define DBX_CONTIN_LENGTH 0

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@end enumerate

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terms.

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to attach them to the start of each source file to most effectively
state 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
@variable{one line to give the program's name and a brief idea of what it does.}
Copyright (C) @variable{year} @variable{name of author}

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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
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@end smallexample

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

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

@example
@var{program} Copyright (C) @var{year} @var{name of author}
This program comes with ABSOLUTELY NO WARRANTY; for details type @samp{show w}.
This is free software, and you are welcome to redistribute it
under certain conditions; type @samp{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, your
program's commands might be different; for a GUI interface, you would
use an `about box'.

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@end c man

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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 Petersen(jep@miiname.mitia.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.ic1.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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#
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# the Free Software Foundation; either version 3, or (at your option)
# any later version.
#
# This script adjusts the copyright notices at the top of source files
# so that they have the form:
#
#   Copyright XXXX-YYYY Free Software Foundation, Inc.
#
# It doesn't change code that is known to be maintained elsewhere or
# that carries a non-FSF copyright.
#
# The script also doesn't change testsuite files, except those in
# libstdc++-v3. This is because libstdc++-v3 has a conformance testsuite,
# while most tests in other directories are just things that failed at some
# point in the past.
#
# Pass --this-year to the script if you want it to add the current year
# to all applicable notices. Pass --quilt if you are using quilt and
# want files to be added to the quilt before being changed.
#
# By default the script will update all directories for which the
# output has been vetted. You can instead pass the names of individual
# directories, including those that haven't been approved. So:
#
#   update-copyright.pl --this-year
#
# is the command that would be used at the beginning of a year to update
# all copyright notices (and possibly at other times to check whether
# new files have been added with old years). On the other hand:
#
#   update-copyright.pl --this-year libjava
#
# would run the script on just libjava/.
#
# Note that things like --version output strings must be updated before
# this script is run. There's already a separate procedure for that.

import os
import re
import sys
import time
import subprocess

class Errors:
    def __init__(self):
        self.num_errors = 0

    def report(self, filename, string):
        if filename:
            string = filename + ': ' + string
        sys.stderr.write(string + '
')
        self.num_errors += 1

    def ok(self):
        return self.num_errors == 0

class GenericFilter:
    def __init__(self):
        self.skip_files = set()
        self.skip_dirs = set()
        self.skip_extensions = set()
        self.fossilised_files = set()
        self.own_files = set()

        self.skip_files |= set(['
            # Skip licence files.
            'COPYING',
            'COPYING.LIB',
            'COPYING3',
            'COPYING3.LIB',
            'LICENSE',
            'fdl.texi',
            'gpl_v3.texi',
            'fdl-1.3.xml',
            'gpl-3.0.xml',

            # Skip auto- and libtool-related files
            'aclocal.m4',
            'compile',
            'config.guess',
            'config.sub',
            'depcomp',
            'install-sh',
            'libtool.m4',
            'ltmain.sh',
            'ltoptions.m4',
        ''])
'ltsgar.m4',
'ltversion.m4',
'lt~obsolete.m4',
'missing',
'mkdep',
'mkinstalldirs',
'move-if-change',
'shlibpath.m4',
'syml ink-tree',
'ylwrap',

# Skip FSF mission statement, etc.
'gnu.texi',
'funding.texi',
'appendix_free.xml',

# Skip imported texinfo files.
'texinfo.tex',
)


def get_line_filter (self, dir, filename):
    if filename.startswith ('ChangeLog'):
        # Ignore references to copyright in changelog entries.
        return re.compile ('	')
    return None

def skip_file (self, dir, filename):
    if filename in self.skip_files:
        return True

    (base, extension) = os.path.splitext (os.path.join (dir, filename))
    if extension in self.skip_extensions:
        return True
    if extension == '.in':
        # Skip .in files produced by automake.
        if os.path.exists (base + '.am'):
            return True

    # Skip files produced by autogen
    if (os.path.exists (base + '.def')
        and os.path.exists (base + '.tpl')):
        return True

    # Skip configure files produced by autoconf
    if filename == 'configure':
if os.path.exists (base + '.ac'):
    return True
if os.path.exists (base + '.in'):
    return True
return False

def skip_dir (self, dir, subdir):
    return subdir in self.skip_dirs

def is_fossilised_file (self, dir, filename):
    if filename in self.fossilised_files:
        return True
    # Only touch current current ChangeLogs.
    if filename != 'ChangeLog' and filename.find ('ChangeLog') >= 0:
        return True
    return False

def by_package_author (self, dir, filename):
    return filename in self.own_files

class Copyright:
    def __init__ (self, errors):
        self.errors = errors

        # Characters in a range of years. Include '.' for typos.
        ranges = '[0-9-](?:[-0-9,.\s]+and\s+)*[0-9-]'

        # Non-whitespace characters in a copyright holder's name.
        name = '[\\w-.]'

        # Matches one year.
        self.year_re = re.compile ('[0-9]+')

        # Matches part of a year or copyright holder.
        self.continuation_re = re.compile (ranges + '|' + name)

        # Matches a full copyright notice:
        self.copyright_re = re.compile (  # 1: 'Copyright (C)', etc.
            '(?:[Cc]opyright'  # [Cc]opyright
            '[Cc]opyright\s+\([Cc]\)'  # [Cc]opyright
            '[Cc]opyright\s+\%'  # [Cc]opyright
            '[Cc]opyright\s+\&copy;'  # [Cc]opyright
            '[Cc]opyright\s+\@copyright\{\}'  # [Cc]opyright
            '@\s+copyright\{\w-\}'])

        # 2: the years. Include the whitespace in the year, so that
# we can remove any excess.
'(\s*\(?::\+ + ranges + ,\)?\n\[\@value\{[^{}]*\}\]s*)'\\n
# 3: 'by ', if used
'(by\s+)?'\\n
# 4: the copyright holder. Don't allow multiple consecutive
# spaces, so that right-margin gloss doesn't get caught
# (e.g. gnat_ugn.texi).
'(\s*+ name + (?::? + name + *))?'\\n
# A regexp for notices that might have slipped by. Just matching
# 'copyright' is too noisy, and 'copyright.*[0-9]' falls foul of
# HTML header markers, so check for 'copyright' and two digits.
self.other_copyright_re = re.compile('copyright.*\[0-9]\[0-9\]',
                                     re.IGNORECASE)\\nself.comment_re = re.compile('#*|[*]+;*|%*//*|-c|dnl ')\\nself.holders = { '@copying': '@copying' }\\nself.holder_prefixes = set()\\n
# True to 'quilt add' files before changing them.
self.use_quilt = False\\n
# If set, force all notices to include this year.
self.max_year = None\\n
# Goes after the year(s). Could be '\,\,'.
self.separator = ','

def add_package_author (self, holder, canon_form = None):
  if not canon_form:
    canon_form = holder
  self.holders[holder] = canon_form
  index = holder.find (' ')\\n  while index >= 0:
    self.holder_prefixes.add(holder[:index])
    index = holder.find (' ', index + 1)

def add_external_author (self, holder):
  self.holders[holder] = None

class BadYear():
  def __init__ (self, year):
    self.year = year
  def __str__ (self):
    return 'unrecognised year: ' + self.year
def parse_year (self, string):
    year = int (string)
    if len (string) == 2:
        if year > 70:
            return year + 1900
    elif len (string) == 4:
        return year
    raise self.BadYear (string)

def year_range (self, years):
    year_list = [self.parse_year (year)
                 for year in self.year_re.findall (years)]
    assert len (year_list) > 0
    return (min (year_list), max (year_list))

def set_use_quilt (self, use_quilt):
    self.use_quilt = use_quilt

def include_year (self, year):
    assert not self.max_year
    self.max_year = year

def canonicalise_years (self, dir, filename, filter, years):
    # Leave texinfo variables alone.
    if years.startswith ('@value'):
        return years
    (min_year, max_year) = self.year_range (years)
    # Update the upper bound, if enabled.
    if self.max_year and not filter.is_fossilised_file (dir, filename):
        max_year = max (max_year, self.max_year)
    # Use a range.
    if min_year == max_year:
        return '%d' % min_year
    else:
        return '%d-%d' % (min_year, max_year)

def strip_continuation (self, line):
    line = line.lstrip()
    match = self.comment_re.match (line)
    if match:
        line = line[match.end():].lstrip()
    return line

def is_complete (self, match):
holder = match.group (4)
return (holder
    and (holder not in self.holder_prefixes
         or holder in self.holders))

def update_copyright(self, dir, filename, filter, file, line, match):
    orig_line = line
    next_line = None
    pathname = os.path.join (dir, filename)

    intro = match.group (1)
    if intro.startswith ('@set'):
        # Texinfo year variables should always be on one line
        after_years = line[match.end (2):].strip()
        if after_years != ':
            self.errors.report (pathname,
                               'trailing characters in @set: ' + after_years)
            return (False, orig_line, next_line)
        else:
            # If it looks like the copyright is incomplete, add the next line.
            while not self.is_complete (match):
                try:
                    next_line = file.next()
                except StopIteration:
                    break
                # If the next line doesn’t look like a proper continuation,
                # assume that what we’ve got is complete.
                continuation = self.strip_continuation (next_line)
                if not self.continuation_re.match (continuation):
                    break
                # Merge the lines for matching purposes.
                orig_line += next_line
                line = line.rstrip() + '' + continuation
                next_line = None

            # Rematch with the longer line, at the original position.
            match = self.copyright_re.match (line, match.start())
            assert match
            holder = match.group (4)
            # Use the filter to test cases where markup is getting in the way.
            if filter.by_package_author (dir, filename):
                assert holder not in self.holders
elif not holder:
    self.errors.report (pathname, 'missing copyright holder')
    return (False, orig_line, next_line)

elif holder not in self.holders:
    self.errors.report (pathname, 'unrecognised copyright holder: ' + holder)
    return (False, orig_line, next_line)
else:
    # See whether the copyright is associated with the package
    # author.
    canon_form = self.holders[holder]
    if not canon_form:
        return (False, orig_line, next_line)

    # Make sure the author is given in a consistent way.
    line = (line[:match.start (4)]
            + canon_form
            + line[match.end (4):])

    # Remove any 'by'
    line = line[:match.start (3)] + line[match.end (3):]

    # Update the copyright years.
    years = match.group (2).strip()
    try:
        canon_form = self.canonicalise_years (dir, filename, filter, years)
    except self.BadYear as e:
        self.errors.report (pathname, str (e))
        return (False, orig_line, next_line)
    line = (line[:match.start (2)]
            + ' ' + canon_form + self.separator
            + line[match.end (2):])

    # Use the standard (C) form.
    if intro.endswith ('right'):
        intro += ' (C)
    elif intro.endswith ('(c)'):
        intro = intro[:-3] + 'C'
    line = line[:match.start (1)] + intro + line[match.end (1):]

    # Strip trailing whitespace
    line = line.rstrip() + '\n'

    return (line != orig_line, line, next_line)
def process_file (self, dir, filename, filter):
    pathname = os.path.join (dir, filename)
    if filename.endswith ('.tmp'):
        # Looks like something we tried to create before.
        try:
            os.remove (pathname)
        except OSError:
            pass
        return

    lines = []
    changed = False
    line_filter = filter.get_line_filter (dir, filename)

    with open (pathname, 'r') as file:
        prev = None
        for line in file:
            while line:
                next_line = None
                # Leave filtered-out lines alone.
                if not (line_filter and line_filter.match (line)):
                    match = self.copyright_re.search (line)
                    if match:
                        res = self.update_copyright (dir, filename, filter,
                                                     file, line, match)
                        (this_changed, line, next_line) = res
                        changed = changed or this_changed

                    # Check for copyright lines that might have slipped by.
                    elif self.other_copyright_re.search (line):
                        self.errors.report (pathname,
                                            'unrecognised copyright: %s'
                                            % line.strip())
                    lines.append (line)

                next_line = line

                # If something changed, write the new file out.
                if changed and self.errors.ok():
                    tmp_pathname = pathname + '.tmp'
                    with open (tmp_pathname, 'w') as file:
                        for line in lines:
                            file.write (line)
                    if self.use_quilt:
                        subprocess.call (['quilt', 'add', pathname])
                    os.rename (tmp_pathname, pathname)

    def process_tree (self, tree, filter):
        for (dir, subdirs, filenames) in os.walk (tree):
            # Don't recurse through directories that should be skipped.
            for filename in filenames:
                process_file (self, dir, filename, filter)
for i in xrange (len (subdirs) - 1, -1, -1):
if filter.skip_dir (dir, subdirs[i]):
del subdirs[i]
# Handle the files in this directory.
for filename in filenames:
if filter.skip_file (dir, filename):
sys.stdout.write ('Skipping %s\n'
% os.path.join (dir, filename))
else:
self.process_file (dir, filename, filter)
class CmdLine:
def __init__ (self, copyright = Copyright):
self.errors = Errors()
self.copyright = copyright (self.errors)
self.dirs = []
self.default_dirs = []
self.chosen_dirs = []
self.option_handlers = dict()
self.option_help = []
self.add_option ('--help', 'Print this help', self.o_help)
self.add_option ('--quilt', '"quilt add" files before changing them',
self.o_quilt)
self.add_option ('--this-year', 'Add the current year to every notice',
self.o_this_year)
def add_option (self, name, help, handler):
self.option_help.append ((name, help))
self.option_handlers[name] = handler
def add_dir (self, dir, filter = GenericFilter()):
self.dirs.append ((dir, filter))
def o_help (self, option = None):
sys.stdout.write ('Usage: %s [options] dir1 dir2...\n\n'
'Options:\n' % sys.argv[0])
format = '%-15s %s\n'
for (what, help) in self.option_help:
sys.stdout.write (format % (what, help))
sys.stdout.write ('\nDirectories:\n')
format = '%-25s'
i=0
for (dir, filter) in self.dirs:
i += 1
if i % 3 == 0 or i == len (self.dirs):

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sys.stdout.write (dir + '\n')
else:
    sys.stdout.write (format % dir)
sys.exit (0)

def o_quilt (self, option):
    self.copyright.set_use_quilt (True)

def o_this_year (self, option):
    self.copyright.include_year (time.localtime().tm_year)

def main (self):
    for arg in sys.argv[1:]:
        if arg[:1] != '-':
            self.chosen_dirs.append (arg)
        elif arg in self.option_handlers:
            self.option_handlers[arg] (arg)
        else:
            self.errors.report (None, 'unrecognised option: ' + arg)
    if self.errors.ok():
        if len (self.chosen_dirs) == 0:
            self.chosen_dirs = self.default_dirs
        if len (self.chosen_dirs) == 0:
            self.o_help()
        else:
            for chosen_dir in self.chosen_dirs:
                canon_dir = os.path.join (chosen_dir, '')
                count = 0
                for (dir, filter) in self.dirs:
                    if (dir + os.sep).startswith (canon_dir):
                        count += 1
                    self.copyright.process_tree (dir, filter)
                if count == 0:
                    self.errors.report (None, 'unrecognised directory: ' + chosen_dir)
                    sys.exit (0 if self.errors.ok() else 1)

#--------------------------------------------------------------------------------

class TopLevelFilter (GenericFilter):
    def skip_dir (self, dir, subdir):
        return True

class ConfigFilter (GenericFilter):
    def __init__ (self):
        GenericFilter.__init__ (self)

    def skip_file (self, dir, filename):

if filename.endswith('.m4'):
    pathname = os.path.join(dir, filename)
    with open(pathname) as file:
        # Skip files imported from gettext.
        if file.readline().find('gettext-') >= 0:
            return True
    return GenericFilter.skip_file(self, dir, filename)

class GCCFilter(GenericFilter):
    def __init__(self):
        GenericFilter.__init__(self)

        self.skip_files |= set(['
            # Not part of GCC
            'math-68881.h',
        ])

        self.skip_dirs |= set(['
            # Better not create a merge nightmare for the GNAT folks.
            'ada',

            # Handled separately.
            'testsuite',
        ])

        self.skip_extensions |= set(['
            # Maintained by the translation project.
            '.po',

            # Automatically-generated.
            '.pot',
        ])

        self.fossilised_files |= set(['
            # Old news won't be updated.
            'ONEWS',
        ])
def skip_file (self, dir, filename):
    # g++.niklas/README contains historical copyright information
    # and isn't updated.
    if filename == 'README' and os.path.basename (dir) == 'g++.niklas':
        return True
    return GenericFilter.skip_file (self, dir, filename)

class LibCppFilter (GenericFilter):
    def __init__ (self):
        GenericFilter.__init__ (self)

        self.skip_extensions |= set (
            # Maintained by the translation project.
            '.po',

            # Automatically-generated.
            '.pot',
        )

class LibGCCFilter (GenericFilter):
    def __init__ (self):
        GenericFilter.__init__ (self)

        self.skip_dirs |= set (
            # Imported from GLIBC.
            'soft-fp',
        )

class LibJavaFilter (GenericFilter):
    def __init__ (self):
        GenericFilter.__init__ (self)

        self.skip_dirs |= set (
            # Handled separately.
            'testsuite',

            # Not really part of the library
            'contrib',

            # Imported from upstream
'classpath',
'libltdl',
]

def get_line_filter (self, dir, filename):
    if filename == 'NameDecoder.h':
        return re.compile ('.*NAME_COPYRIGHT')
    if filename == 'ICC_Profile.h':
        return re.compile ('.*icSigCopyrightTag')
    return GenericFilter.get_line_filter (self, dir, filename)

class LibMudflapFilter (GenericFilter):
    def __init__ (self):
        GenericFilter.__init__ (self)

        self.skip_dirs |= set ({
            # Handled separately.
            'testsuite',
        })

class LibStdCxxFilter (GenericFilter):
    def __init__ (self):
        GenericFilter.__init__ (self)

        self.skip_files |= set ({
            # Contains no copyright of its own, but quotes the GPL.
            'intro.xml',
        })

        self.skip_dirs |= set ({
            # Contains automatically-generated sources.
            'html',

            # The testsuite data files shouldn't be changed.
            'data',

            # Contains imported images
            'images',
        })

        self.own_files |= set ({
            # Contains markup around the copyright owner.
            'spine.xml',
        })

    def get_line_filter (self, dir, filename):
        if filename == 'boost_concept_check.h':
            return re.compile ('// (C) Copyright Jeremy Siek')
return GenericFilter.get_line_filter (self, dir, filename)

class GCCCopyright (Copyright):
    def __init__ (self, errors):
        Copyright.__init__ (self, errors)

        canon_fsf = 'Free Software Foundation, Inc.'
        self.add_package_author ('Free Software Foundation', canon_fsf)
        self.add_package_author ('Free Software Foundation.', canon_fsf)
        self.add_package_author ('Free Software Foundation Inc', canon_fsf)
        self.add_package_author ('Free Software Foundation, Inc', canon_fsf)
        self.add_package_author ('Free Software Foundation, Inc.', canon_fsf)
        self.add_package_author ('The Free Software Foundation', canon_fsf)
        self.add_package_author ('The Free Software Foundation, Inc.', canon_fsf)
        self.add_package_author ('Software Foundation, Inc.', canon_fsf)

        self.add_external_author ('ARM')
        self.add_external_author ('AdaCore')
        self.add_external_author ('Ami Tavory and Vladimir Dreizin, IBM-HRL')
        self.add_external_author ('Cavium Networks')
        self.add_external_author ('Faraday Technology Corp')
        self.add_external_author ('Florida State University')
        self.add_external_author ('Greg Colvin and Beman Dawes')
        self.add_external_author ('Hewlett-Packard Company')
        self.add_external_author ('Information Technology Industry Council')
        self.add_external_author ('James Theiler, Brian Gough')
        self.add_external_author ('Makoto Matsumoto and Takuji Nishimura')
        self.add_external_author ('National Research Council of Canada')
        self.add_external_author ('Peter Dimov and Multi Media Ltd')
        self.add_external_author ('Peter Dimov')
        self.add_external_author ('Pipeline Associates, Inc')
        self.add_external_author ('Regents of the University of California')
        self.add_external_author ('Silicon Graphics Computer Systems, Inc')
        self.add_external_author ('Silicon Graphics')
        self.add_external_author ('Stephen L. Moshier')
        self.add_external_author ('Sun Microsystems, Inc. All rights reserved')
        self.add_external_author ('The Go Authors. All rights reserved')
        self.add_external_author ('The Go Authors. All rights reserved')
        self.add_external_author ('The Regent of the University of California')
        self.add_external_author ('Unicode, Inc')
        self.add_external_author ('University of Toronto')

    class GCCCmdLine (CmdLine):
        def __init__ (self):
            CmdLine.__init__ (self, GCCCopyright)

            self.add_dir ('.', TopLevelFilter())
# boehm-gc is imported from upstream.
self.add_dir('config', ConfigFilter())

# contrib isn’t really part of GCC.
self.add_dir('fixincludes')
self.add_dir('gcc', GCCFilter())
self.add_dir(os.path.join('gcc', 'testsuite'), TestsuiteFilter())
self.add_dir('gnattools')
self.add_dir('include')
self.add_dir('libada')
self.add_dir('libatomic')
self.add_dir('libbacktrace')
self.add_dir('libcpp', LibCppFilter())
self.add_dir('libdecnumber')

# libffi is imported from upstream.
self.add_dir('libgcc', LibGCCFilter())
self.add_dir('libgfortran')
self.add_dir('libgomp')
self.add_dir('libiberty')
self.add_dir('libitm')
self.add_dir('libjava', LibJavaFilter())
self.add_dir(os.path.join('libjava', 'testsuite'), TestsuiteFilter())
self.add_dir('libmudflap', LibMudflapFilter())
self.add_dir(os.path.join('libmudflap', 'testsuite'), TestsuiteFilter())
self.add_dir('libobjc')
self.add_dir('libquadmath')

# libsanitiser is imported from upstream.
self.add_dir('libssp')
self.add_dir('libstdc++-v3', LibStdCxxFilter())
self.add_dir('lto-plugin')

# zlib is imported from upstream.

self.default_dirs = [
    'gcc',
    'libada',
    'libatomic',
    'libbacktrace',
    'libcpp',
    'libdecnumber',
    'libgcc',
    'libgfortran',
    'libgomp',
    'libiberty',
    'libitm',
    'libmudflap',
    'libobjc',
    'libstdc++-v3',
]
GCCCmdLine().main()
<?xml version="1.0" encoding="UTF-8" standalone="no"?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd"><html
xmlns="http://www.w3.org/1999/xhtml"><head><meta http-equiv="Content-Type" content="text/html;
charset=UTF-8" /></head><body><div class="navheader"><table width="100%"
summary="Navigation header"><tr><th colspan="3" align="center">License</th></tr><tr><td width="20%" align="left"><a accesskey="p" href="status.html">Prev</a></td><th width="60%" align="center">Chapter1.Status</th><td width="20%" align="right"><a accesskey="n" href="bugs.html">Next</a></td></tr></table><hr /></div><div class="section"><div class="titlepage"><div><div><h2 class="title" style="clear: both"><a id="manual.intro.status.license"></a>License</h2></div></div></div><p>There are two licenses affecting GNU libstdc++: one for the code,
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and one for the documentation.
</p></div><div class="section"><div class="titlepage"><div><div><h3 class="title"><a id="manual.intro.status.license.gccruntimelibraryexception"></a>GCC Runtime Library Exception</h3></div></div></div><p>Version 3.1, 31 March 2009</p><p>Copyright(C)2009<a class="link" href="http://www.fsf.org" target="_top">Free Software Foundation, Inc.</a></p><p>Everyone is permitted to copy and distribute verbatim copies of this<br />
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exception statement from your version. */
package gnu.classpath.tools.taglets;

import java.util.Map;

import com.sun.tools.doclets.Taglet;

import com.sun.javadoc.Tag;

/**
 * A simple Taglet which handles Copyright information.
 */
public class CopyrightTaglet implements Taglet {

    private static final String NAME = "copyright";
    private static final String HEADER = "Copyright:";

    public String getName() {
        return NAME;
    }

    public boolean inField() {
        return true;
    }

    public boolean inConstructor() {
        return true;
    }

    public boolean inMethod() {
        return true;
    }

    public boolean inOverview() {
        return true;
    }

    public boolean inPackage() {
        return true;
    }

    public boolean inType() {
        return true;
    }

    public boolean isInlineTag() {
        return false;
    }
}
public static void register(Map tagletMap) {
    CopyrightTaglet copyrightTaglet = new CopyrightTaglet();
    tagletMap.put(copyrightTaglet.getName(), copyrightTaglet);
}

public String toString(Tag tag) {
    return toString(new Tag[] { tag });
}

public String toString(Tag[] tags) {
    if (tags.length == 0) {
        return null;
    } else {
        boolean haveValidTag = false;
        for (int i = 0; i < tags.length && !haveValidTag; ++i) {
            if (tags[i].text().length() > 0) {
                haveValidTag = true;
            }
        }
        if (haveValidTag) {
            StringBuffer result = new StringBuffer();
            result.append("<dl>");
            for (int i = 0; i < tags.length; i++) {
                if (tags[i].text().length() > 0) {
                    result.append("<dt><i>Copyright © " + tags[i].text() + " <i>/" + tags[i].text() + "></dt>"");
                }
            result.append("</dl>");
            return result.toString();
        } else {
            return null;
        }
    }
}

/* Permission.java -- The superclass for all permission objects

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exception statement from your version. */

package java.security;

import gnu.java.lang.CPStringBuilder;

import java.io.Serializable;

/**
 * This class is the abstract superclass of all classes that implement
 * the concept of a permission. A permission consists of a permission name
 * and optionally a list of actions that relate to the permission. The
 * actual meaning of the name of the permission is defined only in the
 * context of a subclass. It may name a resource to which access permissions
 * are granted (for example, the name of a file) or it might represent
 * something else entirely. Similarly, the action list only has meaning
 * within the context of a subclass. Some permission names may have no
 * actions associated with them. That is, you either have the permission
 * or you don't.
 *
 * <p>The most important method in this class is <code>implies</code>. This
 * checks whether if one has this permission, then the specified
permission is also implied. As a conceptual example, consider the
permissions "Read All Files" and "Read File foo". The permission
"Read All Files" implies that the caller has permission to read the
file foo.

<p><code>Permission</code>'s must be immutable - do not change their
state after creation.

@<author>Aaron M. Renn</author> (<a>arenn@urbanophile.com</a>)
@see Permissions
@see PermissionCollection
@since 1.1
@status updated to 1.4

public abstract class Permission implements Guard, Serializable
{
/**
 * Compatible with JDK 1.1+.
 */
private static final long serialVersionUID = -5636570222231596674L;

/**
 * This is the name assigned to this permission object.
 *
 * @serial the name of the permission
 */
private String name;

/**
 * Create an instance with the specified name.
 *
 * @param name the permission name
 */
public Permission(String name)
{
  this.name = name;
}

/**
 * This method implements the <code>Guard</code> interface for this class.
 * It calls the <code>checkPermission</code> method in
 * <code>SecurityManager</code> with this <code>Permission</code> as its
 * argument. This method returns silently if the security check succeeds
 * or throws an exception if it fails.
 *
 * @param obj the <code>Object</code> being guarded - ignored by this class
 * @throws SecurityException if the security check fails
 * @see GuardedObject
public void checkGuard(Object obj) {
    SecurityManager sm = System.getSecurityManager();
    if (sm != null) 
        sm.checkPermission(this);
}

/**
 * This method tests whether this <code>Permission</code> implies that the
 * specified <code>Permission</code> is also granted.
 *
 * @param perm the <code>Permission</code> to test against
 * @return true if perm is implied by this
 */
public abstract boolean implies(Permission perm);

/**
 * Check to see if this object equals obj. Use <code>implies</code>, rather
 * than <code>equals</code>, when making access control decisions.
 *
 * @param obj the object to compare to
 */
public abstract boolean equals(Object obj);

/**
 * This method returns a hash code for this <code>Permission</code>. It
 * must satisfy the contract of <code>Object.hashCode</code>: it must be
 * the same for all objects that equals considers to be the same.
 *
 * @return a hash value
 */
public abstract int hashCode();

/**
 * Get the name of this <code>Permission</code>.
 *
 * @return the name
 */
public final String getName() {
    return name;
}

/**
 * This method returns the list of actions for this <code>Permission</code>
 * as a <code>String</code>. The string should be in canonical order, for
* example, both <code>new FilePermission(f, "write,read")</code> and
* <code>new FilePermission(f, "read,write")</code> have the action list
* "read,write".
*
* @return the action list for this <code>Permission</code>
*/
public abstract String getActions();

/**
 * This method returns an empty <code>PermissionCollection</code> object
 * that can store permissions of this type, or <code>null</code> if no
 * such collection is defined. Subclasses must override this to provide
 * an appropriate collection when one is needed to accurately calculate
 * <code>implies</code>.
 *
 * @return a new <code>PermissionCollection</code>
 */
public PermissionCollection newPermissionCollection()
{
    return null;
}

/**
 * This method returns a <code>String</code> representation of this
 * <code>Permission</code> object. This is in the format:
 * <code>'(' + getClass().getName() + ' ' + getName() + ' ' + getActions
 * + ')'</code>.
 *
 * @return this object as a <code>String</code>
 */
public String toString()
{
    CPStringBuilder string = new CPStringBuilder();
    string = string.append('(');
    string = string.append(getClass().getName());
    string = string.append(' ');
    string = string.append(getName());
    if (!(getActions().equals("")))
    {
        string = string.append(' ');
        string = string.append(getActions());
    }
    string = string.append(')');
    return string.toString();
}
package java.security.acl;

/**
 * This interface provides information about a permission that can be
 * granted. Note that this is <em>not</em> the same as the class
 * <code>java.security.Permission</code>.
 *
 * @version 0.0
 *
 * @author Aaron M. Renn (arenn@urbanophile.com)
 */
public interface Permission
{
/**
 * This method tests whether or not a specified <code>Permission</code>
 * (passed as an <code>Object</code>) is the same as this permission.
 *
 * @param perm The permission to check for equality
 *
 * @return <code>true</code> if the specified permission is the same as this one, <code>false</code> otherwise
 */
boolean equals (Object perm);

/**
 * This method returns this <code>Permission</code> as a <code>String</code>.
 *
 * @return A <code>String</code> representing this permission.
 */
String toString();
}

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1.77 GeoIP 1.5.0 :13.el7

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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.)

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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. 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.)

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

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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   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.)

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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.

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.

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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) 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.

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<signature of Ty Coon>, 1 April 1990
Ty Coon, President of Vice

That's all there is to it!
commit ef7344f09c5ce00eb519ed14598b2a8e39e68387
Author: Joseph Myers <joseph@codesourcery.com>
Date:   Sun Dec 22 14:49:48 2013 +0000

Flatten sysdeps/unix/bsd/bsd4.4 into sysdeps/unix/bsd.

As discussed in
<https://sourceware.org/ml/libc-alpha/2012-04/msg00840.html> and
<https://sourceware.org/ml/libc-alpha/2012-04/msg00989.html>, it seems appropriate to flatten sysdeps/unix/bsd/bsd4.4 into sysdeps/unix/bsd.

The bulk of the patch is just moving files. The only other changes are: update paths in sysdeps/mach/hurd/Implies and
sysdeps/unix/sysv/linux/wait3.c; merge the two syscalllist files,
with the removal of syscalls that were in
sysdeps/unix/bsd/syscalls.list but overridden in the bsd4.4 directory
by .c files there.

Tested x86_64. The installed shared libraries are identical before
and after the patch except for libc.so where the move of wait3.c
(included by sysdeps/unix/sysv/linux/wait3.c) affects debug info, but
the disassembly is unchanged.

* sysdeps/mach/hurd/Implies: Change unix/bsd/bsd4.4 to unix/bsd.
* sysdeps/unix/bsd/syscalls.list (chflags): Add entry from
  sysdeps/unix/bsd/bsd4.4/syscalls.list.
  (fchflags): Likewise.
  (revoke): Likewise.
  (setlogin): Likewise.
  (sigaltstack): Likewise.
  (wait4): Likewise.
  (sigblock): Remove.
  (sigsetmask): Likewise.
  (wait3): Likewise.
  (waitpid): Likewise.
* sysdeps/unix/bsd/bsd4.4/syscalls.list: Remove file.
* sysdeps/unix/sysv/linux/wait3.c: Update directory of included
  file.
* sysdeps/unix/bsd/bsd4.4/Makefile: Move to ...
* sysdeps/unix/bsd/Makefile: ... here.
* sysdeps/unix/bsd/bsd4.4/Versions: Move to ...
* sysdeps/unix/bsd/Versions: ... here.
* sysdeps/unix/bsd/bsd4.4/bits/socketaddr.h: Move to ...
* sysdeps/unix/bsd/bits/socketaddr.h: ... here.
* sysdeps/unix/bsd/bsd4.4/cmsg_nxthdr.c: Move to ...
* sysdeps/unix/bsd/cmsg_nxthdr.c: ... here.
* sysdeps/unix/bsd/bsd4.4/sigblock.c: Move to ...
* sysdeps/unix/bsd/sigblock.c: ... here.
* sysdeps/unix/bsd/bsd4.4/sigsetmask.c: Move to ...
* sysdeps/unix/bsd/sigsetmask.c: ... here.
* sysdeps/unix/bsd/bsd4.4/sigvec.c: Move to ...
* sysdeps/unix/bsd/sigvec.c: ... here.
* sysdeps/unix/bsd/bsd4.4/tcdrain.c: Move to ...
* sysdeps/unix/bsd/tcdrain.c: ... here.
* sysdeps/unix/bsd/bsd4.4/tcgetattr.c: Move to ...
* sysdeps/unix/bsd/tcgetattr.c: ... here.
* sysdeps/unix/bsd/bsd4.4/tcgetattr.c: Move to ...
* sysdeps/unix/bsd/tcgetattr.c: ... here.
* sysdeps/unix/bsd/bsd4.4/waitpid.c: Move to ...
* sysdeps/unix/bsd/waitpid.c: ... here.

diff --git a/sysdeps/mach/hurd/Implies b/sysdeps/mach/hurd/Implies
index b6063463ce34f3b7..d2d5234e1df1522 100644
--- a/sysdeps/mach/hurd/Implies
+++ b/sysdeps/mach/hurd/Implies
@@ -2,4 +2,4 @@
 # Hurd-based GNU systems.
gnu
 # The Hurd provides a rough superset of the functionality of 4.4 BSD.
-unix/bsd/bsd4.4
+unix/bsd

diff --git a/sysdeps/unix/bsd/bsd4.4/Makefile b/sysdeps/unix/bsd/Makefile
similarity index 100%
rename from sysdeps/unix/bsd/bsd4.4/Makefile
rename to sysdeps/unix/bsd/Makefile
diff --git a/sysdeps/unix/bsd/bsd4.4/Versions b/sysdeps/unix/bsd/Versions
similarity index 100%
rename from sysdeps/unix/bsd/bsd4.4/Versions
rename to sysdeps/unix/bsd/Versions
diff --git a/sysdeps/unix/bsd/bsd4.4/bits/sockaddr.h b/sysdeps/unix/bsd/bits/sockaddr.h
similarity index 100%
rename from sysdeps/unix/bsd/bsd4.4/bits/sockaddr.h
rename to sysdeps/unix/bsd/bits/sockaddr.h
diff --git a/sysdeps/unix/bsd/bsd4.4/syscalls.list b/sysdeps/unix/bsd/bsd4.4/syscalls.list
deleted file mode 100644
index a4d354685424ac61..0000000000000000
--- a/sysdeps/unix/bsd/bsd4.4/syscalls.list
+++ /dev/null
@@ -1,8 +0,0 @@
-# File nameCallerSyscall name# argsStrong nameWeak names
-
-chflags-chflags2chflags
-fchflags-fchflags2fchflags
-revoke-revoke1revoke
-setlogin-setlogin2setlogin
-sigaltstack-sigaltstack2__sigaltstack signalsigaltstack
-wait4-wait4wait4wait4

diff --git a/sysdeps/unix/bsd/bsd4.4/cmsg_nxthdr.c b/sysdeps/unix/bsd/cmsg_nxthdr.c
similarity index 100%
rename from sysdeps/unix/bsd/bsd4.4/cmsg_nxthdr.c
rename to sysdeps/unix/bsd/cmsg_nxthdr.c
diff --git a/sysdeps/unix/bsd/bsd4.4/sigblock.c b/sysdeps/unix/bsd/sigblock.c
similarity index 100%
rename from sysdeps/unix/bsd/bsd4.4/sigblock.c
rename to sysdeps/unix/bsd/sigblock.c
diff --git a/sysdeps/unix/bsd/bsd4.4/sigsetmask.c b/sysdeps/unix/bsd/sigsetmask.c
similarity index 100%
rename from sysdeps/unix/bsd/bsd4.4/sigsetmask.c
to sysdeps/unix/bsd/sigsetmask.c
diff --git a/sysdeps/unix/bsd/bsd4.4/sigvec.c b/sysdeps/unix/bsd/sigvec.c
similarity index 100%
rename from sysdeps/unix/bsd/bsd4.4/sigvec.c
to sysdeps/unix/bsd/sigvec.c
diff --git a/sysdeps/unix/bsd/syscalls.list b/sysdeps/unix/bsd/syscalls.list
index e84819dc1f19d148..9f48a144d475f342 100644
--- a/sysdeps/unix/bsd/syscalls.list
+++ b/sysdeps/unix/bsd/syscalls.list
@@ -1,14 +1,16 @@
 # File nameCallerSyscall name# argsStrong nameWeak names

+chflags-chflags2chflags
+fchflags-fchflags2fchflags
 fcntl-flock2__fcntlflock
getdents-getdirentries4__getdirentriesgetdirentries
getdtsz-getdtablesize0__getdtablesizegetdtablesize
getpagesize-getpagesize0__getpagesizegetpagesize
killpg-killpg2killpg
 -sigblock-sigblock1__sigblocksigblock
 +revoke-revoke1revoke
 +setlogin-setlogin2setlogin
 +sigaltstack-sigaltstack2__sigaltstacksigaltstack
 sigpause-sigpause1__sigpausesigpause
 -sigsetmask-sigsetmask1__sigsetmasksigsetmask
 sigstack-sigstack2sigstack
 sigvec-sigvec3__sigvecsигvec
 -wait3-wait33__wait3wait3
 -waitpid-waitpid3__waitpidwaitpid
 +wait4-wait44__wait4wait4
diff --git a/sysdeps/unix/bsd/bsd4.4/tcdrain.c b/sysdeps/unix/bsd/tcdrain.c
similarity index 100%
rename from sysdeps/unix/bsd/bsd4.4/tcdrain.c
to sysdeps/unix/bsd/tcdrain.c
diff --git a/sysdeps/unix/bsd/bsd4.4/tcgetattr.c b/sysdeps/unix/bsd/tcgetattr.c
similarity index 100%
rename from sysdeps/unix/bsd/bsd4.4/tcgetattr.c
to sysdeps/unix/bsd/tcgetattr.c
diff --git a/sysdeps/unix/bsd/bsd4.4/tcsetattr.c b/sysdeps/unix/bsd/tcsetattr.c
similarity index 100%
rename from sysdeps/unix/bsd/bsd4.4/tcsetattr.c
to sysdeps/unix/bsd/tcsetattr.c
diff --git a/sysdeps/unix/bsd/bsd4.4/wait.c b/sysdeps/unix/bsd/wait.c
similarity index 100%
rename from sysdeps/unix/bsd/bsd4.4/wait.c
to sysdeps/unix/bsd/wait.c

diff --git a/sysdeps/unix/bsd/bsd4.4/wait3.c b/sysdeps/unix/bsd/wait3.c
similarity index 100%
rename from sysdeps/unix/bsd/bsd4.4/wait3.c
rename to sysdeps/unix/bsd/wait3.c
diff --git a/sysdeps/unix/bsd/bsd4.4/waitpid.c b/sysdeps/unix/bsd/waitpid.c
similarity index 100%
rename from sysdeps/unix/bsd/bsd4.4/waitpid.c
rename to sysdeps/unix/bsd/waitpid.c
diff --git a/sysdeps/unix/sysv/linux/wait3.c b/sysdeps/unix/sysv/linux/wait3.c
index 0b3bdee771782b7b..2ff027f0e1d83eb2 100644
--- a/sysdeps/unix/sysv/linux/wait3.c
+++ b/sysdeps/unix/sysv/linux/wait3.c
@@ -1 +1 @@
-#include <sysdeps/unix/bsd/bsd4.4/wait3.c>
+#include <sysdeps/unix/bsd/wait3.c>

1.83 gmp 6.0.0 :15.el7
1.83.1 Available under license :

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1.86 gobject-introspection 1.50.0 :1.el7

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src/preproc/grn/gprint.h
src/preproc/grn/hdb.cpp
src/preproc/grn/hgraph.cpp
src/preproc/grn/hpoint.cpp
src/preproc/grn/main.cpp

The `gxditview' output device. It is based on X11's `xditview' program and thus has the X license.

src/devices/xditview/DESC.in
src/devices/xditview/Dvi.c
src/devices/xditview/Dvi.h
src/devices/xditview/DviP.h
src/devices/xditview/FontMap
src/devices/xditview/GXditview.ad
src/devices/xditview/Menu.h
src/devices/xditview/ad2c
src/devices/xditview/device.c
src/devices/xditview/device.h
src/devices/xditview/draw.c
src/devices/xditview/font.c
src/devices/xditview/gray1.bm
src/devices/xditview/gray2.bm
src/devices/xditview/gray3.bm
src/devices/xditview/gray4.bm
src/devices/xditview/gray5.bm
src/devices/xditview/gray6.bm
src/devices/xditview/gray7.bm
src/devices/xditview/gray8.bm
src/devices/xditview/gxditview.man
src/devices/xditview/lex.c
src/devices/xditview/page.c
src/devices/xditview/parse.c
src/devices/xditview/xdit.bm
src/devices/xditview/xdit_mask.bm
src/devices/xditview/xditview.c

src/include/DviChar.h
src/include/XFontName.h

src/libs/libxutil/DviChar.c
src/libs/libxutil/XFontName.c

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. The -mdoc macro set, using the BSD license.

  tmac/doc.tmac
  tmac/doc-old.tmac
  tmac/doc-common
  tmac/doc-ditroff
  tmac/doc-nroff
  tmac/doc-syms
  tmac/groff_mdoc.man

. The -me macro set, using the BSD license.

  tmac/e.tmac
  tmac/groff_me.man
  doc/meintro.me
  doc/meref.me

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---------------------

. The file `tmac/hyphen.us' is identical to the file `hyphen.tex', part of
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Public License instead of this License.  But first, please read
1.91 groovy 2.4.10

1.92 grub2 2.02 :0.65.el7.centos.2

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From 0df1a50e41b12fbeb6709575e5f12d64ed73b66 Mon Sep 17 00:00:00 2001
From: Stephane Rochoy <sheda>
Date: Sun, 22 Jun 2014 01:35:52 +0200
Subject: [PATCH 085/260] * grub-core/loader/i386/bsd.c (grub_netbsd_boot):
Pass pointer to EFI system table.

---
ChangeLog                           | 5 ++++++
grub-core/loader/i386/bsd.c         | 8 ++++++++include/grub/i386/netbsd_bootinfo.h | 7 +++++++
3 files changed, 20 insertions(+)
diff --git a/ChangeLog b/ChangeLog
index abf8f4b27..0cdd095a4 100644
--- a/ChangeLog
+++ b/ChangeLog
@@ -1,5 +1,10 @@
2014-06-21  Stephane Rochoy <sheda>

+* grub-core/loader/i386/bsd.c (grub_netbsd_boot): Pass pointer to
+EFI system table.
+
+2014-06-21  Stephane Rochoy <sheda>
+
+* grub-core/commands/efi/lsefisystab.c (grub_cmd_lsefisystab): Show
EFI system table physical address.

diff --git a/grub-core/loader/i386/bsd.c b/grub-core/loader/i386/bsd.c
index 41ef9109e..8f691e0e2 100644
--- a/grub-core/loader/i386/bsd.c
+++ b/grub-core/loader/i386/bsd.c
@@ -1145,6 +1145,14 @@ grub_netbsd_boot (void)
     if (err)
         return err;

+#ifdef GRUB_MACHINE_EFI
+    err = grub_bsd_add_meta (NETBSD_BTINFO_EFI,
+                           &grub_efi_system_table,
+                           sizeof (grub_efi_system_table));

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2223
if (err)
    return err;
#endif
{
    struct bsd_tag *tag;
    tag_buf_len = 0;

diff --git a/include/grub/i386/netbsd_bootinfo.h b/include/grub/i386/netbsd_bootinfo.h
index e48c19b40..9b4f46041 100644
--- a/include/grub/i386/netbsd_bootinfo.h
+++ b/include/grub/i386/netbsd_bootinfo.h
@@ -58,6 +58,8 @@
#define NETBSD_BTINFO_BOOTWEDGE 10
#define NETBSD_BTINFO_MODULES 11
#define NETBSD_BTINFO_FRAMEBUFFER 12
+define NETBSD_BTINFO_USERCONFCOMMANDS 13
+define NETBSD_BTINFO_EFI 14

struct grub_netbsd_bootinfo
{
@@ -146,4 +148,9 @@ struct grub_netbsd_btinfo_framebuf
#define GRUB_NETBSD_MAX_ROOTDEVICE_LEN 16

+struct grub_netbsd_btinfo_efi
+{
+    void *pa_systbl; /* Physical address of the EFI System Table */
+};
+
+endif
--
2.13.0
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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.

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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"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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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
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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.

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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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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.

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2328
package org.apache.hadoop.fs.permission;

import static org.junit.Assert.*;
import org.junit.BeforeClass;
import org.junit.Test;

/**
 * Tests covering basic functionality of the ACL objects.
 */
public class TestAcl {
    private static AclEntry ENTRY1, ENTRY2, ENTRY3, ENTRY4, ENTRY5, ENTRY6,
                       ENTRY7, ENTRY8, ENTRY9, ENTRY10, ENTRY11, ENTRY12, ENTRY13;
    private static AclStatus STATUS1, STATUS2, STATUS3, STATUS4;

    @BeforeClass
    public static void setUp() {
        // named user
        AclEntry.Builder aclEntryBuilder = new AclEntry.Builder()
                        .setType(AclEntryType.USER)
                        .setName("user1")
                        .setPermission(FsAction.ALL);
        ENTRY1 = aclEntryBuilder.build();
        ENTRY2 = aclEntryBuilder.build();
        // named group
        ENTRY3 = new AclEntry.Builder()
                        .setType(AclEntryType.GROUP)
                        .setName("group2")
                        .setPermission(FsAction.READ_WRITE)
                        .build();
        // default other
        ENTRY4 = new AclEntry.Builder()
                        .setType(AclEntryType.OTHER)
                        .setPermission(FsAction.NONE)
                        .setScope(AclEntryScope.DEFAULT)
ENTRY5 = new AclEntry.Builder()
    .setType(AclEntryType.USER)
    .setPermission(FsAction.ALL)
    .build();

ENTRY6 = new AclEntry.Builder()
    .setType(AclEntryType.GROUP)
    .setName("group3")
    .setPermission(FsAction.READ_WRITE)
    .setScope(AclEntryScope.DEFAULT)
    .build();

ENTRY7 = new AclEntry.Builder()
    .setType(AclEntryType.OTHER)
    .setPermission(FsAction.NONE)
    .build();

ENTRY8 = new AclEntry.Builder()
    .setType(AclEntryType.USER)
    .setName("user3")
    .setPermission(FsAction.ALL)
    .setScope(AclEntryScope.DEFAULT)
    .build();

ENTRY9 = new AclEntry.Builder()
    .setType(AclEntryType.MASK)
    .setPermission(FsAction.READ)
    .build();

ENTRY10 = new AclEntry.Builder()
    .setType(AclEntryType.MASK)
    .setPermission(FsAction.READ_EXECUTE)
    .setScope(AclEntryScope.DEFAULT)
    .build();

ENTRY11 = new AclEntry.Builder()
    .setType(AclEntryType.GROUP)
    .setPermission(FsAction.READ)
    .build();

ENTRY12 = new AclEntry.Builder()
    .setType(AclEntryType.GROUP)
    .setPermission(FsAction.READ)
    .setScope(AclEntryScope.DEFAULT)
    .build();
ENTRY13 = new AclEntry.Builder()
    .setType(AclEntryType.USER)
    .setPermission(FsAction.ALL)
    .setScope(AclEntryScope.DEFAULT)
    .build();

AclStatus.Builder aclStatusBuilder = new AclStatus.Builder()
    .owner("owner1")
    .group("group1")
    .addEntry(ENTRY1)
    .addEntry(ENTRY3)
    .addEntry(ENTRY4);
STATUS1 = aclStatusBuilder.build();
STATUS2 = aclStatusBuilder.build();
STATUS3 = new AclStatus.Builder()
    .owner("owner2")
    .group("group2")
    .stickyBit(true)
    .build();

STATUS4 = new AclStatus.Builder()
    .addEntry(ENTRY1)
    .addEntry(ENTRY3)
    .addEntry(ENTRY4)
    .addEntry(ENTRY5)
    .addEntry(ENTRY6)
    .addEntry(ENTRY7)
    .addEntry(ENTRY8)
    .addEntry(ENTRY9)
    .addEntry(ENTRY10)
    .addEntry(ENTRY11)
    .addEntry(ENTRY12)
    .addEntry(ENTRY13)
    .build();
}

@Test
public void testEntryEquals() {
    assertNotSame(ENTRY1, ENTRY2);
    assertNotSame(ENTRY1, ENTRY3);
    assertNotSame(ENTRY1, ENTRY4);
    assertNotSame(ENTRY2, ENTRY3);
    assertNotSame(ENTRY2, ENTRY4);
    assertNotSame(ENTRY3, ENTRY4);
    assertEquals(ENTRY1, ENTRY1);
    assertEquals(ENTRY2, ENTRY2);
    assertEquals(ENTRY1, ENTRY2);
    assertEquals(ENTRY2, ENTRY1);
assertFalse(ENTRY1.equals(ENTRY3));
assertFalse(ENTRY1.equals(ENTRY4));
assertFalse(ENTRY3.equals(ENTRY4));
assertFalse(ENTRY1.equals(null));
assertFalse(ENTRY1.equals(new Object()));
}

@Test
public void testEntryHashCode() {
    assertEquals(ENTRY1.hashCode(), ENTRY2.hashCode());
    assertFalse(ENTRY1.hashCode() == ENTRY3.hashCode());
    assertFalse(ENTRY1.hashCode() == ENTRY4.hashCode());
    assertFalse(ENTRY3.hashCode() == ENTRY4.hashCode());
}

@Test
public void testEntryScopeIsAccessIfUnspecified() {
    assertEquals(AclEntryScope.ACCESS, ENTRY1.getScope());
    assertEquals(AclEntryScope.ACCESS, ENTRY2.getScope());
    assertEquals(AclEntryScope.ACCESS, ENTRY3.getScope());
    assertEquals(AclEntryScope.DEFAULT, ENTRY4.getScope());
}

@Test
public void testStatusEquals() {
    assertNotSame(STATUS1, STATUS2);
    assertNotSame(STATUS1, STATUS3);
    assertNotSame(STATUS2, STATUS3);
    assertEquals(STATUS1, STATUS1);
    assertEquals(STATUS2, STATUS2);
    assertEquals(STATUS1, STATUS2);
    assertEquals(STATUS2, STATUS1);
    assertFalse(STATUS1.equals(STATUS3));
    assertFalse(STATUS2.equals(STATUS3));
    assertFalse(STATUS1.equals(null));
    assertFalse(STATUS1.equals(new Object()));
}

@Test
public void testStatusHashCode() {
    assertEquals(STATUS1.hashCode(), STATUS2.hashCode());
    assertFalse(STATUS1.hashCode() == STATUS3.hashCode());
    }

@Test
public void testToString() {
    assertEquals("user:user1:rwx", ENTRY1.toString());
    assertEquals("user:user1:rwx", ENTRY2.toString());
}
assertEquals("group:group2:rw-", ENTRY3.toString());
assertEquals("default:other::---", ENTRY4.toString());

assertEquals(
  "owner: owner1, group: group1, acl: {entries: [user:user1:rwx, group:group2:rw-, default:other::---], stickyBit:
false}",
  STATUS1.toString());
assertEquals(
  "owner: owner1, group: group1, acl: {entries: [user:user1:rwx, group:group2:rw-, default:other::---], stickyBit:
false}",
  STATUS2.toString());
assertEquals(
  "owner: owner2, group: group2, acl: {entries: [], stickyBit: true}",
  STATUS3.toString());
}
}
/**
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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.
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 * limitations under the License.
 */
package org.apache.hadoop.fs.permission;

import java.io.IOException;
import org.apache.hadoop.conf.Configuration;
import junit.framework.TestCase;
import static org.apache.hadoop.fs.permission.FsAction.*;
public class TestFsPermission extends TestCase {
  public void testFsAction() {
    //implies
    for(FsAction a : FsAction.values()) {
      assertTrue(ALL.implies(a));
    }
  }
}
for(FsAction a : FsAction.values()) {
    assertTrue(a == NONE? NONE.implies(a): !NONE.implies(a));
}

for(FsAction a : FsAction.values()) {
    assertTrue(a == READ_EXECUTE || a == READ || a == EXECUTE || a == NONE?
               READ_EXECUTE.implies(a): !READ_EXECUTE.implies(a));
}

//masks
assertEquals(EXECUTE, EXECUTE.and(READ_EXECUTE));
assertEquals(READ, READ.and(READ_EXECUTE));
assertEquals(NONE, WRITE.and(READ_EXECUTE));

assertEquals(READ, READ_EXECUTE.and(READ_WRITE));
assertEquals(NONE, READ_EXECUTE.and(WRITE));
assertEquals(WRITE_EXECUTE, ALL.and(WRITE_EXECUTE));
}

/**
 * Ensure that when manually specifying permission modes we get
 * the expected values back out for all combinations
 */
public void testConvertingPermissions() {
    short s = 0;
    for(boolean sb : new boolean [] { false, true }) {
        for(FsAction u : FsAction.values()) {
            for(FsAction g : FsAction.values()) {
                for(FsAction o : FsAction.values()) {
                    // Cover constructor with sticky bit.
                    FsPermission f = new FsPermission(u, g, o, sb);
                    assertEquals(s, f.toShort());
                    FsPermission f2 = new FsPermission(f);
                    assertEquals(s, f2.toShort());
                    s++;
                }
            }
        }
    }
}

public void testSpecialBitsToString() {
}
for (boolean sb : new boolean[] { false, true }) {
    for (FsAction u : FsAction.values()) {
        for (FsAction g : FsAction.values()) {
            for (FsAction o : FsAction.values()) {
                FsPermission f = new FsPermission(u, g, o, sb);
                String fString = f.toString();

                // Check that sticky bit is represented correctly.
                if (f.getStickyBit() && f.getOtherAction().implies(EXECUTE))
                    assertEquals('t', fString.charAt(8));
                else if (f.getStickyBit() && !f.getOtherAction().implies(EXECUTE))
                    assertEquals('T', fString.charAt(8));
                else if (!f.getStickyBit() && f.getOtherAction().implies(EXECUTE))
                    assertEquals('x', fString.charAt(8));
                else
                    assertEquals('-', fString.charAt(8));

                assertEquals(9, fString.length());
            }
        }
    }
}

public void testFsPermission() {
    String symbolic = "-rwxrwxrwx";

    for(int i = 0; i < (1 << 10); i++) {
        StringBuilder b = new StringBuilder("----------");
        String binary = String.format("%11s", Integer.toBinaryString(i));
        String permBinary = binary.substring(2, binary.length());
        int len = permBinary.length();
        for(int j = 0; j < len; j++) {
            if (permBinary.charAt(j) == '1') {
                int k = 9 - (len - 1 - j);
                b.setCharAt(k, symbolic.charAt(k));
            }
        }

        // Check for sticky bit.
        if (binary.charAt(1) == '1') {
            char replacement = b.charAt(9) == 'x' ? 't' : 'T';
            b.setCharAt(9, replacement);
        }

        assertEquals(i, FsPermission.valueOf(b.toString()).toShort());
    }
}
public void testUMaskParser() throws IOException {
    Configuration conf = new Configuration();

    // Ensure that we get the right octal values back for all legal values
    for(FsAction u : FsAction.values()) {
        for(FsAction g : FsAction.values()) {
            for(FsAction o : FsAction.values()) {
                FsPermission f = new FsPermission(u, g, o);
                String asOctal = String.format("%1$03o", f.toShort());
                conf.set(FsPermission.UMASK_LABEL, asOctal);
                FsPermission fromConf = FsPermission.getUMask(conf);
                assertEquals(f, fromConf);
            }
        }
    }
}

public void testSymbolicUmasks() {
    Configuration conf = new Configuration();

    // Test some symbolic to octal settings
    // Symbolic umask list is generated in linux shell using by the command:
    // umask 0; umask <octal number>; umask -S
    String [][] symbolic = new String [][] {
        {"a+rw", "111"},
        {"u=rwx,g=rwx,o=rwx", "0"},
        {"u=rwx,g=rwx,o=rw", "1"},
        {"u=rwx,g=rwx,o=rx", "2"},
        {"u=rwx,g=rwx,o=r", "3"},
        {"u=rwx,g=rwx,o=rx", "4"},
        {"u=rwx,g=rwx,o=w", "5"},
        {"u=rwx,g=rwx,o=x", "6"},
        {"u=rwx,g=rwx,o="},
        {"u=rwx,g=rw,o=rwx", "10"},
        {"u=rwx,g=rw,o=wr", "11"},
        {"u=rwx,g=rw,o=rx", "12"},
        {"u=rwx,g=rw,o=r", "13"},
        {"u=rwx,g=rw,o=wr", "14"},
        {"u=rwx,g=rw,o=w", "15"},
        {"u=rwx,g=rw,o=x", "16"},
        {"u=rwx,g=rw,o="},
        {"u=rwx,g=rx,o=rwx", "20"},
        {"u=rwx,g=rx,o=rw", "21"},
        {"u=rwx,g=rx,o=rx", "22"},
        {"u=rwx,g=rx,o=r", "23"},
    };
}
{"u=rw,g=rx,o=rwx", "104"},
{"u=rw,g=rx,o=rw", "105"},
{"u=rw,g=rx,o=rx", "106"},
{"u=rw,g=rx,o=r", "107"},
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{"u=rw,g=x,o=rwx", "160"},
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<th>Value</th>
</tr>
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<td>&quot;u=rx,g=rx,o=rx&quot;</td>
<td>247</td>
</tr>
<tr>
<td>&quot;u=rx,g=rx,o=rx&quot;</td>
<td>250</td>
</tr>
<tr>
<td>&quot;u=rx,g=rx,o=rx&quot;</td>
<td>251</td>
</tr>
<tr>
<td>&quot;u=rx,g=rx,o=rx&quot;</td>
<td>252</td>
</tr>
<tr>
<td>&quot;u=rx,g=rx,o=rx&quot;</td>
<td>253</td>
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<td>254</td>
</tr>
<tr>
<td>&quot;u=rx,g=rx,o=rx&quot;</td>
<td>255</td>
</tr>
<tr>
<td>&quot;u=rx,g=rx,o=rx&quot;</td>
<td>256</td>
</tr>
<tr>
<td>&quot;u=rx,g=rx,o=rx&quot;</td>
<td>257</td>
</tr>
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<td>260</td>
</tr>
<tr>
<td>&quot;u=rx,g=rx,o=rx&quot;</td>
<td>261</td>
</tr>
<tr>
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<tr>
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<td>266</td>
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<tr>
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<td>321</td>
</tr>
<tr>
<td>&quot;u=r,g=rx,o=rx&quot;</td>
<td>322</td>
</tr>
<tr>
<td>&quot;u=r,g=rx,o=rx&quot;</td>
<td>323</td>
</tr>
</tbody>
</table>
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{"u=wx,g=rw,o=rx", "401"},
{"u=wx,g=rw,o=r", "402"},
{"u=wx,g=rw,o=w", "403"}.  

---

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2341
["u=x,g=r,o=rx", "624"],
["u=x,g=r,o=w", "625"],
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["u=x,g=x,o=r", "663"],
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["u=x,g=,o=r", "673"],
["u=x,g=,o=wx", "674"],
["u=x,g=,o=w", "675"],
["u=x,g=,o=x", "676"],
["u=x,g=,o=", "677"],
["u=g=rwx,o=rwx", "700"],
["u=g=rwx,o=rw", "701"],
["u=g=rwx,o=rx", "702"],
["u=g=rwx,o=r", "703"].
for(int i = 0; i < symbolic.length; i += 2) {
    conf.set(FsPermission.UMASK_LABEL, symbolic[i][0]);
    short val = Short.valueOf(symbolic[i][1], 8);
    assertEquals(val, FsPermission.getUMask(conf).toShort());
}

public void testBadUmasks() {
    Configuration conf = new Configuration();

    for(String b : new String [] {"1777", "22", "99", "foo", ""}) {
        conf.set(FsPermission.UMASK_LABEL, b);
        try {
            FsPermission.getUMask(conf);
            fail("Shouldn't have been able to parse bad umask");
        } catch(IllegalArgumentException iae) {
            assertTrue("Exception should specify parsing error and invalid umask: ",
                    isCorrectExceptionMessage(iae.getMessage(), b));
        }
    }
}

private boolean isCorrectExceptionMessage(String msg, String umask) {
    return msg.contains("Unable to parse") &&
            msg.contains(umask) &&
            msg.contains("octal or symbolic");
}

// Ensure that when the deprecated decimal umask key is used, it is correctly
// parsed as such and converted correctly to an FsPermission value
public void testDeprecatedUmask() {
    Configuration conf = new Configuration();
    conf.set(FsPermission.DEPRECATED_UMASK_LABEL, "302"); // 302 = 0456
    FsPermission umask = FsPermission.getUMask(conf);
assertEquals(0456, umask.toShort());
}
}
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*/
package org.apache.hadoop.fs.permission;
import org.apache.hadoop.classification.InterfaceAudience;

import org.apache.hadoop.hadoop.fs.permission;
import org.apache.hadoop.classification.InterfaceStability;

/**
 * File system actions, e.g. read, write, etc.
 */
@InterfaceAudience.Public
@InterfaceStability.Stable
public enum FsAction {
    // POSIX style
    NONE("---"),
    EXECUTE("--x"),
    WRITE("-w-"),
    WRITE_EXECUTE("-wx"),
    READ("r--"),
    READ_EXECUTE("r-x"),
    READ_WRITE("rw-"),
    ALL("rwx");

    /** Retain reference to value array. */
    private final static FsAction[] vals = values();

    /** Symbolic representation */
    public final String SYMBOL;

    private FsAction(String s) {
        SYMBOL = s;
    }

    /** Return true if this action implies that action.
     * @param that
     */
    public boolean implies(FsAction that) {
        if (that != null) {
            return (ordinal() & that.ordinal()) == that.ordinal();
        }
        return false;
    }

    /** AND operation. */
    public FsAction and(FsAction that) {
        return vals[ordinal() & that.ordinal()];
    }

    /** OR operation. */
    public FsAction or(FsAction that) {
        return vals[ordinal() | that.ordinal()];
    }

    /** NOT operation. */
public FsAction not() {
    return vals[7 - ordinal()];
}

/**
 * Get the FsAction enum for String representation of permissions
 *
 * @param permission
 *    3-character string representation of permission. ex: rwx
 * @return Returns FsAction enum if the corresponding FsAction exists for permission.
 *         Otherwise returns null
 */
public static FsAction getFsAction(String permission) {
    for (FsAction fsAction : vals) {
        if (fsAction.SYMBOL.equals(permission)) {
            return fsAction;
        }
    }
    return null;
}

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 */
package org.apache.hadoop.fs.permission;
import java.util.List;
import org.apache.hadoop.classification.InterfaceAudience;
import org.apache.hadoop.classification.InterfaceStability;
import com.google.common.base.Objects;
import com.google.common.base.Preconditions;
import com.google.common.collect.Lists;
/**
 * An AclStatus contains the ACL information of a specific file. AclStatus
 * instances are immutable. Use a '{@link Builder}' to create a new instance.
 */
@InterfaceAudience.Public
@InterfaceStability.Evolving
public class AclStatus {
    private final String owner;
    private final String group;
    private final boolean stickyBit;
    private final List<AclEntry> entries;
    private final FsPermission permission;

    /**
     * Returns the file owner.
     *
     * @return String file owner
     */
    public String getOwner() {
        return owner;
    }

    /**
     * Returns the file group.
     *
     * @return String file group
     */
    public String getGroup() {
        return group;
    }

    /**
     * Returns the sticky bit.
     *
     * @return boolean sticky bit
     */
    public boolean isStickyBit() {
        return stickyBit;
    }

    /**
     * Returns the list of all ACL entries, ordered by their natural ordering.
     *
     * @return List&lt;AclEntry&gt; unmodifiable ordered list of all ACL entries
     */
    public List<AclEntry> getEntries() {
        return entries;
    }
}
/**
 * Returns the permission set for the path
 * @return @link FsPermission} for the path
 */
public FsPermission getPermission() {
    return permission;
}

@Override
public boolean equals(Object o) {
    if (o == null) {
        return false;
    }
    if (getClass() != o.getClass()) {
        return false;
    }
    AclStatus other = (AclStatus)o;
    return Objects.equal(owner, other.owner)
            && Objects.equal(group, other.group)
            && stickyBit == other.stickyBit
            && Objects.equal(entries, other.entries);
}

@Override
public int hashCode() {
    return Objects.hashCode(owner, group, stickyBit, entries);
}

@Override
public String toString() {
    return new StringBuilder()
            .append("owner: ").append(owner)
            .append("), group: ").append(group)
            .append("), acl: ")
            .append("entries: ").append(entries)
            .append("), stickyBit: ").append(stickyBit)
            .append(")
            .toString();
}

/**
 * Builder for creating new Acl instances.
 */
public static class Builder {
    private String owner;
    private String group;
}
private boolean stickyBit;
private List<AclEntry> entries = Lists.newArrayList();
private FsPermission permission = null;

/**
 * Sets the file owner.
 */
@Param owner String file owner
@return Builder this builder, for call chaining
*/
public Builder owner(String owner) {
    this.owner = owner;
    return this;
}

/**
 * Sets the file group.
 */
@Param group String file group
@return Builder this builder, for call chaining
*/
public Builder group(String group) {
    this.group = group;
    return this;
}

/**
 * Adds an ACL entry.
 */
@Param e AclEntry entry to add
@return Builder this builder, for call chaining
*/
public Builder addEntry(AclEntry e) {
    this.entries.add(e);
    return this;
}

/**
 * Adds a list of ACL entries.
 */
@Param entries AclEntry entries to add
@return Builder this builder, for call chaining
*/
public Builder addEntries(Iterable<AclEntry> entries) {
    for (AclEntry e : entries)
        this.entries.add(e);
    return this;
}
/**
 * Sets sticky bit. If this method is not called, then the builder assumes
 * false.
 * @param stickyBit
 * @return Builder this builder, for call chaining
 */
public Builder stickyBit(boolean stickyBit) {
    this.stickyBit = stickyBit;
    return this;
}

/**
 * Sets the permission for the file.
 * @param permission
 */
public Builder setPermission(FsPermission permission) {
    this.permission = permission;
    return this;
}

/**
 * Builds a new AclStatus populated with the set properties.
 * @return AclStatus new AclStatus
 */
public AclStatus build() {
    return new AclStatus(owner, group, stickyBit, entries, permission);
}

/**
 * Private constructor.
 * @param file Path file associated to this ACL
 * @param owner String file owner
 * @param group String file group
 * @param stickyBit the sticky bit
 * @param entries the ACL entries
 * @param permission permission of the path
 */
private AclStatus(String owner, String group, boolean stickyBit,
        Iterable<AclEntry> entries, FsPermission permission) {
    this.owner = owner;
    this.group = group;
    this.stickyBit = stickyBit;
this.entries = Lists.newArrayList(entries);
this.permission = permission;
}

/**
* Get the effective permission for the AclEntry
* @param entry AclEntry to get the effective action
*/
public FsAction getEffectivePermission(AclEntry entry) {
    return getEffectivePermission(entry, permission);
}

/**
* Get the effective permission for the AclEntry. <br>
* Recommended to use this API ONLY if client communicates with the old
* NameNode, needs to pass the Permission for the path to get effective
* permission, else use {@link AclStatus#getEffectivePermission(AclEntry)}.
* @param entry AclEntry to get the effective action
* @param permArg Permission for the path. However if the client is NOT
* communicating with old namenode, then this argument will not have
* any preference.
* @return Returns the effective permission for the entry.
* @throws IllegalArgumentException If the client communicating with old
*           namenode and permission is not passed as an argument.
*/
public FsAction getEffectivePermission(AclEntry entry, FsPermission permArg)
    throws IllegalArgumentException {
    // At least one permission bits should be available.
    Preconditions.checkArgument(this.permission != null || permArg != null,
    "Permission bits are not available to calculate effective permission");
    if (this.permission != null) {
        // permission bits from server response will have the priority for
        // accuracy.
        permArg = this.permission;
    }
    if ((entry.getName() != null || entry.getType() == AclEntryType.GROUP)) {
        if (entry.getScope() == AclEntryScope.ACCESS) {
            FsAction entryPerm = entry.getPermission();
            return entryPerm.and(permArg.getGroupAction());
        } else {
            Preconditions.checkArgument(this.entries.contains(entry)
            && this.entries.size() >= 3,
            "Passed default ACL entry not found in the list of ACLs");
            // default mask entry for effective permission calculation will be the
            // penultimate entry. This can be mask entry in case of extended ACLs.
            // In case of minimal ACL, this is the owner group entry, and we end up
            // intersecting group FsAction with itseIf, which is a no-op.
            FsAction defaultMask = this.entries.get(this.entries.size() - 2)
.getPermission();
FsAction entryPerm = entry.getPermission();
return entryPerm.and(defaultMask);
}  
} else {
return entry.getPermission();
}

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 */

package org.apache.hadoop.fs.permission;

import java.util.Iterator;
import java.util.List;
import org.apache.hadoop.classification.InterfaceAudience;
import org.apache.hadoop.classification.InterfaceStability;
import com.google.common.collect.Lists;

/**
 * AclUtil contains utility methods for manipulating ACLs.
 */
@InterfaceAudience.LimitedPrivate("
HDFS", "MapReduce")
@InterfaceStability.Unstable
public final class AclUtil {

/**
 * Given permissions and extended ACL entries, returns the full logical ACL.
 *
 * @param perm FsPermission containing permissions
 * @param entries List<AclEntry> containing extended ACL entries
 */
public static List<AclEntry> getAclFromPermAndEntries(FsPermission perm,
        List<AclEntry> entries) {
    List<AclEntry> acl = Lists.newArrayListWithCapacity(entries.size() + 3);

    // Owner entry implied by owner permission bits.
    acl.add(new AclEntry.Builder()
        .setScope(AclEntryScope.ACCESS)
        .setType(AclEntryType.USER)
        .setPermission(perm.getUserAction())
        .build());

    // All extended access ACL entries.
    boolean hasAccessAcl = false;
    Iterator<AclEntry> entryIter = entries.iterator();
    AclEntry curEntry = null;
    while (entryIter.hasNext()) {
        curEntry = entryIter.next();
        if (curEntry.getScope() == AclEntryScope.DEFAULT) {
            break;
        }
        hasAccessAcl = true;
        acl.add(curEntry);
    }

    // Mask entry implied by group permission bits, or group entry if there is
    // no access ACL (only default ACL).
    acl.add(new AclEntry.Builder()
        .setScope(AclEntryScope.ACCESS)
        .setType(hasAccessAcl ? AclEntryType.MASK : AclEntryType.GROUP)
        .setPermission(perm.getGroupAction())
        .build());

    // Other entry implied by other bits.
    acl.add(new AclEntry.Builder()
        .setScope(AclEntryScope.ACCESS)
        .setType(AclEntryType.OTHER)
        .setPermission(perm.getOtherAction())
        .build());

    // Default ACL entries.
    if (curEntry != null && curEntry.getScope() == AclEntryScope.DEFAULT) {
        acl.add(curEntry);
        while (entryIter.hasNext()) {
            acl.add(entryIter.next());
        }
    }
}
return acl;
}

/**
 * Translates the given permission bits to the equivalent minimal ACL.
 * @param perm FsPermission to translate
 * @return List<AclEntry> containing exactly 3 entries representing the owner,
 * group and other permissions
 */
public static List<AclEntry> getMinimalAcl(FsPermission perm) {
    return Lists.newArrayList(
        new AclEntry.Builder()
            .setScope(AclEntryScope.ACCESS)
            .setType(AclEntryType.USER)
            .setPermission(perm.getUserAction())
            .build(),
        new AclEntry.Builder()
            .setScope(AclEntryScope.ACCESS)
            .setType(AclEntryType.GROUP)
            .setPermission(perm.getGroupAction())
            .build(),
        new AclEntry.Builder()
            .setScope(AclEntryScope.ACCESS)
            .setType(AclEntryType.OTHER)
            .setPermission(perm.getOtherAction())
            .build());
}

/**
 * Checks if the given entries represent a minimal ACL (contains exactly 3
 * entries).
 * @param entries List<AclEntry> entries to check
 * @return boolean true if the entries represent a minimal ACL
 */
public static boolean isMinimalAcl(List<AclEntry> entries) {
    return entries.size() == 3;
}

/**
 * There is no reason to instantiate this class.
 */
private AclUtil() {
}
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*/
package org.apache.hadoop.fs.permission;
import java.util.regex.Pattern;
import org.apache.hadoop.classification.InterfaceAudience;
import org.apache.hadoop.classification.InterfaceStability;
import org.apache.hadoop.fs.FileStatus;
/**
* Parse a permission mode passed in from a chmod command and apply that
* mode against an existing file.
*/
@InterfaceAudience.Private
@InterfaceStability.Unstable
public class ChmodParser extends PermissionParser {
private static Pattern chmodOctalPattern =
Pattern.compile("^\\s*[+]?([01]?)([0-7]{3})\\s*$");
private static Pattern chmodNormalPattern =
Pattern.compile("\\G\\s*([ugoa]*)([+=-]+)([rwxXt]+)([,\\s]*)\\s*");
public ChmodParser(String modeStr) throws IllegalArgumentException {
super(modeStr, chmodNormalPattern, chmodOctalPattern);
}
/**
* Apply permission against specified file and determine what the
* new mode would be
* @param file File against which to apply mode
* @return File's new mode if applied.
*/
public short applyNewPermission(FileStatus file) {

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FsPermission perms = file.getPermission();
int existing = perms.toShort();
boolean exeOk = file.isDirectory() || (existing & 0111) != 0;
return (short)combineModes(existing, exeOk);
}
}
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package org.apache.hadoop.fs.permission;
import java.util.Collections;
import java.util.List;
import org.apache.hadoop.classification.InterfaceAudience;
import org.apache.hadoop.classification.InterfaceStability;
import org.apache.hadoop.fs.permission.AclEntry;
import org.apache.hadoop.fs.permission.AclEntryScope;
/**
* Groups a list of ACL entries into separate lists for access entries vs.
* default entries.
*/
@InterfaceAudience.LimitedPrivate({"HDFS", "MapReduce"})
@InterfaceStability.Unstable
public final class ScopedAclEntries {
private static final int PIVOT_NOT_FOUND = -1;
private final List<AclEntry> accessEntries;
private final List<AclEntry> defaultEntries;
/**
* Creates a new ScopedAclEntries from the given list. It is assumed that the

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* list is already sorted such that all access entries precede all default entries.
* 
* @param aclEntries List<AclEntry> to separate
*/

public ScopedAclEntries(List<AclEntry> aclEntries) {
    int pivot = calculatePivotOnDefaultEntries(aclEntries);
    if (pivot != PIVOT_NOT_FOUND) {
        accessEntries = pivot != 0 ? aclEntries.subList(0, pivot) : Collections.<AclEntry>emptyList();
        defaultEntries = aclEntries.subList(pivot, aclEntries.size());
    } else {
        accessEntries = aclEntries;
        defaultEntries = Collections.emptyList();
    }
}

/**
 * Returns access entries.
 *
 * @return List<AclEntry> containing just access entries, or an empty list if
 * there are no access entries
 */
public List<AclEntry> getAccessEntries() {
    return accessEntries;
}

/**
 * Returns default entries.
 *
 * @return List<AclEntry> containing just default entries, or an empty list if
 * there are no default entries
 */
public List<AclEntry> getDefaultEntries() {
    return defaultEntries;
}

/**
 * Returns the pivot point in the list between the access entries and the
 * default entries. This is the index of the first element in the list that is
 * a default entry.
 *
 * @param aclBuilder ArrayList<AclEntry> containing entries to build
 * @return int pivot point, or -1 if list contains no default entries
 */
private static int calculatePivotOnDefaultEntries(List<AclEntry> aclBuilder) {
    for (int i = 0; i < aclBuilder.size(); ++i) {
        if (aclBuilder.get(i).getScope() == AclEntryScope.DEFAULT) {
            return i;
        }
    }
    return -1;
}
return i;
}
}
return PIVOT_NOT_FOUND;
}
}
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*/
package org.apache.hadoop.fs.permission;

import java.util.ArrayList;
import java.util.Collection;
import java.util.List;
import com.google.common.base.Objects;
import org.apache.hadoop.HadoopIllegalArgumentException;
import org.apache.hadoop.classification.InterfaceAudience;
import org.apache.hadoop.classification.InterfaceStability;
import org.apache.hadoop.util.StringUtils;

/**
* Defines a single entry in an ACL. An ACL entry has a type (user, group,
* mask, or other), an optional name (referring to a specific user or group), a
* set of permissions (any combination of read, write and execute), and a scope
* (access or default). AclEntry instances are immutable. Use a {@link Builder}
* to create a new instance.
*/
@InterfaceAudience.Public
@InterfaceStability.Evolving
public class AclEntry {
private final AclEntryType type;
private final String name;

private final FsAction permission;
private final AclEntryScope scope;

/**
 * Returns the ACL entry type.
 *
 * @return AclEntryType ACL entry type
 */
public AclEntryType getType() {
    return type;
}

/**
 * Returns the optional ACL entry name.
 *
 * @return String ACL entry name, or null if undefined
 */
public String getName() {
    return name;
}

/**
 * Returns the set of permissions in the ACL entry.
 *
 * @return FsAction set of permissions in the ACL entry
 */
public FsAction getPermission() {
    return permission;
}

/**
 * Returns the scope of the ACL entry.
 *
 * @return AclEntryScope scope of the ACL entry
 */
public AclEntryScope getScope() {
    return scope;
}

@Override
public boolean equals(Object o) {
    if (o == null) {
        return false;
    }
    if (getClass() != o.getClass()) {
        return false;
    }
    AclEntry other = (AclEntry) o;
    return false;
}
return Objects.equal(type, other.type) &&
        Objects.equal(name, other.name) &&
        Objects.equal(permission, other.permission) &&
        Objects.equal(scope, other.scope);
    }

    @Override
    public int hashCode() {
        return Objects.hashCode(type, name, permission, scope);
    }

    @Override
    public String toString() {
        StringBuilder sb = new StringBuilder();
        if (scope == AclEntryScope.DEFAULT) {
            sb.append("default:");
        }
        if (type != null) {
            sb.append(StringUtils.toLowerCase(type.toString()));
        }
        sb.append(':');
        if (name != null) {
            sb.append(name);
        }
        sb.append(':');
        if (permission != null) {
            sb.append(permission.SYMBOL);
        }
        return sb.toString();
    }

    /**
     * Builder for creating new AclEntry instances.
     */
    public static class Builder {
        private AclEntryType type;
        private String name;
        private FsAction permission;
        private AclEntryScope scope = AclEntryScope.ACCESS;

        /**
         * Sets the ACL entry type.
         *
         * @param type AclEntryType ACL entry type
         * @return Builder this builder, for call chaining
         */
        public Builder setType(AclEntryType type) {
            this.type = type;
        }
return this;
}

/**
 * Sets the optional ACL entry name.
 *
 * @param name String optional ACL entry name
 * @return Builder this builder, for call chaining
 */
public Builder setName(String name) {
    if (name != null && !name.isEmpty()) {
        this.name = name;
    }
    return this;
}

/**
 * Sets the set of permissions in the ACL entry.
 *
 * @param permission FsAction set of permissions in the ACL entry
 * @return Builder this builder, for call chaining
 */
public Builder setPermission(FsAction permission) {
    this.permission = permission;
    return this;
}

/**
 * Sets the scope of the ACL entry. If this method is not called, then the
 * builder assumes [@link AclEntryScope#ACCESS].
 *
 * @param scope AclEntryScope scope of the ACL entry
 * @return Builder this builder, for call chaining
 */
public Builder setScope(AclEntryScope scope) {
    this.scope = scope;
    return this;
}

/**
 * Builds a new AclEntry populated with the set properties.
 *
 * @return AclEntry new AclEntry
 */
public AclEntry build() {
    return new AclEntry(type, name, permission, scope);
}
/**
 * Private constructor.
 *
 * @param type AclEntryType ACL entry type
 * @param name String optional ACL entry name
 * @param permission FsAction set of permissions in the ACL entry
 * @param scope AclEntryScope scope of the ACL entry
 */
private AclEntry(AclEntryType type, String name, FsAction permission, AclEntryScope scope) {
    this.type = type;
    this.name = name;
    this.permission = permission;
    this.scope = scope;
}
/**
 * Parses a string representation of an ACL spec into a list of AclEntry objects. Example: "user::rwx,user:foo:rw-,group::r--,other::---"
 *
 * @param aclSpec String representation of an ACL spec.
 * @param includePermission for setAcl operations this will be true. i.e. AclSpec should include permissions.<br>
 * But for removeAcl operation it will be false. i.e. AclSpec should not contain permissions.<br>
 * Example: "user:foo,group:bar"
 * @return Returns list of [link AclEntry] parsed
 */
public static List<AclEntry> parseAclSpec(String aclSpec, boolean includePermission) {
    List<AclEntry> aclEntries = new ArrayList<AclEntry>();
    Collection<String> aclStrings = StringUtils.getStringCollection(aclSpec, ",");
    for (String aclStr : aclStrings) {
        AclEntry aclEntry = parseAclEntry(aclStr, includePermission);
        aclEntries.add(aclEntry);
    }
    return aclEntries;
}
/**
 * Parses a string representation of an ACL into a AclEntry object.<br>
 *
 * @param aclStr String representation of an ACL.<br>
 * Example: "user:foo:rw-"
* @param includePermission
  * for setAcl operations this will be true. i.e. Acl should include
  * permissions.<br>
  * But for removeAcl operation it will be false. i.e. Acl should not
  * contain permissions.<br>
  * Example: "user:foo,group:bar,mask::"
* @return Returns an {@link AclEntry} object
*/
public static AclEntry parseAclEntry(String aclStr,
  boolean includePermission) {
  AclEntry.Builder builder = new AclEntry.Builder();
  // Here "::" represent one empty string.
  // StringUtils.getStringCollection() will ignore this.
  String[] split = aclStr.split(";");

  if (split.length == 0) {
    throw new HadoopIllegalArgumentException("Invalid <aclSpec> : "+ aclStr);
  }
  int index = 0;
  if ("default".equals(split[0])) {
    // default entry
    index++;
    builder.setScope(AclEntryScope.DEFAULT);
  }

  if (split.length <= index) {
    throw new HadoopIllegalArgumentException("Invalid <aclSpec> : "+ aclStr);
  }

  AclEntryType aclType = null;
  try {
    aclType = Enum.valueOf(
      AclEntryType.class, StringUtils.toUpperCase(split[index]));
    builder.setType(aclType);
    index++;
  } catch (IllegalArgumentException iae) {
    throw new HadoopIllegalArgumentException(
      "Invalid type of acl in <aclSpec> :" + aclStr);
  }

  if (split.length > index) {
    String name = split[index];
    if (!name.isEmpty()) {
      builder.setName(name);
    }
    index++;
  }

  return builder.build();
}
if (includePermission) {
    if (split.length <= index) {
        throw new HadoopIllegalArgumentException("Invalid <aclSpec> : "
            + aclStr);
    }
    String permission = split[index];
    FsAction fsAction = FsAction.getFsAction(permission);
    if (null == fsAction) {
        throw new HadoopIllegalArgumentException(
            "Invalid permission in <aclSpec> : " + aclStr);
    }
    builder.setPermission(fsAction);
    index++;
}

if (split.length > index) {
    throw new HadoopIllegalArgumentException("Invalid <aclSpec> : " + aclStr);
}
AclEntry aclEntry = builder.build();
return aclEntry;
}

/**
 * Convert a List of AclEntries into a string - the reverse of parseAclSpec.
 * @param aclSpec List of AclEntries to convert
 * @return String representation of aclSpec
 */
public static String aclSpecToString(List<AclEntry> aclSpec) {
    StringBuilder buf = new StringBuilder();
    for (AclEntry e : aclSpec) {
        buf.append(e.toString());
        buf.append(",");
    }
    return buf.substring(0, buf.length()-1);  // remove last ,
}

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* limitations under the License.
*/
package org.apache.hadoop.fs.permission;
import java.util.regex.Pattern;
import org.apache.hadoop.classification.InterfaceAudience;
import org.apache.hadoop.classification.InterfaceStability;
/**
* Parse umask value provided as a string, either in octal or symbolic
* format and return it as a short value. Umask values are slightly
* different from standard modes as they cannot specify sticky bit
* or X.
*
*/
@InterfaceAudience.Private
@InterfaceStability.Unstable
class UmaskParser extends PermissionParser {
private static Pattern chmodOctalPattern =
Pattern.compile("^\\s*[+]?()([0-7]{3})\\s*$"); // no leading 1 for sticky bit
private static Pattern umaskSymbolicPattern = /* not allow X or t */
Pattern.compile("\\G\\s*([ugoa]*)([+=-]+)([rwx]*)([,\\s]*)\\s*");
final short umaskMode;
public UmaskParser(String modeStr) throws IllegalArgumentException {
super(modeStr, umaskSymbolicPattern, chmodOctalPattern);
umaskMode = (short)combineModes(0, false);
}
/**
* To be used for file/directory creation only. Symbolic umask is applied
* relative to file mode creation mask; the permission op characters '+'
* results in clearing the corresponding bit in the mask, '-' results in bits
* for indicated permission to be set in the mask.
*
* For octal umask, the specified bits are set in the file mode creation mask.
*
* @return umask
*/
public short getUMask() {
if (symbolic) {
// Return the complement of octal equivalent of umask that was computed
return (short) (~umaskMode & 0777);

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return umaskMode;
}

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 * limitations under the License.
 */

package org.apache.hadoop.fs.permission;

import org.apache.hadoop.classification.InterfaceAudience;
import org.apache.hadoop.classification.InterfaceStability;

/**
 * Specifies the type of an ACL entry.
 */
@InterfaceAudience.Public
@InterfaceStability.Evolving
public enum AclEntryType {
/**
 * An ACL entry applied to a specific user. These ACL entries can be unnamed,
 * which applies to the file owner, or named, which applies to the specific
 * named user.
 */
USER,

/**
 * An ACL entry applied to a specific group. These ACL entries can be
 * unnamed, which applies to the file's group, or named, which applies to the
 * specific named group.
 */
GROUP,

/**
 * An ACL mask entry. Mask entries are unnamed. During permission checks,
* the mask entry interacts with all ACL entries that are members of the group * class. This consists of all named user entries, the unnamed group entry, * and all named group entries. For each such entry, any permissions that are * absent from the mask entry are removed from the effective permissions used * during the permission check.

*/

MASK,

/**
 * An ACL entry that applies to all other users that were not covered by one * of the more specific ACL entry types.
 */

OTHER;
}

*/

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 */

package org.apache.hadoop.fs.permission;

import java.io.DataInput;
import java.io.DataOutput;
import java.io.IOException;
import org.apache.commons.logging.Log;
import org.apache.commons.logging.LogFactory;
import org.apache.hadoop.classification.InterfaceAudience;
import org.apache.hadoop.classification.InterfaceStability;
import org.apache.hadoop.conf.Configuration;
import org.apache.hadoop.fs.CommonConfigurationKeys;
import org.apache.hadoop.io.Writable;
import org.apache.hadoop.io.WritableFactories;
import org.apache.hadoop.io.WritableFactory;

/**
* A class for file/directory permissions.
* /
@InterfaceAudience.Public
@InterfaceStability.Stable
public class FsPermission implements Writable {
private static final Log LOG = LogFactory.getLog(FsPermission.class);

static final WritableFactory FACTORY = new WritableFactory() {
    @Override
    public Writable newInstance() { return new FsPermission(); }
};
static {                                      // register a ctor
    WritableFactories.setFactory(FsPermission.class, FACTORY);
    WritableFactories.setFactory(ImmutableFsPermission.class, FACTORY);
}

/** Maximum acceptable length of a permission string to parse */
public static final int MAX_PERMISSION_LENGTH = 10;

/** Create an immutable { @link FsPermission} object. */
public static FsPermission createImmutable(short permission) {
    return new ImmutableFsPermission(permission);
}

//POSIX permission style
private FsAction useraction = null;
private FsAction groupaction = null;
private FsAction otheraction = null;
private boolean stickyBit = false;

private FsPermission() {

/**
  * Construct by the given { @link FsAction}.
  * @param u user action
  * @param g group action
  * @param o other action
  */
public FsPermission(FsAction u, FsAction g, FsAction o) {
    this(u, g, o, false);
}

public FsPermission(FsAction u, FsAction g, FsAction o, boolean sb) {
    set(u, g, o, sb);
}

/**
  * Construct by the given mode.
* @param mode
* @see #toShort()
*/
public FsPermission(short mode) { fromShort(mode); }

/**
 * Copy constructor
 *
 * @param other other permission
 */
public FsPermission(FsPermission other) {
    this.useraction = other.useraction;
    this.groupaction = other.groupaction;
    this.otheraction = other.otheraction;
    this.stickyBit = other.stickyBit;
}

/**
 * Construct by given mode, either in octal or symbolic format.
 * @param mode mode as a string, either in octal or symbolic format
 * @throws IllegalArgumentException if <code>mode</code> is invalid
 */
public FsPermission(String mode) {
    this(new UmaskParser(mode).getUMask());
}

/** Return user { @link FsAction}. */
public FsAction getUserAction() {return useraction;}

/** Return group { @link FsAction}. */
public FsAction getGroupAction() {return groupaction;}

/** Return other { @link FsAction}. */
public FsAction getOtherAction() {return otheraction;}

private void set(FsAction u, FsAction g, FsAction o, boolean sb) {
    useraction = u;
    groupaction = g;
    otheraction = o;
    stickyBit = sb;
}

public void fromShort(short n) {
    FsAction[] v = FSACTION_VALUES;
    set(v[(n >>> 6) & 7], v[(n >>> 3) & 7], v[n & 7], (((n >>> 9) & 1) == 1) );
}

@Override
public void write(DataOutput out) throws IOException {
    out.writeShort(toShort());
}

@Override
public void readFields(DataInput in) throws IOException {
    fromShort(in.readShort());
}

/**
 * Create and initialize a @link {FsPermission} from @link {DataInput}.
 */
public static FsPermission read(DataInput in) throws IOException {
    FsPermission p = new FsPermission();
    p.readFields(in);
    return p;
}

/**
 * Encode the object to a short.
 */
public short toShort() {
    int s = (stickyBit ? 1 << 9 : 0)     |
            (useraction.ordinal() << 6)  |
            (groupaction.ordinal() << 3) |
            otheraction.ordinal();

    return (short)s;
}

/**
 * Encodes the object to a short. Unlike @link #toShort(), this method may
 * return values outside the fixed range 00000 - 01777 if extended features
 * are encoded into this permission, such as the ACL bit.
 *
 * @return short extended short representation of this permission
 */
public short toExtendedShort() {
    return toShort();
}

@Override
public boolean equals(Object obj) {
    if (obj instanceof FsPermission) {
        FsPermission that = (FsPermission)obj;
        return this.useraction == that.useraction
            && this.groupaction == that.groupaction
            && this.otheraction == that.otheraction
            ...
&& this.stickyBit == that.stickyBit;
}
return false;
}

@Override
public int hashCode() {return toShort();}

@Override
public String toString() {
String str = useraction.SYMBOL + groupaction.SYMBOL + otheraction.SYMBOL;
if(stickyBit) {
StringBuilder str2 = new StringBuilder(str);
str2.replace(str2.length() - 1, str2.length(),
otheraction.implies(FsAction.EXECUTE) ? "t" : "T");
str = str2.toString();
}
return str;
}

/**
 * Apply a umask to this permission and return a new one.
 * The umask is used by create, mkdir, and other Hadoop filesystem operations.
 * The mode argument for these operations is modified by removing the bits
 * which are set in the umask. Thus, the umask limits the permissions which
 * newly created files and directories get.
 *
 * @param umask          The umask to use
 *
 * @return               The effective permission
 */
public FsPermission applyUMask(FsPermission umask) {
return new FsPermission(useraction.and(umask.useraction.not()),
groupaction.and(umask.groupaction.not()),
otheraction.and(umask.otheraction.not()));
}

/** umask property label deprecated key and code in getUMask method
 * to accommodate it may be removed in version .23 */
public static final String DEPRECATED_UMASK_LABEL = "dfs.umask";
public static final String UMASK_LABEL =
CommonConfigurationKeys.FS_PERMISSIONS_UMASK_KEY;
public static final int DEFAULT_UMASK =
CommonConfigurationKeys.FS_PERMISSIONS_UMASK_DEFAULT;

private static final FsAction[] FsACTION_VALUES = FsAction.values();
/**
 * Get the user file creation mask (umask)
 *
 * @code UMASK_LABEL @endcode config param has umask value that is either symbolic
 * or octal.
 *
 * Symbolic umask is applied relative to file mode creation mask;
 * the permission op characters '+' clears the corresponding bit in the mask,
 * '-' sets bits in the mask.
 *
 * Octal umask, the specified bits are set in the file mode creation mask.
 *
 * @code DEPRECATED_UMASK_LABEL @endcode config param has umask value set to decimal.
 */

public static FsPermission getUMask(Configuration conf) {
    int umask = DEFAULT_UMASK;
    // To ensure backward compatibility first use the deprecated key.
    // If the deprecated key is not present then check for the new key
    if(conf != null) {
        String confUmask = conf.get(UMASK_LABEL);
        int oldUmask = conf.getInt(DEPRECATED_UMASK_LABEL, Integer.MIN_VALUE);
        try {
            if(confUmask != null) {
                umask = new UmaskParser(confUmask).getUMask();
            }
        } catch(IllegalArgumentException iae) {
            // Provide more explanation for user-facing message
            String type = iae instanceof NumberFormatException ? "decimal"
                : "octal or symbolic";
            String error = "Unable to parse configuration " + UMASK_LABEL
                + " with value " + confUmask + " as " + type + " umask."
                + ";"
            LOG.warn(error);
        }
        if(oldUmask != Integer.MIN_VALUE) { // Property was set with old key
            if (umask != oldUmask) {
                LOG.warn(DEPRECATED_UMASK_LABEL
                    + " configuration key is deprecated. " + "Convert to 
                    + UMASK_LABEL + ", using octal or symbolic umask 
                    + "specifications."");
                // Old and new umask values do not match - Use old umask
            }
        }
    }
    if(oldUmask != Integer.MIN_VALUE) { // Property was set with old key
        if (umask != oldUmask) {
            LOG.warn(DEPRECATED_UMASK_LABEL
                + " configuration key is deprecated. " + "Convert to 
                + UMASK_LABEL + ", using octal or symbolic umask 
                + "specifications."");
            // Old and new umask values do not match - Use old umask
        }
    }
}
umask = oldUmask;
}
}
}

return new FsPermission((short)umask);
}

public boolean getStickyBit() {
    return stickyBit;
}

/**
 * Returns true if there is also an ACL (access control list).
 * @return boolean true if there is also an ACL (access control list).
 */
public boolean getAclBit() {
    // File system subclasses that support the ACL bit would override this.
    return false;
}

/**
 * Returns true if the file is encrypted or directory is in an encryption zone
 */
public boolean getEncryptedBit() {
    return false;
}

/** Set the user file creation mask (umask) */
public static void setUMask(Configuration conf, FsPermission umask) {
    conf.set(UMASK_LABEL, String.format("%1$03o", umask.toShort()));
    conf.setInt(DEPRECATED_UMASK_LABEL, umask.toShort());
}

/**
 * Get the default permission for directory and symlink.
 * In previous versions, this default permission was also used to
 * create files, so files created end up with ugo+x permission.
 * See HADOOP-9155 for detail.
 * Two new methods are added to solve this, please use
 * | @link FsPermission#getDirDefault() for directory, and use
 * | @link FsPermission#getFileDefault() for file.
 * This method is kept for compatibility.
 */
public static FsPermission getDefault() {
    return new FsPermission((short)00777);
}
/**
 * Get the default permission for directory.
 */
public static FsPermission getDirDefault() {
    return new FsPermission((short)00777);
}

/**
 * Get the default permission for file.
 */
public static FsPermission getFileDefault() {
    return new FsPermission((short)00666);
}

/**
 * Get the default permission for cache pools.
 */
public static FsPermission getCachePoolDefault() {
    return new FsPermission((short)00755);
}

/**
 * Create a FsPermission from a Unix symbolic permission string
 * @param unixSymbolicPermission e.g. "-rw-rw-rw-"
 */
public static FsPermission valueOf(String unixSymbolicPermission) {
    if (unixSymbolicPermission == null) {
        return null;
    }
    else if (unixSymbolicPermission.length() != MAX_PERMISSION_LENGTH) {
        throw new IllegalArgumentException(String.format(
            "length != %d(unixSymbolicPermission=%s)", MAX_PERMISSION_LENGTH, unixSymbolicPermission));
    }

    int n = 0;
    for(int i = 1; i < unixSymbolicPermission.length(); i++) {
        n = n << 1;
        char c = unixSymbolicPermission.charAt(i);
        n += (c == '-' || c == 'T' || c == 'S') ? 0: 1;
    }

    // Add sticky bit value if set
    if(unixSymbolicPermission.charAt(9) == 't' ||
       unixSymbolicPermission.charAt(9) == 'T')
        n += 01000;
return new FsPermission((short)n);
}

private static class ImmutableFsPermission extends FsPermission {
    public ImmutableFsPermission(short permission) {
        super(permission);
    }

    @Override
    public void readFields(DataInput in) throws IOException {
        throw new UnsupportedOperationException();
    }
}

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 */

package org.apache.hadoop.fs.permission;

import org.apache.hadoop.classification.InterfaceAudience;
import org.apache.hadoop.classification.InterfaceStability;
import org.apache.hadoop.io.*;
import java.io.DataInput;
import java.io.DataOutput;
import java.io.IOException;

/**
 * Store permission related information.
 */

@InterfaceAudience.LimitedPrivate({"HDFS", "MapReduce"})
@InterfaceStability.Unstable
public class PermissionStatus implements Writable {
    static final WritableFactory FACTORY = new WritableFactory() {


@Override
public Writable newInstance() { return new PermissionStatus(); }
};
static { // register a ctor
WritableFactories.setFactory(PermissionStatus.class, FACTORY);
}

/** Create an immutable [@link PermissionStatus] object. */
public static PermissionStatus createImmutable(
    String user, String group, FsPermission permission) {
    return new PermissionStatus(user, group, permission) {
        @Override
        public PermissionStatus applyUMask(FsPermission umask) {
            throw new UnsupportedOperationException();
        }
        @Override
        public void readFields(DataInput in) throws IOException {
            throw new UnsupportedOperationException();
        }
    };
}

private String username;
private String groupname;
private FsPermission permission;

private PermissionStatus() {}

/** Constructor */
public PermissionStatus(String user, String group, FsPermission permission) {
    username = user;
    groupname = group;
    this.permission = permission;
}

/** Return user name */
public String getUserName() { return username; }

/** Return group name */
public String getGroupName() { return groupname; }

/** Return permission */
public FsPermission getPermission() { return permission; }

/**
* Apply umask.
* @see FsPermission#applyUMask(FsPermission)
*/
public PermissionStatus applyUMask(FsPermission umask) {
    permission = permission.applyUMask(umask);
    return this;
}

@Override
public void readFields(DataInput in) throws IOException {
    username = Text.readString(in, Text.DEFAULT_MAX_LEN);
    groupname = Text.readString(in, Text.DEFAULT_MAX_LEN);
    permission = FsPermission.read(in);
}

@Override
public void write(DataOutput out) throws IOException {
    write(out, username, groupname, permission);
}

/**
 * Create and initialize a {@link PermissionStatus} from {@link DataInput}.
 */
public static PermissionStatus read(DataInput in) throws IOException {
    PermissionStatus p = new PermissionStatus();
    p.readFields(in);
    return p;
}

/**
 * Serialize a {@link PermissionStatus} from its base components.
 */
public static void write(DataOutput out,
    String username,
    String groupname,
    FsPermission permission) throws IOException {
    Text.writeString(out, username, Text.DEFAULT_MAX_LEN);
    Text.writeString(out, groupname, Text.DEFAULT_MAX_LEN);
    permission.write(out);
}

@Override
public String toString() {
    return username + ":" + groupname + ":" + permission;
}

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 * regarding copyright ownership. The ASF licenses this file
package org.apache.hadoop.fs.permission;

import java.io.IOException;
import org.apache.hadoop.classification.InterfaceAudience;
import org.apache.hadoop.classification.InterfaceStability;

/**
 * An exception class for access control related issues.
 * @deprecated Use [{@link org.apache.hadoop.security.AccessControlException}]
 *             instead.
 * @Deprecated
 * @InterfaceAudience.Public
 * @InterfaceStability.Stable
 * public class AccessControlException extends IOException {
 *     //Required by [{@link java.io.Serializable}].
 *     private static final long serialVersionUID = 1L;
 *
 *     /**
 *      * Default constructor is needed for unwrapping from
 *      * [{@link org.apache.hadoop.ipc.RemoteException}].
 *      */
 *     public AccessControlException() {
 *         super("Permission denied.");
 *     }
 *
 *     /**
 *      * Constructs an [{@link AccessControlException}]
 *      * with the specified detail message.
 *      * @param s the detail message.
 *      */
 *     public AccessControlException(String s) {
 *         super(s);
 *     }
 * }
/**
 * Constructs a new exception with the specified cause and a detail message of (cause==null ? null : cause.toString()) (which typically contains the class and detail message of cause).
 * @param cause the cause (which is saved for later retrieval by the getCause() method). (A null value is permitted, and indicates that the cause is nonexistent or unknown.)
 */

public AccessControlException(Throwable cause) {
    super(cause);
}

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 */

package org.apache.hadoop.fs.permission;

import java.util.regex.Matcher;
import java.util.regex.Pattern;
import org.apache.hadoop.classification.InterfaceAudience;
import org.apache.hadoop.classification.InterfaceStability;

/**
 * Base class for parsing either chmod permissions or umask permissions. Includes common code needed by either operation as implemented in UmaskParser and ChmodParser classes.
 */
@InterfaceAudience.Private
@InterfaceStability.Unstable
class PermissionParser {
    protected boolean symbolic = false;
    protected short userMode;
protected short groupMode;
protected short othersMode;
protected short stickyMode;
protected char userType = '+';
protected char groupType = '+';
protected char othersType = '+';
protected char stickyBitType = '+';

/**
 * Begin parsing permission stored in modeStr
 *
 * @param modeStr Permission mode, either octal or symbolic
 * @param symbolic Use-case specific symbolic pattern to match against
 * @throws IllegalArgumentException if unable to parse modeStr
 */
public PermissionParser(String modeStr, Pattern symbolic, Pattern octal)
    throws IllegalArgumentException {
    Matcher matcher = null;
    if ((matcher = symbolic.matcher(modeStr)).find()) {
        applyNormalPattern(modeStr, matcher);
    } else if ((matcher = octal.matcher(modeStr)).matches()) {
        applyOctalPattern(modeStr, matcher);
    } else {
        throw new IllegalArgumentException(modeStr);
    }
}

private void applyNormalPattern(String modeStr, Matcher matcher) {
    // Are there multiple permissions stored in one chmod?
    boolean commaSeperated = false;
    for (int i = 0; i < 1 || matcher.end() < modeStr.length(); i++) {
        if (i > 0 && (!commaSeperated || !matcher.find())) {
            throw new IllegalArgumentException(modeStr);
        } else {
            String str = matcher.group(2);
            char type = str.charAt(str.length() - 1);
            boolean user, group, others, stickyBit;
            user = group = others = stickyBit = false;
            for (char c : matcher.group(1).toCharArray()) {
                // groups : 1 : [ugoa]* 2 : [+-=] 3 : [rwxXt]+ 4 : [.\s]*
            }
    }

    String str = matcher.group(2);
    char type = str.charAt(str.length() - 1);

    boolean user, group, others, stickyBit;
    user = group = others = stickyBit = false;
    for (char c : matcher.group(1).toCharArray()) {
        // groups : 1 : [ugoa]* 2 : [+-=] 3 : [rwxXt]+ 4 : [.\s]*
    }
switch (c) {
    case 'u':
        user = true;
        break;
    case 'g':
        group = true;
        break;
    case 'o':
        others = true;
        break;
    case 'a':
        break;
    default:
        throw new RuntimeException("Unexpected");
}
}

if (!(user || group || others)) { // same as specifying 'a'
    user = group = others = true;
}

short mode = 0;

for (char c : matcher.group(3).toCharArray()) {
    switch (c) {
    case 'r':
        mode |= 4;
        break;
    case 'w':
        mode |= 2;
        break;
    case 'x':
        mode |= 1;
        break;
    case 'X':
        mode |= 8;
        break;
    case 't':
        stickyBit = true;
        break;
    default:
        throw new RuntimeException("Unexpected");
    }
}

if (user) {
    userMode = mode;
    userType = type;
}
if (group) {
    groupMode = mode;
    groupType = type;
}

if (others) {
    othersMode = mode;
    othersType = type;
    stickyMode = (short) (stickyBit ? 1 : 0);
    stickyBitType = type;
}

commaSeperated = matcher.group(4).contains(",");
}
symbolic = true;
}

private void applyOctalPattern(String modeStr, Matcher matcher) {
    userType = groupType = othersType = '=';

    // Check if sticky bit is specified
    String sb = matcher.group(1);
    if (!sb.isEmpty()) {
        stickyMode = Short.valueOf(sb.substring(0, 1));
        stickyBitType = '=';
    }

    String str = matcher.group(2);
    userMode = Short.valueOf(str.substring(0, 1));
    groupMode = Short.valueOf(str.substring(1, 2));
    othersMode = Short.valueOf(str.substring(2, 3));
}

protected int combineModes(int existing, boolean exeOk) {
    return combineModeSegments(stickyBitType, stickyMode,
        (existing >>> 9), false) << 9 |
    combineModeSegments(userType, userMode,
        (existing >>> 6)&7, exeOk) << 6 |
    combineModeSegments(groupType, groupMode,
        (existing >>> 3)&7, exeOk) << 3 |
    combineModeSegments(othersType, othersMode, existing&7, exeOk);
}

protected int combineModeSegments(char type, int mode,
    int existing, boolean exeOk) {
boolean capX = false;

if ((mode&8) != 0) { // convert X to x;
    capX = true;
    mode &= ~8;
    mode |= 1;
}

switch (type) {
    case '+' : mode = mode | existing; break;
    case '-' : mode = (~mode) & existing; break;
    case '=' : break;
    default  : throw new RuntimeException("Unexpected");
}

// if X is specified add 'x' only if exeOk or x was already set.
if (capX && !exeOk && (mode&1) != 0 && (existing&1) == 0) {
    mode &= ~1; // remove x
}

return mode;
}

package org.apache.hadoop.fs.permission;

import org.apache.hadoop.classification.InterfaceAudience;
import org.apache.hadoop.classification.InterfaceStability;

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 *
 * @since 2.0
 */

import org.apache.hadoop.hadoop.classification.InterfaceAudience;
import org.apache.hadoop.hadoop.classification.InterfaceStability;

/**
 * Specifies the scope or intended usage of an ACL entry.
 */
@InterfaceAudience.Public
@InterfaceStability.Evolving
public enum AclEntryScope {
    /**
     * An ACL entry that is inspected during permission checks to enforce
     * permissions.
     */
    ACCESS,
    /**
     * An ACL entry to be applied to a directory's children that do not otherwise
     * have their own ACL defined. Unlike an access ACL entry, a default ACL
     * entry is not inspected as part of permission enforcement on the directory
     * that owns it.
     */
    DEFAULT;
}
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 */
package org.apache.hadoop.fs.permission;

import static org.apache.hadoop.fs.permission.AclEntryScope.*;
import static org.apache.hadoop.fs.permission.AclEntryType.*;
import static org.apache.hadoop.fs.permission.FsAction.*;
import static org.apache.hadoop.hdfs.server.namenode.AclTestHelpers.*;
import static org.junit.Assert.assertEquals;
import static org.junit.Assert.assertFalse;
import static org.junit.Assert.assertTrue;
import static org.junit.Assert.fail;
import java.io.IOException;
import java.util.Arrays;

import java.io.IOException;
import java.util.Arrays;
import org.apache.hadoop.conf.Configuration;
import org.apache.hadoop.fs.FSDataOutputStream;
import org.apache.hadoop.fs.FileStatus;
import org.apache.hadoop.fs.FileSystem;
import org.apache.hadoop.fs.Path;
import org.apache.hadoop.hdfs.DFSConfigKeys;
import org.apache.hadoop.hdfs.DFSTestUtil;
import org.apache.hadoop.hdfs.DistributedFileSystem;
import org.apache.hadoop.hdfs.HdfsConfiguration;
import org.apache.hadoop.hdfs.MiniDFSCluster;
import org.apache.hadoop.hadoop.security.AccessControlException;
import org.apache.hadoop.io.IOUtils;
import org.apache.hadoop.security.UserGroupInformation;
import org.junit.AfterClass;
import org.junit.Before;
import org.junit.BeforeClass;
import org.junit.Test;
public class TestStickyBit {

    static final UserGroupInformation user1 = 
    UserGroupInformation.createUserForTesting("theDoctor", new String[] {"tardis"});
    static final UserGroupInformation user2 = 
    UserGroupInformation.createUserForTesting("rose", new String[] {"powellestates"});

    private static MiniDFSCluster cluster;
    private static Configuration conf;
    private static FileSystem hdfs;
    private static FileSystem hdfsAsUser1;
    private static FileSystem hdfsAsUser2;

    @BeforeClass
    public static void init() throws Exception {
        conf = new HdfsConfiguration();
        conf.setBoolean(DFSConfigKeys.DFS_PERMISSIONS_ENABLED_KEY, true);
        conf.setBoolean(DFSConfigKeys.DFS_NAMENODE_ACLS_ENABLED_KEY, true);
        initCluster(true);
    }

    private static void initCluster(boolean format) throws Exception {
        cluster = new MiniDFSCluster.Builder(conf).numDataNodes(4).format(format)
        .build();
        hdfs = cluster.getFileSystem();
        assertTrue(hdfs instanceof DistributedFileSystem);
        hdfsAsUser1 = DFSTestUtil.getFileSystemAs(user1, conf);
        assertTrue(hdfsAsUser1 instanceof DistributedFileSystem);
        hdfsAsUser2 = DFSTestUtil.getFileSystemAs(user2, conf);
        assertTrue(hdfsAsUser2 instanceof DistributedFileSystem);

    }

    private static void initCluster(boolean format) throws Exception {
        cluster = new MiniDFSCluster.Builder(conf).numDataNodes(4).format(format)
        .build();
        hdfs = cluster.getFileSystem();
        assertTrue(hdfs instanceof DistributedFileSystem);
        hdfsAsUser1 = DFSTestUtil.getFileSystemAs(user1, conf);
        assertTrue(hdfsAsUser1 instanceof DistributedFileSystem);
        hdfsAsUser2 = DFSTestUtil.getFileSystemAs(user2, conf);
        assertTrue(hdfsAsUser2 instanceof DistributedFileSystem);
    }

}
@Before
public void setup() throws Exception {
    if (hdfs != null) {
        for (FileStatus stat: hdfs.listStatus(new Path("/"))) {
            hdfs.delete(stat.getPath(), true);
        }
    }
}

@AfterClass
public static void shutdown() throws Exception {
    IOUtils.cleanup(null, hdfs, hdfsAsUser1, hdfsAsUser2);
    if (cluster != null) {
        cluster.shutdown();
    }
}

/**
 * Ensure that even if a file is in a directory with the sticky bit on,
 * another user can write to that file (assuming correct permissions).
 */
private void confirmCanAppend(Configuration conf, Path p) throws Exception {
    // Write a file to the new tmp directory as a regular user
    Path file = new Path(p, "foo");
    writeFile(hdfsAsUser1, file);
    hdfsAsUser1.setPermission(file, new FsPermission((short) 0777));

    // Log onto cluster as another user and attempt to append to file
    Path file2 = new Path(p, "foo");
    FSDataOutputStream h = null;
    try {
        h = hdfsAsUser2.append(file2);
        h.write("Some more data").getBytes();
        h.close();
    } finally {
        IOUtils.cleanup(null, h);
    }
}

/**
 * Test that one user can't delete another user's file when the sticky bit is
 * set.
 */
private void confirmDeletingFiles(Configuration conf, Path p) throws Exception {
    // Execute tests...
}
// Write a file to the new temp directory as a regular user
Path file = new Path(p, "foo");
writeFile(hdfsAsUser1, file);

// Make sure the correct user is the owner
assertEquals(user1.getShortUserName(),
        hdfsAsUser1.getFileStatus(file).getOwner());

// Log onto cluster as another user and attempt to delete the file
try {
    hdfsAsUser2.delete(file, false);
    fail("Shouldn't be able to delete someone else's file with SB on");
} catch (IOException ioe) {
    assertTrue(ioe instanceof AccessControlException);
    assertTrue(ioe.getMessage().contains("sticky bit");
}

/**
* Test that if a directory is created in a directory that has the sticky bit
* on, the new directory does not automatically get a sticky bit, as is
* standard Unix behavior
*/
private void confirmStickyBitDoesntPropagate(FileSystem hdfs, Path p)
    throws IOException {
    // Create a subdirectory within it
    Path p2 = new Path(p, "bar");
    hdfs.mkdirs(p2);

    // Ensure new directory doesn't have its sticky bit on
    assertFalse(hdfs.getFileStatus(p2).getPermission().getStickyBit());
}

/**
* Test basic ability to get and set sticky bits on files and directories.
*/
private void confirmSettingAndGetting(FileSystem hdfs, Path p, Path baseDir)
    throws IOException {
    // Initially sticky bit should not be set
    assertFalse(hdfs.getFileStatus(p).getPermission().getStickyBit());

    // Same permission, but with sticky bit on
    short withSB;
    withSB = (short) (hdfs.getFileStatus(p).getPermission().toShort() | 01000);

    assertTrue((new FsPermission(withSB)).getStickyBit());

    hdfs.setPermission(p, new FsPermission(withSB));
assertTrue(hdfs.getFileStatus(p).getPermission().getStickyBit());

// Write a file to the fs, try to set its sticky bit
Path f = new Path(baseDir, "somefile");
writeFile(hdfs, f);
assertFalse(hdfs.getFileStatus(f).getPermission().getStickyBit());

withSB = (short) (hdfs.getFileStatus(f).getPermission().toShort() | 01000);

hdfs.setPermission(f, new FsPermission(withSB));
assertTrue(hdfs.getFileStatus(f).getPermission().getStickyBit());
}

@Test
public void testGeneralSBBehavior() throws Exception {
    Path baseDir = new Path("/mcgann");
hdfs.mkdirs(baseDir);

    // Create a tmp directory with wide-open permissions and sticky bit
    Path p = new Path(baseDir, "tmp");

    hdfs.mkdirs(p);
hdfs.setPermission(p, new FsPermission((short) 01777));

    confirmCanAppend(conf, p);

    baseDir = new Path("/eccleston");
hdfs.mkdirs(baseDir);
p = new Path(baseDir, "rogue traders");

    hdfs.mkdirs(p);
    confirmSettingAndGetting(hdfs, p, baseDir);

    baseDir = new Path("/tennant");
hdfs.mkdirs(baseDir);
p = new Path(baseDir, "contemporary");
    hdfs.mkdirs(p);
    hdfs.setPermission(p, new FsPermission((short) 01777));
    confirmDeletingFiles(conf, p);

    baseDir = new Path("/smith");
hdfs.mkdirs(baseDir);
p = new Path(baseDir, "scissorsisters");

    // Turn on its sticky bit
    hdfs.mkdirs(p, new FsPermission((short) 01666));
    confirmStickyBitDoesntPropagate(hdfs, baseDir);
@Test
public void testAclGeneralSBBehavior() throws Exception {
    Path baseDir = new Path("/mcgann");
    hdfs.mkdirs(baseDir);

    // Create a tmp directory with wide-open permissions and sticky bit
    Path p = new Path(baseDir, "tmp");
    hdfs.mkdirs(p);
    hdfs.setPermission(p, new FsPermission((short) 01777));
    applyAcl(p);
    confirmCanAppend(conf, p);

    baseDir = new Path("/eccleston");
    hdfs.mkdirs(baseDir);
    p = new Path(baseDir, "rogue traders");
    hdfs.mkdirs(p);
    applyAcl(p);
    confirmSettingAndGetting(hdfs, p, baseDir);

    baseDir = new Path("/tennant");
    hdfs.mkdirs(baseDir);
    p = new Path(baseDir, "contemporary");
    hdfs.mkdirs(p);
    hdfs.setPermission(p, new FsPermission((short) 01777));
    applyAcl(p);
    confirmDeletingFiles(conf, p);

    baseDir = new Path("/smith");
    hdfs.mkdirs(baseDir);
    p = new Path(baseDir, "scissorsisters");

    // Turn on its sticky bit
    hdfs.mkdirs(p, new FsPermission((short) 01666));
    applyAcl(p);
    confirmStickyBitDoesntPropagate(hdfs, p);
}

/**
 * Test that one user can't rename/move another user's file when the sticky
 * bit is set.
 */
@Test
public void testMovingFiles() throws Exception {
    testMovingFiles(false);
}
private void testMovingFiles(boolean useAcl) throws Exception {
    // Create a tmp directory with wide-open permissions and sticky bit
    Path tmpPath = new Path("/tmp");
    Path tmpPath2 = new Path("/tmp2");
hdfs.mkdirs(tmpPath);
hdfs.mkdirs(tmpPath2);
hdfs.setPermission(tmpPath, new FsPermission((short) 01777));
    if (useAcl) {
        applyAcl(tmpPath);
    }
    hdfs.setPermission(tmpPath2, new FsPermission((short) 01777));
    if (useAcl) {
        applyAcl(tmpPath2);
    }

    // Write a file to the new tmp directory as a regular user
    Path file = new Path(tmpPath, "foo");

    writeFile(hdfsAsUser1, file);

    // Log onto cluster as another user and attempt to move the file
    try {
        hdfsAsUser2.rename(file, new Path(tmpPath2, "renamed"));
    fail("Shouldn't be able to rename someone else's file with SB on");
    } catch (IOException ioe) {
        assertTrue(ioe instanceof AccessControlException);
        assertTrue(ioe.getMessage().contains("sticky bit"));
    }
}

/**
 * Ensure that when we set a sticky bit and shut down the file system, we get
 * the sticky bit back on re-start, and that no extra sticky bits appear after
 * re-start.
 */
@Test
public void testStickyBitPersistence() throws Exception {
    // A tale of three directories...
    Path sbSet = new Path("/Housemartins");
    Path sbNotSpecified = new Path("/INXS");
    Path sbSetOff = new Path("/Easyworld");
for (Path p : new Path[] { sbSet, sbNotSpecified, sbSetOff })
    hdfs.mkdirs(p);

    // Two directories had their sticky bits set explicitly...
    hdfs.setPermission(sbSet, new FsPermission((short) 01777));
    hdfs.setPermission(sbSetOff, new FsPermission((short) 00777));

    shutdown();

    // Start file system up again
    initCluster(false);

    assertTrue(hdfs.exists(sbSet));
    assertTrue(hdfs.getFileStatus(sbSet).getPermission().getStickyBit());

    assertTrue(hdfs.exists(sbNotSpecified));
    assertFalse(hdfs.getFileStatus(sbNotSpecified).getPermission().getStickyBit());

    assertTrue(hdfs.exists(sbSetOff));
    assertFalse(hdfs.getFileStatus(sbSetOff).getPermission().getStickyBit());

} }

@Test
public void testAclStickyBitPersistence() throws Exception {
    // A tale of three directories...
    Path sbSet = new Path("/Housemartins");
    Path sbNotSpecified = new Path("/INXS");
    Path sbSetOff = new Path("/Easyworld");

    for (Path p : new Path[] { sbSet, sbNotSpecified, sbSetOff })
        hdfs.mkdirs(p);

    // Two directories had their sticky bits set explicitly...
    hdfs.setPermission(sbSet, new FsPermission((short) 01777));
    applyAcl(sbSet);
    hdfs.setPermission(sbSetOff, new FsPermission((short) 00777));
    applyAcl(sbSetOff);

    shutdown();

    // Start file system up again
    initCluster(false);

    assertTrue(hdfs.exists(sbSet));
    assertTrue(hdfs.getFileStatus(sbSet).getPermission().getStickyBit());
```java
assertTrue(hdfs.exists(sbNotSpecified));
assertFalse(hdfs.getFileStatus(sbNotSpecified).getPermission().getStickyBit());

assertTrue(hdfs.exists(sbSetOff));
assertFalse(hdfs.getFileStatus(sbSetOff).getPermission().getStickyBit());
}

/**
 * Write a quick file to the specified file system at specified path
 */
static private void writeFile(FileSystem hdfs, Path p) throws IOException {
    FSDataOutputStream o = null;
    try {
        o = hdfs.create(p);
        o.write("some file contents".getBytes());
        o.close();
        o = null;
    } finally {
        IOUtils.cleanup(null, o);
    }

    /**
     * Applies an ACL (both access and default) to the given path.
     *
     * @param p Path to set
     * @throws IOException if an ACL could not be modified
     */
    private static void applyAcl(Path p) throws IOException {
        hdfs.modifyAclEntries(p, Arrays.asList(
            aclEntry(ACCESS, USER, user2.getShortUserName(), ALL),
            aclEntry(DEFAULT, USER, user2.getShortUserName(), ALL)));
    }
}
```

1.97 hardlink 1.0 :19.el7

1.97.1 Available under license:
    From RPM File Metadata:GPL+

1.98 hostname 3.13 :3.el7
1.98.1 Available under license:

hostname -- set the host name or show the host/domain name

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 * httpd@ncsa.uiuc.edu
 *
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#
# install - install a program, script, or datafile
# This comes from X11R5 (mit/util/scripts/install.sh).
#
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For the test/zb.c component:

/* ZeusBench V1.01

=======================

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Written by Adam Twiss (adam@zeus.co.uk). March 1996

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1.100 hwdata 0.252 :8.8.el7

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1.101 icu 50.1.2 :15.el7

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```bash
## 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 library options
LD_SOOPTIONS= -Wl,-Bsymbolic

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

### 1.102 initscripts 9.49.41 :1.el7

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Version 2.1, February 1999

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1.112 jansson 2.10 :1.el7
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1.114 jline 0.9.94
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1.115 jq 1.5 :1.el7
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1.116 json-c 0.11 :4.el7_0

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1.117 kafka 1.0.1 :2

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Jackson is a high-performance, Free/Open Source JSON processing library. It was originally written by Tatu Saloranta (tatu.saloranta@iki.fi), and has been in development since 2007. It is currently developed by a community of developers, as well as supported commercially by FasterXML.com.

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**1.118 kbd 1.15.5 :15.el7**

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```
#  # PC Screen (console) Fonts - psf1 header
#  0 leshort 0x0436 psf screen font data
>2 byte 0 256 characters, no index
>2 byte 1 512 characters, no index
>2byte2256 characters, Unicode index
>2byte3512 characters, Unicode index
>2byte4256 characters, Unicode level 2 index
>2byte5512 characters, Unicode level 2 index
>3byte8x%d
#
# PC Screen (console) Fonts - psf2 header
#  0 lelong0x864ab572 psf2 screen font data
```
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is Copyright (C) 1992 Rickard E. Faith.

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showkey.c keymaps.5 loadkeys.1 dumpkeys.1 showkey.1
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setfont.c setfont.8 mapscrn.c mapscrn.8
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setleds.c setmetamode.c setvesablank.c showconsolefont.c
spawn_console.c spawn_login.c
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/* nicstar.c v0.22 Jawaid Bazyar (bazyar@hypermall.com) */
/* nicstar.c, M. Welsh (matt.welsh@cl.cam.ac.uk) */
/* Hacked October, 1997 by Jawaid Bazyar, Interlink Advertising Services Inc. */
/* http://www.hypermall.com/ */
/* 10/1/97 - commented out CFG_PHYIE bit - we don't care when the PHY */
/* interrupts us (except possibly for removal/insertion of the cable?) */
/* 10/4/97 - began heavy inline documentation of the code. Corrected typos */
and spelling mistakes.

* 10/5/97 - added code to handle PHY interrupts, disable PHY on loss of link, and correctly re-enable PHY when link is re-established. (put back CFG_PHYIE)

* Modified to work with the IDT7721 nicstar -- AAL5 (tested) only.

* R. D. Rechenmacher <ron@fnal.gov>, Aug. 6, 1997

* Linux driver for the IDT77201 NICStAR PCI ATM controller.
* PHY component is expected to be 155 Mbps S/UNI-Lite or IDT 77155;
* see init_nicstar() for PHY initialization to change this. This driver
* expects the Linux ATM stack to support scatter-gather lists
* (skb->atm.iovcnt != 0) for Rx skb's passed to vcc->push.

* Implementing minimal-copy of received data:
* IDT always receives data into a small buffer, then large buffers
* as needed. This means that data must always be copied to create
* the linear buffer needed by most non-ATM protocol stacks (e.g. IP)
* Fix is simple: make large buffers large enough to hold entire
* SDU, and leave <small_buffer_data> bytes empty at the start. Then
* copy small buffer contents to head of large buffer.
* Trick is to avoid fragmenting Linux, due to need for a lot of large
* buffers. This is done by 2 things:
* 1) skb->destructor / skb->atm.recycle_buffer
* combined, allow nicstar_free_rx_skb to be called to
* recycle large data buffers
* 2) skb_clone of received buffers

* See nicstar_free_rx_skb and linearize_buffer for implementation
details.


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            || strcmp(license, "GPL v2") == 0
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lib/gssapi/mechglue/g_acquire_cred.c
lib/gssapi/mechglue/g_canon_name.c
lib/gssapi/mechglue/g_compare_name.c
and the initial implementation of incremental propagation, including
the following new or changed files:

include/iprop_hdr.h
kadmin/server/ipropd_svc.c
lib/kdb/iprop.x
lib/kdb/kdb_convert.c
lib/kdb/kdb_log.c
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cmd/krb5/kproplog/kproplog.c
cmd/krb5/slave/kpropd_rpc.c
lib/gss_mechs/mech_krb5/et/kdb5_err.c
lib/gss_mechs/mech_spnego/mach/gssapiP_spnego.h
lib/gss_mechs/mech_spnego/mach/spnego_mech.c
lib/krb5/kadm5/kadm_host_srv_names.c
lib/krb5/kdb/kdb_convert.c
lib/krb5/kdb/kdb_hdr.h
lib/krb5/kdb/kdb_log.c
lib/krb5/kdb/kdb_log.h
lib/libgss/g_accept_sec_context.c
lib/libgss/g_acquire_cred.c
lib/libgss/g_canon_name.c
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lib/libgss/g_export_name.c
lib/libgss/g_glue.c
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lib/libgss/g_inquire_context.c
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lib/libgss/g_inquire_names.c
lib/libgss/g_process_context.c
lib/libgss/g_rel_buffer.c
lib/libgss/g_rel_cred.c
lib/libgss/g_rel_name.c
lib/libgss/g_rel_oid_set.c
lib/libgss/g_seal.c
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lib/libgss/g_userok.c
lib/libgss/g_utils.c
```
lib/libgss/g_verify.c
lib/libgss/gssd_pname_to_uid.c
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import os
import sys
import re

def warn(fname, ln, msg):
    print '%s: %d: %s' % (fname, ln + 1, msg)

def indicates_license(line):
    return 'Copyright' in line or 'COPYRIGHT' in line or 'License' in line

# Check a comment for boilerplate violations. Return true if the comment
# is a license statement.
def check_comment(comment, fname, ln, code_seen, nonlicense_seen):
    text_seen = False
    is_license = False
    for line in comment:
        if not is_license and indicates_license(line):
            is_license = True
        if text_seen:
            warn(fname, ln, 'License begins after first line of comment')
        elif code_seen:
            warn(fname, ln, 'License after code')
        elif nonlicense_seen:
            warn(fname, ln, 'License after non-license comments')
        break
# DB2 licenses start with '/*-' and we don't want to change them.
if line != '' and line != '-':
    text_seen = True
return is_license

def check_file(lines, fname):
    # Skip emacs mode line if present.
    ln = 0
    if '-*- mode: c;' in lines[ln]:
        ln += 1

    # Check filename comment if present.
    m = re.match(r'^(([^ ]*)\(*\(-\.*?\*/)', lines[ln])
    if m:
        if m.group(1) != fname:
            warn(fname, ln, 'Wrong filename in comment')
        ln += 1

    # Scan for license statements.
    in_comment = False
    code_seen = False
    nonlicense_seen = False
    for line in lines[ln:]:
        # Strip out whitespace and comments contained within a line.
        if not in_comment:
            line = re.sub(r'/\*.*?\*/', '', line)
        line = line.strip()

        if not in_comment and '/*' in line:
            (line, sep, comment_part) = line.partition('/*')
            comment = [comment_part.strip()]
            comment_starts_at = ln
            in_comment = True
        elif in_comment and '*/' not in line:
            comment.append(line.lstrip('*').lstrip())
        elif in_comment:
            (comment_part, sep, line) = line.partition('*/')
            comment.append(comment_part.strip())
        is_license = check_comment(comment, fname, comment_starts_at,
                                    code_seen, nonlicense_seen)
        nonlicense_seen = nonlicense_seen or not is_license
        in_comment = False
        elif line.strip() != '':
            code_seen = True
            ln += 1

    for fname in sys.argv[1:]:
if fname.startswith('./):
    fname = fname[2:]
f = open(fname)
lines = f.readlines()
f.close()
check_file(lines, fname)

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<link rel="stylesheet" href="_static/agogo.css" type="text/css" />
<link rel="stylesheet" href="_static/pygments.css" type="text/css" />
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<script type="text/javascript">
var DOCUMENTATION_OPTIONS = {
    URL_ROOT: '../',
    VERSION: '1.15.1',
    COLLAPSE_INDEX: false,
    FILE_SUFFIX: '.html',
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};
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lib/gssapi/generic/gssapi_err_generic
lib/gssapi/mechglue/*
g_accept_sec_context.c

lib/gssapi/mechglue/g_acquire_cred.c

lib/gssapi/mechglue/g_canon_name.c

lib/gssapi/mechglue/g_compare_name.c

lib/gssapi/mechglue/g_context_time.c

lib/gssapi/mechglue/g_delete_sec_context.c

lib/gssapi/mechglue/g_dsp_name.c

lib/gssapi/mechglue/g_dsp_status.c

lib/gssapi/mechglue/g_dup_name.c

lib/gssapi/mechglue/g_exp_sec_context.c

lib/gssapi/mechglue/g_export_name.c

lib/gssapi/mechglue/g_glue.c

lib/gssapi/mechglue/g_imp_name.c

lib/gssapi/mechglue/g_imp_sec_context.c

lib/gssapi/mechglue/g_init_sec_context.c

lib/gssapi/mechglue/g_initialize.c

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and the initial implementation of incremental propagation, including
the following new or changed files:

```highlight-python
include/iprop_hdr.h
kadmin/server/ipropd_svc.c
lib/kdb/iprop.x
lib/kdb/kdb_convert.c
lib/kdb/kdb_log.c
lib/kdb/kdb_log.h
lib/krb5/error_tables/kdb5_err.et
slave/kpropd_rpc.c
slave/kproplog.c
```

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lib/gssapi/mechglue/g_canon_name.c
lib/gssapi/mechglue/g_compare_name.c
lib/gssapi/mechglue/g_context_time.c
lib/gssapi/mechglue/g_delete_sec_context.c
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lib/gssapi/mechglue/g_utils.c
lib/gssapi/mechglue/g_verify.c
lib/gssapi/mechglue/gssd_pname_to_uid.c
lib/gssapi/mechglue/mglueP.h
lib/gssapi/mechglue/oid_ops.c
lib/gssapi/spnego/gssapiP_spnego.h
lib/gssapi/spnego/spnego_mech.c

and the initial implementation of incremental propagation, including
the following new or changed files:

include/iprop_hdr.h
kadmin/server/ipropd_svc.c
lib/kdb/iprop.c
lib/kdb/kdb_convert.c
lib/kdb/kdb_log.c
lib/kdb/kdb_log.h
lib/krb5/error_tables/kdb5_err.et
slave/kpropd_rpc.c
slave/kproplog.c

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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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it.

Thus, it is not the intent of this section to claim rights or contest
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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
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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.

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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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Sections 1 and 2 above); and, if the work is an executable linked
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that the user who changes the contents of definitions files in the
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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
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the user installs one, as long as the modified version is
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c) Accompany the work with a written offer, valid for at
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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.

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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
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It may happen that this requirement contradicts the license
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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
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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.

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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.

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1.127 libcap 2.22 :9.el7

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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. 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
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
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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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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.

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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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entire whole, and thus to each and every part regardless of who wrote it.

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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.
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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.)

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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.

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1.131 libdaemon 0.14 :7.el7
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Author: Ruben Rodriguez <ruben@trisquel.info>

--- db-5.3.21/src/crypto/mersenne/mt19937db.c.licensefix
+++ db-5.3.21/src/crypto/mersenne/mt19937db.c
@@ -16,16 +16,27 @@
    /*   Coded by Takuji Nishimura, considering the suggestions by    */
    /* Topher Cooper and Marc Rieffel in July-Aug. 1997.              */
    /*                                                                         */
-/* This library is free software under the Artistic 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
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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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(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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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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(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
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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. 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.

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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.

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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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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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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.

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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.

<one line to give the program's name and a brief idea of what it does.>
Copyright (C) 19yy <name of author>

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 2 of the License, or (at your option) any later version.

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You should have received a copy of the GNU General Public License along with this program; if not, write to the Free Software Foundation, Inc., 675 Mass Ave, Cambridge, MA 02139, USA.

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:

Gnomovision version 69, Copyright (C) 19yy 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.

The hypothetical commands `show w' and `show c' should show the appropriate
parts of the General Public License. Of course, the commands you use may
be called something other than `show w' and `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:

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

This General Public License does not permit incorporating your program into
proprietary programs. If your program is a subroutine library, you may
consider it more useful to permit linking proprietary applications with the
library. If this is what you want to do, use the GNU Library General
Public License instead of this License.

1.150 libnl3 3.2.28 :4.el7
1.150.1 Available under license :

From RPM File Metadata:LGPLv2

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Version 2.1, February 1999

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of this license document, but changing it is not allowed.

[This is the first released version of the Lesser GPL. It also counts
as the successor of the GNU Library Public License, version 2, hence
the version number 2.1.]

Preamble

The licenses for most software are designed to take away your
freedom to share and change it. By contrast, the GNU General Public
Licenses are intended to guarantee your freedom to share and change
free software--to make sure the software is free for all its users.

This license, the Lesser General Public License, applies to some
specially designated software packages--typically libraries--of the
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can use it too, but we suggest you first think carefully about whether
this license or the ordinary General Public License is the better
strategy to use in any particular case, based on the explanations below.

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For example, if you distribute copies of the library, whether gratis
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code. If you link other code with the library, you must provide
complete object files to the recipients, so that they can relink them
with the library after making changes to the library and recompiling
it. And you must show them these terms so they know their rights.

We protect your rights with a two-step method: (1) we copyright the
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introduced by others.

Finally, software patents pose a constant threat to the existence of
any free program. We wish to make sure that a company cannot
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restrictive license from a patent holder. Therefore, we insist that
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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.

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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0. This License Agreement applies to any software library or other 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.

1. You may copy and distribute verbatim copies of the Library's complete source code as you receive it, in any medium, provided that you conspicuously and appropriately publish on each copy an appropriate copyright notice and disclaimer of warranty; keep intact all the notices that refer to this License and to the absence of any warranty; and distribute a copy of this License along with the Library.

You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

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, 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:

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.

7. You may place library facilities that are a work based on the
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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:

a) Accompany the combined library with a copy of the same work
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facilities. This must be distributed under the terms of the
Sections above.

b) 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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END OF TERMS AND CONDITIONS

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<one line to give the library's name and a brief idea of what it does.>
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Also add information on how to contact you by electronic and paper mail.

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:

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

That's all there is to it!
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Version 3, 29 June 2007

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For example, if you distribute copies of such a program, whether
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or can get the source code. And you must show them these terms so they
know their rights.

Developers that use the GNU GPL protect your rights with two steps:
(1) assert copyright on the software, and (2) offer you this License
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For the developers' and authors' protection, the GPL clearly explains
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authors of previous versions.
Some devices are designed to deny users access to install or run modified versions of the software inside them, although the manufacturer can do so. This is fundamentally incompatible with the aim of protecting users' freedom to change the software. The systematic pattern of such abuse occurs in the area of products for individuals to use, which is precisely where it is most unacceptable. Therefore, we have designed this version of the GPL to prohibit the practice for those products. If such problems arise substantially in other domains, we stand ready to extend this provision to those domains in future versions of the GPL, as needed to protect the freedom of users.

Finally, every program is threatened constantly by software patents. States should not allow patents to restrict development and use of software on general-purpose computers, but in those that do, we wish to avoid the special danger that patents applied to a free program could make it effectively proprietary. 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.

TERMS AND CONDITIONS

0. Definitions.

"This License" refers to version 3 of the GNU General Public License.

"Copyright" also means copyright-like laws that apply to other kinds of works, such as semiconductor masks.

"The Program" refers to any copyrightable work licensed under this License. Each licensee is addressed as "you". "Licensees" and "recipients" may be individuals or organizations.

To "modify" a work means to copy from or adapt all or part of the work in a fashion requiring copyright permission, other than the making of an exact copy. The resulting work is called a "modified version" of the earlier work or a work "based on" the earlier work.

A "covered work" means either the unmodified Program or a work based on the Program.

To "propagate" a work means to do anything with it that, without permission, would make you directly or secondarily liable for infringement under applicable copyright law, except executing it on a computer or modifying a private copy. Propagation includes copying, distribution (with or without modification), making available to the
public, and in some countries other activities as well.

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.


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 "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.

The Corresponding Source need not include anything that users can regenerate automatically from other parts of the Corresponding Source.

The Corresponding Source for a work in source code form is that same work.

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You may make, run and propagate covered works that you do not convey, without conditions so long as your license otherwise remains in force. You may convey covered works to others for the sole purpose of having them make modifications exclusively for you, or provide you with facilities for running those works, provided that you comply with the terms of this License in conveying all material for which you do not control copyright. Those thus making or running the covered works for you must do so exclusively on your behalf, under your direction and control, on terms that prohibit them from making any copies of your copyrighted material outside their relationship with you.

Conveying under any other circumstances is permitted solely under the conditions stated below. Sublicensing is not allowed; section 10 makes it unnecessary.

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b) Use a suitable shared library mechanism for linking with the
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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, 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.

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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. 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.

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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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      (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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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
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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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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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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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You may charge a fee for the physical act of transferring a copy, and you may at your option offer warranty protection in exchange for a fee.

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, 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,
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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 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
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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) Accompany the work with a written offer, valid for at
least three years, to give the same user the materials
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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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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.

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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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.

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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.

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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.

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1.167 libverto 0.2.5 :4.el7

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**1.171 lm_sensors 3.4.0**

:4.20160601gitf9185e5.el7

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Here is a list of the main contributors to lm-sensors version 3.

* Frodo Looijaard  
  Original author of libsensors, sensors-detect, sensors and isadump.
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  Original author of sensord.
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  Dynamic chip feature detection (a.k.a. generic chip support) in libsensors and sensors.
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* Jean Delvare  
  New libsensors API, and migration of sensors and sensord thereto.  
  Many optimizations in libsensors and sensors.  
  Configuration file converter.  
  Rewrite of sensors-detect.  
  Support for multiple configuration files in libsensors.

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1.176 lvm2 2.02.177 :4.el7

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Network Working Group	H. Krawczyk
Request for Comments: 2104	IBM
Category: Informational	M. Bellare
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R. Canetti
IBM
February 1997

HMAC: Keyed-Hashing for Message Authentication

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1.182 make 3.82 :23.el7

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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.

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If such an object file uses only numerical parameters, data
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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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1.184 mariadb 5.5.56 :2.el7

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== MariaDB ==

The Debian package of MySQL was first debianized on 1997-04-12 by Christian Schwarz <schwarz@debian.org> and ist maintained since 1999-04-20 by Christian Hammers <ch@debian.org>.

The MariaDB packages were initially made by http://ourdelta.org/, and are now managed by the MariaDB development team, maria-developers@lists.launchpad.net

MariaDB can be downloaded from http://downloads.askmonty.org/mariadb/
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Warnings:
Warning: `SHOW CONTRIBUTORS` is deprecated and will be removed in a future release.

```
# Variable Name: license
# Scope: Global
# Access Type: Static
# Data Type: string
# Creation Date: 2008-02-07
# Author: Sharique Abdullah
#
# Description: Test Cases of Dynamic System Variable license that checks the behavior of this variable in the following ways
#   * Value Check
#   * Scope Check
#

--echo '#---------------------BS_STVARS_040_01----------------------#'
---
SELECT COUNT(@@GLOBAL.license);
--echo 1 Expected

--echo '#---------------------BS_STVARS_040_02----------------------#'

--error ER_INCORRECT_GLOBAL_LOCAL_VAR
SET @@GLOBAL.license=1;
```
--echo Expected error 'Read only variable'

SELECT COUNT(@@GLOBAL.license);
--echo 1 Expected

--echo '#---------------------BS_STVARS_040_03----------------------#'

# Check if the value in GLOBAL Table matches value in variable #

SELECT @@GLOBAL.license = VARIABLE_VALUE
FROM INFORMATION_SCHEMA.GLOBAL_VARIABLES
WHERE VARIABLE_NAME='license';
--echo 1 Expected

SELECT COUNT(@@GLOBAL.license);
--echo 1 Expected

SELECT COUNT(VARIABLE_VALUE)
FROM INFORMATION_SCHEMA.GLOBAL_VARIABLES
WHERE VARIABLE_NAME='license';
--echo 1 Expected

--echo '#---------------------BS_STVARS_040_04----------------------#'

# Check if accessing variable with and without GLOBAL point to same variable #

SELECT @@license = @@GLOBAL.license;
--echo 1 Expected

--echo '#---------------------BS_STVARS_040_05----------------------#'

# Check if license can be accessed with and without @@ sign #

SELECT COUNT(@@license);
--echo 1 Expected

--Error ER_INCORRECT_GLOBAL_LOCAL_VAR

SELECT COUNT(@@local.license);
--echo Expected error 'Variable is a GLOBAL variable'
-- Error ER_INCORRECT_GLOBAL_LOCAL_VAR
SELECT COUNT(@@SESSION.license);
-- echo Expected error 'Variable is a GLOBAL variable'

SELECT COUNT(@@GLOBAL.license);
-- echo 1 Expected

-- Error ER_BAD_FIELD_ERROR
SELECT license = @@SESSION.license;
-- echo Expected error 'Readonly variable'
'
SELECT COUNT(@@GLOBAL.license);
1
1 Expected
'

SELECT @@GLOBAL.license = VARIABLE_VALUE
FROM INFORMATION_SCHEMA.GLOBAL_VARIABLES
WHERE VARIABLE_NAME='license';

SELECT COUNT(@@GLOBAL.license);
COUNT(@@GLOBAL.license)
1
1 Expected

SELECT COUNT(VARIABLE_VALUE)
FROM INFORMATION_SCHEMA.GLOBAL_VARIABLES
WHERE VARIABLE_NAME='license';

SELECT @@license = @@GLOBAL.license;

SELECT COUNT(@@license);
COUNT(@@license)
1
1 Expected
SELECT COUNT(@@local.license);
ERROR HY000: Variable 'license' is a GLOBAL variable
Expected error 'Variable is a GLOBAL variable'
SELECT COUNT(@@SESSION.license);
ERROR HY000: Variable 'license' is a GLOBAL variable
Expected error 'Variable is a GLOBAL variable'
SELECT COUNT(@@GLOBAL.license);
COUNT(@@GLOBAL.license)
1
1 Expected
SELECT license = @@SESSION.license;
ERROR 42S22: Unknown column 'license' in 'field list'
Expected error 'Readonly variable'

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Version 2, June 1991

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

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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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1.186 mlocate 0.26 :8.el7

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# canonicalize-lgpl.m4 serial 4

```
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dnl This file is free software; the Free Software Foundation
dnl gives unlimited permission to copy and/or distribute it,
dnl with or without modifications, as long as this notice is preserved.

AC_DEFUN([gl_CANONICALIZE_LGPL],
[
  dnl Do this replacement check manually because the file name is shorter
  dnl than the function name.
  AC_CHECK_DECLS_ONCE(canonicalize_file_name)
  AC_CHECK_FUNCS_ONCE(canonicalize_file_name)
  if test $ac_cv_func_canonicalize_file_name = no; then
    AC_LIBOBJ(canonicalize-lgpl)
    AC_DEFINE([realpath], [rpl_realpath],
                [Define to a replacement function name for realpath().])
    gl_PREREQ_CANONICALIZE_LGPL
  fi
])
```

# Like gl_CANONICALIZE_LGPL, except prepare for separate compilation
# (no AC_LIBOBJ).

```
AC_DEFUN([gl_CANONICALIZE_LGPL_SEPARATE],
[
  AC_CHECK_DECLS_ONCE(canonicalize_file_name)
  AC_CHECK_FUNCS_ONCE(canonicalize_file_name)
  gl_PREREQ_CANONICALIZE_LGPL
])
```

# Prerequisites of lib/canonicalize-lgpl.c.

```
AC_DEFUN([gl_PREREQ_CANONICALIZE_LGPL],
[
  AC_CHECK_HEADERS_ONCE(sys/param.h unistd.h)
  AC_CHECK_FUNCS_ONCE(getcwd readlink)
])
```
1.187 MongoDB 3.4.9

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PCRE is a library of functions to support regular expressions whose syntax
and semantics are as close as possible to those of the Perl 5 language.

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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
-------------------------------

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PCRE JUST-IN-TIME COMPILATION SUPPORT
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Written by: Zoltan Herczeg
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THE C++ WRAPPER FUNCTIONS
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//
//
/////////////////////////////////////////////////////////////////////////////

#ifndef BOOST_INTRUSIVE_DETAIL_MPL_HPP
#define BOOST_INTRUSIVE_DETAIL_MPL_HPP

#ifndef BOOST_CONFIG_HPP
  #include <boost/config.hpp>
#endif

#if defined(BOOST_HAS_PRAGMA_ONCE)
  #pragma once
#endif

#include <boost/intrusive/detail/config_begin.hpp>
#include <boost/move/detail/type_traits.hpp>
#include <cstddef>

#ifndef BOOST_INTRUSIVE_DETAIL_MPL_HPP
#define BOOST_INTRUSIVE_DETAIL_MPL_HPP

#ifndef BOOST_CONFIG_HPP
  # include <boost/config.hpp>
#endif

#if defined(BOOST_HAS_PRAGMA_ONCE)
  # pragma once
#endif

#include <boost/intrusive/detail/config_begin.hpp>
#include <boost/move/detail/type_traits.hpp>
#include <cstddef>

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3560
namespace boost {
namespace intrusive {
namespace detail {

using boost::move_detail::is_same;
using boost::move_detail::add_const;
using boost::move_detail::remove_const;
using boost::move_detail::remove_cv;
using boost::move_detail::remove_reference;
using boost::move_detail::add_reference;
using boost::move_detail::remove_pointer;
using boost::move_detail::add_pointer;
using boost::move_detail::true_type;
using boost::move_detail::false_type;
using boost::move_detail::enable_if_c;
using boost::move_detail::enable_if;
using boost::move_detail::disable_if_c;
using boost::move_detail::disable_if;
using boost::move_detail::is_convertible;
using boost::move_detail::if_c;
using boost::move_detail::if_;
using boost::move_detail::is_const;
using boost::move_detail::identity;
using boost::move_detail::alignment_of;
using boost::move_detail::is_empty;
using boost::move_detail::addressof;
using boost::move_detail::integral_constant;
using boost::move_detail::enable_if_convertible;
using boost::move_detail::disable_if_convertible;
using boost::move_detail::bool_;
using boost::move_detail::true_;
using boost::move_detail::false_;
using boost::move_detail::yes_type;
using boost::move_detail::no_type;
using boost::move_detail::apply;
using boost::move_detail::eval_if_c;
using boost::move_detail::eval_if;
using boost::move_detail::unvoid_ref;
using boost::move_detail::add_const_if_c;

template<std::size_t S>
struct ls_zeros
{
    static const std::size_t value = (S & std::size_t(1)) ? 0 : (1 + ls_zeros<(S>>1u)>::value);
};

template<>
struct ls_zeros<0>
{
    static const std::size_t value = 0;
};

template<>
struct ls_zeros<1>
{
    static const std::size_t value = 0;
};

// Infrastructure for providing a default type for T::TNAME if absent.
#define BOOST_INTRUSIVE_INSTANTIATE_DEFAULT_TYPE_TMPLT(TNAME)   \
    template <typename T, typename DefaultType>               \
    struct boost_intrusive_default_type_ ## TNAME             \
    {
        template <typename X>                                       \
        static char test(int, typename X::TNAME*);                  \
        \
        template <typename X>                                       \
        static int test(...);                                       \
        \
        struct DefaultWrap { typedef DefaultType TNAME; };          \
        \
        static const bool value = (1 == sizeof(test<T>(0, 0)));     \
        \
        typedef typename                                            \
            ::boost::intrusive::detail::if_c                         \
            <value, T, DefaultWrap>::type::TNAME type;            \
    };                                                             \
#
#define BOOST_INTRUSIVE_OBTAIN_TYPE_WITH_DEFAULT(INSTANTIATION_NS_PREFIX, T, \
    TNAME, TIMPL)   \
    typename INSTANTIATION_NS_PREFIX                                                     \
        boost_intrusive_default_type_ ## TNAME< T, TIMPL >::type                            \
#
#define BOOST_INTRUSIVE_INSTANTIATE_EVAL_DEFAULT_TYPE_TMPLT(TNAME)
    template <typename T, typename DefaultType>               \
    struct boost_intrusive_eval_default_type_ ## TNAME          \
    {
        template <typename X>                                       \
        static char test(int, typename X::TNAME*);                  \
        \
        template <typename X>                                       \
        static int test(...);                                       

struct DefaultWrap
{
    typedef typename DefaultType::type TNAME;
};

static const bool value = (1 == sizeof(test<T>(0, 0)));

typedef typename
    ::boost::intrusive::detail::eval_if_c
    < value
    , ::boost::intrusive::detail::identity<T>
    , ::boost::intrusive::detail::identity<DefaultWrap>
    >::type::TNAME type;

//

#define BOOST_INTRUSIVE_OBTAIN_TYPE_WITH_EVAL_DEFAULT(INSTANTIATION_NS_PREFIX, T, TNAME, TIMPL)
    typename INSTANTIATION_NS_PREFIX
    boost_intrusive_eval_default_type_##TNAME< T, TIMPL >::type
/
//

#define BOOST_INTRUSIVE_INTERNAL_STATIC_BOOL_IS_TRUE(TRAITS_PREFIX, TYPEDEF_TO_FIND)
    template <class T>
    struct TRAITS_PREFIX##_bool
    {
        template<bool Add>
        struct two_or_three {yes_type _[2 + Add];};
        template <class U> static yes_type test(...);
        template <class U> static two_or_three<U::TYPEDEF_TO_FIND> test (int);
        static const std::size_t value = sizeof(test<T>(0));
    };
/
    template <class T>
    struct TRAITS_PREFIX##_bool_is_true
    {
        static const bool value = TRAITS_PREFIX##_bool<T>::value > sizeof(yes_type)*2;
    };
/
//

#define BOOST_INTRUSIVE_HAS_STATIC_MEMBER_FUNC_SIGNATURE(TRAITS_NAME, FUNC_NAME)
    template <typename U, typename Signature>
    class TRAITS_NAME
    {
        private:
        template<Signature> struct helper;
        template<typename T>
        static ::boost::intrusive::detail::yes_type test(helper<&T::FUNC_NAME>*);
//
//
/////////////////////////////////////////////////////////////////////////////
#ifndef BOOST_CONTAINER_CONTAINER_DETAIL_MPL_HPP
#define BOOST_CONTAINER_CONTAINER_DETAIL_MPL_HPP

#ifndef BOOST_CONFIG_HPP
#  include <boost/config.hpp>
#endif
#if defined(BOOST_HAS_PRAGMA_ONCE)
#  pragma once
#endif
#include <boost/container/detail/config_begin.hpp>
#include <boost/container/detail/workaround.hpp>
#include <boost/move/detail/mpl.hpp>
#include <cstddef>
namespace boost {
 namespace container {
 namespace container_detail {

 using boost::move_detail::integral_constant;
 using boost::move_detail::true_type;
 using boost::move_detail::false_type;
 using boost::move_detail::enable_if_c;
 using boost::move_detail::enable_if;
 using boost::move_detail::enable_if_convertible;
 using boost::move_detail::disable_if_c;
 using boost::move_detail::disable_if;
 using boost::move_detail::disable_if_convertible;
 using boost::move_detail::is_convertible;
 using boost::move_detail::if_c;
 using boost::move_detail::if_;  
 using boost::move_detail::identity;
 using boost::move_detail::bool_;  
 using boost::move_detail::true_;  
 using boost::move_detail::false_;  
 using boost::move_detail::yes_type;
 using boost::move_detail::no_type;
 using boost::move_detail::bool_;  
 using boost::move_detail::true_;  
 using boost::move_detail::false_;
using boost::move_detail::unvoid_ref;
using boost::move_detail::and_
using boost::move_detail::or_
using boost::move_detail::not_
using boost::move_detail::enable_if_and;
using boost::move_detail::disable_if_and;
using boost::move_detail::enable_if_or;
using boost::move_detail::disable_if_or;

template <class Pair>
struct select1st
{
  typedef Pair argument_type;
  typedef typename Pair::first_type result_type;

template<class OtherPair>
  typename Pair::first_type& operator()(const OtherPair& x) const
  {  return x.first;  }

  typename Pair::first_type& operator()(const typename Pair::first_type& x) const
  {  return x;  };

} //namespace container_detail {
} //namespace container {
} //namespace boost {
#include <boost/container/detail/config_end.hpp>

#ifndef BOOST_INTERPROCESS_DETAIL_MPL_HPP
#define BOOST_INTERPROCESS_DETAIL_MPL_HPP
#ifndef BOOST_CONFIG_HPP
  #include <boost/config.hpp>
#endif   //#ifndef BOOST_CONTAINER_CONTAINER_DETAIL_MPL_HPP
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//
//
// statements...
#endif   //#ifndef BOOST_CONFIG_HCPP

#ifdef
#
#if defined(BOOST_HAS_PRAGMA_ONCE)
  #pragma once
#endif

#include <cstdint>

namespace boost {
  namespace interprocess {
    namespace ipcdetail {

      template <class T, T val>
      struct integral_constant {
        static const T value = val;
        typedef integral_constant<T,val> type;
      };

      template< bool C_>
      struct bool_ : integral_constant<bool, C_>
      {
        static const bool value = C_;
      };

      typedef bool_<true> true_;
      typedef bool_<false> false_;

      typedef true_ true_type;
      typedef false_ false_type;

      typedef char yes_type;
      struct no_type {
        char padding[8];
      };

      template <bool B, class T = void>
      struct enable_if_c {
        typedef T type;
      };

      template <class T>
      struct enable_if_c<false, T> {};

      template <class Cond, class T = void>
      struct enable_if : public enable_if_c<Cond::value, T> {};

    } // namespace ipcdetail
  } // namespace interprocess
} // namespace boost
template <class Cond, class T = void>
struct disable_if : public enable_if_c<!Cond::value, T> {}

template <class T, class U>
class is_convertible
{
    typedef char true_t;
    class false_t { char dummy[2]; };  
    static true_t dispatch(U);
    static false_t dispatch(...);
    static T trigger();
    public:
    static const bool value = sizeof(dispatch(trigger())) == sizeof(true_t);
};

template<
    bool C
    , typename T1
    , typename T2
>
struct if_c
{
    typedef T1 type;
};

template<
    typename T1
    , typename T2
>
struct if_c<false,T1,T2>
{
    typedef T2 type;
};

template<
    typename T1
    , typename T2
    , typename T3
>
struct if_
{
    typedef typename if_c<0 != T1::value, T2, T3>::type type;
};

template <class Pair>
struct select1st
  // : public std::unary_function<Pair, typename Pair::first_type>
template<class OtherPair>
const typename Pair::first_type & operator()(const OtherPair & x) const
{  return x.first;  }

const typename Pair::first_type & operator()(const typename Pair::first_type & x) const
{  return x;  }

// identity is an extension: it is not part of the standard.
template <class T>
struct identity
//   : public std::unary_function<T,T>
{
    typedef T type;
    const T& operator()(const T& x) const
    {  return x;  }
};

template<std::size_t S>
struct ls_zeros
{
  static const std::size_t value = (S & std::size_t(1)) ? 0 : (1u + ls_zeros<(S >> 1u)>::value);
};
template<>
struct ls_zeros<0>
{
  static const std::size_t value = 0;
};
template<>
struct ls_zeros<1>
{
  static const std::size_t value = 0;
};

}  //namespace ipcdetail {
}  //namespace interprocess {
}  //namespace boost {

#endif   //#ifndef BOOST_INTERPROCESS_DETAIL_MPL_HPP

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-----------------------------------------
mgo - MongoDB driver for Go

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BSON library for Go

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---------------------------------------------
tomb - support for clean goroutine termination in Go.

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BSON library for Go

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mgo - MongoDB driver for Go

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tomb - support for clean goroutine termination in Go.

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zlib.h -- interface of the 'zlib' general purpose compression library

version 1.2.8, April 28th, 2013
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</tr>
<tr>
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<td>Yann Collet</td>
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#
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1.190 ncurses 5.9 :14.20130511.el7_4

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1.191 ncurses-libs 5.9 :14.20130511.el7_4

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 *
 * PKCS #5 PBKDF2 used with HMAC-SHA256, see RFC 2898.
 */

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 *
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1.195 nettle/gplv2 2.7.1 :8.el7

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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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On all platforms, Nmap is normally linked with:
o libpcap: Network packet capture library. Distributed with Nmap in the
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   is in the file NMAP_MODIFICATIONS.
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o PCRE: Perl-compatible regular expressions. PCRE is part of Nmap's
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o liblua: Lua programming language. Lua is the implementation language
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   http://www.lua.org/
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o LIBLINEAR. Used for IPv6 OS classification.
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  o Python. The binary distributions of Nmap include a Python interpreter
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  o libgailutil: Accessibility support for GTK+.

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  o Expat: XML parser library.
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Written by: Philip Hazel
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3. [3]Bernd Altmeier <altmeier@atsoft.de> hopf Elektronik serial line and PCI-bus devices
5. [6]Michael Barone <michael,barone@lmco.com> GPSVME fixes
6. [7]Karl Berry <karl@owl.HQ.ileaf.com> syslog to file option
7. [8]Greg Brackley <greg.brackley@bigfoot.com> Major rework of WINNT port. Clean up recvbuf and iosignal code into separate modules.
8. [9]Marc Brett <Marc.Brett@westgeo.com> Magnavox GPS clock driver
9. [10]Piete Brooks <Piete.Brooks@el.cam.ac.uk> MSF clock driver, Trimble PARSE support
10. [11]Nelson B Bolyard <nelson@bolyard.me> update and complete broadcast and crypto features in sntp
11. [12]Jean-Francois Boudreault <Jean-Francois.Boudreault@viagenie.qc.ca> IPv6 support
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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 clock driver, NT adj. residuals, integrated Greg's Winnt port.
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<td>29.</td>
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<td>38.</td>
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56. [60] Brian Utterback <brian.utterback@oracle.com> General codebase, Solaris issues
57. [61] Loganaden Velvindron <loganaden@gmail.com> Sandboxing (libseccomp) support
58. [62] Paul A Vixie <vixie@vix.com> TrueTime GPS driver, generic TrueTime clock driver
59. [63] Ulrich Windl <Ulrich.Windl@rz.uni-regensburg.de> corrected and validated HTML documents according to the HTML DTD

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version-proc = ntpOptionPrintVersion;

version = `
eval VERSION=`sed -e 's/.*,\[//' -e 's/\].*//' < ../sntp/m4/version.m4`
[ -z "$VERSION" ] && echo "Cannot determine VERSION" && kill -TERM $AG_pid
echo $VERSION`;

version-value = ";/* Don't use -v as a shortcut for --version */

/*
 * HMS: man pages already have this, and texi pages can use the values in sntp/include/version.texi .
 */
// doc-sub = {
  // sub-name = version;
  // sub-text = 's/#VERSION#/<<version>>/g';
};
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN">
<html>
<head>
<meta http-equiv="content-type" content="text/html;charset=iso-8859-1">
<title>Copyright Notice</title>
<!-- Changed by: Harlan Stenn, 10-Mar-2014 -->
<link href="scripts/style.css" type="text/css" rel="stylesheet">
</head>
<body>
<h3>Copyright Notice</h3>
<p>"Clone me," says Dolly sheepishly. </p>
<br clear="left">
<hr>
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#ifndef HAVE_SETRESGID
int setresgid(gid_t, gid_t, gid_t);
#endif
#ifndef HAVE_SETRESUID
int setresuid(uid_t, uid_t, uid_t);
#endif

/*$OpenBSD: poll.h,v 1.11 2003/12/10 23:10:08 millert Exp $*/

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/* OPENBSD ORIGINAL: sys/sys/poll.h */

#if !defined(HAVE_POLL) && !defined(HAVE_POLL_H)
#ifndef COMPAT_POLL_H_
#define COMPAT_POLL_H_

typedef struct pollfd {
    int fd;
    short events;
    short revents;
} pollfd_t;

typedef unsigned int nfds_t;

#define POLLIN 0x0001
#define POLLOUT 0x0004
#define POLLERR 0x0008
#define POLLHUP 0x0010
#define POLLNVAL 0x0020
#if 0
    /* the following are currently not implemented */
    #define POLLPRI 0x0002
    #define POLLRDNDM 0x0040
    #define POLLNORMPOLLRDNDM
    #define POLLWRNORM POLLOUT
    #define POLLWRBAND 0x0080
    #define POLLWRBAND 0x0100
#endif
#define INFTIM (-1) /* not standard */

int poll(struct pollfd *, nfds_t, int);
#endif /* !_COMPAT_POLL_H_ */
#endif /* !HAVE_POLL_H */

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* 
* */

#ifndef _BSD_WAITPID_H
#define _BSD_WAITPID_H

#ifndef HAVE_WAITPID
/* Clean out any potential issues */
#undef WIFEXITED
#undef WIFSTopped
#undef WIFSIGNALED

/* Define required functions to mimic a POSIX look and feel */
#define _W_INT(w) (*(int *)&(w)) /* convert union wait to int */
#define WIFEXITED(w) (!(_W_INT(w)) & 0377)
#define WIFSTopped(w) ((_W_INT(w)) & 0100)
#define WIFSIGNALED(w) !WIFEXITED(w) && !WIFSTopped(w)
#define WEXITSTATUS(w) (int)(WIFEXITED(w) ? ((_W_INT(w) >> 8) & 0377) : -1)
#define WTERMSIG(w) (int)(WIFSIGNALED(w) ? (_W_INT(w) & 0177) : -1)
#define WCOREFLAG 0x80
#define WCOREDUMP(w) ((_W_INT(w)) & WCOREFLAG)

/* Prototype */
pid_t waitpid(int, int *, int);
#endif /* !HAVE_WAITPID */
#endif /* _BSD_WAITPID_H */

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------
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diff -up openssh-7.4p1/sftp-server.8.sftp-force-mode openssh-7.4p1/sftp-server.8
--- openssh-7.4p1/sftp-server.8.sftp-force-mode 2016-12-19 05:59:41.000000000 +0100
+++ openssh-7.4p1/sftp-server.8 2017-02-09 10:35:41.926475399 +0100
@@ -38,6 +38,7 @@
 .Op Fl P Ar blacklisted_requests
 .Op Fl p Ar whitelisted_requests
 .Op Fl u Ar umask
+.Op Fl m Ar force_file_perms
 .Ek
 .Nm
 .Fl Q Ar protocol_feature
 @@ -38,6 +38,7 @@ Sets an explicit
to be applied to newly-created files and directories, instead of the user's default mask.

Sets explicit file permissions to be applied to newly-created files instead of the default or client requested mode. Numeric values include: +777, 755, 750, 666, 644, 640, etc. Option -u is ineffective if -m is set.

 /* Version of client */
 static u_int version;

 /* Force file permissions */
 +int permforce = 0;
 +long permforcemode;
 +
 /* SSH2_FXP_INIT received */
 static int init_done;

 @@ -679,6 +683,7 @@ process_open(u_int32_t id)
 Attrib a;
     char *name;
     int r, handle, fd, flags, mode, status = SSH2_FX_FAILURE;
     +mode_t old_umask = 0;

     if ((r = sshbuf_get_cstring(iqueue, &name, NULL)) != 0 ||
         (r = sshbuf_get_u32(iqueue, &pflags)) != 0 || /* portable flags */
 @@ -688,6 +693,10 @@ process_open(u_int32_t id)
     flags = flags_from_portable(pflags);
     mode = (a.flags & SSH2_FILEXFER_ATTR_PERMISSIONS) ? a.perm : 0666;
     +if (permforce == 1) { /* Force perm if -m is set */
         +mode = permforcemode;
         +old_umask = umask(0); /* so umask does not interfere */
         +}
     logit("open "%s" flags %s mode 0%o",
         name, string_from_portable(pflags), mode);
     if (readonly &&
 @@ -709,6 +718,8 @@ process_open(u_int32_t id)
     } }
 }

 +if (permforce == 1)
+(void) umask(old_umask); /* restore umask to something sane */
if (status != SSH2_FX_OK)
send_status(id, status);
free(name);
@@ -1490,7 +1501,7 @@ sftp_server_usage(void)
fprintf(stderr,
    "usage: %s [-ehR] [-d start_directory] [-f log_facility] "
    "[-l log_level] [-t -P blacklisted_requests] "
-    "[-p whitelisted_requests] [-u umask]\n"
+    "[-p whitelisted_requests] [-u umask] [-m force_file_perms]\n"
    "%s -Q protocol_feature\n",
    __proname, __proname);
exit(1);
@@ -1516,7 +1527,7 @@ sftp_server_main(int argc, char **argv, pw = pwcopy(user_pw);

while (!skipargs && (ch = getopt(argc, argv,
+    "d:f:l:P:p:Q:u:m:cehR") != -1) {
    switch (ch) {
      case 'Q':
        if (strcasecmp(optarg, "requests") != 0) {
@@ -1576,6 +1587,15 @@ sftp_server_main(int argc, char **argv,
          fatal("Invalid umask \"%s\", optarg);
          (void) umask((mode_t)mask);
        break;
      +case 'm':
      +/* Force permissions on file received via sftp */
      +permforce = 1;
      +permforcemode = strtol(optarg, &cp, 8);
      +if (permforcemode < 0 || permforcemode > 0777 ||
          *cp != '\0' || (permforcemode == 0 &&
          errno != 0))
          fatal("Invalid file mode \"%s\", optarg);
        break;
      case 'h':
        default:
        sftp_server_usage();
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/* OPENBSD ORIGINAL: sys/sys/poll.h */

#ifdef HAVE_POLL && !defined(HAVE_POLL_H)
#elif defined_COMPAT_POLL_H_
#defineCompat_POLL_H_

typedef struct pollfd {
    int fd;
    short events;
    short revents;
} pollfd_t;

typedef unsigned int nfds_t;

#define POLLIN 0x0001
#define POLLOUT 0x0004
#define POLLERR 0x0008
#if 0
/* the following are currently not implemented */
#define POLLPRI 0x0002
#define POLLHUP 0x0010
#define POLLNVAL 0x0020
#define POLLRDNORM 0x0040
#define POLLNORM POLLRDNORM
#define POLLWRNORM POLLOUT
#define POLLRDBAND 0x0080
#define POLLWRBAND 0x0100
#endif

#define INFTIM (-1) /* not standard */

int poll(struct pollfd *, nfds_t, int);
#endif /* !_COMPAT_POLL_H_ */
#endif /* !HAVE_POLL_H */

/* $Id: bsd-waitpid.h,v 1.5 2003/08/29 16:59:52 mouring Exp $ */

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  *
  */

#ifndef _BSD_WAITPID_H
#define _BSD_WAITPID_H

#ifndef HAVE_WAITPID
/* Clean out any potential issues */
#undef WIFEXITED
#undef WIFSTOPPED
#undef WIFSIGNALED

/* Define required functions to mimic a POSIX look and feel */
#define _W_INT(w)(*(int*)&(w)) /* convert union wait to int */
#define WIFEXITED(w) (!(_W_INT(w)) & 0377)
#define WIFSTOPPED(w) ((_W_INT(w)) & 0100)
#define WIFSIGNALED(w) (!WIFEXITED(w) && !WIFSTOPPED(w))
#define WEXITSTATUS(w) (int)(WIFEXITED(w) ? ((_W_INT(w) >> 8) & 0377) : -1)
#define WTERMSIG(w) (int)(WIFSIGNALED(w) ? (_W_INT(w) & 0177) : -1)
#define WCOREFLAG 0x80
#define WCOREDUMP(w) ((_W_INT(w)) & WCOREFLAG)

/* Prototype */
pid_t waitpid(int, int *, int);

#endif /* !HAVE_WAITPID */
#endif /* _BSD_WAITPID_H */

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* 
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* 
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* @author Antoon Bosselaers <antoon.bosselaers@esat.kuleuven.ac.be>
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1.225 pcre 8.32 :17.el7

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------------

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THE BASIC LIBRARY FUNCTIONS

-----------------------------

Written by: Philip Hazel
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1.226 perl 5.16.3 :292.el7
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From: Father Chrysostomos <sprout@cpan.org>
Date: Sun, 23 Sep 2012 12:42:15 -0700
Subject: [PATCH] =?UTF-8?q?Don=E2=80=99t=20leak=20if=20hh=20copying=20dies?==
MIME-Version: 1.0
Content-Type: text/plain; charset=UTF-8
Content-Transfer-Encoding: 8bit

When %^H is copied on entering a new scope, if it happens to have been tied it can die. This was resulting in leaks, because no protections
were added to handle that case.

The two things that were leaking were the new hash in `hv_copy_hints_hv` and the new value (for an element) in `newSVsv`.

By fixing `newSVsv` itself, this also fixes any potential leaks when other pieces of code call `newSVsv` on explosive values.

Petr Pisar: Ported to 5.16.3

---

```
# 6 ++++++
sv.c | 7 +++++--
t/op/svleak.t | 22 +++++++++++++++++++++--
3 files changed, 31 insertions(+), 4 deletions(-)
```

diff --git a/hv.c b/hv.c
index 3c35341..29d6352 100644
--- a/hv.c
+++ b/hv.c
@@ -1440,6 +1440,9 @@ Perl_hv_copy_hints_hv(pTHX_ HV *const ohv)
     HvMAX(hv) = hv_max;
@@ -1461,6 +1464,9 @@ Perl_hv_copy_hints_hv(pTHX_ HV *const ohv)
     HvRITER_set(ohv, riter);
     HvEITER_set(ohv, eiter);
+
     +SvREFCNT_inc_simple_void_NN(hv);
     +LEAVE;
     }
```

diff --git a/sv.c b/sv.c
index a43feac..597d71b 100644
--- a/sv.c
+++ b/sv.c
@@ -8764,11 +8764,12 @@ Perl_newSVsv(pTHX_ register SV *const old)
     Perl_cke_warner_d(daTHX_ packWARN(WARN_INTERNAL), "semi-panic: attempt to dup freed string");
     return NULL;
+
     /* Do this here, otherwise we leak the new SV if this croaks. */
+SvGETMAGIC(old);
   new_SV(sv);
- /* SV_GMAGIC is the default for sv_setv()
-    SV_NOSTEAL prevents TEMP buffers being, well, stolen, and saves games
-    /* SV_NOSTEAL prevents TEMP buffers being, well, stolen, and saves games
+    with SvTEMP_off and SvTEMP_on round a call to sv_setsv. */
- sv_setsv_flags(sv, old, SV_GMAGIC | SV_NOSTEAL);
+ sv_setsv_flags(sv, old, SV_NOSTEAL);
   return sv;
}

diff --git a/t/op/svleak.t b/t/op/svleak.t
index 2f09af3..011c184 100644
--- a/t/op/svleak.t
+++ b/t/op/svleak.t
@@ -13,7 +13,7 @@ BEGIN {
 or skip_all("XS::APItest not available");
 }

-plan tests => 23;
+plan tests => 24;

 # run some code N times. If the number of SVs at the end of loop N is
 # greater than (N-1)*delta at the end of loop 1, we've got a leak
@@ -176,3 +176,23 @@ leak(2, 0, sub {
   each %$h;
   undef $h;
 }, 'tied hash iteration does not leak');
+
+# [perl #107000]
+package hhtie { 
+    sub TIEHASH { bless [] }
+    sub STORE { $_[0][0]{$_[1]} = $_[2] }
+    sub FETCH { die if $explosive; $_[0][0]{$_[1]} }
+    sub FIRSTKEY { keys %{$_[0][0]}; each %{$_[0][0]} }
+    sub NEXTKEY { each %{$_[0][0]} }
+} 
+leak(2,!!$Config{mad}, sub {
+   eval q`
+    BEGIN {
+        $hhtie::explosive = 0;
+        tie %^H, hhtie;
+        $^H{foo} = bar;
+        $hhtie::explosive = 1;
+    }
+    +{ 1; }
+    `;
+ }, 'hint-hash copying does not leak');

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<one line to give the program's name and a brief idea of what it does.>
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```
Gnomovision version 69, Copyright (C) 19xx name of author
Gnomovision comes with ABSOLUTELY NO WARRANTY; for details type `show w'.
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under certain conditions; type `show c' for details.

The hypothetical commands `show w' and `show c' should show the
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program `Gnomovision' (a program to direct compilers to make passes
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<signature of Ty Coon>, 1 April 1989
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The End
---
abstract: 'Build and install Perl modules'
author:
  - 'Ken Williams <kwilliams@cpan.org>'
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Julian Seward, jseward@bzip.org
bzip2/libbzip2 version 1.0.6 of 6 September 2010

use strict;
use lib 't/lib';
use MBTest;
use DistGen;

plan 'no_plan';

# Ensure any Module::Build modules are loaded from correct directory
blib_load('Module::Build');

# Create test distribution
#
#
{
    my $dist = DistGen->new(
        name => 'Simple::Name',
        version => '0.01',
        license => 'perl',
    );

    $dist->regen;
    $dist->chdir_in;

    my $mb = $dist->new_from_context();
    isa_ok( $mb, "Module::Build" );
    is( $mb->license, 'perl',
        "license 'perl' is valid"
    );

    my $meta = $mb->get_metadata( fatal => 0 );

    is( $meta->{license} => 'perl', "META license will be 'perl'" );
    is( $meta->{resources} {license}, "http://dev.perl.org/licenses/",
        "META license URL is correct"
    );
my $dist = DistGen->new(
    name => 'Simple::Name',
    version => '0.01',
    license => 'VaporWare'
);

$dist->regen;
$dist->chdir_in;

my $mb = $dist->new_from_context();
isa_ok( $mb, "Module::Build" );
is( $mb->license, 'VaporWare',
   "license 'VaporWare' is valid" );

my $meta = $mb->get_metadata( fatal => 0 );
is( $meta->{license} => 'unrestricted', "META license will be 'unrestricted'" );
is( $meta->{resources}->{license}, "http://example.com/vaporware/",
   "META license URL is correct" );

# Test with alpha number
# vim:ts=2:sw=2:et:sta:sts=2
This module is free software; you can redistribute it and/or
modify it under the same terms as Perl itself.

1.227 perl-Carp 1.26 :244.el7
1.227.1 Available under license:
   From RPM File Metadata:GPL+ or Artistic

1.228 perl-constant 1.27 :2.el7
1.228.1 Available under license:
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1.230 perl-Error 0.17020 :2.el7
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1.234.1 Available under license :
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1.235 perl-Getopt-Long 2.40 :3.el7

1.236 perl-HTTP-Tiny 0.033 :3.el7
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1.246 perl-TermReadKey 2.30 :20.el7
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1.247 perl-Text-ParseWords 3.29 :4.el7
1.247.1 Available under license:
Return-Path: rt-cpan-org-return@perl.org
Received: from zmta04.collab.prod.int.phx2.redhat.com (LHLO zmta04.collab.prod.int.phx2.redhat.com) (10.5.81.11) by zmail14.collab.prod.int.phx2.redhat.com with LMTP; Mon, 18 Nov 2013 11:06:10 -0500 (EST)
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4218
Subject: [rt.cpan.org #90483] missing license file
From: "Alexandr Ciornii via RT" <bug-Text-ParseWords@rt.cpan.org>
Reply-To: bug-Text-ParseWords@rt.cpan.org
In-Reply-To: <rt-4.0.18-4704-1384789048-1647.90483-6-0@rt.cpan.org>
References: <RT-Ticket-90483@rt.cpan.org>
<Message-ID: <rt-4.0.18-4704-1384789048-1647.90483-6-0@rt.cpan.org>
X-RT-Loop-Prevention: rt.cpan.org
RT-Ticket: rt.cpan.org #90483
Managed-BY: RT 4.0.18 (http://www.bestpractical.com/rt/)
RT-Originator: CHORNY@cpan.org
To: mmaslano@redhat.com
MIME-Version: 1.0
Content-Transfer-Encoding: 8bit
Content-Type: text/plain; charset="utf-8"
X-RT-Original-Encoding: utf-8
Date: Mon, 18 Nov 2013 11:06:08 -0500
X-RedHat-Spam-Score: -1.9  (BAYES_00,SPF_PASS,URIBL_BLOCKED)
X-Scanned-By: MIMEDefang 2.68 on 10.5.11.23
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<URL: https://rt.cpan.org/Ticket/Display.html?id=90483 >

On Mon Nov 18 10:37:28 2013, mmaslano@redhat.com wrote:
> It would be a big help if you have better defined license. License
> text in .pm file would be enough.

Will do in next version.

> I found Perl license in Makefile.PL,
> so we assumed it's Perl (GPL+ or Artistic). Is it correct?

yes

--
Alexandr Ciornii, http://chorny.net

1.248 perl-threads 1.87 :4.el7
1.248.1 Available under license :
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1.249 perl-threads-shared 1.43 :6.el7
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    <signature of Ty Coon>, 1 April 1989
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1.258 polkit-pkla-compat 0.1 :4.el7

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1.259 popt 1.13 :16.el7
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1.260 postfix 2.10.1 :6.el7

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Included for the use of the fix_strcasecmp.c module which works around a Solaris problem.

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Although the Lesser General Public License is Less protective of the
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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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(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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1.265 pygobject3 3.22.0 :1.el7_4.1

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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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1.268 Python 2.7.15 2.7.15

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.. _history-and-license:

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History and License

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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 https://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 https://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 https://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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Mersenne Twister

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A C-program for MT19937, with initialization improved 2002/1/26. Coded by Takuji Nishimura and Makoto Matsumoto.

Before using, initialize the state by using init_genrand(seed) or init_by_array(init_key, key_length).

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http://www.math.sci.hiroshima-u.ac.jp/~m-mat/MT/emt.html
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Sockets
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L. Peter Deutsch
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Independent implementation of MD5 (RFC 1321).

This code implements the MD5 Algorithm defined in RFC 1321, whose text is available at

   http://www.ietf.org/rfc/rfc1321.txt

The code is derived from the text of the RFC, including the test suite (section A.5) but excluding the rest of Appendix A. It does not include any code or documentation that is identified in the RFC as being copyrighted.

The original and principal author of md5.h is L. Peter Deutsch <ghost@aladdin.com>. Other authors are noted in the change history that follows (in reverse chronological order):

2002-04-13 lpd Removed support for non-ANSI compilers; removed references to Ghostscript; clarified derivation from RFC 1321; now handles byte order either statically or dynamically.
1999-11-04 lpd Edited comments slightly for automatic TOC extraction.
1999-10-18 lpd Fixed typo in header comment (ansi2knr rather than md5); added conditionalization for C++ compilation from Martin Purschke <purschke@bnl.gov>.
1999-05-03 lpd Original version.
Asynchronous socket services

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UUencode and UUdecode functions

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Modified by Jack Jansen, CWI, July 1995:
- Use binascii module to do the actual line-by-line conversion
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- Arguments more compliant with Python standard

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-----------------------------

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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.

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1.270 python-backports-ssl_match_hostname

3.5.0.1 :1.el7

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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
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.

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:

a) 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.

b) 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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11. If, as a consequence of a court judgment or allegation of patent infringement or for any other reason (not limited to patent issues), conditions are imposed on you (whether by court order, agreement or otherwise) that contradict the conditions of this License, they do not excuse you from the conditions of this License. If you cannot distribute so as to satisfy simultaneously your obligations under this License and any other pertinent obligations, then as a consequence you may not distribute the Library at all. For example, if a patent license would not permit royalty-free redistribution of the Library by all those who receive copies directly or indirectly through you, then the only way you could satisfy both it and this License would be to refrain entirely from distribution of the Library.

If any portion of this section is held invalid or unenforceable under any particular circumstance, the balance of the section is intended to apply, and the section as a whole is intended to apply in other circumstances.

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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.

<one line to give the library's name and a brief idea of what it does.>
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Also add information on how to contact you by electronic and paper mail.

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:

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

That's all there is to it!

1.273 python-configobj 4.7.2 :7.el7
1.273.1 Available under license:
From RPM File Metadata:BSD

1.274 python-crypto 2.6.1 :15.el7
1.274.1 Available under license:

Copyright and licensing of the Python Cryptography Toolkit ("PyCrypto"): 

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Previously, the copyright and/or licensing status of the Python Cryptography Toolkit ("PyCrypto") had been somewhat ambiguous. The original intention of Andrew M. Kuchling and other contributors has been to dedicate PyCrypto to the public domain, but that intention was not necessarily made clear in the original disclaimer (see LEGAL/copy/LICENSE.orig).

Additionally, some files within PyCrypto had specified their own licenses that differed from the PyCrypto license itself. For example, the original RIPEMD.c module simply had a copyright statement and warranty disclaimer, without clearly specifying any license terms. (An updated version on the author's website came with a license that contained a GPL-incompatible advertising clause.)

To rectify this situation for PyCrypto 2.1, the following steps have been taken:

1. Obtaining explicit permission from the original contributors to dedicate their contributions to the public domain if they have not already done so. (See the "LEGAL/copy/stmts" directory for contributors' statements.)

2. Replacing some modules with clearly-licensed code from other sources (e.g. the DES and DES3 modules were replaced with new ones based on Tom St. Denis's public-domain LibTomCrypt library.)

3. Replacing some modules with code written from scratch (e.g. the RIPEMD and Blowfish modules were re-implemented from their respective algorithm specifications without reference to the old implementations).

4. Removing some modules altogether without replacing them.

To the best of our knowledge, with the exceptions noted below or within the files themselves, the files that constitute PyCrypto are in the public domain. Most are distributed with the following notice:

The contents of this file are dedicated to the public domain. To the extent that dedication to the public domain is not available, everyone is granted a worldwide, perpetual, royalty-free, non-exclusive license to exercise all rights associated with the contents of this file for any purpose whatsoever. No rights are reserved.
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Exception:

- Portions of HMAC.py and setup.py are derived from Python 2.2, and are therefore Copyright (c) 2001, 2002, 2003 Python Software Foundation (All Rights Reserved). They are licensed by the PSF under the terms of the Python 2.2 license. (See the file LEGAL/copy/LICENSE.python-2.2 for details.)

EXPORT RESTRICTIONS:

Note that the export or re-export of cryptographic software and/or source code may be subject to regulation in your jurisdiction.

PyCrypto Code Submission Requirements - Rev. C

Last updated: 2009-02-28

In an effort to further clarify PyCrypto's licensing terms, anyone submitting code to PyCrypto must be able to certify the following (taken from the Linux kernel's SubmittingPatches file):

Developer's Certificate of Origin 1.1

By making a contribution to this project, I certify that:

(a) The contribution was created in whole or in part by me and I have the right to submit it under the open source license indicated in the file; or

(b) The contribution is based upon previous work that, to the best of my knowledge, is covered under an appropriate open source license and I have the right under that license to submit that work with modifications, whether created in whole or in part by me, under the same open source license (unless I am permitted to submit under a different license), as indicated in the file; or

(c) The contribution was provided directly to me by some other person who certified (a), (b) or (c) and I have not modified
(d) I understand and agree that this project and the contribution are public and that a record of the contribution (including all personal information I submit with it, including my sign-off) is maintained indefinitely and may be redistributed consistent with this project or the open source license(s) involved.

In addition, the code’s author must not be a national, citizen, or resident of the United States of America.

In addition, the code must not be of U.S. origin.

In addition, all new code contributed to PyCrypto must be dedicated to the public domain as follows:

The contents of this file are dedicated to the public domain. To the extent that dedication to the public domain is not available, everyone is granted a worldwide, perpetual, royalty-free, non-exclusive license to exercise all rights associated with the contents of this file for any purpose whatsoever. No rights are reserved.

Hi Mark,

I am the new maintainer of the Python Cryptography Toolkit, and I am working on a new release at http://www.pycrypto.org/.

People often ask me what license PyCrypto is covered by, if it’s GPL-compatible, etc. Right now, I’m not really sure what to tell them. The text in the current LICENSE file (quoted below) is not entirely clear on the point of whether distributing modified versions is allowed. (It
says "distribute and use", but not "modify".)

Distribute and use freely; there are no restrictions on further dissemination and usage except those imposed by the laws of your country of residence. This software is provided "as is" without warranty of fitness for use or suitability for any purpose, express or implied. Use at your own risk or not at all.

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Incorporating the code into commercial products is permitted; you do not have to make source available or contribute your changes back (though that would be nice).

--amk (www.amk.ca)

For the next PyCrypto release, I would like to take steps to move toward a clearer licensing regime. I am asking as many copyright holders as I can find if I can release PyCrypto under something clearer and more standard. Below, I have quoted a public domain dedication that was recommended in_ Intellectual Property and Open Source: A Practical Guide to Protecting Code_, by Van Lindberg. I have already contacted A. M. Kuchling, Robey Pointer, Wim Lewis, Jeethu Rao, and Barry Warsaw, and they have all approved the following dedication for their contributions.

I understand that you have made contributions to PyCrypto. May I, on your behalf, dedicate to the public domain all your contributions to PyCrypto, with the following notice?

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The contents of this file are dedicated to the public domain. To the extent that dedication to the public domain is not available, everyone is granted a worldwide, perpetual, royalty-free, non-exclusive license to exercise all rights associated with the contents of this file for any purpose whatsoever. No rights are reserved.

=======================================================================

Regards,
- Dwayne

--

Dwayne C. Litzenberger <dlitz@dlitz.net>
Key-signing key - 19E1 1FE8 B3CF F273 ED17 4A24 928C EC13 39C2 5CF7

From markmoraes@yahoo.com Mon Apr 20 19:25:37 2009
X-Maildir-Dup-Checked: Yes
Return-Path: <markmoraes@yahoo.com>
X-Original-To: dwon@rivest.dlitz.net
Hi Dwayne.
Sure, the new license sounds fine for all my contributions to PyCrypto, and thanks for taking it on. My apologies for not responding to your previous e-mail.

Regards,
Mark.

--- On Sat, 4/18/09, Dwayne C. Litzenberger <dlitz@dlitz.net> wrote:

> From: Dwayne C. Litzenberger <dlitz@dlitz.net>
> Subject: PyCrypto license clarification
> To: "Mark Moraes" <moraes@computer.org>
> Date: Saturday, April 18, 2009, 9:14 AM
> Hi Mark,
> I am the new maintainer of the Python Cryptography Toolkit,
> and I am
> working on a new release at http://www.pycrypto.org/.
> People often ask me what license PyCrypto is covered by, if
> it's
> GPL-compatible, etc. Right now, I'm not really sure
> what to tell them.
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> entirely clear
> on the point of whether distributing modified versions is
> allowed. (It
> says "distribute and use", but not "modify".)
> 
> Distribute and use freely; there are
> no restrictions on further
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> imposed by the laws of your
> country of residence. This
> software is provided "as is" without
> warranty of fitness for use or
> suitability for any purpose, express
> or implied. Use at your own risk or
> not at all.
> 
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> not have to make source available or
> contribute your changes back
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======================================================================

Regards,

- Dwayne

-- Dwayne C. Litzenberger <dlitz@dlitz.net>
Thanks a lot, and don't worry about not responding to previous emails. I do that too much myself. :)

On Mon, Apr 20, 2009 at 04:25:32PM -0700, M Moraes wrote:

> Hi Dwayne.

> Sure, the new license sounds fine for all my contributions to PyCrypto, and thanks for taking it on. My apologies for not responding to your previous e-mail.

> Regards,

> Mark.

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Distribute and use freely; there are no restrictions on further dissemination and usage except those imposed by the laws of your country of residence. This software is provided "as is" without warranty of fitness for use or suitability for any purpose, express or implied. Use at your own risk or not at all.

Incorporating the code into commercial products is permitted; you do not have to make source available or contribute your changes back (though that would be nice).

--amk

(www.amk.ca)

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>> to Protecting
>> Code_. by Van Lindberg. I have already contacted A.
>> M. Kuchling, Robey
>> Pointer, Wim Lewis, Jeethu Rao, and Barry Warsaw, and they
>> have all
>> approved the following dedication for their contributions.
>>
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>> PyCrypto. May I, on your
>> behalf, dedicate to the public domain all your
>> contributions to PyCrypto,
>> with the following notice?
>>
>> The contents of this file are
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>> to exercise all rights associated with
>> the contents of this file for
>> any purpose whatsoever. No
>> rights are reserved.

-- Regards,
- Dwayne

-- Dwayne C. Litzenberger <dlitz@dlitz.net>
Key-signing key - 19E1 1FE8 B3CF F273 ED17 4A24 928C EC13 39C2 5CF7

Hi Jeethu,

I am the new maintainer of the Python Cryptography Toolkit, and I am working on a new release at http://www.pycrypto.org/.

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===================================================================

Incorporating the code into commercial products is permitted; you do not have to make source available or contribute your changes back (though that would be nice).

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extent that dedication to the public domain is not available, everyone is granted a worldwide, perpetual, royalty-free, non-exclusive license to exercise all rights associated with the contents of this file for any purpose whatsoever. No rights are reserved.

=======================================================================

Regards,
- Dwayne

--
Dwayne C. Litzenberger <dlitz@dlitz.net>
  Key-signing key   - 19E1 1FE8 B3CF F273 ED17  4A24 928C EC13 39C2 5CF7

From jeethurao@gmail.com Sun Mar  8 17:28:16 2009
X-Maildir-Dup-Checked: Yes
Return-Path: <jeethurao@gmail.com>
X-Original-To: dwon@rivest.dlitz.net
Delivered-To: dwon@rivest.dlitz.net
Received: from goedel.dlitz.net (unknown [10.159.255.6])
  by rivest.dlitz.net (Postfix) with ESMTP id 0CC83515D9
  for <dwon@rivest.dlitz.net>; Sun,  8 Mar 2009 17:28:16 -0400 (EDT)
Received: from localhost (localhost [127.0.0.1])
  by goedel.dlitz.net (Postfix) with QMQP id 4E58F450CB
  for <dwon@rivest.dlitz.net>; Sun,  8 Mar 2009 15:28:15 -0600 (CST)
Received: (vmailmgr-postfix 5011 invoked by uid 1003);  8 Mar 2009 15:28:15 -0600
Delivered-To: m-dlitz-dlitz@dlitz.net
Received-SPF: pass (gmail.com ... _spf.google.com: 209.85.128.0/17 matched) receiver=goedel.dlitz.net; identity=mfrom; envelope-from="jeethurao@gmail.com"; helo=rv-out-0708.google.com; client-ip=209.85.198.249
Received: from rv-out-0708.google.com (unknown [209.85.198.249])
  by goedel.dlitz.net (Postfix) with ESMTP id 3C097449E7
  for <dlitz@dlitz.net>; Sun,  8 Mar 2009 15:28:12 -0600 (CST)
Received: by rv-out-0708.google.com with SMTP id k29so1252333rvb.26
  for <dlitz@dlitz.net>; Sun, 08 Mar 2009 14:27:56 -0700 (PDT)
DKIM-Signature: v=1; a=rsa-sha256; c=relaxed/relaxed;
  d=gmail.com; s=gamma;
  h=mime-version:in-reply-to:references:date:message-id:subject:from:to:
  :content-type; bh=YWw9U32WCU/ksRqikHwaoZyJQBUs4Yvt5mI20U6mI/; b=1oMjI22lIxYlKge2znUW3rRiU9LqFxme55Wp0pLtuNF+x3duyfhopTuBAKw7MwVY
  B5E6wQGVEyzBbNscytVqgg6DhQ1QtoUCZymSviobmumKm5DIjKxopDk0xGxQmHYaas
  L9/A6D3/J66kKwX9mc0GPeZTvriVFYYkPR0Q=
DomainKey-Signature: a=rsa-sha1; c=nofws;
  d=gmail.com; s=gamma;
  h=mime-version:in-reply-to:references:date:message-id:subject:to:
  :content-type; bh=YM7CSuEDfJKaylAJyWZkJmZJALnTcwCG6akBHAXLd8ht6PFCmslZfZG8hJCI1VJ8
  vljqcT+G6cywVTBw1pyGX7ECYzr0+vhGvqdpACGrs24zikHfpSSd5GFogzXaLVvGVH8p
Hi Dwayne,

My contribution to pycrypto are very very minimal (The sha256 module, IIRC).
I'd be fine with the public domain license for PyCrypto.

Jeethu Rao

PS: Apologies for the delay in my response.
I don't really check this email address all that often, please direct any further correspondence to jeethu@jeethurao.com

On Sun, Mar 1, 2009 at 9:54 AM, Dwayne C. Litzenberger <dlitz@dlitz.net> wrote:

> Hi Jeethu,
> >
> > I am the new maintainer of the Python Cryptography Toolkit, and I am
> > working on a new release at http://www.pycrypto.org/.
> >
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> >
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> > dissemination and usage except those imposed by the laws of your
> > country of residence. This software is provided "as is" without
> > warranty of fitness for use or suitability for any purpose, express
> > or implied. Use at your own risk or not at all.
> > ============================================================== 
Incorporating the code into commercial products is permitted; you do not have to make source available or contribute your changes back (though that would be nice).

--amk (www.amk.ca)

For the next PyCrypto release, I would like to take steps to move toward a clearer licensing regime. I am asking as many copyright holders as I can find if I can release PyCrypto under something clearer and more standard. Below, I have quoted a public domain dedication that was recommended in _Intellectual Property and Open Source: A Practical Guide to Protecting Code_, by Van Lindberg. I have already contacted A. M. Kuchling, Robey Pointer, and Wim Lewis, and they have all approved the following text for their contributions.

I understand that you have made contributions to PyCrypto. May I, on your behalf, dedicate to the public domain all your contributions to PyCrypto, with the following notice?

The contents of this file are dedicated to the public domain. To the extent that dedication to the public domain is not available, everyone is granted a worldwide, perpetual, royalty-free, non-exclusive license to exercise all rights associated with the contents of this file for any purpose whatsoever. No rights are reserved.

Regards,

- Dwayne

--

Dwayne C. Litzenberger <dlitz@dlitz.net>
Key-signing key - 19E1 1FE8 B3CF F273 ED17 4A24 928C EC13 39C2 5CF7

--

Jeethu Rao

--000e0cd209d0e5a3d40464a23054
Content-Type: text/html; charset=ISO-8859-1
Content-Transfer-Encoding: quoted-printable

Hi Dwayne,

My contribution to pycrypto are very very minimal (The sha256 module, IIRC). I'd be fine with the public domain license f= or PyCrypto.

Jeethu Rao

PS: Apologies fo=
I am the new maintainer of the Python Cryptography Toolkit, and I am working on a new release at http://www.pycrypto.org/.

People often ask me what license PyCrypto is covered by, if it is GPL-compatible, etc. Right now, I don't really have a clear understanding of the point of whether distributing modified versions is allowed. It says "distribute and use", but not "modify".

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---

Hi Jeethu,

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Regards,

-Dwayne

-- Dwayne C. Litzenberger  
<dlitz@dlitz.net>

---

Date: Sun, 23 Nov 2008 15:54:35 -0800
From: Wim Lewis <wiml@hhhh.org>
Subject: Re: PyCrypto license clarification
To: "Dwayne C. Litzenberger" <dlitz@dlitz.net>
Cc: Wim Lewis <wiml@hhhh.org>
Message-Id: <9D5C3135-7414-47D7-9D41-0AC6C3A84D97@hhhh.org>

-----BEGIN PGP SIGNED MESSAGE-----
Hash: SHA1

On November 23, 2008, you wrote:

> Hi Wim,
> 
> I am the new maintainer of the Python Cryptography Toolkit, and I am working on a new release at http://www.pycrypto.org/
> 

-----BEGIN PGP SIGNED MESSAGE-----

On November 23, 2008, you wrote:

> Hi Wim,
> 
> I am the new maintainer of the Python Cryptography Toolkit, and I am working on a new release at http://www.pycrypto.org/
> 

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======================================================================

Certainly! I think the only code of mine in PyCrypto is the CAST-5 / CAST-128 implementation, which already has a public-domain notice at the top of the file. But I am happy to have that, any any other code of mine that might have wandered in there under an unclear open sourcish license, distributed under the public-domain dedication you quote.

Wim.

-----BEGIN PGP SIGNATURE-----
Version: GnuPG v1.4.6 (Darwin)

iQCVAwUBSSnnAl8UnN8n93LBAQLp/gQAhr7x8Av1mstc2kxEJDWTm26PTAZxMz4B
FektbDOzkxgc5580MGGeeX/MVn8aw+1BHg0YD85gsntIDzkcQtb+BR/xAv15zKyA
J/Mn/I+6ekJQzjyh8IPHLAduOXM9Rtguas/yR+Doaq0xOPKoBx+/5+t1ILJtBcZ
wrPEa9Oui9s=
=zSY9
-----END PGP SIGNATURE-----

From dlitz@dlitz.net Sat Feb 28 21:45:09 2009
Date: Sat, 28 Feb 2009 21:45:09 -0500
From: "Dwayne C. Litzenberger" <dlitz@dlitz.net>
To: Barry A Warsaw <barry@python.org>
Subject: PyCrypto license clarification
Message-ID: <20090301024509.GA13195@rivest.dlitz.net>
MIME-Version: 1.0
Content-Type: text/plain; charset=us-ascii; format=flowed
Content-Disposition: inline
User-Agent: Mutt/1.5.16 (2007-06-11)
Status: RO
Content-Length: 2535

Hi Barry,

I am the new maintainer of the Python Cryptography Toolkit, and I am working on a new release at http://www.pycrypto.org/.

People often ask me what license PyCrypto is covered by, if it's
GPL-compatible, etc. Right now, I'm not really sure what to tell them. The text in the current LICENSE file (quoted below) is not entirely clear on the point of whether distributing modified versions is allowed. (It says "distribute and use", but not "modify").

===================================================================
Distribute and use freely; there are no restrictions on further dissemination and usage except those imposed by the laws of your country of residence. This software is provided "as is" without warranty of fitness for use or suitability for any purpose, express or implied. Use at your own risk or not at all.
===================================================================

Incorporating the code into commercial products is permitted; you do not have to make source available or contribute your changes back (though that would be nice).

--amk (www.amk.ca)

For the next PyCrypto release, I would like to take steps to move toward a clearer licensing regime. I am asking as many copyright holders as I can find if I can release PyCrypto under something clearer and more standard. Below, I have quoted a public domain dedication that was recommended in _Intellectual Property and Open Source: A Practical Guide to Protecting Code_, by Van Lindberg. I have already contacted A. M. Kuchling, Robey Pointer, and Wim Lewis, and they have all approved the following dedication for their contributions.

I understand that you have made contributions to PyCrypto. May I, on your behalf, dedicate to the public domain all your contributions to PyCrypto, with the following notice?

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The contents of this file are dedicated to the public domain. To the extent that dedication to the public domain is not available, everyone is granted a worldwide, perpetual, royalty-free, non-exclusive license to exercise all rights associated with the contents of this file for any purpose whatsoever. No rights are reserved.
=======================================================================

Regards,
- Dwayne

--
Dwayne C. Litzenberger <dlitz@dlitz.net>
    Key-signing key   - 19E1 1FE8 B3CF F273 ED17  4A24 928C EC13 39C2 5CF7

From barry@python.org Mon Mar 2 11:29:39 2009
On Feb 28, 2009, at 9:45 PM, Dwayne C. Litzenberger wrote:

> I am the new maintainer of the Python Cryptography Toolkit, and I am =20=

> working on a new release at http://www.pycrypto.org/.

Great! I’m glad to see someone taking up the mantle of this important =20=

Python library.
I understand that you have made contributions to PyCrypto. May I, on your behalf, dedicate to the public domain all your contributions?

Absolutely yes.

Cheers,
Barry

-----BEGIN PGP SIGNATURE-----
Version: GnuPG v1.4.9 (Darwin)
iQCVAwUBSawJhnEjvBPtuxVAQLZjgP/ccG+JdZwNvPJRfSa6rhY6+MHLDH16agk
evJnSJQaeVHIznVIvEr51XgvDUMakZJu4SOv7MqkhKA9lle7PaD9VSYgn3ra5
gElwi2DQDoOy5GExXMm74gqrrb1PCCbCRmpaYNo+DZohwHkeFbjwDRA3wItOrH7
SK4w9VBhtY=5D
=3DQdYuY
-----END PGP SIGNATURE-----
Date: Mon, 16 Feb 2009 12:58:00 -0800
From: Robey Pointer <robey@lag.net>
Subject: Re: PyCrypto license clarification
To: "Dwayne C. Litzenberger" <dlitz@dlitz.net>
Received-SPF: pass (goedel.dlitz.net: domain of robey@lag.net designates 69.61.78.186 as permitted sender)
Message-Id: <F469A078-6305-4484-BEA8-F4EC38A4154F@lag.net>

-----BEGIN PGP SIGNED MESSAGE-----
Hash: SHA1

On 23 Nov 2008, at 07:42, Dwayne C. Litzenberger wrote:

> For the next PyCrypto release, I would like to take steps to move
> toward a clearer licensing regime. I am asking as many copyright
> holders as I can find if I can release PyCrypto under something
> clearer and more standard. Below, I have quoted a public domain
> dedication that was recommended in _Intellectual Property and Open
> Source: A Practical Guide to Protecting Code_, by Van Lindberg. I
> have already contacted A. M. Kuchling, and he has approved the
> following dedication for his contributions.
> >
> > May I, on your behalf, dedicate to the public domain all your
> > contributions to PyCrypto, with the following notice?
> >
> > The contents of this file are dedicated to the public domain. To
> >
extent that dedication to the public domain is not available,
everyone
is granted a worldwide, perpetual, royalty-free, non-exclusive
license
to exercise all rights associated with the contents of this file
for
any purpose whatsoever. No rights are reserved.

In case I haven't replied to this yet: Yes, this is fine with me.

robery

-----BEGIN PGP SIGNATURE-----
Version: GnuPG v1.4.8 (Darwin)

iEYEARECAAYFAkmZ01gACgkQQQDkKvyJ6cOLvQCfQmYYuVODv1lyLg0hgCI9LAhBQ
SH8AoLJgaoq111i7/ZYDc+/Cd8VO0xLbr
=Mv6g
d-----END PGP SIGNATURE-----
Hi Andrew,

People often ask me what license PyCrypto is covered by, if it's=20
GPL-compatible, etc. Right now, I'm not really sure what to tell them. =20
The text in the current LICENSE file (quoted below) is not entirely clear=
=20
on the point of whether distributing modified versions is allowed. (It=20
says "distribute and use", but not "modify").

\[
\text{Distribute and use freely; there are no restrictions on further} \\
\text{dissemination and usage except those imposed by the laws of your} \\
\text{country of residence. This software is provided "as is" without} \\
\text{warranty of fitness for use or suitability for any purpose, express} \\
\text{or implied. Use at your own risk or not at all.}
\]

Incorporating the code into commercial products is permitted; you do
not have to make source available or contribute your changes back
(though that would be nice).

--amk (www.amk.ca)

For the next PyCrypto release, I'd like to take steps to move toward a=20
clearer licensing regime. I'm asking as many copyright holders as I can=20
find, starting with you, if I can release PyCrypto under something clearer=20
and more standard. Below, I have quoted a public domain dedication that=20
was recommended in _Intellectual Property and Open Source: A Practical=20

May I, on your behalf, dedicate to the public domain your considerable=20
contributions to PyCrypto, with the following notice?

\[
\text{The contents of this file are dedicated to the public domain. To the} \\
\text{extent that dedication to the public domain is not available, everyone} \\
\text{is granted a worldwide, perpetual, royalty-free, non-exclusive license}
\]
to exercise all rights associated with the contents of this file for any purpose whatsoever. No rights are reserved.

Regards,
- Dwayne

--20
Dwayne C. Litzenberger <dlitz@dlitz.net>
Key-signing key  - 19E1 1FE8 B3CF F273 ED17 4A24 928C EC13 39C2 5CF7
Annual key (2008) - 4B2A FD82 FC7D 9E38 38D9 179F 1C11 B877 E780 4B45

--YiEDa0DAkWCtVeE4
Content-Type: application/pgp-signature; name="signature.asc"
Content-Description: Digital signature
Content-Disposition: inline

-----BEGIN PGP SIGNATURE-----
Version: GnuPG v1.4.5 (GNU/Linux)
iEYEARECAAYFAkk052IAgkQHQB4d+eAS0XPPQCfcyQ2DddAXKg9N7Z+jcSFFD5EZ
yloAn33aZJkkeyJzbfEqImOEW8JGpf
=aBEW
-----END PGP SIGNATURE-----

--YiEDa0DAkWCtVeE4--
People often ask me what license PyCrypto is covered by, if it's
GPL-compatible, etc. Right now, I'm not really sure what to tell them.
The text in the current LICENSE file (quoted below) is not entirely clear
on the point of whether distributing modified versions is allowed. (It
says "distribute and use", but not "modify".)

The intention is that it be public domain.

May I, on your behalf, dedicate to the public domain your considerable
contributions to PyCrypto, with the following notice?

You may.

--amk

Hi Paul,
I am the new maintainer of the Python Cryptography Toolkit, and I am working on a new release at http://www.pycrypto.org/.

People often ask me what license PyCrypto is covered by, if it's GPL-compatible, etc. Right now, I'm not really sure what to tell them. The text in the current LICENSE file (quoted below) is not entirely clear on the point of whether distributing modified versions is allowed. (It says "distribute and use", but not "modify".)

===================================================================
Distribute and use freely; there are no restrictions on further dissemination and usage except those imposed by the laws of your country of residence. This software is provided "as is" without warranty of fitness for use or suitability for any purpose, express or implied. Use at your own risk or not at all.
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I understand that you have made contributions to PyCrypto, under nickname "z3p" and/or other names. May I, on your behalf, dedicate to the public domain all your contributions to PyCrypto, with the following notice?

=======================================================================
The contents of this file are dedicated to the public domain. To the extent that dedication to the public domain is not available, everyone is granted a worldwide, perpetual, royalty-free, non-exclusive license to exercise all rights associated with the contents of this file for any purpose whatsoever. No rights are reserved.
=======================================================================

Regards,
- Dwayne
On Sun, Aug 2, 2009 at 9:48 PM, Dwayne C. Litzenberger <dlitz@dlitz.net> wrote:

> Hi Paul,
>
> I am the new maintainer of the Python Cryptography Toolkit, and I am
> working on a new release at http://www.pycrypto.org/.

That's great!

> I understand that you have made contributions to PyCrypto, under nickname
> "z3p" and/or other names. =C2=A0May I, on your behalf, dedicate to the pu=
blic
> domain all your contributions to PyCrypto, with the following notice?
>
> =C2=A0=3D=3D=3D=3D=3D=3D=3D=3D=3D=3D=3D=3D=3D=3D=3D=3D=3D=3D=3D=3D=3D=3D=
> =C2=A0The contents of this file are dedicated to the public domain. =C2=
=A0To the
> =C2=A0extent that dedication to the public domain is not available, every=
one
> =C2=A0is granted a worldwide, perpetual, royalty-free, non-exclusive lice=
=ns
> =C2=A0to exercise all rights associated with the contents of this file fo=
>r
> =C2=A0any purpose whatsoever. =C2=A0No rights are reserved.

Yes, that's fine. Good luck with the new release!

-p
--=20
Paul Swartz
paulswartz at gmail dot com
http://paulswartz.net/
AIM: z3penguin
On Mon, Aug 03, 2009 at 12:13:43PM -0400, Paul Swartz wrote:
> On Sun, Aug 2, 2009 at 9:48 PM, Dwayne C. Litzenberger<dlitz@dlitz.net> wrote:
> >> Hi Paul,
> >>
> >> I am the new maintainer of the Python Cryptography Toolkit, and I am
> >> working on a new release at http://www.pycrypto.org/.
> >
> >That's great!
> >
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> >> to exercise all rights associated with the contents of this file for
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> >>======================================================================
> >
> >Yes, that's fine. Good luck with the new release!
Hi Joris,

I am the new maintainer of the Python Cryptography Toolkit, and I am working on a new release at http://www.pycrypto.org/.

People often ask me what license PyCrypto is covered by, if it's GPL-compatible, etc. Right now, I'm not really sure what to tell them. The text in the current LICENSE file (quoted below) is not entirely clear on the point of whether distributing modified versions is allowed. (It says "distribute and use", but not "modify".)

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 Distribute and use freely; there are no restrictions on further
 dissemination and usage except those imposed by the laws of your
 country of residence. This software is provided "as is" without
 warranty of fitness for use or suitability for any purpose, express
 or implied. Use at your own risk or not at all.
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(www.amk.ca)

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=======================================================================

Regards,
- Dwayne

--
Dwayne C. Litzenberger <dlitz@dlitz.net>
Key-signing key   - 19E1 1FE8 B3CF F273 ED17  4A24 928C EC13 39C2 5CF7

From joris@bontje.nl Tue May  5 03:08:32 2009
X-Maildir-Dup-Checked: Yes
Return-Path: <joris@bontje.nl>
X-Original-To: dwon@rivest.dlitz.net
Delivered-To: dwon@rivest.dlitz.net
Received: from goedel.dlitz.net (unknown [10.159.255.6])
by rivest.dlitz.net (Postfix) with ESMTP id 7AA4B9E5078
for <dwon@rivest.dlitz.net>; Tue,  5 May 2009 03:08:32 -0400 (EDT)
Received: from localhost (localhost [127.0.0.1])
by goedel.dlitz.net (Postfix) with QMQP id 2315B40583
for <dwon@rivest.dlitz.net>; Tue,  5 May 2009 01:08:32 -0600 (CST)
Received: (qmailmgr-postfix 16890 invoked by uid 1003);  5 May 2009 01:08:32 -0600
Delivered-To: m-dlitz-dlitz@dlitz.net
Received-SPF: none (bontje.nl: No applicable sender policy available) receiver=goedel.dlitz.net; identity=mfrom;
envelope-from="joris@bontje.nl"; helo=smtp6.versatel.nl; client-ip=62.58.50.97
Received: from smtp6.versatel.nl (smtp6.versatel.nl [62.58.50.97])
by goedel.dlitz.net (Postfix) with ESMTP id 2D76A40583C
for <dlitz@dlitz.net>; Tue,  5 May 2009 01:08:32 -0600 (CST)
Received: (qmail 4224 invoked by uid 0); 5 May 2009 07:08:25 -0000
Received: from qmail06.zonnet.nl (HELO dell062.admin.zonnet.nl) ([10.170.1.123])
    (envelope-sender <joris@bontje.nl>)
    by 10.170.1.96 (qmail-ldap-1.03) with SMTP
    for < >; 5 May 2009 07:08:25 -0000
Received: by dell062.admin.zonnet.nl (Postfix, from userid 33)
Hi Dwayne,

Thanks for taking over the PyCrypto library and putting in the required effort to keep this going. I was very excited to read that it is now one of the installed libraries for Google AppsEngine!

You have my full permission to dedicate all my contributions to PyCrypto to the public domain with your suggested notice:

=======================================================================
The contents of this file are dedicated to the public domain. To the extent that dedication to the public domain is not available, everyone is granted a worldwide, perpetual, royalty-free, non-exclusive license to exercise all rights associated with the contents of this file for any purpose whatsoever. No rights are reserved.
=======================================================================

Regards,
Joris

Citeren “Dwayne C. Litzenberger” <dlitz@dlitz.net>:

> Hi Joris,
> 
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working on a new release at http://www.pycrypto.org/.

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country of residence. This software is provided "as is" without
warranty of fitness for use or suitability for any purpose, express
or implied. Use at your own risk or not at all.
==================================================================

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any purpose whatsoever. No rights are reserved.
==================================================================

Regards,
- Dwayne

--
Dwayne C. Litzenberger <dlitz@dlitz.net>
From dlitz@dlitz.net Tue May 5 17:53:47 2009
Date: Tue, 5 May 2009 17:53:47 -0400
From: "Dwayne C. Litzenberger" <dlitz@dlitz.net>
To: joris@bontje.nl
Subject: Re: PyCrypto license clarification
Message-ID: <20090505215347.GB9933@rivest.dlitz.net>
References: <20090505024914.GA9219@rivest.dlitz.net>
<20090505090825.gsq1ps7hg08wwwook@www.webmail.vuurwerk.nl>
MIME-Version: 1.0
Content-Type: text/plain; charset=us-ascii; format=flowed
Content-Disposition: inline
In-Reply-To: <20090505090825.gsq1ps7hg08wwwook@www.webmail.vuurwerk.nl>
X-Primary-Address: dlitz@dlitz.net
X-Homepage: http://www.dlitz.net/
X-OpenPGP: url=http://www.dlitz.net/go/gpgkey/;
  id=19E11FE8B3CF273ED174A24928CEC1339C25CF7 (only for key signing);
  preference=unprotected
X-OpenPGP: url=http://www.dlitz.net/go/gpgkey/;
  id=4B2AF8DD82FC7D9E3838D9179F1C11B877E7804B45 (2008);
  preference=signencrypt
User-Agent: Mutt/1.5.16 (2007-06-11)
Status: RO
Content-Length: 3863

Excellent! Thank you!

On Tue, May 05, 2009 at 09:08:25AM +0200, joris@bontje.nl wrote:
> Hi Dwayne,
> >
> > Thanks for taking over the PyCrypto library and putting in the required
> > effort to keep this going.
> > I was very excited to read that it is now one of the installed libraries
> > for Google AppsEngine!
> >
> > You have my full permission to dedicate all my contributions to PyCrypto to
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> >============================================================================
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> > extent that dedication to the public domain is not available, everyone
> > is granted a worldwide, perpetual, royalty-free, non-exclusive license
> > to exercise all rights associated with the contents of this file for
> > any purpose whatsoever. No rights are reserved.
> >============================================================================
> >
Hi Joris,

I am the new maintainer of the Python Cryptography Toolkit, and I am working on a new release at http://www.pycrypto.org/.

People often ask me what license PyCrypto is covered by, if it's GPL-compatible, etc. Right now, I'm not really sure what to tell them. The text in the current LICENSE file (quoted below) is not entirely clear on the point of whether distributing modified versions is allowed. (It says "distribute and use", but not "modify".)

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--amk (www.amk.ca)

For the next PyCrypto release, I would like to take steps to move toward a clearer licensing regime. I am asking as many copyright holders as I can find if I can release PyCrypto under something clearer and more standard. Below, I have quoted a public domain dedication that was recommended in _Intellectual Property and Open Source: A Practical Guide to Protecting Code_ by Van Lindberg. I have already contacted A.M. Kuchling, Robey Pointer, Barry Warsaw, Wim Lewis, Jeethu Rao, and Mark Moraes, and they have all approved the following dedication for their contributions.

I understand that you have made contributions to PyCrypto. May I, on your behalf, dedicate to the public domain all your contributions to PyCrypto, with the following notice?

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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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---

Dwayne C. Litzenberger <dlitz@dlitz.net>

Key-signing key - 19E1 1FE8 B3CF F273 ED17 4A24 928C EC13 39C2 5CF7

Annual key (2008) - 4B2A FD82 FC7D 9E38 38D9 179F 1C11 B877 E780 4B45

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4446
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From dlitz@dlitz.net Wed Aug 27 20:54:38 EDT 2008
X-Maildir-Dup-Checked: Yes
Return-Path: <dlitz@dlitz.net>
X-Original-To: dwon@rivest.dlitz.net
Delivered-To: dwon@rivest.dlitz.net
Received: from goedel.dlitz.net (unknown [10.159.255.6])
by rivest.dlitz.net (Postfix) with ESMTP id ECFDFC6641D
for <dwon@rivest.dlitz.net>; Wed, 27 Aug 2008 20:45:06 -0400 (EDT)
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Delivered-To: m-dlitz-dlitz@dlitz.net
Received-SPF: pass (goedel.dlitz.net: domain of dlitz@dlitz.net designates 193.201.42.13 as permitted sender)
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    X-Homepage: http://www.dlitz.net/
    X-OpenPGP: url=http://www.dlitz.net/go/gpgkey/;
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    From: "Dwayne C. Litzenberger" <dlitz@dlitz.net>
    X-DNSBL: 0
    Status: O
    Content-Length: 2182


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SUBMISSION TYPE: TSU
SUBMITTED BY: Dwayne C. Litzenberger
SUBMITTED FOR: Dwayne C. Litzenberger
POINT OF CONTACT: Dwayne C. Litzenberger
PHONE and/or FAX: +1-613-693-1296
MANUFACTURER: n/a
PRODUCT NAME/MODEL #: The Python Cryptography Toolkit ("PyCrypto")
ECCN: 5D002

NOTIFICATION: http://www.pycrypto.org/

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1.275 python-cryptography 1.7.2 :2.el7

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1.280 python-iniparse 0.4 :9.el7

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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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1.286 python-kitchen 1.1.1 :5.el7

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1.287 python-linux-procfs 0.4.9 :3.el7
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1.288 python-markupsafe 0.11 :10.el7

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1.289 python-paramiko 2.1.1 :4.el7

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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 
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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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b) 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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That's all there is to it!

1.290 python-ply 3.4 :11.el7

1.291 python-pyasn1 0.1.9 :7.el7

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1.292 python-pycparser 2.14 :1.el7

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The list is sorted in increasing alphabetic order by first name.

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* Andrew de los Reyes
* Benoit Pradelle
* Dov Feldstern
* Even Wiik Thomassen
* Greg Smith
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* Li Xuan Ji
* Mateusz Czaplinski
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1.293 python-pycurl 7.19.0 :19.el7
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(For example, a function in a library to compute square roots has
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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.

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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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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.

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although it includes many contributions from others.

In 1995, Guido continued his work on Python at the Corporation for National
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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 https://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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Mersenne Twister
-------------

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    A C-program for MT19937, with initialization improved 2002/1/26.
    Coded by Takuji Nishimura and Makoto Matsumoto.

    Before using, initialize the state by using init_genrand(seed)
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http://www.math.sci.hiroshima-u.ac.jp/~m-mat/MT/emt.html
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Sockets
-------

The `module` socket module uses the functions, `function` getaddrinfo, and `function` getnameinfo, which are coded in separate source files from the WIDE Project, http://www.wide.ad.jp/. ::

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MD5 message digest algorithm

--------------------

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L. Peter Deutsch
ghost@aladdin.com

Independent implementation of MD5 (RFC 1321).

This code implements the MD5 Algorithm defined in RFC 1321, whose text is available at

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The code is derived from the text of the RFC, including the test suite (section A.5) but excluding the rest of Appendix A. It does not include any code or documentation that is identified in the RFC as being copyrighted.

The original and principal author of md5.h is L. Peter Deutsch <ghost@aladdin.com>. Other authors are noted in the change history that follows (in reverse chronological order):

2002-04-13 lpd Removed support for non-ANSI compilers; removed references to Ghostscript; clarified derivation from RFC 1321;
now handles byte order either statically or dynamically.
1999-11-04 lpd Edited comments slightly for automatic TOC extraction.
1999-10-18 lpd Fixed typo in header comment (ans2knr rather than md5);
added conditionalization for C++ compilation from Martin Purschke <purschke@bnl.gov>.
1999-05-03 lpd Original version.

Asynchronous socket services

--------------------------------

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UUencode and UUdecode functions

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Modified by Jack Jansen, CWI, July 1995:
- Use binascii module to do the actual line-by-line conversion between ascii and binary. This results in a 1000-fold speedup. The C version is still 5 times faster, though.
- Arguments more compliant with Python standard

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strtod and dtoa

---------------

The file :file:`Python/dtoa.c`, which supplies C functions dtoa and 
strtod for conversion of C doubles to and from strings, is derived 
from the file of the same name by David M. Gay, currently available 
from http://www.netlib.org/fp/. The original file, as retrieved on 
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 *
 */
#**************************************************************************/

OpenSSL

------

the OpenSSL library for added performance if made available by the 
operating system. Additionally, the Windows and Mac OS X installers for 
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of the OpenSSL license here::

---
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==============

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-----------------------

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expat
-----

The :mod:`pyexpat` extension is built using an included copy of the expat
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------

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zlib
----

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1.301 python2-crypto 2.6.1 :15.el7
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From dlitz@dlitz.net Sat Apr 18 09:14:20 2009
Date: Sat, 18 Apr 2009 09:14:20 -0400
From: "Dwayne C. Litzenberger" <dlitz@dlitz.net>
To: Mark Moraes <moraes@computer.org>
Subject: PyCrypto license clarification
Message-ID: <20090418131419.GA14494@rivest.dlitz.net>
MIME-Version: 1.0
Content-Type: text/plain; charset=us-ascii; format=flowed
Content-Disposition: inline
User-Agent: Mutt/1.5.16 (2007-06-11)
Status: RO
Content-Length: 2635

Hi Mark,

I am the new maintainer of the Python Cryptography Toolkit, and I am
working on a new release at http://www.pycrypto.org/.

People often ask me what license PyCrypto is covered by, if it's
GPL-compatible, etc. Right now, I'm not really sure what to tell them.
The text in the current LICENSE file (quoted below) is not entirely clear
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says "distribute and use", but not "modify".)

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For the next PyCrypto release, I would like to take steps to move toward a
clearer licensing regime. I am asking as many copyright holders as I can
find if I can release PyCrypto under something clearer and more standard.
Below, I have quoted a public domain dedication that was recommended in
_intellectual Property and Open Source: A Practical Guide to Protecting
Code_ by Van Lindberg. I have already contacted A. M. Kuchling, Robey
Pointer, Wim Lewis, Jeethu Rao, and Barry Warsaw, and they have all
approved the following dedication for their contributions.

I understand that you have made contributions to PyCrypto. May I, on your
behalf, dedicate to the public domain all your contributions to PyCrypto,
with the following notice?

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Regards,
- Dwayne

--

Dwayne C. Litzenberger <dlitz@dlitz.net>

Key-signing key - 19E1 1FE8 B3CF F273 ED17 4A24 928C EC13 39C2 5CF7

From markmoraes@yahoo.com Mon Apr 20 19:25:37 2009
X-Maildir-Dup-Checked: Yes
Return-Path: <markmoraes@yahoo.com>
X-Original-To: dwon@rivest.dlitz.net
Delivered-To: dwon@rivest.dlitz.net
Received: from goedel.dlitz.net (unknown [10.159.255.6])
by rivest.dlitz.net (Postfix) with ESMTP id 5D9AE984FDD
for <dwon@rivest.dlitz.net>; Mon, 20 Apr 2009 19:25:37 -0400 (EDT)
Hi Dwayne.

Sure, the new license sounds fine for all my contributions to PyCrypto, and thanks for taking it on. My apologies for not responding to your previous e-mail.
Regards,
Mark.

--- On Sat, 4/18/09, Dwayne C. Litzenberger <dlitz@dlitz.net> wrote:

> From: Dwayne C. Litzenberger <dlitz@dlitz.net>
> Subject: PyCrypto license clarification
> To: "Mark Moraes" <moraes@computer.org>
> Date: Saturday, April 18, 2009, 9:14 AM
> Hi Mark,
> I am the new maintainer of the Python Cryptography Toolkit,
> and I am
> working on a new release at http://www.pycrypto.org/.
> People often ask me what license PyCrypto is covered by, if
> it's
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Regards,
- Dwayne

-- Dwayne C. Litzenberger <dlitz@dlitz.net>
  Key-signing key - 19E1 1FE8 B3CF F273 ED17 4A24 928C EC13 39C2 5CF7
```
Thanks a lot, and don't worry about not responding to previous emails. I do that too much myself. :)

On Mon, Apr 20, 2009 at 04:25:32PM -0700, M Moraes wrote:
>
> Hi Dwayne.
>
> Sure, the new license sounds fine for all my contributions to PyCrypto, and thanks for taking it on. My apologies for not responding to your previous e-mail.
>
> Regards,
> Mark.
>
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> >> Hi Mark,
> >>
> >> I am the new maintainer of the Python Cryptography Toolkit,
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Date: Sun, 23 Nov 2008 15:54:35 -0800
From: Wim Lewis <wiml@hhhh.org>
Subject: Re: PyCrypto license clarification
To: "Dwayne C. Litzenberger" <dlitz@dlitz.net>
Cc: Wim Lewis <wiml@hhhh.org>
Message-Id: <9D5C3135-7414-47D7-9D41-0AC6C3A84D97@hhhh.org>

-----BEGIN PGP SIGNED MESSAGE-----
Hash: SHA1
On November 23, 2008, you wrote:
> Hi Wim,
>
> I am the new maintainer of the Python Cryptography Toolkit, and I am
> working on a new release at http://www.pycrypto.org/.
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> I understand that you have made contributions to PyCrypto. May I, on
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Wim.

-----BEGIN PGP SIGNATURE-----
Version: GnuPG v1.4.6 (Darwin)
iQCVAwUBSsnnAl8UnN8n93LBAQL-p/gQAhr7x8Av1mstc2ksEJEDW7m26PTAZxMz4B
FektbDOzkgc558oMGGeeyX/MVn8aw+1BHg0YD85gsntDzkQtb+BR/xAVJ5zKYA
J/Mn/l+6ekQJ3juh8IPHLAduOXM9Rtguas/yR+Doaq0xOPKoBx+/5+t1LJtBcZ
wrPEa9Oi9s=
=2SY9
-----END PGP SIGNATURE-----
From dlitz@dlitz.net Sun Nov 23 00:17:22 2008
Date: Sun, 23 Nov 2008 00:17:22 -0500
From: "Dwayne C. Litzenberger" <dlitz@dlitz.net>
To: "A. M. Kuchling" <amk@amk.ca>
Subject: PyCrypto license clarification
Message-ID: <20081123051722.GA29253@rivest.dlitz.net>
MIME-Version: 1.0
Content-Type: multipart/signed; micalg=pgp-sha1;
protocol="application/pgp-signature"; boundary="YiEDa0DAkWCtVeE4"
Content-Disposition: inline
X-Primary-Address: dlitz@dlitz.net
X-Homepage: http://www.dlitz.net/
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- Dwayne

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--YiEDa0DAkWCtVeE4
Content-Type: application/pgp-signature; name="signature.asc"
Content-Description: Digital signature
Content-Disposition: inline

-----BEGIN PGP SIGNATURE-----
Version: GnuPG v1.4.5 (GNU/Linux)
iEYEARECAAYFAkko52IACgkQHCG4d+eAS0XPPQCfcyQ2DdAXKg9N7Z+jcSFFD5EZ
yloAn33aZjkteyJaTbzEqImOEW8JGpf
=aBEW
-----END PGP SIGNATURE-----

--YiEDa0DAkWCtVeE4--

From amk@amk.ca Sun Nov 23 07:51:59 2008
X-Maildir-Dup-Checked: Yes
Return-Path: <amk@amk.ca>
X-Original-To: dwon@rivest.dlitz.net
Delivered-To: dwon@rivest.dlitz.net
Received: from goedel.dlitz.net (unknown [10.159.255.6])

Open Source Used In Network Assurance Engine 4.0(1)
> People often ask me what license PyCrypto is covered by, if it's
> GPL-compatible, etc. Right now, I'm not really sure what to tell them.
> The text in the current LICENSE file (quoted below) is not entirely clear
> on the point of whether distributing modified versions is allowed. (It
> says "distribute and use", but not "modify".)

The intention is that it be public domain.

> May I, on your behalf, dedicate to the public domain your considerable
> contributions to PyCrypto, with the following notice?

You may.

--amk

From dlitz@dlitz.net Sat Feb 28 21:45:09 2009
Date: Sat, 28 Feb 2009 21:45:09 -0500
Hi Barry,

I am the new maintainer of the Python Cryptography Toolkit, and I am working on a new release at http://www.pycrypto.org/.

People often ask me what license PyCrypto is covered by, if it’s GPL-compatible, etc. Right now, I’m not really sure what to tell them. The text in the current LICENSE file (quoted below) is not entirely clear on the point of whether distributing modified versions is allowed. (It says "distribute and use", but not "modify".)

```
Distribute and use freely; there are no restrictions on further dissemination and usage except those imposed by the laws of your country of residence. This software is provided "as is" without warranty of fitness for use or suitability for any purpose, express or implied. Use at your own risk or not at all.
```

Incorporating the code into commercial products is permitted; you do not have to make source available or contribute your changes back (though that would be nice).

--amk (www.amk.ca)

For the next PyCrypto release, I would like to take steps to move toward a clearer licensing regime. I am asking as many copyright holders as I can find if I can release PyCrypto under something clearer and more standard. Below, I have quoted a public domain dedication that was recommended in _Intellectual Property and Open Source: A Practical Guide to Protecting Code_, by Van Lindberg. I have already contacted A. M. Kuchling, Robey Pointer, and Wim Lewis, and they have all approved the following dedication for their contributions.

I understand that you have made contributions to PyCrypto. May I, on your behalf, dedicate to the public domain all your contributions to PyCrypto, with the following notice:

---
The contents of this file are dedicated to the public domain. To the extent that dedication to the public domain is not available, everyone is granted a worldwide, perpetual, royalty-free, non-exclusive license to exercise all rights associated with the contents of this file for any purpose whatsoever. No rights are reserved.

Regards,
- Dwayne

--
Dwayne C. Litzenberger <dlitz@dlitz.net>
  Key-signing key   - 19E1 1FE8 B3CF F273 ED17 4A24 928C EC13 39C2 5CF7

From barry@python.org Mon Mar  2 11:29:39 2009
X-Maildir-Dup-Checked: Yes
Return-Path: <barry@python.org>
X-Original-To: dwon@rivest.dlitz.net
Delivered-To: dwon@rivest.dlitz.net
Received: from goedel.dlitz.net (unknown [10.159.255.6])
    by rivest.dlitz.net (Postfix) with ESMTP id 6E01AC6640B
    for <dwon@rivest.dlitz.net>; Mon,  2 Mar 2009 11:29:39 -0500 (EST)
    Received: from localhost (localhost [127.0.0.1])
        by goedel.dlitz.net (Postfix) with QMQP id 0644E1007A
        for <dwon@rivest.dlitz.net>; Mon,  2 Mar 2009 10:29:39 -0600 (CST)
    Received: (vmailmgr-postfix 8668 invoked by uid 1003);  2 Mar 2009 10:29:39 -0600
    Delivered-To: m-dlitz-dlitz@dlitz.net
    Received-SPF: none (python.org: No applicable sender policy available) receiver=goedel.dlitz.net; identity=mfrom;
        envelope-from="barry@python.org"; helo=mail.wooz.org; client-ip=216.15.33.230
    Received: from mail.wooz.org (216-15-33-230.c3-0.slvr-ubr2.lnh-slvr.md.static.cable.rcn.com [216.15.33.230])
        by goedel.dlitz.net (Postfix) with ESMTP id CCEA110073
        for <dlitz@dlitz.net>; Mon,  2 Mar 2009 10:29:38 -0600 (CST)
    Received: from snowdog.wooz.org (snowdog.wooz.org [192.168.11.202])
        by mail.wooz.org (Postfix) with ESMTPSA id ACE30E3C9F
        for <dlitz@dlitz.net>; Mon,  2 Mar 2009 11:29:35 -0500 (EST)
Message-Id: <09BF1A39-B015-4820-97A3-8642490C8254@python.org>
From: Barry Warsaw <barry@python.org>
To: Dwayne C. Litzenberger <dlitz@dlitz.net>
In-Reply-To: <20090301024509.GA13195@rivest.dlitz.net>
Content-Type: text/plain; charset=US-ASCII; format=floated; delsp=yes
Content-Transfer-Encoding: quoted-printable
Mime-Version: 1.0 (Apple Message framework v930.3)
Subject: Re: PyCrypto license clarification
Date: Mon, 2 Mar 2009 11:29:34 -0500
References: <20090301024509.GA13195@rivest.dlitz.net>
X-Pgp-Agent: GPGMail d55 (v55, Leopard)
On Feb 28, 2009, at 9:45 PM, Dwayne C. Litzenberger wrote:

> I am the new maintainer of the Python Cryptography Toolkit, and I am =20=
> working on a new release at http://www.pycrypto.org/.

Great! I'm glad to see someone taking up the mantle of this important =20=
Python library.

> I understand that you have made contributions to PyCrypto. May I, =20=
> on your behalf, dedicate to the public domain all your contributions =20=
> to PyCrypto, with the following notice?

Absolutely yes.

Cheers,

Barry

-----BEGIN PGP SIGNATURE-----
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SK4w9VBIfY=3D
=3DQduY
-----END PGP SIGNATURE-----
Hi Paul,

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or implied. Use at your own risk or not at all.
===================================================================

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(www.amk.ca)

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I understand that you have made contributions to PyCrypto, under nickname "z3p" and/or other names. May I, on your behalf, dedicate to the public domain all your contributions to PyCrypto, with the following notice?

===================================================================
The contents of this file are dedicated to the public domain. To the extent that dedication to the public domain is not available, everyone is granted a worldwide, perpetual, royalty-free, non-exclusive license to exercise all rights associated with the contents of this file for any purpose whatsoever. No rights are reserved.
===================================================================
Regards,
- Dwayne

--
Dwayne C. Litzenberger <dlitz@dlitz.net>
Key-signing key - 19E1 1FE8 B3CF F273 ED17 4A24 928C EC13 39C2 5CF7

From paulswartz@gmail.com Mon Aug 3 12:14:07 2009
X-Maildir-Dup-Checked: Yes
Return-Path: <paulswartz@gmail.com>
X-Original-To: dwon@rivest.dlitz.net
Delivered-To: dwon@rivest.dlitz.net
Received: from goedel.dlitz.net (unknown [10.159.255.6])
by rivest.dlitz.net (Postfix) with ESMTP id 30B9D984FC4
for <dwon@rivest.dlitz.net>; Mon, 3 Aug 2009 12:14:07 -0400 (EDT)
Received: from localhost (localhost [127.0.0.1])
by goedel.dlitz.net (Postfix) with QMQP id AD9AE81068
for <dwon@rivest.dlitz.net>; Mon, 3 Aug 2009 10:14:06 -0600 (CST)
Received: (vmailmgr-postfix 32055 invoked by uid 1003); 3 Aug 2009 10:14:06 -0600
Delivered-To: d-litz-dlitz@dlitz.net
Received-SPF: pass (gmail.com ... _spf.google.com: 72.14.220.159 is authorized to use 'paulswartz@gmail.com' in 'mfrom' identity (mechanism 'ip4:72.14.192.0/18' matched)) receiver=goedel.dlitz.net; identity=mfrom; envelope-from="paulswartz@gmail.com"; helo=fg-out-1718.google.com; client-ip=72.14.220.159
Received: from fg-out-1718.google.com (fg-out-1718.google.com [72.14.220.159])
by goedel.dlitz.net (Postfix) with ESMTP id 4E63881066
for <dlitz@dlitz.net>; Mon, 3 Aug 2009 10:14:05 -0600 (CST)
Received: by fg-out-1718.google.com with SMTP id d23so1076840fga.3
for <dlitz@dlitz.net>; Mon, 03 Aug 2009 09:14:04 -0700 (PDT)
DKIM-Signature: v=1; a=rsa-sha256; c=relaxed/relaxed;
d=dlitz.com; s=gamma;
h=domainkey-signature:mime-version:received:in-reply-to:references
:from:date:message-id:subject:to:content-type
:content-transfer-encoding;
b=A0RHBt0TnrbKS5qOHI3WYbkZ+b0cuPeuoKAyvApWcc=;
b=gyTqkRhKIHadFKIZCBW5bRbnMNVDqjPWJlybyC0EvxPskaorHr3HAR96MWQNBpU40Ac
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Y9++7Q0GqYdALsfvmwv7Q3/bEmjVTt0tQE=
DomainKey-Signature: a=rsa-sha1; c=nofws;
d=dlitz.com; s=gamma;
h=mime-version:in-reply-to:references:from:date:message-id:subject:to
:content-type:content-transfer-encoding;
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MIME-Version: 1.0
Received: by 10.239.157.147 with SMTP id q19mr601802hbc.61.1249316043185; Mon, 03 Aug 2009 09:14:03 -0700 (PDT)
In-Reply-To: <20090803014825.GA1326@rivest.dlitz.net>
On Sun, Aug 2, 2009 at 9:48 PM, Dwayne C. Litzenberger<dlitz@dlitz.net> wrote:
> Hi Paul,
>
> I am the new maintainer of the Python Cryptography Toolkit, and I am
> working on a new release at http://www.pycrypto.org/.

That's great!

> I understand that you have made contributions to PyCrypto, under nickname
> "z3p" and/or other names. =C2=A0May I, on your behalf, dedicate to the pu=
blic
> domain all your contributions to PyCrypto, with the following notice?
> 
> =C2=A0=3D=3D=3D=3D=3D=3D=3D=3D=3D=3D=3D=3D=3D=3D=3D=3D=3D=3D=3D=3D=3D=3D=
> Yes, that's fine. Good luck with the new release!

-P
--=20
Paul Swartz
paulswartz at gmail dot com
On Mon, Aug 03, 2009 at 12:13:43PM -0400, Paul Swartz wrote:
> On Sun, Aug 2, 2009 at 9:48 PM, Dwayne C. Litzenberger<dlitz@dlitz.net>
> wrote:
> >> Hi Paul,
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> >> to exercise all rights associated with the contents of this file for
> >> any purpose whatsoever. No rights are reserved.
> >> ==============================================================
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===================================================================

Incorporating the code into commercial products is permitted; you do not have to make source available or contribute your changes back (though that would be nice).

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=======================================================================

Regards,
- Dwayne

--
Dwayne C. Litzenberger <dlitz@dlitz.net>

Key-signing key   - 19E1 1FE8 B3CF F273 ED17  4A24 928C EC13 39C2 5CF7

From joris@bontje.nl Tue May  5 03:08:32 2009
X-Maildir-Dup-Checked: Yes
Return-Path: <joris@bontje.nl>
X-Original-To: dwon@rivest.dlitz.net
Delivered-To: dwon@rivest.dlitz.net
Received: from goedel.dlitz.net (unknown [10.159.255.6])
    by rivest.dlitz.net (Postfix) with ESMTP id 7AA4B9E5078
    for <dwon@rivest.dlitz.net>; Tue,  5 May 2009 03:08:32 -0400 (EDT)
    Received: from localhost (localhost [127.0.0.1])
        by goedel.dlitz.net (Postfix) with QMQP id 2315B40583
    for <dwon@rivest.dlitz.net>; Tue,  5 May 2009 01:08:32 -0600 (CST)
    Received: (vmailmgr-postfix 16890 invoked by uid 1003); 5 May 2009 07:08:25 -0000
    Received: from qmail06.zonnet.nl (HELO dell062.admin.zonnet.nl) ([10.170.1.123])
        (envelope-sender <joris@bontje.nl>)

Open Source Used In Network Assurance Engine 4.0(1)
4611
Hi Dwayne,

Thanks for taking over the PyCrypto library and putting in the required effort to keep this going.
I was very excited to read that it is now one of the installed libraries for Google AppsEngine!

You have my full permission to dedicate all my contributions to PyCrypto to the public domain with your suggested notice:

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Regards,
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Citeren "Dwayne C. Litzenberger" <dlitz@dlitz.net>:
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==================================================================

Regards,
- Dwayne
Excellent! Thank you!

On Tue, May 05, 2009 at 09:08:25AM +0200, joris@bontje.nl wrote:
> Hi Dwayne,
> 
> Thanks for taking over the PyCrypto library and putting in the required
> effort to keep this going.
> I was very excited to read that it is now one of the installed libraries
> for Google AppsEngine!
> 
> You have my full permission to dedicate all my contributions to PyCrypto to
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> _________________________________________________________________
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any purpose whatsoever. No rights are reserved.

==-------------------------------------------------------------------

> Regards,
> Joris

Citeren "Dwayne C. Litzenberger" <dlitz@dlitz.net>:

>> Hi Joris,
>>
>> I am the new maintainer of the Python Cryptography Toolkit, and I am
>> working on a new release at http://www.pycrypto.org/.
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>> ==-------------------------------------------------------------------
>>
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>> country of residence. This software is provided "as is" without
>> warranty of fitness for use or suitability for any purpose, express
>> or implied. Use at your own risk or not at all.
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Regards,
- Dwayne

--
Dwayne C. Litzenberger <dlitz@dlitz.net>
Key-signing key   - 19E1 1FE8 B3CF F273 ED17  4A24 928C EC13 39C2 5CF7

--

On 23 Nov 2008, at 07:42, Dwayne C. Litzenberger wrote:

For the next PyCrypto release, I would like to take steps to move toward a clearer licensing regime. I am asking as many copyright holders as I can find if I can release PyCrypto under something clearer and more standard. Below, I have quoted a public domain dedication that was recommended in _Intellectual Property and Open Source: A Practical Guide to Protecting Code_, by Van Lindberg. I have already contacted A. M. Kuchling, and he has approved the following dedication for his contributions.

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the extent that dedication to the public domain is not available, everyone is granted a worldwide, perpetual, royalty-free, non-exclusive license to exercise all rights associated with the contents of this file for any purpose whatsoever. No rights are reserved.

In case I haven’t replied to this yet: Yes, this is fine with me.

roby

-----BEGIN PGP SIGNATURE-----
Version: GnuPG v1.4.8 (Darwin)

iEYERcAAAYFAkmZ01gACgkQQQDkKvyJ6cOLvQClQmYYuVODvIlyLg0hgCf19LAbQ  
SH8AoLJgaq1Ii7ZYDc+Cd8VO0xLbr  
=Mv6g
-----END PGP SIGNATURE-----

00INDEX This file LICENSE.org Original (deprecated) license for the Python Cryptography Toolkit LICENSE.libtom LICENSE file from LibTomCrypt stmts/ Statements by contributors

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 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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</tr>
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<td>2001</td>
<td>PSF</td>
<td>yes</td>
</tr>
<tr>
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~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

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3. Replacing some modules with code written from scratch (e.g. the RIPEMD and Blowfish modules were re-implemented from their respective algorithm specifications without reference to the old implementations).

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   crypt@bis.doc.gov
   enc@nsa.gov
   web_site@bis.doc.gov
   pycrypto@lists.dlitz.net
   PYTHON-CRYPTO@NIC.SURFNET.NL
   dlitz@dlitz.net

This certificate was issued at 00:45 (GMT) on Thursday 28 August 2008 with reference 0520978

-----END PGP SIGNED MESSAGE-----
# CAUTION: while the message may well be from the sender
# indicated in the "From:" header, the sender
# has NOT been authenticated by this service
#
# For information about the Stamper service see
# http://www.itconsult.co.uk/stamper.htm
#
# """

SUBMISSION TYPE: TSU
SUBMITTED BY: Dwayne C. Litzenberger
SUBMITTED FOR: Dwayne C. Litzenberger
POINT OF CONTACT: Dwayne C. Litzenberger
PHONE and/or FAX: +1-613-693-1296
MANUFACTURER: n/a
PRODUCT NAME/MODEL #: The Python Cryptography Toolkit ("PyCrypto")
ECCN: 5D002

NOTIFICATION: http://www.pycrypto.org/

Note: I am a Canadian citizen posting software to my website located in Canada. I am not certain whether PyCrypto contains enough US-origin cryptography to be covered by U.S. export controls, but I am submitting this anyway.

(Sorry for spamming the lists, but I want there to be a record of this.)

- --
Dwayne C. Litzenberger <dlitz@dlitz.net>
Key-signing key - 19E1 1FE8 B3CF F273 ED17 4A24 928C EC13 39C2 5CF7
Annual key (2008) - 4B2A FD82 FC7D 9E38 38D9 179F 1C11 B877 E780 4B45

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Charset: noconv
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=3oIX
-----END PGP SIGNATURE-----

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=== EOF ===
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(www.amk.ca)

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=======================================================================

Regards,
- Dwayne

--
Dwayne C. Litzenberger <dlitz@dlitz.net>

From jeethurao@gmail.com Sun Mar 8 17:28:16 2009
X-Maildir-Dup-Checked: Yes
Return-Path: <jeethurao@gmail.com>
X-Original-To: dwon@rivest.dlitz.net
Delivered-To: dwon@rivest.dlitz.net
Received: from goedel.dlitz.net (unknown [10.159.255.6])
by rivest.dlitz.net (Postfix) with ESMTP id 0CC83515D9
for <dwon@rivest.dlitz.net>; Sun,  8 Mar 2009 17:28:16 -0400 (EDT)
Received: from localhost (localhost [127.0.0.1])
by goedel.dlitz.net (Postfix) with QMQP id 4E58F450CB
for <dwon@rivest.dlitz.net>; Sun,  8 Mar 2009 15:28:15 -0600 (CST)
Received: (vmailmgr-postfix 5011 invoked by uid 1003); 8 Mar 2009 15:28:15 -0600
Delivered-To: m-dlitz-dlitz@dlitz.net
Received-SPF: pass (gmail.com ... _spf.google.com: 209.85.198.249 is authorized to use 'jeethurao@gmail.com' in 'mfrom' identity (mechanism 'ip4:209.85.128.0/17' matched)) receiver=goedel.dlitz.net; identity=mfrom; envelope-from="jeethurao@gmail.com"; helo=rv-out-0708.google.com; client-ip=209.85.198.249
Received: from rv-out-0708.google.com (unknown [209.85.198.249])
by goedel.dlitz.net (Postfix) with ESMTP id 3C097449E7
for <dlitz@dlitz.net>; Sun,  8 Mar 2009 15:28:12 -0600 (CST)
Received: by rv-out-0708.google.com with SMTP id k29so1252333rvb.26
for <dlitz@dlitz.net>; Sun, 08 Mar 2009 14:27:56 -0700 (PDT)
DKIM-Signature: v=1; a=rsa-sha256; c=relaxed/relaxed;
d=email.com; s=gamma;
h=domainkey-signature:mime-version:received:in-reply-to:references :date:message-id:subject:from:to:content-type; bh=YWy9U32WCUKsRsQukHwaOZyJQBU4Yvt5mI2O6mI/g=; b=oMjI22lIxYjIKge2zNJW3rRi9LqFXmey5Wp0pL1tuNF+X3duyfhopTuBw7MwVY
Hi Dwayne,

My contribution to pycrypto are very very minimal (The sha256 module, IIRC). I'd be fine with the public domain license for PyCrypto.

Jeethu Rao

PS: Apologies for the delay in my response. I don't really check this email address all that often, please direct any further correspondence to jeethu@jeethurao.com

On Sun, Mar 1, 2009 at 9:54 AM, Dwayne C. Litzenberger <dlitz@dlitz.net> wrote:

> Hi Jeethu,
> 
> I am the new maintainer of the Python Cryptography Toolkit, and I am working on a new release at http://www.pycrypto.org/.
> 
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Dwayne C. Litzenberger <dlitz@dlitz.net>
Key-signing key - 19E1 1FE8 B3CF F273 ED17 4A24 928C EC13 39C2 5CF7

--
Jeethu Rao
Hi Dwayne,<br>My contribution to pycrypto are very very minimal (The sha256 module, IIRC).<br>I'd be fine with the public domain license for PyCrypto.<br>Jeethu Rao<br>PS: Apologies for the delay in my response.<br>I don't really check this email address all that often.<br>Please direct any further correspondence to jeethu@jeethurao.com<br>Jeethu Rao<br>On Sun, Mar 1, 2009 at 9:54 AM, Dwayne C. Litzenberger wrote:<br>I am the new maintainer of the Python Cryptography Toolkit, and I am working on a new release at http://www.pycrypto.org/. People often ask me what license PyCrypto is covered by, if it's GPL-compatible, etc. Right now, I'm not really sure what to tell them. The text in the current LICENSE file (quoted below) is not entirely clear on the point of whether distributing modified versions is allowed. (It says "distribute and use", but not "modify"). People often ask me what license PyCrypto is covered by, if it's GPL-compatible, etc. Right now, I'm not really sure what to tell them. The text in the current LICENSE file (quoted below) is not entirely clear on the point of whether distributing modified versions is allowed. (It says "distribute and use", but not "modify").

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-Dwayne

--
Dwayne C. Litzenberger <<a href=mailto:dlitz@dlitz.net" target="_blank">dlitz@dlitz.net</a>><br>
39C2 5CF7<br>

--000e0cd209d0e5a3d40464a23054--

1.302 pyxattr 0.5.1 :5.el7
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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.

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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.

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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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(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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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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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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concluded that weaker conditions might promote sharing better.

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1.311 rsync 3.1.2 :4.el7

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 */

package org.slf4j;

import org.slf4j.helpers.BasicMarkerFactory;
import org.slf4j.helpers.Util;
import org.slf4j.impl.StaticMarkerBinder;

/**
 * MarkerFactory is a utility class producing [@link Marker] instances as
 * appropriate for the logging system currently in use.
 *
 * <p>
 * This class is essentially implemented as a wrapper around an
 * [@link IMarkerFactory] instance bound at compile time.
 * 
 * <p>
 * Please note that all methods in this class are static.
 * 
 * @author Ceki G\uuml;lç\uuml;
 */
public class MarkerFactory {
    static IMarkerFactory markerFactory;

    private MarkerFactory() {
    }

    static {
        try {
            markerFactory = StaticMarkerBinder.SINGLETON.getMarkerFactory();
        } catch (NoClassDefFoundError e) {
            markerFactory = new BasicMarkerFactory();
        } catch (Exception e) {
            // we should never get here
            Util.report("Unexpected failure while binding MarkerFactory", e);
        }
    }

    /**
     * Return a Marker instance as specified by the name parameter using the
     * previously bound [IMarkerFactory] instance.
     *
     * @param name
     *          The name of the [Marker] object to return.
     * @return marker
     */
    public static Marker getMarker(String name) {
        return markerFactory.getMarker(name);
    }

    /**
     * Create a marker which is detached (even at birth) from the MarkerFactory.
     *
     * @param name the name of the marker
     * @return a dangling marker
     * @since 1.5.1
     */
    public static Marker getDetachedMarker(String name) {
        return markerFactory.getDetachedMarker(name);
    }

    /**
     * Return the [IMarkerFactory] instance in use.
     *
     * <p>The IMarkerFactory instance is usually bound with this class at
     * compile time.
     *
     * @return the IMarkerFactory instance in use
     */
    public static IMarkerFactory getMarkerFactory() {
        return markerFactory;
    }
}
public static IMarkerFactory getIMarkerFactory() {
    return markerFactory;
}

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The following list of people, sorted by last name, have contributed code or patches to this implementation of sudo since I began maintaining it in 1993. This list is known to be incomplete--if you believe you should be listed, please send a note to sudo@sudo.ws.

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
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 Y.
Libby, Kendall
Lobbes, 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
Miller, Dworkin
Nieusma, Jeff
Nikitser, Peter A.
Nussel, Ludwig
Ouellet, Jean-Philippe
Paquet, Eric
Paradis, Chantal
Percival, Ted
Perera, Andres
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
Ryabinkin, Eygene
SATO, Yuichi
Sánchez, Wilfredo
Saucier, Jean-Francois
Schoenfeld, Patrick
Schuring, Arno
Schwarze, Ingo
Scott, Dougal
Sieger, Nick
Simon, Thor Lancelot
Slemko, Marc
Smith, Andy
Sobrado, Igor
Soulen, Steven
Spangler, Aaron
Spradling, Cloyce D.
Stier, Matthew
Stoeckmann, Tobias
Street, Russell
Stritzky, Tilo
Stroucken, Michael
Tarrall, Robert
Thomas, Matthew
Todd, Giles
Toft, Martin
Torek, Chris
Tucker, Darren
Uhl, Robert
Uzel, Petr
Valery, Reznic
Van Dinter, Theo
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:

Blittermann, Mario
Bogusz, Jakub
Casagrande, Milo
Castro, Felipe
Cho, Seong-ho
Chornoivan, Yuri
Diguez, Francisco
Ferreira, Rafael
Garca-Fontes, Walter
Gezer, Volkan
Hamasaki, Takeshi
Hamming, Peter
Hansen, Joe
Hantrais, Frederic
Hein, Jochen
Huflhammer, Karl Ove
Jerovek, Damir
Karvonen, Jorma
Kazik, Duan
Kelemen, Gbor
Koir, Klemen
Kozlov, Yuri
Kramer, Jakob
Krznar, Tomislav
Marchal, Frederic
Margevicius, Algimantas
Maryanov, Pavel
Nikoli, Miroslav
Nylander, Daniel
Psa, Petr
Qun, Tng Ngc
Regueiro, Leandro
Sarer, zgr
Sendn, Abel
Sikrom, ka
Spingos, Dimitris
Taniguchi, Yasuaki
Uranga, Mikel Olasagasti
1.329 sysfsutils 2.1.0 :16.el7

1.329.1 Available under license:

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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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1.330 sysstat 10.1.5 :17.el7

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The of the start-stop-daemon

* A rewrite of the original Debian’s start-stop-daemon Perl script
* in C (faster - it is executed many times during system startup).
* Written by Marek Michalkiewicz <marekm@i17linuxb.ists.pwr.wroc.pl>,
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Also add information on how to contact you by electronic and paper mail.

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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

That's all there is to it!
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LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT
(INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE
USE OF THIS SOFTWARE, EVEN IF NOT ADVISED OF THE POSSIBILITY OF SUCH
DAMAGE.

Initialize empty image
f1c9645dbc14efddc7d8a322685f26eb bsd.img
Create new DOS partition table
57e721e38d1266c2df055067c18f2c9 bsd.img

---layout--------
__ts_dev__: 10 MB, 10485760 bytes, 20480 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: dos
Disk identifier: 0x00000001

Device Boot Start End Blocks Id System
------------------

Create 1st primary partition
ada64ace122978d00d1d1c0e5ee45d26 bsd.img

---layout--------
__ts_dev__: 10 MB, 10485760 bytes, 20480 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: dos
Disk identifier: 0x00000001

Device Boot Start End Blocks Id System
__ts_dev__1 2048 4095 1024 83 Linux
------------------

Create 2st primary partition
1bebfb87248e05d6e4e62b749da65d023 bsd.img
Set 2nd partition type
2d8e8df51a88a045db233418dd73fbd bsd.img

---layout--------
__ts_dev__: 10 MB, 10485760 bytes, 20480 sectors
Units = sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disk label type: dos
Disk identifier: 0x00000001

<table>
<thead>
<tr>
<th>Device</th>
<th>Boot</th>
<th>Start</th>
<th>End</th>
<th>Blocks</th>
<th>Id</th>
<th>System</th>
</tr>
</thead>
<tbody>
<tr>
<td>__ts_dev__1</td>
<td></td>
<td>2048</td>
<td>4095</td>
<td>1024</td>
<td>83</td>
<td>Linux</td>
</tr>
<tr>
<td>__ts_dev__2</td>
<td></td>
<td>4096</td>
<td>20479</td>
<td>8192</td>
<td>a5</td>
<td>FreeBSD</td>
</tr>
</tbody>
</table>

Create default BSD
2e1cee529cb59c9341afe0443f196a1 bsd.img

---layout--------

Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

Command (m for help):

BSD disklabel command (m for help):
4 partitions:
#  start  end  size  fstype  [fs size bsize cpg]
c:  4096  20479  16384  unused  0 0
d:   0   16064  16065  unused  0 0

BSD disklabel command (m for help):
Command (m for help):

-------------------

b5c121c2091b2ff26b880551feac7112 bsd.img

---layout--------

Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

Command (m for help):

BSD disklabel command (m for help):
4 partitions:
#  start  end  size  fstype  [fs size bsize cpg]
a:  4096   6144  2049  4.2BSD   0 0 0
c:  4096  20479  16384  unused  0 0
d:   0  16064  16065  unused  0 0

BSD disklabel command (m for help):
Command (m for help):

-------------------
Changes will remain in memory only, until you decide to write them. Be careful before using the write command.

Command (m for help):

BSD disklabel command (m for help):
0 unused 5 4.1BSD 9 4.4LFS d boot
1 swap 6 Eighth Edition a unknown e ADOS
2 Version 6 7 4.2BSD b HPFS f HFS
3 Version 7 8 MS-DOS c ISO-9660 10 AdvFS
4 System V

BSD disklabel command (m for help):
size: 8388608, sector size: 512, PT: dos, offset: 446, id=0x8f8378c0
---
#1: 32 7648 0x83
#2: 7680 8704 0xa5
#5: 7936 4864 0x7 (freebsd)
#6: 12544 3584 0x7 (freebsd)

1.342 vim 7.4.160 :5.el7
1.342.1 Available under license:

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    Voice phone:   (33) 93.65.77.71, Fax: (33) 93 65 77 66, Telex: 97 00 50 F
*uganda.txt*    For Vim version 7.4.  Last change: 2013 Jul 06

VIM REFERENCE MANUAL   by Bram Moolenaar

*uganda*   *Uganda*   *copying*   *copyright*   *license*
SUMMARY
*iicf*   *ICCF*
Vim is Charityware. You can use and copy it as much as you like, but you are
couraged to make a donation for needy children in Uganda. Please see |kcc|
below or visit the ICCF web site, available at these URLs:

http://iccf-holland.org/
http://www.vim.org/iccf/
http://www.iccf.nl/

You can also sponsor the development of Vim. Vim sponsors can vote for
features. See |sponsor|. The money goes to Uganda anyway.

The Open Publication License applies to the Vim documentation, see
[manual-copyright].

=== begin of license ===

VIM LICENSE

I) There are no restrictions on distributing unmodified copies of Vim except
that they must include this license text. You can also distribute
unmodified parts of Vim, likewise unrestricted except that they must
include this license text. You are also allowed to include executables
that you made from the unmodified Vim sources, plus your own usage
examples and Vim scripts.

II) It is allowed to distribute a modified (or extended) version of Vim,
including executables and/or source code, when the following four
conditions are met:
1) This license text must be included unmodified.
2) The modified Vim must be distributed in one of the following five ways:
   a) If you make changes to Vim yourself, you must clearly describe in
      the distribution how to contact you. When the maintainer asks you
      (in any way) for a copy of the modified Vim you distributed, you
      must make your changes, including source code, available to the
      maintainer without fee. The maintainer reserves the right to
      include your changes in the official version of Vim. What the
      maintainer will do with your changes and under what license they
      will be distributed is negotiable. If there has been no negotiation
      then this license, or a later version, also applies to your changes.
      The current maintainer is Bram Moolenaar <Bram@vim.org>. If this
      changes it will be announced in appropriate places (most likely
      vim.sf.net, www.vim.org and/or comp.editors). When it is completely
      impossible to contact the maintainer, the obligation to send him
      your changes ceases. Once the maintainer has confirmed that he has
      received your changes they will not have to be sent again.
   b) If you have received a modified Vim that was distributed as
      mentioned under a) you are allowed to further distribute it
      unmodified, as mentioned at I). If you make additional changes the
      text under a) applies to those changes.
   c) Provide all the changes, including source code, with every copy of
      the modified Vim you distribute. This may be done in the form of a
      context diff. You can choose what license to use for new code you
      add. The changes and their license must not restrict others from
      making their own changes to the official version of Vim.
   d) When you have a modified Vim which includes changes as mentioned
      under c), you can distribute it without the source code for the
      changes if the following three conditions are met:
      - The license that applies to the changes permits you to distribute
        the changes to the Vim maintainer without fee or restriction, and
        permits the Vim maintainer to include the changes in the official
        version of Vim without fee or restriction.
      - You keep the changes for at least three years after last
        distributing the corresponding modified Vim. When the maintainer
        or someone who you distributed the modified Vim to asks you (in
        any way) for the changes within this period, you must make them
        available to him.
      - You clearly describe in the distribution how to contact you. This
        contact information must remain valid for at least three years
        after last distributing the corresponding modified Vim, or as long
        as possible.
   e) When the GNU General Public License (GPL) applies to the changes,
      you can distribute the modified Vim under the GNU GPL version 2 or
      any later version.
3) A message must be added, at least in the output of the ":version"
   command and in the intro screen, such that the user of the modified Vim
   is able to see that it was modified. When distributing as mentioned
under 2)e) adding the message is only required for as far as this does not conflict with the license used for the changes.

4) The contact information as required under 2)a) and 2)d) must not be removed or changed, except that the person himself can make corrections.

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IV) It is not allowed to remove this license from the distribution of the Vim sources, parts of it or from a modified version. You may use this license for previous Vim releases instead of the license that they came with, at your option.

=== end of license ===

Note:

- If you are happy with Vim, please express that by reading the rest of this file and consider helping needy children in Uganda.

- If you want to support further Vim development consider becoming a sponsor. The money goes to Uganda anyway.

- According to Richard Stallman the Vim license is GNU GPL compatible. A few minor changes have been made since he checked it, but that should not make a difference.

- If you link Vim with a library that goes under the GNU GPL, this limits further distribution to the GNU GPL. Also when you didn't actually change anything in Vim.

- Once a change is included that goes under the GNU GPL, this forces all further changes to also be made under the GNU GPL or a compatible license.

- If you distribute a modified version of Vim, you can include your name and contact information with the "--with-modified-by" configure argument or the MODIFIED_BY define.

==============================================================================

Kibaale Children's Centre	*kcc* *Kibaale* *charity*

Kibaale Children's Centre (KCC) is located in Kibaale, a small town in the
south of Uganda, near Tanzania, in East Africa. The area is known as Rakai District. The population is mostly farmers. Although people are poor, there is enough food. But this district is suffering from AIDS more than any other part of the world. Some say that it started there. Estimations are that 10 to 30% of the Ugandans are infected with HIV. Because parents die, there are many orphans. In this district about 60,000 children have lost one or both parents, out of a population of 350,000. And this is still continuing.

The children need a lot of help. The KCC is working hard to provide the needy with food, medical care and education. Food and medical care to keep them healthy now, and education so that they can take care of themselves in the future. KCC works on a Christian base, but help is given to children of any religion.

The key to solving the problems in this area is education. This has been neglected in the past years with president Idi Amin and the following civil wars. Now that the government is stable again, the children and parents have to learn how to take care of themselves and how to avoid infections. There is also help for people who are ill and hungry, but the primary goal is to prevent people from getting ill and to teach them how to grow healthy food.

Most of the orphans are living in an extended family. An uncle or older sister is taking care of them. Because these families are big and the income (if any) is low, a child is lucky if it gets healthy food. Clothes, medical care and schooling is beyond its reach. To help these needy children, a sponsorship program was put into place. A child can be financially adopted. For a few dollars a month KCC sees to it that the child gets indispensable items, is healthy, goes to school and KCC takes care of anything else that needs to be done for the child and the family that supports it.

Besides helping the child directly, the environment where the child grows up needs to be improved. KCC helps schools to improve their teaching methods. There is a demonstration school at the centre and teacher trainings are given. Health workers are being trained, hygiene education is carried out and households are stimulated to build a proper latrine. I helped setting up a production site for cement slabs. These are used to build a good latrine. They are sold below cost price.

There is a small clinic at the project, which provides children and their family with medical help. When needed, transport to a hospital is offered. Immunization programs are carried out and help is provided when an epidemic is breaking out (measles and cholera have been a problem).

Summer 1994 to summer 1995 I spent a whole year at the centre, working as a volunteer. I have helped to expand the centre and worked in the area of water and sanitation. I learned that the help that the KCC provides really helps. When I came back to Holland, I wanted to continue supporting KCC. To do this I'm raising funds and organizing the sponsorship program. Please consider one
of these possibilities:

1. Sponsor a child in primary school: 17 euro a month (or more).
2. Sponsor a child in secondary school: 25 euro a month (or more).
3. Sponsor the clinic: Any amount a month or quarter
4. A one-time donation

Compared with other organizations that do child sponsorship the amounts are very low. This is because the money goes directly to the centre. Less than 5% is used for administration. This is possible because this is a small organization that works with volunteers. If you would like to sponsor a child, you should have the intention to do this for at least one year.

How do you know that the money will be spent right? First of all you have my personal guarantee as the author of Vim. I trust the people that are working at the centre, I know them personally. Further more, the centre has been co-sponsored and inspected by World Vision, Save the Children Fund and is now under the supervision of Pacific Academy Outreach Society. The centre is visited about once a year to check the progress (at our own cost). I have visited the centre myself many times, starting in 1993. The visit reports are on the ICCF web site.

If you have any further questions, send me e-mail: <Bram@vim.org>.

The address of the centre is:
Kibaale Children's Centre
p.o. box 1658
Masaka, Uganda, East Africa

Sending money:*iccf-donations*

Check the ICCF web site for the latest information! See [iccf] for the URL.

USA: The methods mentioned below can be used.
Sending a check to the Nehemiah Group Outreach Society (NGOS) is no longer possible, unfortunately. We are looking for another way to get you an IRS tax receipt.
For sponsoring a child contact KCF in Canada (see below). US checks can be sent to them to lower banking costs.

Canada: Contact Kibaale Children's Fund (KCF) in Surrey, Canada. They take care of the Canadian sponsors for the children in Kibaale. KCF forwards 100% of the money to the project in Uganda. You can send them a one time donation directly. Please send me a note so that I know what has been donated because of Vim. Ask KCF for information about sponsorship.
Kibaale Children's Fund c/o Pacific Academy Outreach Society
If you make a donation to Kibaale Children's Fund (KCF) you will receive a tax receipt which can be submitted with your tax return.

Holland: Transfer to the account of "Stichting ICCF Holland" in Lisse. This will allow for tax deduction if you live in Holland.
Postbank, nr. 4548774
IBAN: NL95 INGB 0004 5487 74

Germany: It is possible to make donations that allow for a tax return. Check the ICCF web site for the latest information:
http://iccf-holland.org/germany.html

World: Use a postal money order. That should be possible from any country, mostly from the post office. Use this name (which is in my passport): "Abraham Moolenaar". Use Euro for the currency if possible.

Europe: Use a bank transfer if possible. Your bank should have a form that you can use for this. See "Others" below for the swift code and IBAN number.
Any other method should work. Ask for information about sponsorship.

Credit Card: You can use PayPal to send money with a Credit card. This is the most widely used Internet based payment system. It's really simple to use. Use this link to find more info:
The e-mail address for sending the money to is:
Bram@iccf-holland.org
For amounts above 400 Euro ($500) sending a check is preferred.

Others: Transfer to one of these accounts if possible:
Postbank, account 4548774
Swift code: INGB NL 2A
IBAN: NL95 INGB 0004 5487 74
under the name "stichting ICCF Holland", Lisse
If that doesn't work:
Rabobank Lisse, account 3765.05.117
Swift code: RABO NL 2U
under the name "Bram Moolenaar", Lisse
Otherwise, send a check in euro or US dollars to the address below. Minimal amount: $70 (my bank does not accept smaller
Address to send checks to:
Bram Moolenaar
Finsterruethof 1
8134 Adliswil
Switzerland

This address is expected to be valid for a long time.

if version < 600
  " Remove any old syntax stuff hanging around
  syn clear
elseif exists("b:current_syntax")
  finish
endif

" Product specification files are case sensitive
syn case match

syn keyword psfObject bundle category control_file depot distribution
syn keyword psfObject end file filesset host installed_software media
syn keyword psfObject product root subproduct vendor

syn match  psfUnquotString +[^"# ][^#]*+ contained
syn region psfQuotString  start=+"+ skip=+"+ end=+"+ contained

syn match  psfObjTag    \[-_+A-Z0-9a-z]+\-\[-_+A-Z0-9a-z]+\) contained
syn match  psfAttAbbrev  ".\<\(fa\|fr\|aclqrv\)\)<\k<="|>=|=|=|=|>=="|>=="|>==" contained
syn match  psfObjTags    \<\-\[-_+A-Z0-9a-z]+\-\[-_+A-Z0-9a-z]+\)+\(\s\+\[-\[-_+A-Z0-9a-z]+\-\[-_+A-Z0-9a-

z]+\)+\) contained

syn match  psfNumber    \d+ contained
syn match  psfFloat     \d+\.(\d+)* contained

syn match  psfLongDate  "\\d{4}\d{2}\d{2}\d{2}\d{2}\d{2}" contained

syn keyword psfState    available configured corrupt installed transient contained
syn keyword psfPState   applied committed superseded contained

syn keyword psfBoolean  false true contained
"Some of the attributes covered by attUnquotString and attQuotString:
" architecture category_tag control_directory copyright
" create_date description directory file_permissions install_source
" install_type location machine_type mod_date number os_name os_release
" os_version pose_as_os_name pose_as_os_release readme revision
" share_link title vendor_tag

syn region psfAttUnquotString matchgroup=psfAttrib start="^\s*[^# \t\n]+[^#\"\t\n]+" rs=e-1
contains=psfUnquotString,psfComment end="$" keepend oneline

syn region psfAttQuotString matchgroup=psfAttrib start="^\s*[^# \t\n]+\"" rs=e-1
contains=psfQuotString,psfComment skip="\\\"" matchgroup=psfQuotString end="\"" keepend

" These regions are defined in attempt to do syntax checking for some
" of the attributes.
syn region psfAttTag matchgroup=psfAttrib start="^\s*tag\s\+" contains=psfObjTag,psfComment end="$" keepend oneline

syn region psfAttSpec matchgroup=psfAttrib
start="^\s*(ancestor\|applied_patches\|applied_to\|contents\|corequisites\|exrequisites\|prerequisites\|software_spec\|
supersedes\|superseded_by\|\s\+" contains=psfObjTag,psfAttAbbrev,psfComment end="$" keepend

syn region psfAttTags matchgroup=psfAttrib start="^\s*all_filesets\s\+" contains=psfObjTags,psfComment end="$" keepend

syn region psfAttNumber matchgroup=psfAttrib
start="^\s*(compressed_size\|instance_id\|media_sequence_number\|sequence_number\|size)\s\+" contains=psfNumber,psfComment end="$" keepend oneline

syn region psfAttTime matchgroup=psfAttrib
start="^\s*(create_time\|ctime\|mod_time\|mtime\|timestamp)\s\+" contains=psfNumber,psfComment end="$" keepend oneline

syn region psfAttFloat matchgroup=psfAttrib
start="^\s*(data_model_revision\|layout_version)\s\+" contains=psfFloat,psfComment end="$" keepend oneline

syn region psfAttLongDate matchgroup=psfAttrib
start="^\s*install_date\s\+" contains=psfLongDate,psfComment end="$" keepend oneline

syn region psfAttState matchgroup=psfAttrib
start="^\s*(state)\s\+" contains=psfState,psfComment end="$" keepend oneline

syn region psfAttPState matchgroup=psfAttrib
start="^\s*(patch_state)\s\+" contains=psfPState,psfComment end="$" keepend oneline

syn region psfAttBoolean matchgroup=psfAttrib
start="^\s*(is_kernel\|is_locatable\|is_patch\|is_protected\|is_reboot\|is_reference\|is_secure\|is_sparse)\s\+"
contains=psfBoolean,psfComment end="$" keepend oneline

syn match psfComment "#.*$"

" Define the default highlighting.
" For version 5.7 and earlier: only when not done already
" For version 5.8 and later: only when an item doesn't have highlighting yet
if version >= 508 || !exists("did_psf_syntax_inits")
if version < 508
  let did_psf_syntax_inits = 1
  command -nargs=+ HiLink hi link <args>
else
  command -nargs=+ HiLink hi def link <args>
endif
endif

HiLink psfObject    Statement
HiLink psfAttrib    Type
HiLink psfQuotString    String
HiLink psfObjTag     Identifier
HiLink psfAttAbbrev  PreProc
HiLink psfObjTags    Identifier

HiLink psfComment   Comment

delcommand HiLink
endif

" Long descriptions and copyrights confuse the syntax highlighting, so
" force vim to backup at least 100 lines before the top visible line
" looking for a sync location.
syn sync lines=100

let b:current_syntax = "psf"

1.343 virt-what 1.18 :4.el7

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1.348 yajl 2.0.4 :4.el7

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1.349 yum 3.4.3 :158.el7.centos

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diff -up yum-3.4.3/yum/update_md.py.org yum-3.4.3/yum/update_md.py
--- yum-3.4.3/yum/update_md.py.org 2017-01-24 18:55:03.529842775 +0100
@@ -58,7 +58,7 @@ class UpdateNotice(object):
     A single update notice (for instance, a security fix).
     
-    def __init__(self, elem=None):
+    def __init__(self, elem=None, repoid=None, vlogger=None):
        self._md = {
            'from' : '',
            'type' : '',
@@ -83,6 +83,9 @@ class UpdateNotice(object):
             self._repoid = repoid
             self._vlogger = vlogger
         
@@ -103,6 +106,24 @@ class UpdateNotice(object):
             if elem:
                 self._parse(elem)

+    def _repoid = repoid
+    self._vlogger = vlogger
+
+    def __getitem__(self, item):
+        """ Allows scriptable metadata access (ie: un['update_id']). ""
+        if type(item) is int:
@@ -103,6 +106,24 @@ class UpdateNotice(object):
             # Tests to see if it's "the same data", which means that the
             # packages can be different (see add_notice).
def _rid(un):
    if hasattr(un, '_repoid') and un._repoid is not None:
        return un._repoid
    else:
        return '<unknown>'

def _log_failure(data):
    '''Log the mismatched data similarly to conflict markers in git.'''
    if self._vlogger is None:
        return
    msg = _('%s differs in some fields:
')
    msg += '<<<<<<< %s:%s
' % (_rid(other), data)
    msg += '%r
=======
%r
' % (other._md[data], self._md[data])
    msg += '>>>>>>> %s:%s' % (_rid(self), data)
    # --verbose mode enables this
    self._vlogger.log(logging.DEBUG_3, msg)

if not other or not hasattr(other, '_md'):
    return False

if data == 'status':  # FIXME: See below...
    continue
if self._md[data] != other._md[data]:
    _log_failure(data)
    return False

if self._md[data] not in ('stable', 'testing'):
    _log_failure(data)
    return False
if other._md[data] not in ('stable', 'testing'):
    _log_failure(data)
    return False

    # They are both really "stable" ...
    self._md[data] = 'stable'

for event, elem in safe_iterparse(infile, logger=self._logger):
    if elem.tag == 'update':
        try:
            if elem.tag == 'update':
                un = UpdateNotice(elem)
                un = UpdateNotice(elem, repoid, self._vlogger)
            except UpdateNoticeException, e:
                msg = _("An update notice%s is broken, skipping.") % _rid(repoid)
                }
if self._vlogger:
@@ -587,6 +611,8 @@ class UpdateMetadata(object):
msg = _("Update notice %s%s is broken, or a bad duplicate, skipping.") % (un['update_id'],
_rid(repoid))
if not have_dup:
msg += _('\nYou should report this problem to the owner of the %srepository.') % _rid(repoid, "%s ")
+
msg += _('\nIf you are the owner, consider re-running the same command with --verbose to see the '
+
'exact data that caused the conflict.')
have_dup = True
if self._vlogger:
self._vlogger.warn("%s", msg)
diff --git a/yum/update_md.py b/yum/update_md.py
--- a/yum/update_md.py2015-01-19 07:44:35.567107008 -0500
@@ -398,6 +399,9 @@ class UpdateMetadata(object):
except Errors.RepoMDError:
continue # No metadata found for this repo
+
+
+

self.arch_storage = ArchStorage()
self.archlist = self.arch_storage.archlist

def get_notices(self, name=None):
""" Return all notices. """
if name is None:
@@ -434,16 +438,29 @@ class UpdateMetadata(object):
name = oldpkgtup[0]
arch = oldpkgtup[1]
ret = []
+
other_arch_list = []
+
notices = set()
for notice in self.get_notices(name):
for upkg in notice['pkglist']:
for pkg in upkg['packages']:
+
other_arch = False
if pkg['name'] != name or pkg['arch'] != arch:
continue
+
if (notice not in notices and pkg['name'] == name and pkg['arch'] in self.archlist):
+
other_arch = True
+
else:
+
continue
pkgtup = (pkg['name'], pkg['arch'], pkg['epoch'] or '0',
pkg['version'], pkg['release'])
if _rpm_tup_vercmp(pkgtup, oldpkgtup) <= 0:
continue
ret.append((pkgtup, notice))
+
if other_arch:
+
other_arch_list.append((pkgtup, notice))
+
else:

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5094


ret.append((pkgtup, notice))
notices.add(notice)
for pkgtup, notice in other_arch_list:
    if notice not in notices:
        ret.append((pkgtup, notice))
ret.sort(cmp=_rpm_tup_vercmp, key=lambda x: x[0], reverse=True)
return ret

diff -up yum-3.4.3/yum/update_md.py.old yum-3.4.3/yum/update_md.py
+++ yum-3.4.3/yum/update_md.py 2015-05-28 19:24:05.971806965 +0200
@@ -33,6 +33,7 @@
 import logginglevels
+from rpmUtils.arch import ArchStorage

def safe_iterparse(filename, logger=None):
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https://jersey.dev.java.net/
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