

line

To identify a specific line for configuration and enter line configuration collection mode, use the **line** command in global configuration mode.

line [**aux** | **console** | **tty** | **vty**] *line-number* [*ending-line-number*]

Syntax Description

aux	(Optional) Auxiliary EIA/TIA-232 DTE port. Must be addressed as relative line 0. The auxiliary port can be used for modem support and asynchronous connections.
console	(Optional) Console terminal line. The console port is DCE.
tty	(Optional) Standard asynchronous line.
vty	(Optional) Virtual terminal line for remote console access.
<i>line-number</i>	Relative number of the terminal line (or the first line in a contiguous group) that you want to configure when the line type is specified. Numbering begins with zero.
<i>ending-line-number</i>	(Optional) Relative number of the last line in a contiguous group that you want to configure. If you omit any keyword, then <i>line-number</i> and <i>ending-line-number</i> are absolute rather than relative line numbers.

Defaults

There is no default line.

Command Modes

Global configuration

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

You can address a single line or a consecutive range of lines with the **line** command. A line number is necessary, though, and you will receive an error message if you forget to include it.

Entering the **line** command with the optional line type (**aux**, **console**, **tty**, or **vty**) designates the line number as a relative line number. For example, to configure line parameters for line 7 (a TTY line), you could enter the following:

```
line tty 7
```

You also can use the **line** command without specifying a line type. In this case, the line number is treated as an absolute line number. For example, to configure line parameters for line 5, which can be of any type, you could enter the following:

```
line 5
```

Absolute line numbers increment consecutively and can be difficult to manage on large systems. Relative line numbers are a shorthand notation used in configuration. Internally, the Cisco IOS software uses absolute line numbers. You cannot use relative line numbers everywhere, but you can use absolute line numbers everywhere.

The absolute line number of the auxiliary port is 1. The relative line number of the auxiliary port is 0. See the **modem** line configuration command to set up modem support on the auxiliary port.

The software keeps a table of absolute and relative line numbers that you can display with the **show users all EXEC** command. A sample display follows:

```
Router> show users all
```

Line	User	Host(s)	Idle	Location
0 con 0				con2 console
1 tty 1				Engineering printer
2 tty 2				
3 tty 3		HOST1	1:07	Employee1 x1111
4 tty 4				Console E3-D
5 tty 5				Mkt. demo area
6 tty 6				
7 tty 7		HOST1	14	Employee2 x1112
10 tty 10				
.				
.				
135 tty 135				
136 tty 136				
137 tty 137				rp4-printer
140 tty 140				Braille printer
141 aux 0				
142 vty 0	User1	idle		ROUTER-MAC.CISCO.COM
143 vty 1	User2	idle	0	HOST1.CISCO.COM
144 vty 2				
145 vty 3				
146 vty 4				
147 vty 5				

The absolute line numbers are listed at the far left, followed by the line type, and then the relative line number. Relative line numbers always begin numbering at zero and define the type of line. Addressing the second virtual terminal line as line VTY 1, for example, is easier than remembering it as line 143—its absolute line number.

The line types are ranked as follows in the line table:

1. Console 0 (con 0)
2. Standard asynchronous line (TTY)
3. Auxiliary port (aux)
4. Virtual terminal line (VTY)
5. Printer

The terminal from which you locally configure the router is attached to the console port. To configure line parameters for the console port, enter the following:

```
line console 0
```

The console relative line number must be 0.

Virtual terminal lines are used to allow remote access to the router. A virtual terminal line is not associated with either the auxiliary or console port. The router has five virtual terminal lines by default. However, you can create additional virtual terminal lines as described in the chapter “Configuring Protocol Translation and Virtual Asynchronous Devices” in the *Cisco IOS Terminal Services Configuration Guide*.

Configuring the console port or virtual terminal lines allows you to perform such tasks as setting communication parameters, specifying autobaud connections, and configuring terminal operating parameters for the terminal you are using.

Examples

The following example starts configuration for virtual terminal lines 0 to 4:

```
line vty 0 4
```

In the following example, the user creates and configures the maximum 100 virtual terminal lines with the **no login** command:

```
line vty 0 99
no login
```

In the following example, the user eliminates virtual terminal line number 5 and all higher-numbered virtual terminal lines. Only virtual terminal lines 0 to 4 will remain.

```
no line vty 5
```

In the following example, the user configures console line 0, auxiliary line 0, and virtual terminal lines 0 to 4:

```
line vty 0 4
login
line console 0
password secretWord
line aux 0
password Mypassword
no exec
access-class 1 in
speed 19200
line vty 0
exec-timeout 0 0
password Mypassword
line vty 1
exec-timeout 0 0
password Mypassword
line vty 2
exec-timeout 0 0
password Mypassword
line vty 3
password Mypassword
line vty 4
password Mypassword
```

Related Commands

Command	Description
show line	Displays the parameters of a terminal line.
show users	Displays information about the active lines on the router.

login (EXEC)

To change a login username, use the **login** command in EXEC mode.

login

Syntax Description This command has no arguments or keywords.

Command Modes EXEC

Release	Modification
10.0	This command was introduced.

Usage Guidelines

You can change a login username if you must match outgoing access list requirements or other login prompt requirements.

When you enter this command, the Cisco IOS software prompts you for a username and password. Enter the new username and the original password. If the username does not match, but the password does, the Cisco IOS software updates the session to the new username with which the **login** command attempt was made.

If no username and password prompts appear when you enter this command, the network administrator did not specify that a username and password be required at login time. If both the username and password are entered correctly, the session becomes associated with the specified username.

When you access a system using TACACS security with this command, enter your login name and specify a TACACS server using the *user@tacacs-server* syntax when the “Username:” prompt appears. The TACACS server must be one of those defined in a Cisco IOS software configuration file. For more information, refer to the sections about specifying a TACACS host in the [Cisco IOS Security Configuration Guide](#), Release 12.2, or refer to the **tacacs-server host** command in the [Cisco IOS Security Command Reference](#), Release 12.2.

If you do not specify a host, the Cisco IOS software tries each of the TACACS servers in the list until it receives a response.

If you do specify a host that does not respond, no other TACACS server is queried. The Cisco IOS software will deny access or function according to the action specified by the **tacacs-server last-resort** command, if one is configured.

If you specified a TACACS server host with the *user@tacacs-server* command, the TACACS server specified will be used for all subsequent authentication or notification queries, with the possible exception of Serial Line Internet Protocol (SLIP) address queries.

Examples

The following example shows how login usernames and passwords can be changed. In this example, a user currently logged in under the username user1 attempts to change that login name to user2. After entering the **login** command, the user enters the new username, but enters an incorrect password. Because the password does not match the original password, the system rejects the attempt to change the username.

■ login (EXEC)

```
Router> login
Username: user2
Password:
% Access denied
Still logged in as "user1"
```

Next, the user attempts the login change again, with the username user2, but enters the correct (original) password. This time the password matches the current login information, the login username is changed to user2, and the user is allowed access to the EXEC at the user level.

```
Router> login
Username: user2
Password:
Router>
```

Related Commands

Command	Description
line-power	Sets up a temporary password on a line.
lockable	Enables the lock EXEC command.

login (line)



Note

This command cannot be used with AAA/TACACS+. Cisco recommends that you use the **login authentication** command instead of the **login** line configuration command. Refer to the *Cisco IOS Security Command Reference* for a description of the **login authentication** command.

To enable password checking at login, use the **login** command in line configuration mode. To disable password checking and allow connections without a password, use the **no login** form of this command.

login [**local** | **tacacs**]

no login

Syntax Description

local	(Optional) Selects local password checking. Authentication is based on the username specified with the username global configuration command.
tacacs	(Optional) Selects the TACACS-style user ID and password-checking mechanism.

Defaults

Virtual terminals require a password. If you do not set a password for a virtual terminal, it responds to attempted connections by displaying an error message and closing the connection.

Command Modes

Line configuration

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

If you specify the **login** command without the **local** or **tacacs** option, authentication is based on the password specified with the **password** line configuration command.

Examples

The following example sets the password letmein on vty 4:

```
line vty 4
 password letmein
 login
```

The following example enables the TACACS-style user ID and password-checking mechanism:

```
line 0
 password mypassword
 login tacacs
```

Related Commands

Command	Description
enable password	Sets a local password to control access to various privilege levels.
peer default ip address	Specifies an IP address, an address from a specific IP address pool, or an address from the DHCP mechanism to be returned to a remote peer connecting to this interface.
virtual-profile aaa	Enables virtual profiles by AAA configuration.

login-string

To define a string of characters that is sent to a host after a successful Telnet connection, use the **login-string** command in global configuration mode. To remove the login string, use the **no** form of this command.

```
login-string host-name d message [%secp] [%secw] [%b] [%m] d
```

```
no login-string host-name
```

Syntax Description

<i>host-name</i>	Specifies the name of the host.
<i>d</i>	Sets a delimiting character of your choice—a pound sign (#), for example. You cannot use the delimiting character in the busy message.
<i>message</i>	Specifies the login string.
<i>%secp</i>	(Optional) Sets a pause in seconds. To insert pauses into the login string, embed a percent sign (%) followed by the number of seconds to pause and the letter “p.”
<i>%secw</i>	(Optional) Prevents users from issuing commands or keystrokes during a pause.
<i>%b</i>	(Optional) Sends a Break character.
<i>%m</i>	(Optional) Supports TN3270 terminals. Sends only CR and no LINE FEED.

Defaults

No login strings are defined.

Command Modes

Global configuration

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

Follow this command with one or more blank spaces and a delimiting character of your choice. Then enter one or more lines of text, terminating the message with the second occurrence of the delimiting character. To use a percent sign in the login string, precede it with another percent sign; that is, type the characters “%%.” The options can be used anywhere within the message string.

This command applies only to rlogin and Telnet sessions.

Examples

In the following example, the value *%5p* causes a 5-second pause:

```
login-string office #ATDT 555-1234
%5p hello
#
```

pad

To log in to a packet assembler/disassembler (PAD), use the **pad** command in EXEC mode.

```
pad {x121-address | host-name} [/ cud text] [/ debug ] [/ profile name] [/ quiet message] [/ reverse ]
[/ use-map ]
```

Syntax Description

<i>x121-address</i>	Specifies the X.121 address of the X.25 host.
<i>host-name</i>	Specifies the X.25 host name if the host-to-address mapping has been set with the X.25 host command.
/ cud <i>text</i>	(Optional) Includes the specified <i>text</i> in the Call User Data (CUD) field of the outgoing Call Request Packet.
/ debug 	(Optional) Displays the informational level of logging messages whenever the remote host changes an X.3 parameter setting or sends any other X.29 control packet.
/ profile <i>name</i>	(Optional) Sets X.3 PAD parameters for the <i>name</i> script. Using this keyword and profile name argument is the same as issuing the x29 profile global configuration command when translating X.25. If the X.29 profile is set to default , the profile is applied to all incoming X.25 PAD calls, including the calls used for protocol translation.
/ quiet <i>message</i>	(Optional) Suppresses information messages. Replace the <i>message</i> argument with the actual message that you want to suppress.
/ reverse 	(Optional) Causes reverse-charge calls to be accepted on a per-call (rather than a per-interface) basis.
/ use-map 	(Optional) Applies x25 map pad command entry options (such as CUD and idle) and facilities (such as packet in, packet out, win in, and win out) to the outgoing PAD call. This function occurs only if a matching X.121 destination address exists in an x25 map pad command entry.

Command Modes

User EXEC

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

The **pad** command supports one-word connections. You need not enter the **pad** command; entering the address is enough to start the connection. A PAD can also be accessed and X.3 parameters configured with the **x28 EXEC** command, which uses the standard X.28 user interface.

You can have several PAD connections open at the same time and switch between them. You also can exit a connection and return to the user EXEC prompt at any point. To open a new connection, first exit the current connection by entering the escape sequence (**Ctrl-Shift-6** then **x** [**Ctrl^x**] by default) to return to the EXEC prompt, then open the new connection. If the **/use-map** option is selected on the outgoing **pad** command, the **x25 map pad** command entries are searched for a matching X.121

destination address. If a match is found, the **x25 map pad** command entry options (such as CUD and idle) and facilities (such as packet in, packet out, win in, and win out) are applied to the outgoing PAD call.

To display information about packet transmission and X.3 PAD parameter settings, use the **show x25 pad** command. To exit a session, simply log out of the remote system. Then, terminate the active session by entering the **exit** command.

Examples

Use the **?** command to display **pad** command options, as shown in the following example:

```
Router# pad / ?
/cud      Call user data
/debug    Debugging option
/profile   Use a defined X.3 profile
/quiet    Suppress informational messages
/reverse   X25 Address reverse
/use-map   Use x25 map pad command facilities for outgoing Calls
```

The following example starts a PAD session:

```
Router> pad 123456789
Trying 123456789...Open
Router>
```

You can also access a PAD using standard X.28 commands. The following example enters X.28 mode with the **x28 EXEC** command and configures a PAD with the **set** X.3 parameter command. The **set** command sets the idle time delay to 40 seconds.

```
Router# x28
* set 4:40
```

The following example uses the **/use-map** option to configure a larger window and packet size than the default specified on the interface, and it sets the virtual circuit idle time to 2 seconds. Notice that the map values are used rather than the interface default values.

```
Router-A(config-if)# x25 map pad 2194441 cud gmcmlilla windowsize 7 7 packetsize 1024
1024 idle 2
Router-A(config-if)# end
Router-A#
%SYS-5-CONFIG_I: Configured from console by console.

Router-A# pad 2194441 /cud gmcmlilla /use-map
Trying 2194441....Open

06:31:12: pad_open_connection: found a matching x25 map pad
06:31:12: Serial1: X.25 O R1 Call (22) 8 lci 1024
06:31:12:   From(7): 2191111 To(7): 2194441
06:31:12:   Facilities: (6)
06:31:12:     Packet sizes: 1024 1024
06:31:12:     Window sizes: 7 7
06:31:12:   Call User Data (12): 0x01000000 (pad)
06:31:12: Serial1: X.25 I R1 Call Confirm (5) 8 lci 1024
06:31:12:   From(0): To(0):
06:31:12:   Facilities: (0)
06:31:12: PAD0: Call completed
```

Related Commands

Command	Description
translate x25	Automatically translates the request to another outgoing protocol connection type when an X.25 connection request to a particular destination address is received.

resume (setting X.3 PAD parameters)

To set X.3 parameters, use the **resume** command in EXEC mode.

```
resume [connection] [/set parameter:value]
```

Syntax Description

<i>connection</i>	(Optional) The name or number of the connection; the default is the most recent connection.
<i>/set parameter:value</i>	(Optional) Sets the X.3 connection options and packet assembler/disassembler (PAD) parameters for the Cisco IOS software. See Table 9 in the Usage Guidelines for the PAD parameter numbers. Refer to the chapter “Configuring the Cisco PAD Facility for X.25 Connections” of the <i>Cisco IOS Terminal Services Configuration Guide</i> , Release 12.2, for a list of these connection options.

Defaults

For outgoing connections, the X.3 parameters default to the following:

```
2:1, 3:2, 4:1, 7:4, 16:127, 17:21, 18:19
```

All other parameters default to zero, but can be changed using the **/set** switch option with either the **resume** command or the **x3** command.

For incoming PAD connections, the software sends an X.29 SET PARAMETER packet to set only the following parameters:

```
2:0, 4:1, 7:21, 15:0
```

Command Modes

EXEC

Command History

Release	Modification
9.1	This command was introduced.

Usage Guidelines

Table 9 summarizes the X.3 PAD Parameters supported on Cisco devices. Refer to the “X.3 PAD Parameters” appendix in the *Cisco IOS Terminal Services Configuration Guide*, Release 12.2 for more complete information about these parameters. See Table 36 in this publication for a list of ASCII characters.

Table 9 Supported X.3 PAD Parameters

Parameter Number	ITU-T Parameter Name	ITU-T X.3 and Cisco Values
1	PAD recall using a character	Minimum value: 0; maximum value: 126; X.28 PAD user emulation mode default: 1.  Note Not supported by PAD EXEC user interface.
2	Echo	Minimum value: 0; maximum value: 1; PAD EXEC mode and X.28 PAD user emulation mode default: 1.
3	Selection of data forwarding character	Minimum value: 0; maximum value: 255; PAD EXEC mode default: 2 (CR); X.28 PAD user emulation mode default: 126 (~).
4	Selection of idle timer delay	Minimum value: 0; maximum value: 255; PAD EXEC mode default: 1; X.28 PAD user emulation mode default: 0.
5	Ancillary device control	Minimum value: 0; maximum value: 2; PAD EXEC mode default: 0; X.28 PAD user emulation mode default: 1.
6	Control of PAD service signals	Minimum value: 0; maximum value: 255; PAD EXEC mode default: 0; X.28 PAD user emulation mode default: 2.  Note Not supported by PAD EXEC user interface.
7	Action upon receipt of a BREAK signal	Minimum value: 0; maximum value: 31; PAD EXEC mode default: 4; X.28 PAD user emulation mode default: 2.
8	Discard output	Minimum value: 0; maximum value: 1; PAD EXEC mode and X.28 PAD user emulation mode default: 0.
9	Padding after Return	Minimum value: 0; maximum value: 255; PAD EXEC mode and X.28 PAD user emulation mode default: 0.
10	Line folding	Not supported.
11	DTE speed (binary speed of start-stop mode DTE)	Minimum value: 0; maximum value: 18; PAD EXEC mode and X.28 PAD user emulation mode default: 14.
12	Flow control of the PAD by the start-stop DTE	Minimum value: 0; maximum value: 1; PAD EXEC mode default: 0; X.28 PAD user emulation mode default: 1.
13	Line feed insertion (after a Return)	Minimum value: 0; maximum value: 7; PAD EXEC mode and X.28 PAD user emulation mode default: 0.
14	Line feed padding	Minimum value: 0; maximum value: 255; PAD EXEC mode and X.28 PAD user emulation mode default: 0.
15	Editing	Minimum value: 0; maximum value: 1; PAD EXEC mode and X.28 PAD user emulation mode default: 0.

Table 9 Supported X.3 PAD Parameters (continued)

Parameter Number	ITU-T Parameter Name	ITU-T X.3 and Cisco Values
16	Character delete	Minimum value: 0; maximum value: 127; PAD EXEC mode and X.28 PAD user emulation mode default: 127 (DEL).
17	Line delete	Minimum value: 0; maximum value: 127; PAD EXEC mode default: 21 (NAK or Ctrl-U); X.28 PAD user emulation mode default: 24 (CAN or Ctrl-X).
18	Line display	Minimum value: 0; maximum value: 127; PAD EXEC mode and X.28 PAD user emulation mode default: 18 (DC2 or Ctrl-R).
19	Editing PAD service signals	Minimum value: 0; maximum value: 126; PAD EXEC mode default: 0; X.28 PAD user emulation mode default: 2.  Note Not supported by PAD EXEC user interface.
20	Echo mask	Minimum value: 0; maximum value: 255; PAD EXEC mode and X.28 PAD user emulation mode default: 0.  Note Not supported by PAD EXEC user interface.
21	Parity treatment	Minimum value: 0; maximum value: 4; PAD EXEC mode and X.28 PAD user emulation mode default: 0.  Note For additional values that can be selected for parameter 21, including parity treatment to conform to the French Transpac public switched data network and its technical specification and utilization of networks standards (STUR), see Appendix A, "X.3 PAD Parameters," in the <i>Cisco IOS Terminal Services Configuration Guide</i> , Release 12.2.
22	Page wait	Not supported.

The `/set` switch sets the X.3 parameters defined by parameter number and value, separated by a colon. You set one or more X.3 PAD parameters, as follows:

-
- Step 1** Escape out of the current session by pressing the escape sequence (**Ctrl-Shift-6** then **x** [**Ctrl^x**] by default) and return to the EXEC prompt.
 - Step 2** Issue the **where** command, to list the open sessions. All open sessions associated with the current terminal line are displayed.
 - Step 3** Enter the **resume** command, followed by the parameter, a colon, and then the value to be set.
-

Examples

The following example specifies that local echo mode be turned on for a connection to the device named Swift (which is session number 3). As shown in Table 7, “local echo on” uses the parameter 2 and the value 1 (represented as 2:1 in this example):

```
Swift% ^^X
Router> resume 3 /set 2:1
Swift%
```

resume (switching sessions)

To switch to another open Telnet, rlogin, local-area transport (LAT), or packet assembler/disassembler (PAD) session, use the **resume** command in EXEC mode.

```
resume [connection] [keyword] [/set parameter:value]
```

Syntax Description

<i>connection</i>	(Optional) The name or number of the connection; the default is the most recent connection.
<i>keyword</i>	(Optional) One of the options listed in Table 8.
<i>/set parameter:value</i>	(Optional) Sets PAD parameters for the Cisco IOS software (see Table 7).

Command Modes

EXEC

Command History

Release	Modification
9.1	This command was introduced.

Usage Guidelines

Table 10 lists Telnet and rlogin resume options.

Table 10 Telnet and rlogin resume Options

Option	Description
/debug	Displays parameter changes and messages. In the Cisco IOS software, this option displays informational messages whenever the remote host changes an X.3 parameter, or sends an X.29 control packet.
/echo	Performs local echo.
/line	Enables line-mode editing.
/nodebug	Cancels printing of parameter changes and messages.
/noecho	Disables local echo.
/noline¹	Disables line mode and enables character-at-a-time mode, which is the default.
/nostream	Disables stream processing.
/set parameter:value	Sets X.3 connection options. Refer to the chapter “Configuring the Cisco PAD Facility for X.25 Connections” of the <i>Cisco IOS Terminal Services Configuration Guide</i> , Release 12.2, for a list of these connection options.
/stream	Enables stream processing.

1. **/noline** is the default keyword.

You can have several concurrent sessions open and switch between them. The number of sessions that can be open is defined by the **session-limit** command.

You can switch between sessions by escaping one session and resuming a previously opened session, as follows:

-
- Step 1** Escape out of the current session by pressing the escape sequence (**Ctrl-Shift-6** then **x** [**Ctrl^x**] by default) and return to the EXEC prompt.
 - Step 2** Enter the **where** command, to list the open sessions. All open sessions associated with the current terminal line are displayed.
 - Step 3** Enter the **resume** command and the session number to make the connection.
- You also can resume the previous session by pressing the **Return** key.
-

The **Ctrl^x**, **where**, and **resume** commands are available with all supported connection protocols.

Examples

The following example shows how to escape out of a connection and to resume connection 2:

```
Swift% ^^x
Router> resume 2
```

You can omit the command name and simply enter the connection number to resume that connection. The following example illustrates how to resume connection 3:

```
Router> 3
```

Related Commands

Command	Description
show tn3270 ascii-hexval	Displays ASCII-hexadecimal character mappings.
where	Lists open sessions associated with the current terminal line.

rlogin

To log in to a UNIX host using rlogin, use the **rlogin** command in EXEC mode.

```
rlogin host [-l username] [/user username] [/quiet] [debug]
```

Syntax Description

<i>host</i>	Specifies the host name or IP address.
-l <i>username</i>	(Optional) The Berkeley Standard Distribution (BSD) UNIX syntax that specifies a username for the remote login. If you do not use this option, the remote username is your local username.
/user <i>username</i>	(Optional) The EXEC command syntax that specifies a remote username in the initial exchange with the remote host. The rlogin protocol will not present you with the <code>login</code> prompt.
/quiet	(Optional) Prevents onscreen display of all messages from the Cisco IOS software.
debug	(Optional) Enables debugging output from the rlogin protocol.

Command Modes

EXEC

Command History

Release	Modification
10.0	This command was introduced.
12.1	The /quiet keyword was added.

Usage Guidelines

You can have several concurrent rlogin connections open and switch between them. To open a new connection, first suspend the current connection by pressing the escape sequence (**Ctrl-Shift-6** then **x** [**Ctrl^x**] by default) to return to the EXEC prompt. Then open a new connection. A user cannot automatically log in to a UNIX system from the router, but must provide a user ID and a password for each connection.

If your preferred transport is set to **rlogin**, you can use the **connect** command in place of the **rlogin** command. Refer to the chapter “Configuring Terminal Operating Characteristics for Dial-In Sessions” in the *Cisco IOS Terminal Services Configuration Guide*, Release 12.2, for more information about configuring a preferred transport type. When your preferred transport is set to **none** or to another protocol, you must use the **rlogin** command to connect to a host.

To terminate an active rlogin session, enter one of the following commands at the UNIX prompt of the device to which you are connecting:

- **close**
- **disconnect**
- **exit**
- **logout**
- **quit**

Examples

The following example illustrates how a user with the login name jsmith can use the **rlogin ?** help command and the **debug** command mode to establish and troubleshoot a remote connection to the host named Alviso:

```
Router> rlogin ?
WORD IP address or hostname of a remote system
Router> rlogin Alviso ?
-l Specify remote username
/quiet Suppress login/logout messages
/user Specify remote username
debug Enable rlogin debugging output
<cr>
Router> rlogin Alviso -l ?
WORD Remote user name
Router> rlogin Alviso -l jsmith?
debug Enable rlogin debugging output
<cr>
Router> rlogin Alviso -l jsmith debug
```

The following example illustrates debug return on the host named zipper by the user named staff:

```
Router# rlogin zipper.cisco.com -l staff debug
Trying zipper.cisco.com (171.69.63.31)... Open
RLOGIN: local username is: ciscoTS
RLOGIN: remote username is: staff
Password:
Last login: Wed Jun 24 06:15:36 from itech-view3.cisc
1 zipper> uptime
 1:40pm up 42 day(s), 20:53, 80 users, load average: 1.44, 2.67, 3.39
2 zipper> logout
[Connection to zipper.cisco.com closed by foreign host]
Router#
```

The following example makes an rlogin connection to a host at address 10.30.21.2 for a user named supervisor and enables the message mode for debugging:

```
Router> rlogin 10.30.21.2 -l supervisor debug
```

The following example makes an rlogin connection to a host named headquarters for the user named admin:

```
Router> rlogin headquarters -l admin
```

The following example suppresses all onscreen messages from the Cisco IOS software during login and logout:

```
Router> rlogin host2 /quiet
```

Related Commands

Command	Description
connect	Logs in to a host that supports Telnet, rlogin, or LAT.
telnet	Logs in to a host that supports Telnet.

rlogin trusted-localuser-source

To choose an authentication method for determining the local username to send to the remote rlogin server, use the **rlogin trusted-localuser-source** command in global configuration mode. To restore the default rlogin behavior, use the **no** form of this command.

rlogin trusted-localuser-source [**local** | **radius** | **tacacs**]

no rlogin trusted-localuser-source [**local** | **radius** | **tacacs**]

Syntax Description

local	(Optional) Uses local username from any authentication method.
radius	(Optional) Uses local username from RADIUS authentication.
tacacs	(Optional) Uses local username from TACACS authentication.

Defaults

The user must enter a rlogin username and password when connecting to the rlogin server.

Command Modes

Global configuration

Command History

Release	Modification
11.1	This command was introduced.

Usage Guidelines

Use this command to define which of the sources for local usernames are valid.

The rlogin protocol passes three types of information: the remote username, the local username, and the local host name of the router. The **rlogin trusted-localuser-source** command allows you to configure one of three behaviors for making connections to the rlogin server, as follows:

- The user must enter a login username and password to connect (default).
- The Cisco IOS-authenticated username can be passed to the rlogin server so the user need only enter a password to connect.
- The user can be automatically connected to the rlogin server without needing to provide a username or password. This configuration is made by using both the **rlogin trusted-localuser-source** and **rlogin trusted-remoteuser-source local** commands where both the Cisco IOS authenticated username and the rlogin server username are the same.

Examples

The following example uses the local username from RADIUS authentication:

```
Router# configure terminal

Router(config)# rlogin trusted-localuser-source ?
  local  Use local username from any authentication method
  radius Use local username from radius authentication
  tacacs Use local username from tacacs authentication

Router(config)# rlogin trusted-localuser-source radius
```

Related Commands

Command	Description
ip alias	Assigns an IP address to the service provided on a TCP port.
retry keepalive	Logs in to a UNIX host using rlogin.
rlogin trusted-remoteuser-source local	Determines the remote username to send to the remote rlogin server.
template	Temporarily defines the list of services to which you or another user can connect.

rlogin trusted-remoteuser-source local

To determine the remote username to send to the remote rlogin server, use the **rlogin trusted-remoteuser-source local** command in global configuration mode. To restore the default rlogin behavior, which is to prompt the user for the remote username, use the **no** form of this command.

rlogin trusted-remoteuser-source local

no rlogin trusted-remoteuser-source local

Syntax Description

This command has no arguments or keywords.

Defaults

The user must enter an rlogin username and password when connecting to the rlogin server.

Command Modes

Global configuration

Command History

Release	Modification
11.1	This command was introduced.

Usage Guidelines

The current username is used only if the **rlogin host /user username** command is not enabled. If the current username is not known, rlogin falls back to providing the “login:” prompt to discover a remote username.

After you issue the **rlogin trusted-remoteuser-source local** command, you will not be prompted for a username. The first response you see is the password prompt from the remote system. For example, when this command is not enabled, you must enter your username twice (once at initial system login and once for the **rlogin** command).



Caution

Configuring the remote host to consider the Cisco router a “trusted” host should be considered a security hole.

Examples

The following sample output shows the two prompts a user must reply to when the **rlogin trusted-remoteuser-source local** command is not set:

```
User Access Verification

Username: gmczilla
Password: xxxxxx

Router> rlogin puli
Trying puli.cisco.com (172.16.3.154) ... Open
login: gmczilla
Password: xxxxxx
```

The following example shows that after you issue the **rlogin trusted-remoteuser-source local** command, you no longer need to specify the username after the **rlogin** command. The username is automatically copied from the user ID of the router:

```
Router# enable
Password: xxxxxx
Router# configure terminal
Router(config)# rlogin ?
    trusted-localuser-source    Allowed authentication types for local username
    trusted-remoteuser-source  Method used to get remote username
Router(config)# rlogin trusted-remoteuser-source local
Router(config)# ^Z
Router# rlogin puli
Trying puli.cisco.com (172.16.3.154)... Open
Password: xxxxxx
```

The following example uses the **/user root** keyword option as an override:

```
Router# rlogin puli /user root
Trying puli.cisco.com (172.16.3.154)... Open
Password: xxxxxx
login:
```

Related Commands

Command	Description
ip alias	Assigns an IP address to the service provided on a TCP port.
retry keepalive	Logs in to a UNIX host using rlogin.
rlogin trusted-localuser-source	Chooses an authentication method for determining the local username to send to the remote rlogin server.
template	Temporarily defines the list of services to which you or another user can connect.

rxspeed

To set the terminal receive speed (how fast the terminal receives information from the modem), use the **rxspeed** command in line configuration mode. To reset the default value, use the **no** form of this command.

rxspeed *bps*

no rxspeed

Syntax Description	<i>bps</i>	Baud rate in bits per second (bps).
---------------------------	------------	-------------------------------------

Defaults	9600 bps
-----------------	----------

Command Modes	Line configuration
----------------------	--------------------

Command History	Release	Modification
	10.0	This command was introduced.

Usage Guidelines	Set the speed to match the baud rate of whatever device you have connected to the port. Some baud rates available on devices connected to the port might not be supported on the system. The system will indicate if the speed you select is not supported.
-------------------------	---



Note

If the line was previously configured for automatic baud rate detection (autobaud), disable autobaud by entering the **no autobaud** command before entering the **rxspeed** command to fix the speed of the port.

Examples	The following example sets the line 5 receive rate to 2400 bps:
-----------------	---

```
line 5
rxspeed 2400
```

Related Commands	Command	Description
	source template	Sets the flow control start character.
	terminal rxspeed	Sets the terminal receive speed (how fast information is sent to the terminal) for the current line and session.
	txspeed	Sets the terminal transmit speed (how fast the terminal sends information to the modem).

service exec-callback

To enable call back to clients who request a callback from the EXEC level, use the **service exec-callback** command in global configuration mode.

service exec-callback

Syntax Description This command has no arguments or keywords.

Defaults Callback is not enabled.

Command Modes Global configuration

Command History	Release	Modification
	11.1	This command was introduced.

Usage Guidelines This command enables the Cisco IOS software to return a call to a device that dials in, connects to the EXEC, and requests callback.

Examples The following example enables EXEC level callback:

```
service exec-callback
```

Related Commands	Command	Description
	arap callback	Enables an ARA client to request a callback from an ARA client.
	debug callback	Displays callback events when the router is using a modem and a chat script to call back on a terminal line.
	debug confmodem	Displays information associated with the discovery and configuration of the modem attached to the router.
	ppp callback (PPP client)	Enables a dialer interface that is not a DTR interface to function either as a callback client that requests callback or as a callback server that accepts callback requests.
	script arap-callback	Specifies that a chat script start on a line when an ARA client requests a callback.
	username	Establishes a username-based authentication system, such as PPP CHAP and PAP.

service old-slip-prompts

To provide backward compatibility for client software scripts expecting Serial Line Internet Protocol (SLIP) and PPP dialogs to be formatted with Cisco IOS software Release 9.1 or earlier releases, use the **service old-slip-prompts** command in global configuration mode. To disable this function, use the **no** form of this command.

service old-slip-prompts

no service old-slip-prompts

Syntax Description This command has no arguments or keywords.

Defaults The prompts and information sent by SLIP and PPP are formatted with the current release of Cisco IOS software.

Command Modes Global configuration

Command History	Release	Modification
	11.1	This command was introduced.

Usage Guidelines This command provides backward compatibility for client software scripts expecting SLIP and PPP dialogs to be formatted with Cisco IOS software Release 9.1 or earlier releases.

Examples The following example shows the output of a SLIP command after the **service old-slip-prompts** command is enabled:

```
Router# configure terminal
Router(config)# service old-slip-prompts
Router(config)# exit
Router# slip
IP address or hostname: 10.2.2.2
Entering SLIP mode.
Your IP address is 10.2.2.2. MTU is 1500 bytes
```

service pt-vty-logging

To log the X.121 calling address, Call User Data (CUD), and IP address assigned to a vty asynchronous connection, use the **service pt-vty-logging** command in global configuration mode. To disable this function, use the **no** form of this command.

service pt-vty-logging

no service pt-vty-logging

Syntax Description This command has no arguments or keywords.

Defaults This feature is disabled.

Command Modes Global configuration

Command History	Release	Modification
	11.2	This command was introduced.

Usage Guidelines This command permits you to log the X.121 calling address, CUD, and IP address assigned to a vty asynchronous connection and direct this information to the console, an internal buffer, or a UNIX syslog server, depending on the logging configuration command you use. This authentication information can be used to associate an incoming packet assembler/disassembler (PAD) vty-asynchronous connection with an IP address.



Note

By default, the Cisco IOS software displays all messages to the console terminal.

Examples The following example enables you to log the X.121 calling address, CUD, and IP address assigned to a vty asynchronous connection and save this information to a syslog server:

```
service pt-vty-logging
```

The following is sample output from the **service pt-vty-logging** command:

```
01:24:31: PAD18: call from 00011890 on LCI 10 PID 1 0 0 0 CUD "xyz"
```

[Table 11](#) describes the fields shown in the output.

Table 11 service pt-vty-logging Field Descriptions

Field	Description
01:24:31:	Time stamp.
PAD18:	Active vty line number using the PAD connection.

Table 11 *service pt-vty-logging Field Descriptions (continued)*

Field	Description
00011890	The source or calling address.
on LCI 10	Incoming call is initiated on Logical Channel 10.
PID 1 0 0 0	The PAD Protocol Identifier is "01000000."
CUD "xyz"	CUD "xyz." If no CUD is available, this field will appear as follows: CUD " "

Related Commands

Command	Description
logging	Logs messages to a syslog server host.
logging buffered	Logs messages to an internal buffer.

session-limit

To set the maximum number of terminal sessions per line, use the **session-limit** command in line configuration mode. To remove any specified session limit, use the **no** form of this command.

session-limit *session-number*

no session-limit

Syntax Description

<i>session-number</i>	Specifies the maximum number of sessions.
-----------------------	---

Defaults

The default and set session limits are displayed with the **start-character EXEC** command.

Command Modes

Line configuration

Command History

Release	Modification
10.0	This command was introduced.

Examples

The following example limits the number of sessions to eight on a ten-line range:

```
line 2 12
 session-limit 8
```

Related Commands

Command	Description
line vty	Specifies a virtual terminal for remote console access.

session-timeout

To set the interval for closing the connection when there is no input or output traffic, use the **session-timeout** command in line configuration mode. To remove the timeout definition, use the **no** form of this command.

session-timeout *minutes* [**output**]

no session-timeout

Syntax Description

<i>minutes</i>	Specifies the timeout interval in minutes.
output	(Optional) Specifies that when traffic is sent to an asynchronous line from the router (within the specified interval), the connection is retained.

Defaults

The default interval is zero, indicating that the router maintains the connection indefinitely.

Command Modes

Line configuration

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

This command sets the interval that the Cisco IOS software waits for traffic before closing the connection to a remote computer and returning the terminal to an idle state.

If only the **session timeout** command is specified, the session timeout interval is based solely on detected input from the user.

If the **session timeout** command is specified with the **output** keyword, the interval is based on both input and output traffic. You can specify a session timeout on each port.

The **session-timeout** command behaves slightly differently on virtual (vty) terminals than on physical console, auxiliary (aux), and terminal (tty) lines. When a timeout occurs on a vty, the user session returns to the EXEC prompt. When a timeout occurs on physical lines, the user session is logged out and the line returned to the idle state.

You can use a combination of the **exec-timeout** and **session-timeout** line configuration commands, set to approximately the same values, to get the same behavior from virtual lines that the **session-timeout** command causes on physical lines.

Examples

The following example sets an interval of 20 minutes and specifies that the timeout is subject to traffic detected from the user (input only):

```
line 5
 session-timeout 20
```

The following example sets an interval of 10 minutes, subject to traffic on the line in either direction:

```
line 5
 session-timeout 10 output
```

Related Commands

Command	Description
absolute-timeout	Sets the interval for closing the connection on a virtual terminal line.
exec-timeout	Sets the interval that the EXEC command interpreter waits until user input is detected.

show arap

To display information about a running AppleTalk Remote Access Protocol (ARAP) connection, use the **show arap** command in EXEC mode.

show arap [*line-number*]

Syntax Description	<i>line-number</i>	(Optional) Number of the line on which an ARAP connection is established and active.
---------------------------	--------------------	--

Command Modes	EXEC
----------------------	------

Command History	Release	Modification
	10.0	This command was introduced.

Usage Guidelines Use the **show arap** command with no arguments to display a summary of the ARAP traffic since the router was last booted.

Examples The following is sample output from the **show arap** command:

```
Router# show arap

Statistics are cumulative since last reboot
Total ARAP connections: 2
Total Appletalk packets output: 157824
Total Appletalk packets input: 12465
```

These fields refer to the sum of all of the ARA connections since the box was last reloaded.

The following sample output results in a display of information about ARA activity on a specific line (line 3):

```
Router# show arap 3

Active for 23 minutes
"Unlimited time left" or "22 minutes left"
"Doing smartbuffering" or "Smartbuffering disabled"
Appletalk packets output: 157824
Appletalk packets input: 12465
Appletalk packets overflowed: 1642
Appletalk packets dropped: 586
V42bis compression efficiency (incoming/outgoing): {percentage/percentage}
MNP4 packets received: 864
MNP4 packets sent: 1068
MNP4 garbled packets received: 4
MNP4 out of order packets received: 0
MNP4 packets resent: 0
MNP4 nobuffers: 0
```

[Table 12](#) describes the significant fields shown in the display.

Table 12 *show arap Field Descriptions*

Field	Description
Active for <i>integer</i> minutes	Number of minutes since ARAP started on the line.
Unlimited time left or <i>integer</i> minutes left	Remaining time limit on the line, if applicable on the line.
Doing smartbuffering or Smartbuffering disabled	Obsolete. Always says "Doing smartbuffering."
Appletalk packets output:	Number of AppleTalk packets that have been received from the Apple Macintosh and out to the network during this connection.
Appletalk packets input:	Number of AppleTalk packets that have been received from the network and sent to the Apple Macintosh during this connection.
Appletalk packets overflowed:	Number of packets from the network that have been dropped because the link to the Apple Macintosh was congested.
Appletalk packets dropped:	Number of packets from the network that have been dropped because it was unnecessary to pass them (frequently RTMP).
V42bis compression efficiency (incoming/outgoing):	Performance of the v42bis protocol underneath ARA, expressed as a percentage of incoming/percentage outgoing. If the efficiency is low, a network user is probably copying already compressed files across the link. Generally, low efficiency means slow performance.
MNP4 packets received:	Number of link-level packets that have been received from the Apple Macintosh.
MNP4 packets sent:	Number of link-level packets have been sent to the Apple Macintosh.
MNP4 garbled packets received:	Number of garbled packets that have been received from the Apple Macintosh.
MNP4 out of order packets received:	Number of out-of-order packets that have been received from the Apple Macintosh.
MNP4 packets resent:	Number of times packets have been re-sent. ¹
MNP4 nobuffers:	Number of times MNP4 has run out of buffers. This field should be zero.

1. Each of these fields indicates line noise. The higher the value, the higher the noise.

show entry

To display the list of queued host-initiated connections to a router, use the **show entry** command in EXEC mode.

show entry

Syntax Description This command has no arguments or keywords.

Command Modes EXEC

Command History	Release	Modification
	11.1	This command was introduced.

Usage Guidelines You can also use this command to determine which local-area transport (LAT) hosts have queue entries for printers on routers.

Examples The following is sample output from the **show entry** command. The display shows that two LAT connections are waiting for access to port 5. The list is ordered so that the lower-numbered entry has been waiting longer, and will use the line next.

```
Router# show entry

1 waiting 0:02:22 for port 5 from LAT node BLUE
2 waiting 0:00:32 for port 5 from LAT node STELLA
```

[Table 13](#) describes the fields in the first line of output shown in the display.

Table 13 *show entry Field Descriptions*

Field	Description
1	Number assigned to the queued connection attempt.
waiting 0:02:22	Interval (hours:minutes:seconds) during which the connection attempt has been waiting.
for port 5	Port for which the connection attempt is waiting.
from LAT node BLUE	Name of the user (BLUE) attempting to make the connection.

show keymap

To test for the availability of a keymap after a connection on a router takes place, use the **show keymap** command in EXEC mode.

```
show keymap [keymap-name | all]
```

Syntax Description

<i>keymap-name</i>	(Optional) Name of the keymap.
all	(Optional) Lists the names of all defined keymaps. The name of the default keymap is not listed.

Command Modes

EXEC

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

The Cisco IOS software searches for the specified keymap in its active configuration image and lists the complete entry if found. If the keymap is not found, an appropriate “not found” message appears.

If you do not use any arguments with the **show keymap** command, then the keymap currently used for the terminal is displayed.

Examples

The following is sample output from the **show keymap** command:

```
Router# show keymap

ciscodefault { clear = '^z'; flinp = '^x'; enter = '^m';\
  delete = '^d' | '^?';\
  synch = '^r'; reshov = '^v'; eof = '^e'; tab = '^i';\
  btab = '^b'; nl = '^n'; left = '^h'; right = '^l';\
  up = '^k'; down = '^j'; einp = '^w'; reset = '^t';\
  xoff = '^s'; xon = '^q'; escape = '^c'; ferase = '^u';\
  insrt = '\E ';\
  pa1 = '^p1'; pa2 = '^p2'; pa3 = '^p3';\
  pfk1 = '\E1'; pfk2 = '\E2'; pfk3 = '\E3'; pfk4 = '\E4';\
  pfk5 = '\E5'; pfk6 = '\E6'; pfk7 = '\E7'; pfk8 = '\E8';\
  pfk9 = '\E9'; pfk10 = '\E0'; pfk11 = '\E-'; pfk12 = '\E=';\
  pfk13 = '\E!'; pfk14 = '\E@'; pfk15 = '\E#'; pfk16 = '\E$';\
  pfk17 = '\E%'; pfk18 = '\E^'; pfk19 = '\E&'; pfk20 = '\E*';\
  pfk21 = '\E('; pfk22 = '\E)'; pfk23 = '\E_'; pfk24 = '\E+';\
}
```

show lat advertised

To display the local-area transport (LAT) services a router offers to other systems running LAT on the network, use the **show lat advertised** command in EXEC mode.

show lat advertised

Syntax Description This command has no arguments or keywords.

Command Modes EXEC

Command History	Release	Modification
	10.0	This command was introduced.

Usage Guidelines Advertised services are created with the **lat service** commands. The display includes the service rating, rotary group if present, and whether the service is enabled for incoming connections.

Examples The following is sample output from the **show lat advertised** command:

```
Router# show lat advertised

Service Name      Rating      Rotary  Flags
BEAR-CAT          4 (Dynamic) None    Enabled
  Autocommand: telnet bear-cat
MODEMS            0 (Dynamic) 12     Enabled
  Ident: SpaceBlazer modem services
RECLUSE           4 (Dynamic) None    Enabled
  Ident: white recluse...
```

The display shows output from a router named sloth that has three services defined: BEAR-CAT, MODEMS, and RECLUSE.

[Table 14](#) describes the significant fields shown in the display.

Table 14 *show lat advertised Field Descriptions*

Field	Description
Service Name	Lists the LAT service name.
Rating	Lists the static service rating set, if any.
Rotary	Lists the associated rotary service.
Flags	Lists whether a service is enabled.
Autocommand	Defines the autocommand associated with the service.
Ident	Lists the advertised identification for the service.

show lat groups

To display the groups that were defined in the Cisco IOS software with the **lat group-list** command, use the **show lat groups** command in EXEC mode.

show lat groups

Syntax Description This command has no arguments or keywords.

Command Modes EXEC

Command History

Release	Modification
10.0	This command was introduced.

Examples The following is sample output from the **show lat groups** command:

```
Router# show lat groups

Group Name      Len  Groups
cafeteria       3    13 15 23
engineering     7     55
manufacturing   10   70 71 72
```

[Table 15](#) describes only the significant fields shown in the display.

Table 15 *show lat groups Field Descriptions*

Field	Description
Group Name	Assigned group name.
Len	Size of internal data structure used to contain the group code map.
Groups	Group codes associated with the learned group.

Related Commands

Command	Description
lat group-list	Allows a name to be assigned to the group list, which is any combination of group names, numbers, or ranges.

show lat nodes

To display information about all known local-area network (LAT) nodes, use the **show lat nodes** command in EXEC mode.

show lat nodes

Syntax Description This command has no arguments or keywords.

Command Modes EXEC

Command History	Release	Modification
	10.0	This command was introduced.

Examples The following is sample output from the **show lat nodes** command:

```
Router# show lat nodes

Node "CHAOS", usage -1, Interface Ethernet0, Address 0000.0c01.0509
  Timer 89, sequence 188, changes 131, flags 0x0, protocol 5.1
  Facility 0, Product code 0, Product version 0
  Recv 0/0/0, Xmit 0/0/0, 0 Dups, 0 ReXmit
  Bad messages: 0, Bad slots: 0, Solicits accepted: 0
  Solicits rejected: 0, Multiple nodes: 0
  Groups: 0
  Service classes: 1
Node "CONFUSED", usage -1, Local
  Timer 99, sequence 4, changes 151, flags 0x0, protocol 5.2
  Facility 0, Product code 0, Product version 0
  Recv 0/0/0, Xmit 0/0/0, 0 Dups, 0 ReXmit
  Bad messages: 0, Bad slots: 0, Solicits accepted: 0
  Solicits rejected: 0, Multiple nodes: 0
  Groups: 0
  Service classes: 1
Node "EMAN-cs", usage -1, Interface Ethernet0, Address 0000.0cff.c9ed
  Timer 99, sequence 9, changes 159, flags 0x0, protocol 5.1
  Facility 0, Product code 0, Product version 0
  Recv 0/0/0, Xmit 0/0/0, 0 Dups, 0 ReXmit
  Bad messages: 0, Bad slots: 0, Solicits accepted: 0
  Solicits rejected: 0, Multiple nodes: 0
  Groups: 0
  Service classes: 1
Node "TARMAC", usage -1, Interface Ethernet0, Address 0000.0c02.c7c1
  Timer -10351, sequence 1, changes 131, flags 0x40, protocol 5.2
  Facility 0, Product code 0, Product version 0
  Recv 0/0/0, Xmit 0/0/0, 0 Dups, 0 ReXmit
  Bad messages: 0, Bad slots: 0, Solicits accepted: 0
  Solicits rejected: 0, Multiple nodes: 0
  Groups: 0
  Service classes: 1
```

Table 16 describes the significant fields shown in the display.

Table 16 *show lat nodes Field Descriptions*

Field	Description
Node	The node name as reported by the host computer.
usage	The number of virtual circuits currently active to this node.
Interface	Node interface type and number.
Address	The MAC address of the Ethernet interface for the node.
Timer	The number of seconds remaining until the service advertisement message for this node will time out; this value is set to three times the nodes multicast timer value whenever a new service advertisement message is received.
sequence	The sequence number received in the last service advertisement message received. Nodes increment their sequence number when the contents of the service advertisement change.
changes	The internal representation of what changed in the multicast message the last time the sequence number changed.
flags	The internal representation of various state information about the node.
protocol	The LAT protocol version used by the node.
Facility	The remote facility number.
Product code	The remote product code.
Product version	The remote product version.
Recv and Xmit	The number of messages, slots, and bytes received or sent to the node. The number of messages is the number of LAT virtual circuit messages. Each virtual circuit message contains some number of slots, which contain actual terminal data or control information. Bytes is the number of data bytes (input or output characters) exchanged.
Dups	The number of duplicate virtual circuit messages received.
ReXmit	The number of virtual circuit messages resent.
Bad messages	The number of bad messages received.
Bad slots	The number of bad slots received.
Solicits accepted	The number of solicit-information requests accepted.
Solicits rejected	The number of solicit-information requests rejected.
Multiple nodes	The total of multiple nodes seen.
Groups	The list of group codes advertised by the service-advertisement message of the node.
Service classes	The number of service classes.

show lat services

To display information about learned local-area transport (LAT) services in the Cisco IOS software, use the **show lat services** command in EXEC mode.

```
show lat services [service-name]
```

Syntax Description	
	<i>service-name</i> (Optional) Name of a specific LAT service.

Command Modes	
	EXEC

Command History	Release	Modification
	11.2	This command was introduced.

Examples The following is sample output from the **show lat services** command:

```
Router# show lat services

Service Name      Rating  Interface  Node (Address)
ABCDEFGHIJ         5      Ethernet0  CONFUSED (0000.0c00.391f)
GLAD              84     Ethernet0  BLUE (aa00.0400.9205)
  Ident: Welcome to Big Blue Gateway
WHEEL            83     Ethernet0  WHEEL (aa00.0400.9005)
ZXYW              5      Ethernet0  CONFUSED (0000.0c00.391f)
```

[Table 17](#) describes the significant fields shown in the display.

Table 17 *show lat services Field Descriptions*

Field	Description
Service Name	LAT service name.
Rating	Rating of the service. If a single service is provided by more than one host, the Cisco IOS software connects to the one with the highest rating.
Interface	Interface type.
Node	Connection address.
(Address)	Advertised identification for the service.

Related Commands	Command	Description
	show lat sessions	Displays active LAT sessions.
	show resource-pool call	Displays specific LAT learned services.

show lat sessions

To display active local-area transport (LAT) sessions, use the **show lat sessions** command in EXEC mode.

show lat sessions [*line-number*]

Syntax Description

line-number (Optional) Displays an active LAT session on a specific line.

Command Modes

EXEC

Command History

Release	Modification
11.2	This command was introduced.

Examples

The following is sample output from the **show lat sessions** command. In this example, information about all active LAT sessions is displayed. The output is divided into three sections for each session (in this case two sessions): TTY data, session data, and remote node data.

```
Router> show lat sessions

tty0, connection 1 to service TERM1
TTY data:
  Name "0", Local usage 1/0, Remote usage disabled
  Flags: Local Connects, Enabled
  Type flags: none
  Config flags: -FlowOut, -FlowIn, Parameter Info
  Flow control ^S/^Q in ^S/^Q out, Mode Normal, Parity None, databits 8
  Groups: 0
Session data:
  Name TERM1, Remote Id 1, Local Id 1
  Remote credits 2, Local credits 0, Advertised Credits 2
  Flags: none
  Max Data Slot 255, Max Attn Slot 255, Stop Reason 0
Remote Node data:
Node "TERM1", Address 0000.0C00.291F, usage 1
  Timer 59, sequence 5, changes 159, flags 0x0, protocol 5.1
  Recv 56/22/83, Xmit 41/23/14, 0 Dups, 0 ReXmit
  Groups: 0
tty10, connection 1 to service ENG2
TTY data:
  Name "10", Local usage 1/0, Remote usage disabled
  Flags: Local Connects, Enabled
  Type flags: none
  Config flags: -FlowOut, +FlowIn, Set Parameters, 0x40000000
  Flow control ^S/^Q in ^S/^Q out, Mode Normal, Parity None, databits 8
  Groups: 0
Session data:
  Name ENG2, Remote Id 1, Local Id 1
  Remote credits 1, Local credits 0, Advertised Credits 2
  Flags: none
  Max Data Slot 255, Max Attn Slot 255, Stop Reason 0
Remote Node data:
```

```
Node "ENG2", Address AA00.0400.34DC, usage 1
  Timer 179, sequence 60, changes 255, flags 0x0, protocol 5.1
  Recv 58/29/186, Xmit 50/36/21, 0 Dups, 0 ReXmit
  Groups: 0
```

The following sample output displays information about active LAT sessions on one line (line 10). The output is divided into three sections: TTY data, session data, and remote node data.

```
Router> show lat sessions 10

tty10, connection 1 to service ENG2
TTY data:
  Name "10", Local usage 1/0, Remote usage disabled
  Flags: Local Connects, Enabled
  Type flags: none
  Config flags: -FlowOut, +FlowIn, Set Parameters, 0x40000000
  Flow control ^S/^Q in ^S/^Q out, Mode Normal, Parity None, databits 8
  Groups: 0
Session data:
  Name ENG2, Remote Id 1, Local Id 1
  Remote credits 1, Local credits 0, Advertised Credits 2
  Flags: none
  Max Data Slot 255, Max Attn Slot 255, Stop Reason 0
Remote Node data:
Node "ENG2", Address AA00.0400.34DC, usage 1
  Timer 189, sequence 61, changes 247, flags 0x0, protocol 5.1
  Recv 60/29/186, Xmit 52/36/21, 0 Dups, 0 ReXmit
  Groups: 0
```

Table 18 describes the screen output for the preceding two examples.

Table 18 *show lat sessions* Field Descriptions

Field	Description
TTY data	Summary of the LAT-oriented terminal-line-specific data.
Name	Name used for this port as a port identification string. The name is reported to remote systems, which can display it in some operating-system dependent manner. This value is also used for targets of host-initiated connections. Currently, this value is hard-wired to be the line number of the associated terminal line.
Local/Remote usage	Current status of the terminal. The number is reported as current/maximum, where current is the current number of sessions of a given type, and maximum is the maximum number of sessions allowed (or zero if there is no maximum). If a terminal is being used for outgoing sessions, the local usage is equal to the number of current LAT sessions. If the terminal is being used for incoming sessions, local usage is disabled, and the remote count and maximum is one.
Flags	Current state of the line, and whether there are any queued host-initiated connections.
Type flags	Report flags not used in the current software release.
Config flags	Current port state as reflected by the most recent configuration message exchange.
Flow control	Lists set flow control characters.
Groups	Group code list currently in use for the line.

Table 18 *show lat sessions Field Descriptions (continued)*

Field	Description
Session data	Reports various parameters about the connection.
Name	For the outbound connection, the name of the remote service to which it is connected. For inbound connections, this field is currently unused.
Remote/Local Id	Slot IDs being used to uniquely identify the session multiplexed over the underlying LAT virtual circuit.
Remote/Local/ Advertised Credits	Number of flow control credits that the Cisco IOS software will be sending to the host as soon as possible. The advertised credits are the number of credits that have already been sent.
Flags	Transient conditions in the LAT-state machine dealing with the current connection status.
Max Data Slot	Maximum number of characters that can be sent in a single data slot.
Max Attn Slot	Maximum amount of data that can be sent in an attention message. Current LAT implementations only send 1-byte attention messages (attention messages are used to flush buffered output). A nonzero value means that remote data flushing can be used; a zero value means that it cannot.
Stop Reason	Reason the session was stopped, if it was stopped but not deleted. This value is usually zero, indicating that the session has not yet been stopped. If a session persists for a long time with a nonzero stop reason, there is probably a problem in the local LAT software.
Remote Node data	Reports information about the remote node. The data includes the same fields as those from the show lat nodes output.
Node	Node name as reported by the host computer.
Address	MAC address of the Ethernet interface for the node.
usage	Number of virtual circuits currently active to the node.
Timer	Number of seconds remaining until the service advertisement message for the node will time out; this value is set to three times greater than the node multicast timer value whenever a new service-advertisement message is received.
sequence	Sequence number received in the last service-advertisement message. Nodes increment their sequence number when the contents of the service-advertisement change.
changes	Internal representation of what changed in the multicast message the last time the sequence number changed.
flags	Internal representation of various state information about the node.
protocol	LAT protocol version used by the node.
Recv and Xmit	Number of messages, slots, and bytes received or sent to the node. The number of messages is the number of LAT virtual circuit messages. Each virtual circuit message contains some number of slots, which contain actual terminal data or control information.
Dups	Number of duplicate virtual circuit messages received.
ReXmit	Number of virtual circuit messages resent.
Groups	Group codes advertised by the service-advertisement message of the node.

■ show lat sessions

Related Commands

Command	Description
show lat services	Displays information about learned LAT services in the Cisco IOS software.
show resource-pool call	Displays specific LAT learned services.

show lat traffic

To display information about traffic and resource utilization statistics on all active lines, use the **show lat traffic** command in EXEC mode.

show lat traffic

Syntax Description This command has no arguments or keywords.

Command Modes EXEC

Command History	Release	Modification
	10.0	This command was introduced.

Examples The following is sample output from the **show lat traffic** command:

```
Router# show lat traffic

Local host statistics:
  0/100 circuits, 0/500 sessions, 1/500 services
  100 sessions/circuit, circuit timer 80, keep-alive timer 5
Recv:  335535 messages (2478 duplicates),  161722 slots,  1950146 bytes
       0 bad circuit messages,  3458 service messages (52 used)
Xmit:  182376 messages (2761 retransmit),  146490 slots,  36085 bytes
       1 circuit timeouts
Total: 23 circuits created,  38 sessions
```

[Table 19](#) describes the significant fields shown in the display.

Table 19 *show lat traffic Field Descriptions*

Field	Description
Local host statistics	Information about the router.
circuits	Current number and maximum support number of virtual circuits.
sessions	Current and maximum number of sessions.
services	Current number of known remote services, and the maximum supported.
sessions/circuit	Number of sessions per virtual circuit supported by the software.
circuit timer	Value of the virtual circuit timer parameter defined by the lat vc-timer global configuration command.
keep-alive timer	Value defined by the lat ka-timer global configuration command.
Recv	Statistics about local node receive totals.
messages	Total count of virtual circuit messages received.
duplicates	Number of duplicate virtual circuit messages received.
slots	Number of slots received.

Table 19 *show lat traffic Field Descriptions (continued)*

Field	Description
bytes	Number of data bytes received.
bad circuit messages	Count of invalid messages received.
service messages	Number of service advertisement multicast messages received.
used	Number of multicast messages that caused the local node information to be updated.
Xmit	Various transmission totals.
messages	Total number of virtual circuit messages sent.
retransmit	Number of virtual circuit messages resent due to the lack of an acknowledgment.
slots	Number of data and control slots sent.
bytes	Count of user data bytes sent.
circuit timeouts	Count of times that a virtual circuit timed out because the remote node stopped responding (due to a node failure or communications failure).
Total	Count of virtual circuits and sessions that have existed since the router booted or rebooted.

show line

To display parameters of a terminal line, use the **show line** command in EXEC mode.

show line [*line-number* | **aux** | **console** | **summary**]

Syntax Description	
<i>line-number</i>	(Optional) Absolute line number of the line for which you want to list parameters.
aux	(Optional) Auxiliary line.
console	(Optional) Primary terminal line.
summary	(Optional) Line status summary.

Command Modes EXEC

Command History	Release	Modification
	10.0	This command was introduced.
	11.3(1)T	The summary keyword added.
	12.1	Output from this command was modified to show the transport method configured.

Usage Guidelines The **show line** command used with the **summary** keyword will provide line status summary details such as whether there were modem calls or character mode calls.

Examples The following sample output from the **show line vty 4** command shows that virtual terminal line 4 has a send and receive rate of 9600 bits per second (bps). Also shown are the terminal screen width and length, modem state, preferred transport method, and other characteristics.

```
Router# show line vty 4

      Tty Typ      Tx/Rx      A Modem  Roty AccO AccI   Uses   Noise  Overruns
      22 VTY              -      -      -      -      -      0       0      0/0 -

Line 22, Location: "", Type: ""
Length: 24 lines, Width: 80 columns
Baud rate (TX/RX) is 9600/9600
Status: No Exit Banner
Capabilities: CUG Security Enabled
Modem state: Idle
Special Chars: Escape  Hold  Stop  Start  Disconnect  Activation
                ^^x  none  -    -      none
Timeouts:      Idle EXEC  Idle Session  Modem Answer  Session
Dispatch
                never          never          none          not set
                Idle Session Disconnect Warning
                never
                Login-sequence User Response
                00:00:30
                Autoselect Initial Wait
                not set
```

```

Modem type is unknown.
Session limit is not set.
Time since activation: never
Editing is enabled.
History is enabled, history size is 10.
DNS resolution in show commands is enabled
Full user help is disabled
Allowed input transports are none.
Allowed output transports are pad v120 telnet rlogin udptn.
Preferred transport is telnet.
No output characters are padded
No special data dispatching characters

```

Table 20 describes the significant fields shown in the display.

Table 20 *show line Field Descriptions*

Field	Description
Tty	Line number.
Typ	Type of line. In this case, a virtual terminal line, which is active, in asynchronous mode denoted by the preceding "A." All possible values follow: <ul style="list-style-type: none"> • VTY—virtual terminal line • CTY—console • AUX—auxiliary port • TTY—asynchronous terminal port • lpt—parallel printer
Tx/Rx	Transmit rate/receive rate of the line.
A	Indicates whether autobaud has been configured for the line. A value of F indicates that autobaud has been configured; a hyphen indicates that it has not been configured.
Modem	Types of modem signals that have been configured for the line. Possible values follow: <ul style="list-style-type: none"> • callin • callout • cts-req • DTR-Act • inout • RIisCD
Roty	Rotary group configured for the line, if set.
AccO, AccI	Output or input access list number configured for the line.
Uses	Number of connections established to or from the line since the system was restarted.
Noise	Number of times noise has been detected on the line since the system restarted.

Table 20 *show line Field Descriptions (continued)*

Field	Description
Overruns	Hardware Universal Asynchronous Receiver/Transmitter (UART) overruns or software buffer overflows, both defined as the number of overruns or overflows that have occurred on the specified line since the system was restarted. Hardware overruns are buffer overruns; the UART chip has received bits from the software faster than it can process them. A software overflow occurs when the software has received bits from the hardware faster than it can process them.
A (or I or *)	An A at the upper left of the display indicates that the user is running an asynchronous interface; an I indicates that the line has an asynchronous interface available; an asterisk (*) indicates that the line is otherwise active (in character mode).
Line	Definition of the specified protocol and address of the line.
Location	Location of the current line.
Type	Type of line, as specified by the line global configuration command.
Length	Length of the terminal or screen display, in rows.
Width	Width of the terminal or screen display, in columns.
Baud rate (TX/RX)	Transmit rate/receive rate of the line, in bps.
Status	State of the line: ready or not, connected or disconnected, active or inactive, exit banner or no exit banner, asynchronous interface active or inactive.
Capabilities	Current terminal capabilities.
Modem state	Modem control state. Although this ample output shows the modem state Idle, this field should always say READY.
Special Chars	Current settings of special characters that were input by the user (or taken by default) from the following global configuration commands: <ul style="list-style-type: none"> • escape-character • hold-character • stop-character • start-character • disconnect-character • activation-character
Timeouts	Current settings that were input by the user (or taken by default) from the following global configuration commands: <ul style="list-style-type: none"> • exec-timeout • session-timeout • dispatch-timeout • modem answer-timeout • session-disconnect-warning • timeout login response • autoselect timeout
Session limit	Maximum number of sessions.
Time since activation	Last time start_process was run.

Table 20 *show line Field Descriptions (continued)*

Field	Description
Editing	Whether command-line editing is enabled.
History	Current history list size, set by the user (or taken by default) from the history configuration command.
DNS resolution in show commands is	Whether Open Shortest Path First (OSPF) is configured to look up Domain Name System (DNS) names for use in show EXEC command displays.
Full user help	Whether full user help has been set by the user with the terminal full-help EXEC command or by the administrator with the full-help line configuration command.
Allowed input transports are	Current set transport method, set by the user (or taken by default) from the transport input line configuration command.
Allowed output transports are	Current set transport method, set by the user (or taken by default) from the transport output line configuration command.
Preferred transport is	Current set transport method, set by the user (or taken by default) from the transport preferred line configuration command.
...characters are padded	Current set padding, set by the user (or taken by default) from the padding line configuration command.
...data dispatching characters	Current dispatch character set by the user (or taken by default) from the dispatch-character line configuration command.

The following sample output from the **show line summary** command shows line summary status for lines 1/3/36 through 1/3/102. Each row of output represents 36 lines, and the line status characters in groups of four for readability. For example, the first row represents information on rows 1/3/36 through 1/3/71, and the first line status character “U” corresponds to line 1/3/36.

```
Router# show line summary

1/3/36: U??? ---- ---- ---- --u- ---- ????. . . .
1/3/72: ---- ????. ---- ????. ????. MMMM MMMM MMMM MMMM

2 character mode users.           (U)
19 lines never used.              (?)
31 lines used, but currently idle. (-)
4 lines do not exist.             (.)
16 lines in use by modem management (M)

18 total lines in use, 1 not authenticated (lowercase)
```

[Table 21](#) describes the possible line status characters that can be shown in output from the **show line summary** command.

Table 21 *Line Status Character Descriptions*

Line Status Character	Description
?	Line has never been used.
-	Lines has been used but is currently idle.
.	Line does not exist.

Table 21 *Line Status Character Descriptions (continued)*

Line Status Character	Description
A	Line in use by a packet mode user such as asynchronous PPP, Serial Line Internet Protocol (SLIP), ARAP or ASTUN.
D	Line in use by a digit mode user such as V.110 or V.120.
F	Line in use by a TCP fast-stream user.
M	Line in use by modem management.
U	Line in use by character mode user, such as an EXEC user making an outbound packet connection using Telnet, rlogin, local-area transport (LAT), packet assembler/disassembler (PAD), or normal (nonfast-stream) TCP clear.
V	Line in use by a voice mode user.

show node

To display information about local-area transport (LAT) nodes, use the **show node** command in EXEC mode.

```
show node [all | node-name] [counters | status | summary]
```

Syntax Description

all	(Optional) Specifies all nodes.
<i>node-name</i>	(Optional) Indicates the name of the node for which status is required.
counters	(Optional) Specifies the various node counters.
status	(Optional) Specifies detailed node status. This is the default if a node name is specified.
summary	(Optional) Specifies a status summary for the node. This is the default if no node name is specified.

Command Modes

EXEC

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

Entering the **show node** command with no arguments is the same as entering the **show node all summary** command and shows a one-line summary of all known nodes.

You can enter the **show node** command with either a specific node name or the **all** keyword, but not both.

The **show node** command displays three different sets of information about a node: the node counters, the node status, or a one-line summary of the node status.

You can enter the **show node** command with only one of the **counters**, **status**, or **summary** keywords. If you enter **show node** and two of these keywords without specifying a node name, the first keyword is treated as a node name, causing an error. If you enter the **show node node-name** command and two of these keywords, the second keyword will be treated as ambiguous.

The **show node** command with a *node-name* argument but no **counters**, **status**, or **summary** keyword defaults to **show node node-name status**.

Examples

The following is sample output from the **show node** command with no further keywords (the same as the **show node all summary** command):

```
Router> show node
```

```
Node Name      Status      Identification
CHAOS          Reachable
MUDDY-RIVER    Reachable
TARMAC         Reachable
WHEEL          Reachable   Welcome to VAX/VMS V5.4-2
```

Table 22 describes the significant fields shown in the display.

Table 22 *show node Field Descriptions*

Field	Description
Node Name	Lists the names of the nodes.
Status	Indicates whether the node is reachable or not.
Identification	Identification string for the node.

The following is sample output from the **show node** output that defaults to **show node chaos status**. It results in a display of the detailed status of node chaos.

```
Router> show node chaos

Node: CHAOS      Address: 00-00-0C-01-05-09
LAT Protocol: V5.1  Data Link Frame Size: 1500
Identification:
Node Groups: 0
Service Name  Status      Rating  Identification
CHAOS        Available  80
```

Table 23 describes the significant fields shown in the display.

Table 23 *show node status Field Descriptions*

Field	Description
Node	Lists the node name as reported by the host computer.
Address	Identifies the MAC address of the node Ethernet interface.
LAT protocol	Lists the version of the LAT protocol used by the node.
Data Link Frame Size	Lists the size of the largest packet that can be sent to the LAT host.
Identification	Lists the identification string for the node.
Node Groups	Lists the group code list that is advertised by the remote node, which comes from the service advertisement of the remote node.
Service Name	Lists the LAT service name.
Status	Indicates whether the node is currently available on the network.
Rating	Indicates the rating of the service: an integer from 0 to 255, with the highest number being the preferred service. Used for load balancing.

The following sample output displays the counter information for a specific node:

```
Router> show node tarmac counters

Node: tarmac
Seconds Since Zeroed: 100 Multiple Node Addresses: 0
Messages Received: 0 Duplicates Received: 0
Messages Transmitted: 0 Messages Re-transmitted: 0
Slots Received: 0 Illegal Messages Received: 0
Slots Transmitted: 0 Illegal Slots Received: 0
Bytes Received: 0 Solicitations Accepted: 0
Bytes Transmitted: 0 Solicitations Rejected: 0
```

In the following sample command and output displays, the **status** keyword is treated as the node name:

```
Router> show node status counters
```

```
Local -710- Node STATUS not known
```

In the following example, the second keyword **counters** is treated as ambiguous:

```
Router> show node lager status counters
```

```
Local -702- Keyword "COUNTERS" not known or ambiguous
```

show service

To display specific local-area transport (LAT) learned services, use the **show service** command in EXEC mode.

```
show service [service-name]
```

Syntax Description

service-name (Optional) The name of a specific LAT service.

Command Modes

EXEC

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

The **show service** command without a service name displays a list of known LAT learned services. When entered with the *service-name* argument, it displays a more-detailed status of the named service. If no LAT learned service by the specified name is known, then a lookup is done for an IP host of that name.

Examples

The following is sample output from the **show service** command:

```
Router> show service

Service Name  Status      Identification
BLUE         Available   Welcome to VAX/VMS V5.4
CHAOS        Available
MRL12        Available
MUDDY-RIVER  Available
STELLA-BLUE Available   Welcome to VAX/VMS V5.4
```

The following is sample output of the **show service** command for a specific service:

```
Router> show service blue

Service BLUE - Available
Node Name  Status  Rating  Identification
BLUE      reachable 84      Welcome to VAX/VMS V5.4
```

[Table 24](#) describes the significant fields shown in the two previous displays.

Table 24 *show service Field Descriptions*

Field	Description
Service	Name of the service.
Node Name	Name of the nodes advertising the service.

Table 24 *show service Field Descriptions (continued)*

Field	Description
Status	Status of the service: Available or Unknown when a command is entered without a service name. Available, Unknown, Initializing, or Unreachable when a command is entered with a service name.
Rating	Rating of the service: An integer from 0 to 255, with the highest number being the preferred service. Used for load balancing.
Identification	Identification string.

show terminal

To obtain information about the terminal configuration parameter settings for the current terminal line, use the **show terminal** command in EXEC mode.

show terminal

Syntax Description This command has no arguments or keywords.

Command Modes EXEC

Command History	Release	Modification
	10.0	This command was introduced.

Examples The following is sample output from the **show terminal** command:

```
Router# show terminal

Line 2, Location: "", Type: ""
Length: 24 lines, Width: 80 columns
Baud rate (TX/RX) is 9600/9600
Status: Ready, Active, No Exit Banner
Capabilities: Enabled
Modem state: Ready
Special Chars: Escape Hold Stop Start Disconnect Activation
                ^^x  none  -    -    none
Timeouts:      Idle EXEC  Idle Session  Modem Answer  Session  Dispatch
                never    never          0:00:15      not imp  not set

Session limit is not set.
Allowed transports are telnet rlogin. Preferred is telnet
No output characters are padded
```

[Table 25](#) describes the fields in the first three lines of the **show terminal** output.

Table 25 *show terminal Field Descriptions—First Three Lines of Output*

Field	Description
Line 2	Current terminal line.
Location: ""	Location of the current terminal line, as specified using the location line configuration command.
Type: ""	Type of the current terminal line, as specified using the line global configuration command.
Length: 24 lines	Length of the terminal display.
Width: 80 columns	Width of the terminal display, in character columns.
Baud rate (TX/RX) is 9600/9600	Transmit rate/receive rate of the line.

The following line of output indicates the status of the line:

```
Status: Ready, Active, No Exit Banner
```

Table 26 describes possible values for the Status field.

Table 26 *show terminal Field Descriptions—Status Field Values*

Field	Description
Active	A process is actively using the line.
Autobauding	The line is running the autobaud process.
Carrier Dropped	Some sense of “carrier” has been dropped, so the line process should be killed.
Connected	The line has at least one active connection.
Dialing Out	A dial-on-demand routing (DDR) asynchronous interface is dialing a remote site on this line.
Echo Off	The line is not echoing what the user types in (for example, because a password must be entered).
Escape Started	The first character of the escape sequence has been typed.
Escape Typed	Both characters of the escape sequence have been typed.
Hanging Up	The line state is “hanging up.”
Hardware XON/XOFF	The line uses a Universal Asynchronous Receiver/Transmitter (UART) that supports XON/XOFF flow control in hardware. (This does not mean that the line is currently using software flow control.)
Hold Typed	The user typed the “hold character” (and the line is paused).
Idle	The line modem state is “idle” (see modem state diagrams).
Idle Timeout	An idle timeout has occurred.
Input Stopped	The input has been turned off because of hardware flow control or overflow.
No Exit Banner	The normal exit banner will not be displayed on this line.
PSI Enabled	The line is paying attention to typed escape characters.
Rcvd BREAK	A BREAK sequence has been received on the line.
Rcvd Command	The line has received a special command sequence (for example, ^^B for send break).
Rcvd CR	The last character received was a carriage return.
Ready	The line state is “ready.”
Ring Transition	A transition has occurred on the RING signal of the line.
Send Break Soon	Send a BREAK on the line soon.
Send XOFF Soon	Buffers are full and an XOFF should be sent soon.
Sending Break	A BREAK sequence is being sent on the line.
Sent XOFF	Buffers were full, so an XOFF was sent.
SLIP Mode	The line is running SLIP or PPP.

The following line of output indicates the status of the capabilities of the line. These capabilities correspond closely to configurable parameters that can be set using configuration commands.

```
Capabilities: Enabled
```

Table 27 describes possible values for the Capabilities field.

Table 27 *show terminal Field Descriptions—Capabilities Field Values*

Field	Description
Autobaud Full Range	Corresponds to the autobaud command.
Character Padding	At least one pad c x configuration command has been used.
Enabled	The user has “enabled” successfully.
EXEC Suppressed	Corresponds to the no exec command.
Hangup on Last Close	Corresponds to the autohangup command.
Hardware Flowcontrol In	Corresponds to the flowcontrol hardware in command.
Hardware Flowcontrol Out	Corresponds to the flowcontrol hardware out command.
Insecure	Corresponds to the insecure command.
Lockable	Corresponds to the lockable command.
Modem Callin	Corresponds to the modem callin command.
Modem Callout	Corresponds to the modem callout command.
Modem CTS-Required	Corresponds to the modem cts-required command.
Modem DTR-Active	Corresponds to the modem dtr-active command.
Modem RI is CD	Corresponds to the modem ri-is-cd command.
No Login Banner	Corresponds to the no exec-banner command.
Notification Set	Corresponds to the notify command.
Output Non-Idle	Corresponds to the session-timeout command.
Permanent SLIP	Corresponds to the slip-dedicated command.
Private Line	Corresponds to the private command.
Refuse Suppress-GA	Corresponds to the telnet refuse command.
Receives Logging Output	Corresponds to the monitor command.
Refuse Telnet Echo	Corresponds to the telnet refuse command.
Send BREAK on IP	Corresponds to the telnet break-on-ip command.
SLIP allowed	Corresponds to the slip address command.
Software Flowcontrol In	Corresponds to the flowcontrol software in command.
Software Flowcontrol Out	Corresponds to the flowcontrol software out command.
Telnet Transparent Mode	Corresponds to the telnet transparent command.

The following line of output indicates the modem state. Values include Autobauding, Carrier Dropped, Hanging Up, Idle, and Ready.

```
Modem state: Ready
```

The following lines of output indicate the special characters that can be entered to activate various terminal operations. The none or hyphen (-) values imply that no special characters are set.

```
Special Chars: Escape  Hold  Stop  Start  Disconnect  Activation
                ^x    none  -    -          none
```

The following lines of output indicate the timeout values that have been configured for the line:

```
Timeouts:      Idle EXEC      Idle Session  Modem Answer  Session      Dispatch
               never          never          0:00:15      not imp      not set
```

Table 28 describes the fields in the preceding lines of output.

Table 28 *show terminal Field Descriptions—Timeouts*

Field	Description
Idle EXEC	Interval that the EXEC command interpreter waits for user input before resuming the current connection; or if no connections exist, returning the terminal to the idle state and disconnecting the incoming session. This interval is set using the exec-timeout command.
Idle Session	Interval that the Cisco IOS software waits for traffic before closing the connection to a remote computer and returning the terminal to an idle state. This interval is set using the session-timeout command.
Modem Answer	Interval during which the software raises DTR in response to RING and the modem response to CTS. This interval is set using the modem answer-timeout command.
Session	Not implemented in this release.
Dispatch	Number of milliseconds the software waits after putting the first character into a packet buffer before sending the packet. This interval is set using the dispatch-timeout command.

The following lines of output indicate how various options have been configured:

```
Session limit is not set.
Allowed transports are telnet rlogin. Preferred is telnet
No output characters are padded
```

show tn3270 ascii-hexval

To determine ASCII-hexadecimal character mappings, use the **show tn3270 ascii-hexval** command in EXEC mode.

```
show tn3270 ascii-hexval
```

Syntax Description This command has no arguments or keywords.

Command Modes EXEC

Command History	Release	Modification
	10.3	This command was introduced.

Usage Guidelines Use the **show tn3270 ascii-hexval** command to display the hexadecimal value of a character on your keyboard. After you enter the **show tn3270 ascii-hexval** command, you will be prompted to press a key. The hexadecimal value of the ASCII character is displayed. This command is useful for users who do not know the ASCII codes associated with various keys or do not have manuals for their terminals.

Examples The following is sample output from the **show tn3270 ascii-hexval** command:

```
Router> show tn3270 ascii-hexval

Press key> 7 - hexadecimal value is 0x37.

Router> show tn3270 ascii-hexval
Press key> f - hexadecimal value is 0x66.

Router> show tn3270 ascii-hexval
Press key> not printable - hexadecimal value is 0xD.
```

Related Commands	Command	Description
	show tn3270 character-map	Displays character mappings between ASCII and EBCDIC.
	tn3270 character-map	Converts incoming EBCDIC characters into ASCII characters for TN3270 connections.

show tn3270 character-map

To display character mappings between ASCII and EBCDIC, use the **show tn3270 character-map** command in EXEC mode.

```
show tn3270 character-map {all | ebcdic-in-hex}
```

Syntax Description

all	Displays all nonstandard character mappings.
<i>ebcdic-in-hex</i>	Displays the ASCII mapping for a specific EBCDIC character.

Command Modes

EXEC

Command History

Release	Modification
11.1	This command was introduced.

Examples

The following is sample output from the **show tn3270 character-map** command:

```
Router# show tn3270 character-map all

EBCDIC 0x81 <=> 0x78 ASCII
EBCDIC 0x82 <=> 0x79 ASCII
EBCDIC 0x83 <=> 0x7A ASCII
```

Related Commands

Command	Description
show tn3270 ascii-hexval	Displays ASCII-hexadecimal character mappings.
tn3270 character-map	Converts incoming EBCDIC characters into ASCII characters for TN3270 connections.

show translate

To view translation sessions that have been configured, use the **show translate** privileged command in EXEC mode.

show translate

Syntax Description This command has no arguments or keywords.

Command Modes Privileged EXEC

Command History	Release	Modification
	10.3	This command was introduced.

Usage Guidelines The display from this command shows each translation session set up on the router. It shows the incoming device and virtual terminal protocol, and the outgoing device and protocol.

Examples The following **show translate** sample output is based on the following **translate** command configuration:

```
translate x25 3131415912345 ppp ip-pool scope-name cardinal keepalive 0
```

If the previous **translate** command is enabled, the following output is created by the **show translate** command:

```
Router# show translate

Translate From: x25 3131415912345
                To:   PPP ip-pool scope-name cardinal keepalive 0
                1/1 users active, 1 peak, 1 total, 0 failures
```

[Table 29](#) describes the significant fields shown in the display.

Table 29 *show translate Field Descriptions—X.25 to IP Translation*

Field	Description
Translate From: x25 3131415912345	Protocol (X.25) and address (3131415912345) of the incoming device.
To: PPP	The virtual terminal protocol (PPP).
ip-pool	Obtain an IP address from a DHCP proxy client or a local pool.
scope-name cardinal	Specific local scope name (cardinal) from which to obtain an IP address.
keepalive 0	Indicates that keepalive updates have been disabled for the current translation session.
1/1 users active	Number of users active over the total number of users.

Table 29 *show translate Field Descriptions—X.25 to IP Translation (continued)*

Field	Description
1 peak	Maximum number of translate sessions up at any given time.
1 total	Total number of translation sessions.
0 failures	Number of failed translation attempts resulting from this configuration.

The following **show translate** sample output is based on the following **translate** command configuration:

```
translate x25 31301234 PPP 192.168.14.23 ipx-client Loopback0
```

If the previous **translate** command is enabled, the following output is created by the **show translate** command:

```
Router# show translate
```

```
Translate From: x25 31301234
              To:  PPP 192.168.14.23 ipx-client Loopback0
              1/1 users active, 1 peak, 1 total, 0 failures
```

[Table 30](#) describes the significant fields shown in the display.

Table 30 *show translate Field Descriptions—X.25 to IPX Translation*

Field	Description
Translate From: x25 31301234	Protocol (X.25) and address (31301234) of the incoming device.
To: PPP 192.168.14.23	The virtual terminal protocol (PPP) and IP address of the outgoing device.
ipx-client loopback0	Indicates that loopback interface 0 has been configured in client mode.
1/1 users active	Number of users active over the total number of users.
1 peak	Maximum number of translate sessions up at any given time.
1 total	Total number of translation sessions.
0 failures	Number of failed translation attempts resulting from this configuration.

show ttycap

To test for the availability of a ttycap after a connection on a router takes place, use the **show ttycap** command in EXEC mode.

```
show ttycap [ttycap-name | all]
```

Syntax Description

<i>ttycap-name</i>	(Optional) Name of a ttycap.
all	(Optional) Lists the names of all defined ttycaps. The name of the default ttycap is not listed.

Command Modes

EXEC

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

The Cisco IOS software searches for the specified ttycap in its active configuration image, and lists the complete entry if found. If it is not found, an appropriate “not found” message appears.

If you do not include any arguments with the **show ttycap** command, then the current keymap used for the terminal is displayed.

Examples

The following is sample output from the **show ttycap** command:

```
Router# show ttycap

d0|vt100|vt100-am|vt100am|dec vt100:do=^J:co#80:li#24:\
cl=50^[[;H^[[2J:bs:am:cm=5^[[%i%d;%dH:nd=2^[[C:up=2^[[A:\
ce=3^[[K:so=2^[[7m:se=2^[[m:us=2^[[4m:ue=2^[[m:md=2^[[1m:\
me=2^[[m:ho=^[[H:xn:sc=^[7:rc=^[8:cs=^[[%i%d;%dr:

Router# show ttycap all

ttycap3    d0|vt100|vt100-am|vt100am|dec vt100
ttycap2    d1|vt200|vt220|vt200-js|vt220-js|dec vt200 series with jump scroll
ttycap1    ku|h19-u|h19u|heathkit with underscore cursor

Router# show ttycap ttycap1

ttycap1    ku|h19-u|h19u|heathkit with underscore cursor:\:vs@:ve@:tc=h19-b:\
:al=1*\EL:am:le=^H:bs:cd=\EJ:ce=\EK:cl=\EE:cm=\EY%+ %+\
:co#80:dc=\EN:\:dl=1*\EM:do=\EB:ei=\EO:ho=\EH\
:im=\E@:li#24:mi:nd=\EC:as=\EF:ae=\EG:\
:ms:pt:sr=\EI:se=\Eq:so=\Ep:up=\EA:vs=\Ex4:ve=\Ey4:\
:kb=^h:ku=\EA:kd=\EB:k1=\ED:kr=\EC:kh=\EH:kn#8:ke=\E>:ks=\E=: \
:k1=\ES:k2=\ET:k3=\EU:k4=\EV:k5=\EW:\
:l6=blue:l7=red:l8=white:k6=\EP:k7=\EQ:k8=\ER:\
:es:hs:ts=\Ej\Ex5\Ex1\EY8%+ \Eo:fs=\EK\Ey5:ds=\Ey1:
```

show users

To display information about the active lines on the router, use the **show users** command in EXEC mode.

show users [all]

Syntax Description	all	(Optional) Specifies that all lines be displayed, regardless of whether anyone is using them.
---------------------------	------------	---

Command Modes	EXEC
----------------------	------

Command History	Release	Modification
	10.0	This command was introduced.

Usage Guidelines This command displays the line number, connection name, idle time, hosts (including virtual access interfaces), and terminal location. An asterisk (*) indicates the current terminal session.

Examples The following is sample output from the **show users** command:

```
Router# show users
      Line      User           Host(s)      Idle Location
      0 con 0
*     2 vty 0     rose         idle         0    BASHFUL.CISCO.COM
```

The following is sample output identifying an active virtual access interface:

```
Router# show users

Line      User           Host(s)      Idle   Location
*  0 con 0           idle         01:58
   10 vty 0         Virtual-Access2  0     1212321
```

The following is sample output from the **show users all** command:

```
Router# show users all
      Line      User           Host(s)      Idle Location
*  0 vty 0     rose         idle         0    BASHFUL.CISCO.COM
   1 vty 1
   2 con 0
   3 aux 0
   4 vty 2
```

[Table 31](#) describes the significant fields shown in the displays.

Table 31 *show users Field Descriptions*

Field	Description
Line	<p>Contains three subfields:</p> <ul style="list-style-type: none"> The first subfield (0 in the sample output) is the absolute line number. The second subfield (vty) indicates the type of line. Possible values follow: <ul style="list-style-type: none"> con—console aux—auxiliary port tty—asynchronous terminal port vty—virtual terminal The third subfield (0 in the * sample output) indicates the relative line number within the type.
User	User using the line. If no user is listed in this field, no one is using the line.
Host(s)	Host to which the user is connected (outgoing connection). A value of idle means that there is no outgoing connection to a host.
Idle	Interval (in minutes) since the user has entered something.
Location	Either the hard-wired location for the line or, if there is an incoming connection, the host from which incoming connection came.

Related Commands

Command	Description
line	Identifies a specific line for configuration and starts the line configuration command collection mode.
show line	Displays the parameters of a terminal line.
username	Configures a username-based authentication system.

show x25 pad

To display information about current open connections, including packet transmissions, X.3 parameter settings, and the current status of virtual circuits, use the **show x25 pad** command in EXEC mode.

show x25 pad

Syntax Description This command has no arguments or keywords.

Command Modes EXEC

Command History	Release	Modification
	11.2	This command was introduced.

Examples The following is sample output from the **show x25 pad** command:

```
Router# show x25 pad

tty2, Incoming PAD connection
Total input: 61, control 6, bytes 129. Queued: 0 of 7 (0 bytes).
Total output: 65, control 6, bytes 696.
Flags: 1, State: 3, Last error: 1
ParamsIn: 1:1, 2:0, 3:2, 4:1, 5:1, 6:0, 7:21,
          8:0, 9:0, 10:0, 11:14, 12:0, 13:0, 14:0, 15:1,
          16:127, 17:21, 18:18, 19:0, 20:0, 21:0, 22:0,
ParamsOut: 1:1, 2:1, 3:2, 4:1, 5:0, 6:0, 7:4,
           8:0, 9:0, 10:0, 11:14, 12:0, 13:0, 14:0, 15:0,
           16:127, 17:21, 18:18, 19:0, 20:0, 21:0, 22:0,
LCI: 1, State: D1, Interface: Serial0
Started 0:11:10, last input 0:00:16, output 0:00:16
Connected to 313700540651
Window size input: 7, output: 7
Packet size input: 512, output: 512
PS: 1 PR: 5 ACK: 5 Remote PR: 1 RCNT: 0 RNR: FALSE
Retransmits: 0 Timer (secs): 0 Reassembly (bytes): 0
Held Fragments/Packets: 0/0
Bytes 696/129 Packets 65/61 Resets 0/0 RNRs 0/0 REJs 0/0 INTs 0/0
```

[Table 32](#) describes fields seen in the display from the **show x25 pad** command.

Table 32 *show x25 pad Field Descriptions*

Field	Description
Total input/output	Number of packets received or sent for the connection.
control	Number of packets with Qbit set (X.29 control packets).
bytes	Number of bytes in each direction.
Queued	Number of unread packets waiting for the connection.
Waiting to send	Local data packet bit not sent (part of a line).

Table 32 *show x25 pad Field Descriptions (continued)*

Field	Description
Flags, State, Last error	Displays data for detecting errors and tracing initialization status. Only useful to your Cisco-certified technical support personnel.
ParamsIn	Parameters read from the PAD at the start of the connection.
ParamsOut	Active X.3 parameters.
LCI, State, Interface	Status of the X.25 virtual circuit associated with the PAD connection. This is the same display that the show x25 vc command shows.

show xremote

To display XRemote connections and monitor XRemote traffic through the router, use the **show xremote** command in EXEC mode.

show xremote

Syntax Description This command has no arguments or keywords.

Command Modes EXEC

Command History	Release	Modification
	10.0	This command was introduced.

Usage Guidelines The **show xremote** command displays XRemote parameters applied to the entire system, and statistics that are pulled for all active XRemote connections.

Examples The following is sample output from the **show xremote** command when XRemote is enabled and XRemote sessions are active:

```
Router# show xremote

XRemote server-wide parameters:
  Font buffersize:      72000           Font retries: 3
  Font memory errors:  0

TFTP font load statistics for host 172.16.1.111:
  Bytes read:          2697239         Files read: 258
  Network errors:      4               File errors: 0

LAT font load statistics for service WHEEL, incarnation 5:
  Bytes read           182401          Files read: 14
  Protocol errors:     0               Insufficient memory: 0

XRemote statistics for tty2:
  Current clients:      9               Total clients: 17
  Requesting client:    5               Current request size: 0
  Replying client:      6               Current reply size: 0
  XDM state:            10              Next timeout: 172460
  Retransmit counter:   0               Local UDP port: 53616
  Keepalive dormancy:  180              Session id: 94
  Unread input:         0               Unwritten output: 0
  Input buffer size:    1024             Output buffer size: 108
  Protocol version:     2               Line state: Connected
  Transmit packets:     50768            Receive packets: 49444
  Transmit errors:      0               Receive errors: 37
  Retransmissions:     403              Receive out of sequence: 76
  Round trip time:      383              Retransmit interval: 766
  Transmit window:      7               Receive window: 7
  Transmit next:        6               Receive next: 3
  Transmit unacked:     6               Receive unacked: 0
```

```

Connection 0 - TCP connection from 172.16.1.55 [Display Manager]
Client state:      CS_ACTIVE          Byte order: MSBfirst
Unread input:     0                   Unwritten output: 0
Input buffer size: 1024              Output buffer size: 1024

Connection 1 - LAT connection from WHEEL
Client state:      CS_ACTIVE          Byte order: LSBfirst
Unread input:     0                   Unwritten output: 0
Input buffer size: 1024              Output buffer size: 1024

```

Table 33 describes the significant fields shown in the display.

Table 33 *show xremote Field Descriptions*

Field	Description
XRemote server-wide parameters	This section displays XRemote parameters that apply to the protocol translator.
Font buffersize	XRemote font buffer size that was specified with the xremote tftp buffersize global configuration command.
Font retries	Number of retries the font loader (host) will attempt before declaring an error condition.
Font memory errors	Number of font memory error conditions that have been declared for the protocol translator.
TFTP font load statistics for host 172.16.1.111	This section displays XRemote statistics for fonts that have been loaded from a TFTP font server at the IP address shown.
Bytes read	Number of bytes the host read in order to load the fonts.
Files read	Number of files the host read in order to load the fonts.
XRemote statistics for tty2	This section displays XRemote for the specified line.
Current clients	Number of clients using this line for active XRemote sessions.
Total clients	Includes the number of clients using this line for active XRemote sessions.
Requesting client	Number of clients requesting XRemote service.
Retransmit counter	Number of times that XRemote connection requests were resent.
Local UDP port	Number assigned to the local UDP port.
Keepalive dormancy	Amount of time between keepalive messages.

show xremote line

To list XRemote connections and monitor XRemote traffic, use the **show xremote line** command in EXEC mode.

show xremote line *number*

Syntax Description	<i>number</i>	A decimal value representing the number of virtual terminal lines about which to display information.
--------------------	---------------	---

Command Modes	EXEC
---------------	------

Command History	Release	Modification
	10.0	This command was introduced.

Examples

The following is sample output from the **show xremote line** command (line 3 is specified) when XRemote is enabled and XRemote sessions are active. Only information specific to an individual terminal line is provided. See [Table 33](#) for output field descriptions.

```
Router# show xremote line 3
Xremote statistics for tty3:
  Current clients:      11          Total clients: 19
  Requesting client:   10          Current request size: 0
  Replying client:     10          Current reply size: 0
  XDM state:           10          Next timeout: 173304
  Retransmit counter:  0           Local UDP port: 28384
  Keepalive dormancy: 180         Session id: 29
  Unread input:        0           Unwritten output: 0
  Input buffer size:   1024        Output buffer size: 108
  Protocol version:    2           Line state: Connected
  Transmit packets:   28875       Receive packets: 18644
  Transmit errors:     0           Receive errors: 13
  Retransmissions:    53          Receive out of sequence: 41
  Round trip time:     384         Retransmit interval: 768
  Transmit window:     7           Receive window: 7
  Transmit next:       2           Receive next: 7
  Transmit unacked:    2           Receive unacked: 0

  Connection 0 - TCP connection from 172.16.1.27 [Display Manager]
    Client state:       CS_ACTIVE   Byte order: MSBfirst
    Unread input:       0           Unwritten output: 0
    Input buffer size: 1024        Output buffer size: 1024

  Connection 1 - TCP connection from 172.16.1.27
    Client state:       CS_ACTIVE   Byte order: MSBfirst
    Unread input:       0           Unwritten output: 0
    Input buffer size: 1024        Output buffer size: 1024

  Connection 2 - TCP connection from 172.16.1.27
    Client state:       CS_ACTIVE   Byte order: MSBfirst
    Unread input:       0           Unwritten output: 0
    Input buffer size: 1024        Output buffer size: 1024
```