

skip (ruleset)

To identify a connection to ignore by the translation ruleset, use the **skip** command in translate ruleset configuration mode. To remove the test operation, use one of the two **no** forms of this command.

```
skip [line-number] incoming-connection-parameter regular-expression [line-number
incoming-connection-parameter regular-expression [...]]
```

```
no skip incoming-connection-parameter regular-expression [incoming-connection-parameter
regular-expression [...]]
```

```
no skip line-number
```

Syntax Description		
<i>line-number</i>	(Optional) The line in the translation ruleset to test for a skip operation.	
<i>incoming-connection-parameter</i>	Incoming protocol parameter to test for; up to six skip tests can be written on one command line. Parameters are available for packet assembler/disassembler (PAD) and Telnet connections, and are listed in Table 39 and Table 40 .	
<i>regular-expression</i>	Pattern with regular expression to test for ignoring.	

Defaults No default behavior or values

Command Modes Translate ruleset configuration

Command History	Release	Modification
	12.3(8)T	This command was introduced.

Usage Guidelines Up to six skip tests can be written on one command line. The ellipses in the format shown above means multiple skip tests can be written in a translation ruleset statement.

For incoming connection attempts, a template is configured, and within the template a connection can be identified by tests written using Cisco regular expressions and a pattern that is ignored (skipped).

The translation ruleset templates have line numbers that can be displayed using the **show translate ruleset EXEC** command.

Cisco regular expressions are described in Appendix A, “Regular Expressions,” in the *Cisco IOS Terminal Services Configuration Guide*.

[Table 39](#) and [Table 40](#) list the protocol parameter keywords and arguments that can be specified in the skip statements for incoming PAD and Telnet connections.

Table 39 Skip Keywords for Incoming PAD Connections

Keyword	Description
cud <i>ASCII-string</i>	Call user data (CUD) that occurs after the protocol identification (PID). For outgoing PAD connections, this is the optional, user-specified text included in the outgoing call request packet after the protocol identification bytes. The CUD is entered as an ASCII string.
dest-addr <i>address</i>	Destination X.121 address entered as a number from 0 to 15 digits long.
dest-addr-ext <i>address</i>	Network service access point (NSAP) destination address extension.
dldci <i>number</i>	Frame Relay data-link connection identifier (DLCI) of an Annex G service entered as a number from one to seven digits, although a size of two to four digits is more likely, or the NULL string if not received on an Annex G service.
interface <i>type number</i>	Interface to be used for the circuit, entered using standard Cisco IOS interface designations: Serial1/0:1, for example.
mac <i>address</i>	Connection-Mode Network Service (CMNS) service remote host MAC address entered as three hexadecimal numbers of four digits separated by a period, 0000.fc08.12ab, for example, or the NULL string if not received on a CMNS service.
packetsize <i>size</i>	X.25 maximum data packet sizes to request, entered as two numbers from the following choices: 16, 32, 64, 128, 256, 512, 1024, 2048, 4096.
pid <i>byte-string</i>	PID string specified in ASCII or hexadecimal. A hexadecimal PID must be prefixed by "0x." For example, 0x01000000 is the standard PAD PID. Although it is available for specifying a nonstandard Call PID, this parameter is not restricted to the common PID length and can be used to specify the entire user data field.
reversed <i>flag</i>	Flag to indicate whether a reverse charged Call is permitted. This flag applies to a switched virtual circuit (SVC) and is entered as a single character, Y or N , for yes or no.
source-addr <i>address</i>	Source X.121 address.
source-addr-ext <i>address</i>	NSAP source address extension.
window-size <i>size</i>	X.25 window sizes to request, entered as two numbers in a range from 1 to 127.
xot-dest-addr <i>address</i>	Destination IP address of an X.25 over TCP (XOT) service entered in standard IP address dotted decimal notation (10.0.0.127, for example) or the NULL string if not received on an XOT service.
xot-source-addr <i>address</i>	Source IP address of an XOT service entered in standard IP address dotted decimal notation (10.0.0.127, for example) or the NULL string if not received on an XOT service.

Table 40 Skip Keywords for Incoming Telnet Connections

Keyword	Description
dest-addr <i>address</i>	Destination IP address entered in standard IP address dotted decimal notation: 10.0.0.127, for example.
dest-port <i>port</i>	Destination port entered as a decimal number from one to five digits long.
source-addr <i>address</i>	Source IP address entered in standard IP address dotted decimal notation: 10.0.0.127, for example.

Examples

The following example shows how to write match and skip tests to skip connection attempts from any subnetwork address starting with 10 or 11 and match only those with a specific IP address and destination port number:

```
translate ruleset customer-case-1 from telnet to pad
! Ignore an incoming Telnet attempt from any subnetwork address starting with 10
skip source-addr ^10\.
! Match an incoming Telnet attempt destined for an IP addresses starting
! with 172.18., and a 5-digit port starting with 10 or 11
match dest-addr ^172\.18\.* dest-port ^1[0-1]..$.
! Or match an incoming Telnet attempt destined an IP addresses starting
! with 172.18., and a 5-digit port starting with 120 through 127
match dest-addr ^172\.18\.* dest-port ^12[0-7]..$
```

The following example shows how to write match and skip tests to skip connection attempts from destination 55554 and to match only those with destination addresses from 55550 to 55553 and from 55556 to 55559:

```
translate ruleset A from pad to telnet
skip dest-addr ^55554$
match dest-addr ^5555.$
```

Related Commands

Command	Description
description (ruleset)	Adds a description about a translation ruleset.
match (ruleset)	Identifies a connection for processing by the translation ruleset.
options (ruleset)	Specifies protocol translation options in a translation ruleset.
set (ruleset)	Unconditionally sets one or more connection parameters to a fixed value for a translation ruleset.
show translate ruleset	Displays a summary of a specific or of all configured translation rulesets, behavioral parameters, and usage statistic.
substitute (ruleset)	Matches an available protocol and substitutes another in a translation ruleset.
test (ruleset)	Tests parameter values in a translation ruleset using regular expressions.
test translate	Displays a trace of protocol translation behavior for a connection attempt.
translate ruleset	Defines a unique name for a translation ruleset, specifies translated protocols, and enters translate ruleset configuration mode.
x25 pvc translate ruleset	Configures PVCs that are valid for protocol translation ruleset handling.

slip

To start a serial connection to a remote host by using Serial Line Internet Protocol (SLIP), use the **slip** command in EXEC mode.

```
slip [/default] {remote-ip-address | remote-name} [@tacacs-server] [/routing] [/compressed]
```

Syntax Description		
/default	(Optional) Makes a SLIP connection when a default address has been configured.	
<i>remote-ip-address</i>	IP address of the client workstation or PC.	
<i>remote-name</i>	Name of the client workstation or PC.	
<i>@tacacs-server</i>	(Optional) IP address or IP host name of the TACACS server to which your TACACS authentication request is sent.	
/routing	(Optional) Indicates that the remote system is a router. Line must be configured for asynchronous routing using SLIP encapsulation.	
/compressed	(Optional) Indicates that IP header compression should be negotiated.	

Command Modes EXEC

Command History	Release	Modification
	10.0	This command was introduced in a release prior to Cisco IOS Release 10.0.

Usage Guidelines

When you connect from a remote node computer to the EXEC facility on a router and want to connect from the router to a device on the network, issue the **slip** command.

If you specify an address for the TACACS server by using **/default** or *tacacs-server* arguments, the address must be the first parameter in the command after you enter **slip**. If you do not specify an address or enter **/default**, you are prompted for an IP address or host name. You can enter the **/default** keyword at this point.

If you do not use the *tacacs-server* argument to specify a TACACS server for SLIP address authentication, the TACACS server specified at login (if any) is used for the SLIP address query.

To optimize bandwidth on a line, SLIP enables compression of the SLIP packets using Van Jacobson TCP header compression as defined in RFC 1144.

Your system administrator must configure the system with the **ip tcp header-compression passive** command for the **/compressed** command option to be valid in EXEC mode. The **ip tcp header-compression** command forces header compression on or off. The default is to not compress the packets. The configuration file must have header compression on and the **slip /compressed** EXEC command must be entered for header compression to occur.

To terminate a session initiated with the **slip** command, disconnect from the device on the network using the command specific to that device. Then, exit from EXEC mode by using the **exit** command.

Examples

The following example makes a connection when a default IP address is assigned. Once a correct password is entered, you are placed in SLIP mode, and the IP address is displayed.

```
Router> slip
Password:
Entering SLIP mode.
Your IP address is 192.168.7.28, MTU is 1524 bytes
```

The following example illustrates the prompts displayed and the response required when you use dynamic addressing to assign the SLIP address:

```
Router> slip
IP address or hostname? 192.168.6.15
Password:
Entering SLIP mode
Your IP address is 192.168.6.15, MTU is 1524 bytes
```

In the preceding example, the address 172.31.6.15 has been assigned as the default. Password verification is still required before SLIP mode can be enabled.

```
Router> slip /default
Password:
Entering SLIP mode
Your IP address is 192.168.6.15, MTU is 1524 bytes
```

The following example illustrates the implementation of header compression on the interface with the IP address 172.24.2.1:

```
Router> slip 172.24.2.1 /compressed
Password:
Entering SLIP mode.
Interface IP address is 172.24.2.1, MTU is 1500 bytes.
Header compression will match your system.
```

In the preceding example, the interface is configured for the **ip tcp header-compression passive** command, which permits the user to enter the **/compressed** keyword at the EXEC mode prompt. The message “Header compression will match your system” indicates that the user specified compression. If the line was configured for the **ip tcp header-compression on** command, this line would read “Header compression is On.”

The following example specifies a TACACS server named server1 for address authentication:

```
Router> slip 10.0.0.1@server1
Password:
Entering SLIP mode.
Interface IP address is 10.0.0.1, MTU is 1500 bytes
Header compression will match your system.
```

Related Commands

Command	Description
ip tcp header-compression	Enables TCP header compression.

substitute (ruleset)

To match an available protocol and substitute another in a translation ruleset, use the **substitute** command in translate ruleset configuration mode. To change or remove the substitution statement, use one of the **no** forms of this command.

```
substitute [line-number] {pad | telnet} variable-parameter reg-exp-match into {pad | telnet}
variable-parameter [reg-exp-write]
```

```
no substitute {pad | telnet} variable-parameter reg-exp-match into {pad | telnet}
variable-parameter [reg-exp-write]
```

```
no substitute line-number ...
```

Syntax Description		
<i>line-number</i>	(Optional)	The line in the translation ruleset to test for substitution.
{ pad telnet }		Identifies the incoming or outgoing protocol and controls which parameters are available in the next element of this command.
<i>variable-parameter</i>		A parameter that varies depending upon the protocol selected, either pad or telnet , and its role, either incoming or outgoing. Protocol parameters that modify the incoming or outgoing connection behavior during protocol translation session setup are indicated in Table 41 with an X.
<i>reg-exp-match</i>		A standard Cisco regular expression match specification.
into		Makes the substitution into an available protocol parameter.
<i>reg-exp-write</i>	(Optional)	A standard Cisco regular expression write specification that uses information from a match specification.

Defaults No default behavior or values

Command Modes Translate ruleset configuration

Command History	Release	Modification
	12.3(8)T	This command was introduced.

Usage Guidelines Up to six substitute specifications can be entered on one command line. The ellipses in the format shown above means multiple **substitute** statements can be specified in a translation ruleset statement.

When you use the first **no** form of this command, specify the full set of parameters and expressions in the command to be removed. The second **no** form must specify the correct **substitute** command and line number within the translation ruleset template.

This command is used to substitute between protocol parameters using regular expressions to match elements with a test string, and to substitute parameters into another string that can take elements from the matched string.

Table 41 *Substitute Connection Parameter Keywords (continued)*

Parameter	Description	Incoming PAD	Outgoing Telnet	Outgoing PAD	Incoming Telnet
dest-addr-ext <i>address</i>	Network service access point (NSAP) destination address extension.	X	—	X	—
dest-port <i>port</i>	Destination port entered as a decimal number from one to five digits long.	—	X	—	X
dldci <i>number</i>	Frame Relay data-link connection identifier (DLCI) of an Annex G service entered as a number from one to seven digits in length, although a size of two to four digits is more likely, or the NULL string if not received on an Annex G service.	X	—	X	—
eor <i>specification</i>	A character set defining the End-of-Record (EOR) string for the protocol translation session, entered as an ASCII or hexadecimal specification from one to four bytes in length, aaa or 0x19, as examples.	—	X	—	X
eor-insert <i>flag</i>	Flag specifying that the EOR character set should be inserted for PAD data being forwarded to a Telnet session, and entered as a single character. Use one of the following characters to specify EOR insertion: Y , y , 1–9 , T , t .	—	X	—	X
hostname <i>address</i>	Destination host name for Domain Name System (DNS) resolution entered as an ASCII string.	—	X	—	—
idle <i>seconds</i>	Number of seconds the PAD connection can be idle before being cleared.	X	—	X	—
interface <i>type number</i>	Interface to be used for the circuit, entered using standard Cisco IOS interface designations; Serial1/0:1, for example.	X	—	X	—

Table 41 *Substitute Connection Parameter Keywords (continued)*

Parameter	Description	Incoming PAD	Outgoing Telnet	Outgoing PAD	Incoming Telnet
keepalive-period <i>seconds</i>	A number that indicates the number of seconds between TCP keepalives for the X.25 over TCP (XOT) connection. TCP keepalive information applies only when a ruleset is configured to match an XOT destination address. Example: match dest-addr ^5555.\$ xot-dest-addr 5.5.5.2	X	—	X	—
keepalive-tries <i>number</i>	A number that indicates the number of TCP keepalives to send before the XOT connection is declared dead. TCP keepalive information applies only when a ruleset is configured to match an XOT destination address. Example: match dest-addr ^5555.\$ xot-dest-addr 5.5.5.2	X	—	X	—
local flag	Flag specifying that Telnet control sequences should be forwarded, not processed, and entered as a single character. Use one of the following characters to specify local mode: Y, y, 1–9, T, t .	—	X	—	X
mac address	Connection-Mode Network Service (CMNS) service remote host MAC address entered as three hexadecimal numbers of four digits separated by a period, (0000.fc08.12ab, for example) or the NULL string if not received on a CMNS service.	X	—	X	—
no-reset	Suppress a PVC Reset packet at session startup.	X	—	X	—
packetsize <i>size</i>	X.25 maximum data packet sizes to request, entered as two numbers from the following choices: 16, 32, 64, 128, 256, 512, 1024, 2048, 4096.	X	—	X	—

Table 41 Substitute Connection Parameter Keywords (continued)

Parameter	Description	Incoming PAD	Outgoing Telnet	Outgoing PAD	Incoming Telnet
pid <i>byte-string</i>	PID string specified in ASCII or hexadecimal. A hexadecimal PID must be prefixed by "0x." For example, 0x01000000 is the standard PAD PID. Although it is available for specifying a nonstandard Call PID, this parameter is not restricted to the common PID length and can be used to specify the entire user data field.	X	—	X	—
printer <i>flag</i>	Printer access mode. Flag specifying that the outgoing connection should be brought up before the incoming connection is confirmed. Use one of the following characters to specify printer mode: Y , y , 1-9 , T , t . An unsuccessful outgoing connection attempt results in the incoming connection to the ruleset being refused, rather than being accepted and then closed, which is the default behavior. Note that using this keyword will force the ruleset quiet keyword to be applied to the translation.	X	—	—	X
profile <i>name</i>	Named PAD profile to use.	X	—	X	—
pvc <i>circuit-number</i>	Permanent virtual circuit (PVC) entered as a number from 1 to 4095, or the null string if not a PVC.	—	—	X	—
reverse	Request reverse charging.	—	—	X	—
reversed <i>flag</i>	Flag to indicate whether a reverse charged Call is permitted. This flag applies to a switched virtual circuit (SVC) and is entered as a single character, Y or N , for yes or no.	X	—	—	—

Table 41 Substitute Connection Parameter Keywords (continued)

Parameter	Description	Incoming PAD	Outgoing Telnet	Outgoing PAD	Incoming Telnet
rotor	Modifies the behavior of the host-name keyword by allowing one of the IP addresses defined by the ip host configuration command to be chosen randomly. If one address fails, another will be tried until a connection is made or all address choices are exhausted.	—	X	—	—
source-addr <i>address</i>	Source X.121 address.	X	—	X	X
source-addr-ext <i>address</i>	NSAP source address extension.	X	—	X	—
source-ifc <i>type</i> <i>number</i>	Interface from which to take the source IP address, entered using standard Cisco IOS interface designations: Loopback0, for example.	—	X	X	—
stream <i>flag</i>	Flag that specifies whether Telnet negotiation should be sent or accepted, entered as one of the following characters to specify stream mode: Y, y, 1–9, T, t .	—	X	—	X
swap <i>flag</i>	X.29 role reversal. Flag that indicates the PAD connection should not initiate X.29 commands when first connected. Use one of the following characters to swap behavior: Y, y, 1–9, T, t . This parameter enables incoming and outgoing PAD connections to be swapped so that a protocol translation is treated like a PAD when it accepts a call. By default, the protocol translation functions like a PAD for calls that it initiates, and like an X.25 host for calls it accepts.	X	—	X	—
use-map <i>map</i>	Use the map defined for PAD service.	—	—	X	—
window <i>size</i> <i>size</i>	X.25 window sizes to request, entered as two numbers in a range from 1 to 127.	X	—	X	—

Table 41 Substitute Connection Parameter Keywords (continued)

Parameter	Description	Incoming PAD	Outgoing Telnet	Outgoing PAD	Incoming Telnet
xot-dest-addr <i>address</i>	Destination IP address of an X.25 over TCP (XOT) service entered in standard IP address dotted decimal notation (10.0.0.127, for example) or the NULL string if not received on an XOT service.	X	—	X	—
xot-source-addr <i>address</i>	Source IP address of an XOT service entered in standard IP address dotted decimal notation (10.0.0.127, for example) or the NULL string if not received on an XOT service.	X	—	—	—

Examples

The following example shows how to build a translation ruleset template by starting with a match connection test, specifying protocol translation options, and setting specific parameters for incoming Telnet connections. The translation ruleset goes on to test and set appropriate parameters for incoming PAD connections, and to construct an SVC source address from Telnet information starting with the source IP address expressed using regular expression characters that allow for subsequent substitution in its last two fields. The translation ruleset is completed by adding in elements extracted from the Telnet destination port; the rewrite pattern is taken from the current value of PAD source address. Note use of the backslash character to construct the test ... set and substitute ... into statements.

```
translate ruleset customer-case-1 from telnet to pad
! Match an incoming Telnet attempt destined for IP addresses starting
! with 172.18., and a 5-digit port starting with the numbers 120 through 127.
match dest-addr ^172\.18\.* dest-port ^12[0-7]..$
! Once the correct network is matched, specify that this ruleset is limited
! to ten concurrent users and requires a login exchange.
options max-users 10 login
! Set Telnet options:
set telnet printer Y telnet binary Y
! Set PAD options:
set pad profile cust-profile-one
! Test conditional parameters and make appropriate settings:
test telnet dest-addr ^172\.18\.0\.* telnet dest-port ^10.00 \
  set pad pvc 1 telnet binary T
! Construct an SVC source address from the Telnet source information;
! start with the source IP address in the form 172.18.##.##, allowing
! for substitutions in the last two fields:
substitute telnet source-addr ^172\.18\.(.)\.(.)\
  into pad source-addr 98\1\2\1
! Now add in an extract from the Telnet destination port,
! where the rewrite pattern is taken from the current value of the PAD
! source address:
substitute telnet dest-port ^.(...) into pad source-addr
```

Related Commands

Command	Description
description (ruleset)	Adds a description about a translation ruleset.
match (ruleset)	Identifies a connection for processing by the translation ruleset.

Command	Description
options (ruleset)	Specifies protocol translation options in a translation ruleset.
set (ruleset)	Unconditionally sets one or more connection parameters to a fixed value for a translation ruleset.
show translate ruleset	Displays a summary of a specific or of all configured translation rulesets, behavioral parameters, and usage statistic.
skip (ruleset)	Identifies a connection for omission by the translation ruleset.
test (ruleset)	Tests parameter values in a translation ruleset using regular expressions.
test translate	Displays a trace of protocol translation behavior for a connection attempt.
translate ruleset	Defines a unique name for a translation ruleset, specifies translated protocols, and enters translate ruleset configuration mode.
x25 pvc translate ruleset	Configures PVCs that are valid for protocol translation ruleset handling.

telnet

To log in to a host that supports Telnet, use the **telnet** command in EXEC mode.

```
telnet host [port] [keyword]
```

Syntax Description	host	A host name or an IP address.
	port	(Optional) A decimal TCP port number; the default is the Telnet router port (decimal 23) on the host.
	keyword	(Optional) One of the keywords listed in Table 42 .

Command Modes EXEC

Command History	Release	Modification
	10.0	This command was introduced.
	12.0(21)ST	The /ipv4 and /ipv6 keywords were added.
	12.1	The /quiet keyword was added.
	12.2(2)T	Support for the /ipv4 and /ipv6 keywords was integrated into Cisco IOS Release 12.2(2)T.

Usage Guidelines [Table 42](#) lists the optional **telnet** command keywords.

Table 42 telnet Keyword Options

Option	Description
/debug	Enables Telnet debugging mode.
/encrypt kerberos	Enables an encrypted Telnet session. This keyword is available only if you have the Kerberized Telnet subsystem. If you authenticate using Kerberos Credentials, the use of this keyword initiates an encryption negotiation with the remote server. If the encryption negotiation fails, the Telnet connection will be reset. If the encryption negotiation is successful, the Telnet connection will be established, and the Telnet session will continue in encrypted mode (all Telnet traffic for the session will be encrypted).
/ipv4	Forces the use of IP version 4.
/ipv6	Forces the use of IP version 6.
/line	Enables Telnet line mode. In this mode, the Cisco IOS software sends no data to the host until you press the Enter key. You can edit the line using the standard Cisco IOS software command-editing characters. The /line keyword is a local switch; the remote router is not notified of the mode change.
/noecho	Disables local echo.
/quiet	Prevents onscreen display of all messages from the Cisco IOS software.

Table 42 telnet Keyword Options (continued)

Option	Description
<i>/route path</i>	Specifies loose source routing. The <i>path</i> argument is a list of host names or IP addresses that specify network nodes and ends with the final destination.
<i>/source-interface</i>	Specifies the source interface.
<i>/stream</i>	Turns on stream processing, which enables a raw TCP stream with no Telnet control sequences. A stream connection does not process Telnet options and can be appropriate for connections to ports running UNIX-to-UNIX Copy Program (UUCP) and other non-Telnet protocols.
<i>port-number</i>	Port number.
bgp	Border Gateway Protocol.
chargen	Character generator.
cmd rcmd	Remote commands.
daytime	Daytime.
discard	Discard.
domain	Domain Name Service.
echo	Echo.
exec	EXEC.
finger	Finger.
ftp	File Transfer Protocol.
ftp-data	FTP data connections (used infrequently).
gopher	Gopher.
hostname	Host name server.
ident	Ident Protocol.
irc	Internet Relay Chat.
klogin	Kerberos login.
kshell	Kerberos shell.
login	Login (rlogin).
lpd	Printer service.
nntp	Network News Transport Protocol.
node	Connect to a specific LAT node
pop2	Post Office Protocol v2.
pop3	Post Office Protocol v3.
port	Destination LAT port name.
smtp	Simple Mail Transport Protocol.
sunrpc	Sun Remote Procedure Call.
syslog	Syslog.
tacacs	Specify TACACS security.
talk	Talk.

Table 42 *telnet Keyword Options (continued)*

Option	Description
telnet	Telnet.
time	Time.
uucp	UNIX-to-UNIX Copy Program.
whois	Nickname.
www	World Wide Web.

With the Cisco IOS implementation of TCP/IP, you are not required to enter the **connect** or **telnet** commands to establish a terminal connection. You can enter only the learned host name—as long as the following conditions are met:

- The host name is different from a command word for the router.
- The preferred transport protocol is set to **telnet**.

To display a list of the available hosts, use the **show hosts** command. To display the status of all TCP connections, use the **show tcp** command.

The Cisco IOS software assigns a logical name to each connection, and several commands use these names to identify connections. The logical name is the same as the host name, unless that name is already in use, or you change the connection name with the **name-connection EXEC** command. If the name is already in use, the Cisco IOS software assigns a null name to the connection.

The Telnet software supports special Telnet commands in the form of Telnet sequences that map generic terminal control functions to operating system-specific functions. To issue a special Telnet command, enter the escape sequence and then a command character. The default escape sequence is Ctrl-^ (press and hold the **Ctrl-Shift-6**). You can enter the command character as you hold down Ctrl or with Ctrl released; you can use either uppercase or lowercase letters. [Table 43](#) lists the special Telnet escape sequences.

Table 43 *Special Telnet Escape Sequences*

Escape Sequence ¹	Purpose
Ctrl-^ b	Break
Ctrl-^ c	Interrupt Process (IP)
Ctrl-^ h	Erase Character (EC)
Ctrl-^ o	Abort Output (AO)
Ctrl-^ t	Are You There? (AYT)
Ctrl-^ u	Erase Line (EL)

1. The caret (^) symbol refers to Shift-6 on your keyboard.

At any time during an active Telnet session, you can list the Telnet commands by pressing the escape sequence keys followed by a question mark at the system prompt:

```
Ctrl-^ ?
```

A sample of this list follows.

In this sample output, the first caret (^) symbol represents the **Ctrl** key, and the second caret represents **Shift-6** on your keyboard:

```
Router> ^^?
[Special telnet escape help]
^^B  sends telnet BREAK
^^C  sends telnet IP
^^H  sends telnet EC
^^O  sends telnet AO
^^T  sends telnet AYT
^^U  sends telnet EL
```

You can have several concurrent Telnet sessions open and switch between them. To open a subsequent session, first suspend the current connection by pressing the escape sequence (**Ctrl-Shift-6** then **x** [**Ctrl^x**] by default) to return to the system command prompt. Then open a new connection with the **telnet** command.

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

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

Examples

The following example establishes an encrypted Telnet session from a router to a remote host named host1:

```
Router> telnet host1 /encrypt kerberos
```

The following example routes packets from the source system host1 to kl.sri.com, then to 10.1.0.11, and finally back to host1:

```
Router> telnet host1 /route:kl.sri.com 10.1.0.11 host1
```

The following example connects to a host with logical name host1:

```
Router> host1
```

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

```
Router> telnet host2 /quiet
```

The following example shows the limited number of messages displayed when connection is done using the optional **/quiet** keyword:

```
login:User2
Password:
      Welcome to OpenVMS VAX version V6.1 on node CRAW
      Last interactive login on Tuesday, 15-DEC-1998 11:01
      Last non-interactive login on Sunday,  3-JAN-1999 22:32

Server3)logout
      User2          logged out at  16-FEB-2000 09:38:27.85
```

Related Commands

Command	Description
connect	Logs in to a host that supports Telnet, rlogin, or LAT.
kerberos clients mandatory	Causes the rsh , rcp , rlogin , and telnet commands to fail if they cannot negotiate the Kerberos Protocol with the remote server.
name connection	Assigns a logical name to a connection.
rlogin	Logs in to a UNIX host using rlogin.
show hosts	Displays the default domain name, the style of name lookup service, a list of name server hosts, and the cached list of host names and addresses.
show tcp	Displays the status of TCP connections.

telnet break-on-ip

To cause the system to generate a hardware BREAK signal on the EIA/TIA-232 line that is associated with a reverse Telnet connection when a Telnet Interrupt-Process command is received on that connection, use the **telnet break-on-ip** command in line configuration mode.

telnet break-on-ip

Syntax Description This command has no arguments or keywords.

Defaults No hardware BREAK signal is generated when an Interrupt-Process command is received.

Command Modes Line configuration

Command History	Release	Modification
	10.0	This command was introduced.

Usage Guidelines This command causes the system to generate a hardware BREAK signal on the EIA/TIA-232 line that is associated with a reverse Telnet connection. It is useful when a Telnet Interrupt-Process command is received on that connection because it can control the translation of Telnet Interrupt-Process commands into X.25 BREAK indications. It is also a useful workaround in the following situations:

- Several user Telnet programs send an Interrupt-Process command, but cannot send a Telnet BREAK signal.
- Some Telnet programs implement a BREAK signal that sends an Interrupt-Process command.
- Some EIA/TIA-232 hardware devices use a hardware BREAK signal for various purposes.

A hardware BREAK signal is generated when a Telnet BREAK command is received.

Examples In the following example, line 5 is configured with the **telnet break-on-ip** command. The location text notes that this line is the location of the high-speed modem. The **telnet transparent** command sets end-of-line handling.

```
line 5
location high-speed modem
telnet transparent
telnet break-on-ip
```

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.
	telnet transparent	Configures the Cisco IOS software to send a CARRIAGE RETURN (CR) as a CR followed by a NULL instead of a CR followed by a LINE FEED (LF).
	terminal telnet break-on-ip	Causes the access server to generate a hardware Break signal on the EIA/TIA-232 line, which is associated with a reverse Telnet connection, for the current line and sessions.

telnet refuse-negotiations

To set a line using Telnet to refuse to negotiate full-duplex, remote echo requests on incoming connections, use the **telnet refuse-negotiations** command in line configuration mode. To disable this function, use the **no** form of this command.

telnet refuse-negotiations

no telnet refuse-negotiations

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values.

Command Modes Line configuration

Command History	Release	Modification
	10.0	This command was introduced.

Usage Guidelines Use this command on reverse Telnet connections to allow the Cisco IOS software to refuse full-duplex, remote echo option connection requests from the other end. This command suppresses negotiation of the Telnet Remote Echo and Suppress Go Ahead options.

This command does not apply to protocol translation configurations. It is intended for applications in which the router is functioning as a terminal server to allow terminal connections to remote devices through the asynchronous terminal ports of the router. Terminal server connections are those where the user types a command similar to the following to access network resources:

```
telnet access-server 2005
```

where access-server is the host name of the Cisco router functioning as a terminal server, and 2005 is the port number on the router to which the remote terminal is connected.

Examples The following example shows how to set line 5 to refuse full-duplex, remote echo requests:

```
line 5
telnet refuse-negotiations
```

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.
	terminal telnet refuse-negotiations	Sets the current line to refuse to negotiate full-duplex, remote echo options on incoming connections for current sessions.

telnet speed

To allow negotiation of the transmission speed of the line to a connected device, use the **telnet speed** command in line configuration mode. To disable this function, use the **no** form of this command.

telnet speed *default-speed maximum-speed*

no telnet speed

Syntax Description	
<i>default-speed</i>	Line speed, in bits per second, that the Cisco IOS software will use if the device on the other end of the connection has not specified a speed.
<i>maximum-speed</i>	Maximum speed, in bits per second, that the device on the port will use.

Defaults No default behavior or values.

Command Modes Line configuration

Command History	Release	Modification
	10.0	This command was introduced.

Usage Guidelines Negotiates speeds on reverse Telnet lines. You can match line speeds on remote systems in reverse Telnet, on host machines hooked up to a router used to access the network, or on a group of console lines hooked up to the router, when disparate line speeds are in use at the local and remote ends of the connection. Line speed negotiation adheres to the Remote Flow Control option defined in RFC 1080.

Examples The following example allows a router to negotiate a bit rate on the line using the Telnet option. If no speed is negotiated, the line will run at 2400 bits per second (bps). If the remote host requests a speed of greater than 9600 bps, then 9600 will be used.

```
line 5
telnet speed 2400 9600
```

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.
	terminal telnet speed	Allows the access server to negotiate transmission speed for the current line and session.

telnet sync-on-break

To configure the Cisco IOS software to cause an incoming connection to send a Telnet Synchronize signal when it receives a Telnet BREAK signal, use the **telnet sync-on-break** command in line configuration mode. To disable this function, use the **no** form of this command.

telnet sync-on-break

no telnet sync-on-break

Syntax Description This command has no arguments or keywords.

Defaults No default behavior or values.

Command Modes Line configuration

Command History	Release	Modification
	10.0	This command was introduced.

Usage Guidelines This command causes a reverse Telnet line to send a Telnet Synchronize signal when it receives a Telnet BREAK signal. This option is used very rarely to ensure the ordering of BREAK reception with respect to data characters sent after the BREAK.

Examples The following example configures the AUX line with the **telnet sync-on-break** command:

```
line aux 0
telnet sync-on-break
```

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.
	terminal telnet sync-on-break	Causes the access server to send a Telnet Synchronize signal when it receives a Telnet Break signal on the current line and session.

telnet transparent

To configure the Cisco IOS software to send a CARRIAGE RETURN (CR) as a CR followed by a NULL instead of a CR followed by a LINE FEED (LF), use the **telnet transparent** command in line configuration mode. To return to the default setting, use the **no** form of this command.

telnet transparent

no telnet transparent

Syntax Description

This command has no arguments or keywords.

Defaults

CARRIAGE RETURN followed by a LINE FEED.

Command Modes

Line configuration

Command History

Release	Modification
10.0	This command was introduced.

Usage Guidelines

This command is useful for coping with different interpretations of end-of-line handling in the Telnet protocol specification.

Examples

The following example causes the Cisco IOS software, when sending a CR, to send a CR followed by a NULL character:

```
line 7
 telnet transparent
```

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.
terminal telnet transparent	Causes the current terminal line to send a Return character (CR) as a CR followed by a NULL instead of a CR followed by a LINE FEED (LF) for the current session.

terminal lat out-group

To temporarily define the list of services to which you or another user can connect, use the **terminal lat out-group** command in EXEC mode.

```
terminal lat out-group group-number [start-end] { disabled | enabled }
```

Syntax Description

<i>group-number</i>	Number of the group that has access to the system through the specified line. This number is identified by the system administrator. You also can specify a range of group numbers. Separate the beginning and end of the range with a hyphen.
[<i>start-end</i>]	(Optional) You can specify a range of group numbers for the <i>group-number</i> argument. Separate the beginning and end of the range with a hyphen.
disabled	Incrementally removes specified groups from a list.
enabled	Incrementally adds specified groups to a list.

Command Modes

EXEC

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

To temporarily define the list of services to which you or another user can connect, you define the group code lists used for connections from specific lines. You limit the connection choices for an individual line by defining the group code lists for an outgoing connection. When a user initiates a connection with a local-area transport (LAT) host, the line must share a common group number with the remote LAT host before a connection can be made.

The group code range entered in this command must fall within the group code range already configured for the line.

Examples

The following example defines a group code list for the outgoing group 4:

```
terminal lat out-group 4, 6-189
```

Related Commands

Command	Description
connect	Logs in to a host that supports Telnet, rlogin, or LAT.
l2f ignore-mid-sequence	Specifies a connection to a particular LAT node that offers LAT services.

terminal lat remote-modification

To set a line running local-area transport (LAT) to be remotely modifiable, use the **terminal lat remote-modification** command in EXEC mode.

terminal lat remote-modification

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 example sets line 6 to be remotely modifiable:

```
terminal lat remote-modification 6
```

Related Commands	Command	Description
	connect	Logs in to a host that supports Telnet, rlogin, or LAT.
	l2f ignore-mid-sequence	Specifies a connection to a particular LAT node that offers LAT services.

terminal transport preferred

To specify the preferred protocol to use for the current session when a command does not specify one, use the **terminal transport preferred** command in EXEC mode.

terminal transport preferred { **all** | **lat** | **mop** | **nasi** | **none** | **pad** | **rlogin** | **telnet** | **v120** }

Syntax Description

all	Specifies all recognized protocols.
lat	Specifies the local-area transport (LAT) protocol.
mop	Specifies the Maintenance Operation Protocol (MOP).
nasi	Specifies the NetWare Asynchronous Services Interface (NASI) protocol.
none	Prevents any protocol selection on the line. The router default is that any unrecognized command is a host name. If the preferred protocol is set to none, the router will not attempt any connections if the command is not recognized.
pad	Specifies X.3 packet assembler/disassembler (PAD), which is used most often to connect a server product to X.25 hosts.
rlogin	Specifies UNIX rlogin.
telnet	Specifies the TCP/IP Telnet protocol.
v120	Selects the V.120 protocol for incoming asynchronous connections over ISDN .

Defaults

lat (if LAT is not supported, **telnet**)

Command Modes

EXEC

Command History

Release	Modification
10.0	This command first appeared in a release prior to Cisco IOS Release 10.0.
11.2	The following keywords were added: <ul style="list-style-type: none"> • all • lat • mop • nasi • pad • preferred • rlogin • v120

Examples

The following example configures the console so that it does not connect when an unrecognized command is entered:

```
terminal transport preferred none
```

Related Commands

Command	Description
transport preferred	Specifies the transport protocol that the Cisco IOS software uses if the user does not specify one when initiating a connection.

test (ruleset)

To test parameter values in a translation ruleset using regular expressions, use the **test** command in translate ruleset configuration mode. To change or remove the specification, use one of the two **no** forms of this command.

```
test [line-number] {pad | telnet} variable-parameter reg-exp-match [{pad | telnet}
variable-parameter reg-exp-match [...]] set {pad | telnet} variable-parameter
```

```
no test {pad | telnet} variable-parameter reg-exp-match [{pad | telnet} variable-parameter
reg-exp-match [...]] set {pad | telnet} variable-parameter
```

```
no test line-number ...
```

Syntax Description		
<i>line-number</i>	(Optional) The line in the translation ruleset to test for substitution.	
{ pad telnet }	Identifies the incoming or outgoing protocol and controls which parameters are available in the next element of this command.	
<i>variable-parameter</i>	A parameter that varies depending upon the protocol selected, either pad or telnet , and its role, either incoming or outgoing. Protocol parameters are available to modify the incoming or outgoing connection behavior during protocol translation session setup. Up to six parameters can be entered on one command line. Table 44 indicates supported incoming and outgoing PAD and Telnet connection parameter keywords for the test command with an X.	
<i>reg-exp-match</i>	A standard Cisco regular expression match specification.	
set	Conditionally sets the specified protocol parameters to a fixed value.	

Defaults No default behavior or values

Command Modes Translate ruleset configuration

Command History	Release	Modification
	12.3(8)T	This command was introduced.

Usage Guidelines Up to six test statements can be entered on one command line. The ellipses in the format shown above means multiple test statements can be specified in a translation ruleset template.

The **test** command is useful for working with conditional parameters.

A test ... set ... statement conditionally sets one or more connection parameters to a given value, but only after a successful comparison of one or more connection parameters against a regular expression.

When you use the first **no** form of this command, specify the full set of parameters and expressions in the command to be removed. The second **no** form must specify the correct **test** command and line number within the translation ruleset template.

Table 44 Test Connection Parameter Keywords

Parameter	Description	Incoming PAD	Outgoing Telnet	Outgoing PAD	Incoming Telnet
authorize-method <i>ASCII-string</i>	Connection authorization method to use that must match one of a fixed set of values.	X	—	—	X
authorize-tag <i>ASCII-string</i>	Connection authorization identity to supply, entered as an ASCII string.	X	—	—	X
binary flag	Flag that specifies whether 8-bit binary data is required, entered as one of the following characters to specify binary mode: Y, y, 1–9, T, t .	—	X	—	X
cud <i>ASCII-string</i>	Call user data (CUD) that occurs after the protocol identification (PID). For X.29 service, this is the optional, user-specified text included in the command to place a call.	X	—	X	—
dest-addr <i>address</i>	Destination IP (Telnet) or X.121 (PAD) address.	X	X	X	X
dest-addr-ext <i>address</i>	Network service access point (NSAP) destination address extension.	X	—	X	—
dest-port <i>port</i>	Destination port entered as a decimal number from one to five digits long.	—	—	—	X
dldci <i>number</i>	Frame Relay data-link connection identifier (DLCI) of an Annex G service entered as a number from one to seven digits in length, although a size of two to four digits is more likely, or the NULL string if not received on an Annex G service.	X	—	X	—
eor <i>specification</i>	A character set defining the End-of-Record (EOR) string for the protocol translation session, entered as an ASCII or hexadecimal specification from one to four bytes in length, aaa or 0x19, as examples.	—	X	—	X

Table 44 Test Connection Parameter Keywords (continued)

Parameter	Description	Incoming PAD	Outgoing Telnet	Outgoing PAD	Incoming Telnet
eor-insert <i>flag</i>	Flag specifying that the EOR character set should be inserted for PAD data being forwarded to a Telnet session, and entered as a single character. Use one of the following characters to specify EOR insertion: Y, y, 1–9, T, t .	—	X	—	X
hostname <i>address</i>	Destination host name for Domain Name System (DNS) resolution entered as an ASCII string.	—	X	—	—
idle <i>seconds</i>	Number of seconds the PAD connection can be idle before being cleared.	X	—	X	—
interface <i>type number</i>	Interface to be used for the circuit, entered using standard Cisco IOS interface designations; Serial1/0:1, for example.	X	—	X	—
keepalive-period <i>seconds</i>	A number that indicates the number of seconds between TCP keepalives for the X.25 over TCP (XOT) connection. TCP keepalive information applies only when a ruleset is configured to match an XOT destination address. Example: match dest-addr ^5555.\$ xot-dest-addr 5.5.5.2	X	—	X	—
keepalive-tries <i>number</i>	A number that indicates the number of TCP keepalives to send before the XOT connection is declared dead. TCP keepalive information applies only when a ruleset is configured to match an XOT destination address. Example: match dest-addr ^5555.\$ xot-dest-addr 5.5.5.2	X	—	X	—
local <i>flag</i>	Flag specifying that Telnet control sequences should be forwarded, not processed, and entered as a single character. Use one of the following characters to specify local mode: Y, y, 1–9, T, t .	—	X	—	X

Table 44 Test Connection Parameter Keywords (continued)

Parameter	Description	Incoming PAD	Outgoing Telnet	Outgoing PAD	Incoming Telnet
<i>mac address</i>	Connection-Mode Network Service (CMNS) service remote host MAC address entered as three hexadecimal numbers of four digits separated by a period, (0000.fc08.12ab, for example) or the NULL string if not received on a CMNS service.	X	—	X	—
<i>no-reset</i>	Suppress a PVC Reset packet at session startup.	X	—	X	—
<i>packetsize size</i>	X.25 maximum data packet sizes to request, entered as two numbers from the following choices: 16, 32, 64, 128, 256, 512, 1024, 2048, 4096.	X	—	X	—
<i>pid byte-string</i>	PID string specified in ASCII or hexadecimal. A hexadecimal PID must be prefixed by "0x." For example, 0x01000000 is the standard PAD PID. Although it is available for specifying a nonstandard Call PID, this parameter is not restricted to the common PID length and can be used to specify the entire user data field.	X	—	X	—
<i>printer flag</i>	Printer access mode. Flag specifying that the outgoing connection should be brought up before the incoming connection is confirmed. Use one of the following characters to specify printer mode: Y , y , 1-9 , T , t . An unsuccessful outgoing connection attempt results in the incoming connection to the ruleset being refused, rather than being accepted and then closed, which is the default behavior. Note that using this keyword will force the ruleset quiet keyword to be applied to the translation.	X	—	—	X
<i>profile name</i>	Named PAD profile to use.	X	—	X	—

Table 44 Test Connection Parameter Keywords (continued)

Parameter	Description	Incoming PAD	Outgoing Telnet	Outgoing PAD	Incoming Telnet
pvc <i>circuit-number</i>	Permanent virtual circuit (PVC) entered as a number from 1 to 4095, or the null string if not a PVC.	—	—	X	—
reverse	Request reverse charging.	—	—	X	—
reversed <i>flag</i>	Flag to indicate whether a reverse charged Call is permitted. This flag applies to a switched virtual circuit (SVC) and is entered as a single character, Y or N , for yes or no.	X	—	—	—
rotor	Modifies the behavior of the host-name keyword by allowing one of the IP addresses defined by the ip host configuration command to be chosen randomly. If one address fails, another will be tried until a connection is made or all address choices are exhausted.	—	X	—	—
source-addr <i>address</i>	Source X.121 address.	X	—	X	X
source-addr-ext <i>address</i>	NSAP source address extension.	X	—	X	—
source-ifc <i>type number</i>	Interface from which to take the source IP address, entered using standard Cisco IOS interface designations: Loopback0, for example.	—	X	X	—
stream <i>flag</i>	Flag that specifies whether Telnet negotiation should be sent or accepted, entered as one of the following characters to specify stream mode: Y , y , 1–9 , T , t .	—	X	—	X

Table 44 Test Connection Parameter Keywords (continued)

Parameter	Description	Incoming PAD	Outgoing Telnet	Outgoing PAD	Incoming Telnet
swap <i>flag</i>	X.29 role reversal. Flag that indicates the PAD connection should not initiate X.29 commands when first connected. Use one of the following characters to swap behavior: Y , y , 1-9 , T , t . This parameter enables incoming and outgoing PAD connections to be swapped so that a protocol translation is treated like a PAD when it accepts a call. By default, the protocol translation functions like a PAD for calls that it initiates, and like an X.25 host for calls it accepts.	X	—	X	—
use-map <i>map</i>	Use the map defined for PAD service.	—	—	X	—
window-size <i>size</i>	X.25 window sizes to request, entered as two numbers in a range from 1 to 127.	X	—	X	—
xot-dest-addr <i>address</i>	Destination IP address of an X.25 over TCP (XOT) service entered in standard IP address dotted decimal notation (10.0.0.127, for example) or the NULL string if not received on an XOT service.	X	—	X	—
xot-source-addr <i>address</i>	Source IP address of an XOT service entered in standard IP address dotted decimal notation (10.0.0.127, for example) or the NULL string if not received on an XOT service.	X	—	—	—

Examples

The following example shows how to integrate a test into a translation ruleset template. The translation ruleset begins with the required match connection test, specifies protocol translation options, and sets specific parameters for incoming Telnet connections. The translation ruleset goes on to test and set appropriate parameters for incoming PAD connections, and to construct an SVC source address from Telnet information, starting with the source IP address. The translation ruleset is completed by adding in elements extracted from the Telnet destination port; the rewrite pattern is taken from the current value of PAD source address. The backslash character is used to construct the test ... set and substitute ... into statements.

```
translate ruleset customer-case-1 from telnet to pad
! Match an incoming Telnet attempt destined for IP addresses starting
! with 172.18., and a 5-digit port starting with the numbers 120 through 127.
match dest-addr ^172\.18\.* dest-port ^12[0-7]..$
```

```

! Once the correct network is matched, specify that this ruleset is limited
! to ten concurrent users and requires a login exchange.
options max-users 10 login
! Set Telnet options:
set telnet printer Y telnet binary Y
! Set PAD options:
set pad profile cust-profile-one
! Test conditional parameters and make appropriate settings:
test telnet dest-addr ^172\.18\.0\..* telnet dest-port ^10.00 \
  set pad pvc 1 telnet binary T
! Construct an SVC source address from the Telnet source information;
! start with the source IP address in the form 172.18.#.##, allowing
! for a following substitute of one field:
substitute telnet source-addr ^172\.18\.(.)\.(.)\
  into pad source-addr 98\1\2\1
! Now add in an extract from the Telnet destination port,
! where the rewrite pattern is taken from the current value of the PAD
! source address:
substitute telnet dest-port ^.(...). into pad source-addr

```

Related Commands

Command	Description
description (ruleset)	Adds a description about a translation ruleset.
match (ruleset)	Identifies a connection for processing by the translation ruleset.
options (ruleset)	Specifies protocol translation options in a translation ruleset.
set (ruleset)	Unconditionally sets one or more connection parameters to a fixed value for a translation ruleset.
show translate ruleset	Displays a summary of a specific or of all configured translation rulesets, behavioral parameters, and usage statistic.
skip (ruleset)	Identifies a connection for omission by the translation ruleset.
substitute (ruleset)	Matches an available protocol and substitutes another in a translation ruleset.
test translate	Displays a trace of protocol translation behavior for a connection attempt.
translate ruleset	Defines a unique name for a translation ruleset, specifies translated protocols, and enters translate ruleset configuration mode.
x25 pvc translate ruleset	Configures PVCs that are valid for protocol translation ruleset handling.

test translate

To display a trace of protocol translation behavior for a connection attempt, use the **test translate** command in user or privileged EXEC mode.

test translate {**pad** | **telnet** | **parameter** *parameter*} [**detail**]

Syntax Description	
pad	Tests a trace of a packet assembler/disassembler (PAD) connection attempt.
telnet	Tests a trace of a Telnet connection attempt.
parameter <i>parameter</i>	Tests one of the following translation ruleset parameters in interactive mode: <ul style="list-style-type: none"> • boolean—Boolean expression parameter. True if at least one character is present and the first character is one of Y, y, 1–9, T, or t; otherwise, false. • hexstring—Hex string parameter. A standard hexadecimal string representation starting with 0x, such as 0x14000F0000. • integer—Integer parameter. A standard decimal number from 0 to 65535. • interface—Two-integer parameter. A character string, possibly with embedded white space, identifying an existing interface, such as Serial 1, on the router. • ip—IP address parameter. A standard four-byte dotted decimal IP address such as 10.0.0.127. • mac—MAC address parameter. A standard set of three 4-digit hexadecimal words in dotted MAC address form such as 0001.00a8.1f2c. • nsap—Network service access point (NSAP) address parameter. • string—String parameter. A null-terminated ASCII string. • two-integer—Two-integer parameter. • x121—X.121 address parameter. A standard X.121 address from 1 to 15 decimal digits long.
detail	(Optional) Provides a more detailed test report.

Defaults No default behavior or values

Command Modes User EXEC
Privileged EXEC

Command History	Release	Modification
	12.3(8)T	This command was introduced.

Usage Guidelines

This command will traverse the set of protocol translation configurations in the order they are listed in the translation ruleset, and report all events that take place. The **detail** keyword shows each line being evaluated and detailed translation test information.

The translation ruleset operations to test, set, and substitute protocol parameter values use strings, and the ruleset generates the set of protocol parameter values as a set of strings. When entered with the optional **parameter** keyword and parameter type, the **test translate** command becomes interactive and queries for incoming connection parameter values. For a given protocol parameter there may be additional validation tests that apply. If the application of a translation ruleset results in an invalid value for a parameter (whether a violation of the basic type rule or the more specific validation tests for the parameter), the protocol translation operation will fail with an informative message.

Configuration errors are not detected when translation ruleset commands are entered. They are tested when the connection is attempted or when you use the **test (ruleset)** command. In the following example, the **set** translation ruleset command unconditionally sets the PAD's profile name to a profile that does not exist in the configuration:

```
set pad profile Bldg-1-5ess
```

This command would be accepted at the command-line interpreter, but not tested until a connection attempt or with the **test translate EXEC** command. When the error is detected, the following messages display:

```
*%PT-3-PARAMRESULTERR: PT ruleset test protocol pad parameter profile parse error:
Bldg-1-5ess.
-Process= "PAD InCall", ipl= 3, pid= 94
*PAD: ruleset translation not generated Cause: 9 Diag: 0
```

Examples

The following example shows a sample of the self-explanatory report from the **test translate** command:

```
Router# test translate pad

dest-addr (X.121 address): 55555
Ruleset A match/skip line 1 compared: match
Ruleset A; pad parameter read:
pad/dest-addr: 55555
Parameters set:
telnet/dest-addr: 10.2.2.1

Translate From: PAD 55555
To: Telnet 10.2.2.1 Port 23
Ruleset A
0/1 users active
```

The following is a sample of a detailed report:

```
Router# test translate pad detail

PAD translate command 1 PVC match not required
dest-addr (X.121 address): 55555
Normalized PAD dest-addr: 55555
PAD translate command 1 skipped, destination address 55555 doesn't match 12345
PAD translate command 2 PVC match not required
PAD translate command 2 skipped, destination address 55555 doesn't match 55551
No PAD translate command matched
(Testing translate command A ...)
Ruleset A match/skip line 1 compared: match
(processing set/test/substitute line 1)
(set/test/subst line 1, item 1, parameter dest-addr set to 10.2.2.1)
```

```

(parsed telnet parameter dest-addr: 10.2.2.1)
Ruleset A; pad parameter read:
  pad/dest-addr: 55555
Parameters set:
  telnet/dest-addr: 10.2.2.1
  (translation requires 0 bytes variable-sized memory)

Translate From: PAD 55555
              To:   Telnet 10.2.2.1 Port 23
              Ruleset A
              0/1 users active

```

The following example tests the **boolean** translate ruleset parameter in interactive mode:

```

Router# test translate parameter boolean

Enter parameter value (boolean): Y

Enter encode buffer size (integer): 10
Encoded into Y
Router#

```

Related Commands

Command	Description
description (ruleset)	Adds a description about a translation ruleset.
match (ruleset)	Identifies a connection for processing by the translation ruleset.
options (ruleset)	Specifies protocol translation options in a translation ruleset.
set (ruleset)	Unconditionally sets one or more connection parameters to a fixed value for a translation ruleset.
show translate ruleset	Displays a summary of a specific or of all configured translation rulesets, behavioral parameters, and usage statistic.
skip (ruleset)	Identifies a connection for omission by the translation ruleset.
substitute (ruleset)	Matches an available protocol and substitutes another in a translation ruleset.
test (ruleset)	Tests parameter values in a translation ruleset using regular expressions.
translate ruleset	Defines a unique name for a translation ruleset, specifies translated protocols, and enters translate ruleset configuration mode.
x25 pvc translate ruleset	Configures PVCs that are valid for protocol translation ruleset handling.

tn3270

To begin a TN3270 session, use the **tn3270** command in EXEC mode.

tn3270 *host*

Syntax Description

<i>host</i>	Name or IP address of a specific host on a network that can be reached by the router. The default terminal emulation mode allows access using a VT100 emulation.
-------------	--

Command Modes

EXEC

Command History

Release	Modification
11.1	This command was introduced.

Usage Guidelines

Unlike Telnet and local-area transport (LAT) connections, you *must* enter the **tn3270** command to make a connection to an IBM TN3278 host.

To terminate an active TN3270 session, enter the escape sequence (**Ctrl-Shift-6** then **x** [**Ctrl^x**] by default) and enter the **disconnect** command at the EXEC prompt. Or log off the remote system by issuing the command specific to that system (such as **exit**, **logout**, **quit**, **close**, or **disconnect**).

Examples

The following example establishes a terminal session with an IBM TN3270 host named finance:

```
tn3270 finance
```

tn3270 8bit display

To configure the Cisco IOS software to use the mask set by the **data-character-bits {7 | 8}** command in line configuration mode or the **terminal data-character bits {7 | 8}** EXEC command, use the **tn3270 8bit display** command in line configuration mode. To restore the default 7-bit mask used for TN3270 connections, use the **no** form of this command.

tn3270 8bit display

no tn3270 8bit display

Syntax Description This command has no arguments or keywords.

Defaults Disabled

Command Modes Line configuration

Command History	Release	Modification
	10.0	This command was introduced.

Usage Guidelines Use the **tn3270-character-map** command to map between extended EBCDIC or extended ASCII characters.

Examples The following example configures the Cisco IOS software to use the mask set by the **data-character-bits** line configuration and EXEC commands on line 5:

```
line 5
tn3270 8bit display
```

Related Commands	Command	Description
	data-character-bits	Sets the number of data bits per character that are interpreted and generated by the Cisco IOS software.
	terminal data-character-bits	Sets the number of data bits per character that are interpreted and generated by the Cisco IOS software for the current line and session.

tn3270 8bit transparent-mode

To configure the Cisco IOS software to use the mask set by the **data-character-bits {7 | 8}** command in line configuration mode or the **terminal data-character bits {7 | 8}** EXEC command, use the **tn3270 8bit transparent-mode** command in line configuration mode. To restore the default 7-bit mask used for TN3270 connections, use the **no** form of this command.

tn3270 8bit transparent-mode

no tn3270 8bit transparent-mode

Syntax Description This command has no arguments or keywords.

Defaults Disabled

Command Modes Line configuration

Command History	Release	Modification
	10.0	This command was introduced.

Usage Guidelines This command is needed if you are using a file transfer protocol such as Kermit in 8-bit mode or you are using 8-bit graphics, both of which rely on transparent mode.

Examples The following example configures the software to use the mask set by the **data-character-bits** line configuration and EXEC commands on line 5:

```
line 5
tn3270 8bit transparent-mode
```

Related Commands	Command	Description
	data-character-bits	Sets the number of data bits per character that are interpreted and generated by the Cisco IOS software.
	terminal data-character-bits	Sets the number of data bits per character that are interpreted and generated by the Cisco IOS software for the current line and session.

tn3270 character-map

To convert incoming EBCDIC characters into ASCII characters, use the **tn3270 character-map** command in global configuration mode. To restore default character mappings, use the **no** form of this command.

```
tn3270 character-map ebcdic-in-hex ascii-in-hex
```

```
no tn3270 character-map {all | ebcdic-in-hex} [ascii-in-hex]
```

Syntax Description		
	<i>ebcdic-in-hex</i>	Hexadecimal value of an EBCDIC character.
	<i>ascii-in-hex</i>	Hexadecimal value of an ASCII character.
	all	Indicates all character mappings.

Defaults Disabled

Command Modes Global configuration

Command History	Release	Modification
	10.0	This command was introduced.

Usage Guidelines Use this command to print international characters that are EBCDIC characters not normally printed, including umlauts (¨) and tildes (~). The command first restores default mapping for both EBCDIC and ASCII characters. In the **no** form of the command, the **all** keyword resets all character mappings to Cisco defaults.

[Table 45](#) shows the default character mappings between ASCII and EBCDIC in decimal and hexadecimal format.

To convert outgoing ASCII characters into EBCDIC characters, use the **keymap** command to modify the keymap structure with the tag *ebcdic_xx=string*, where *xx* is a hexadecimal value and *string* is the sequence of characters that send the EBCDIC character.

Table 45 Default ASCII, EBCDIC Character Mappings

Character	ASCII Decimal	ASCII Hexadecimal	EBCDIC Decimal	EBCDIC Hexadecimal
!	33	0x21	90	0x5a
"	34	0x22	127	0x7f
#	35	0x23	123	0x7b
\$	36	0x24	91	0x5b
%	37	0x25	108	0x6c
&	38	0x26	80	0x50

Table 45 Default ASCII, EBCDIC Character Mappings (continued)

Character	ASCII Decimal	ASCII Hexadecimal	EBCDIC Decimal	EBCDIC Hexadecimal
'	39	0x27	125	0x7d
(40	0x28	77	0x4d
)	41	0x29	93	0x5d
*	42	0x2a	92	0x5c
+	43	0x2b	78	0x4e
,	44	0x2c	107	0x6b
-	45	0x2d	96	0x60
.	46	0x2e	75	0x4b
/	47	0x2f	97	0x61
0	48	0x30	240	0xf0
1	49	0x31	241	0xf1
2	50	0x32	242	0xf2
3	51	0x33	243	0xf3
4	52	0x34	244	0xf4
5	53	0x35	245	0xf5
6	54	0x36	246	0xf6
7	55	0x37	247	0xf7
8	56	0x38	248	0xf8
9	57	0x39	249	0xf9
:	58	0x3a	122	0x7a
;	59	0x3b	94	0x5e
<	60	0x3c	76	0x4c
=	61	0x3d	126	0x7e
>	62	0x3e	110	0x6e
?	63	0x3f	111	0x6f
@	64	0x40	124	0x7c
A	65	0x41	193	0xc1
B	66	0x42	194	0xc2
C	67	0x43	195	0xc3
D	68	0x44	196	0xc4
E	69	0x45	197	0xc5
F	70	0x46	198	0xc6
G	71	0x47	199	0xc7
H	72	0x48	200	0xc8
I	73	0x49	201	0xc9
J	74	0x4a	209	0xd1

Table 45 *Default ASCII, EBCDIC Character Mappings (continued)*

Character	ASCII Decimal	ASCII Hexadecimal	EBCDIC Decimal	EBCDIC Hexadecimal
K	75	0x4b	210	0xd2
L	76	0x4c	211	0xd3
M	77	0x4d	212	0xd4
N	78	0x4e	213	0xd5
O	79	0x4f	214	0xd6
P	80	0x50	215	0xd7
Q	81	0x51	216	0xd8
R	82	0x52	217	0xd9
S	83	0x53	226	0xe2
T	84	0x54	227	0xe3
U	85	0x55	228	0xe4
V	86	0x56	229	0xe5
W	87	0x57	230	0xe6
X	88	0x58	231	0xe7
Y	89	0x59	232	0xe8
Z	90	0x5a	233	0xe9
[91	0x5b	173	0xad
\	92	0x5c	224	0xe0
]	93	0x5d	189	0xbd
^	94	0x5e	95	0x5f
_	95	0x5f	109	0x6d
`	96	0x60	121	0x79
a	97	0x61	129	0x81
b	98	0x62	130	0x82
c	99	0x63	131	0x83
d	100	0x64	132	0x84
e	101	0x65	133	0x85
f	102	0x66	134	0x86
g	103	0x67	135	0x87
h	104	0x68	136	0x88
i	105	0x69	137	0x89
j	106	0x6a	145	0x91
k	107	0x6b	146	0x92
l	108	0x6c	147	0x93
m	109	0x6d	148	0x94
n	110	0x6e	149	0x95

Table 45 Default ASCII, EBCDIC Character Mappings (continued)

Character	ASCII Decimal	ASCII Hexadecimal	EBCDIC Decimal	EBCDIC Hexadecimal
o	111	0x6f	150	0x96
p	112	0x70	151	0x97
q	113	0x71	152	0x98
r	114	0x72	153	0x99
s	115	0x73	162	0xa2
t	116	0x74	163	0xa3
u	117	0x75	164	0xa4
v	118	0x76	165	0xa5
w	119	0x77	166	0xa6
x	120	0x78	167	0xa7
y	121	0x79	168	0xa8
z	122	0x7a	169	0xa9
{	123	0x7b	192	0xc0
	124	0x7c	79	0x4f
}	125	0x7d	208	0xd0
~	126	0x7e	161	0xa1

Examples

The following example creates a two-way binding between an EBCDIC character and an ASCII character:

```
tn3270 character-map 0x81 0x78
```

Related Commands

Command	Description
show tn3270 ascii-hexval	Displays ASCII-hexadecimal character mappings.
show tn3270 character-map	Displays character mappings between ASCII and EBCDIC.

tn3270 datastream

To enable the TN3270 extended datastream, use the **tn3270 datastream** command in global configuration mode. To return to the normal TN3270 datastream, use the **no** form of this command.

```
tn3270 datastream { extended | normal }
```

```
no tn3270 datastream
```

Syntax Description

extended	Extended datastream.
normal	Normal datastream.

Defaults

Normal datastream

Command Modes

Global configuration

Command History

Release	Modification
10.3	This command was introduced.

Usage Guidelines

This command causes an “-E” to be appended to the terminal type string sent to the IBM host, which allows you to use the extended TN3270 features.

Examples

The following example shows the supported TN3270 datastream options:

```
tn3270 datastream ?
  extended  Use extended TN3270 datastream
  normal    Use normal TN3270 datastream
```

tn3270 null-processing

To specify how NULL signals are handled, use the **tn3270 null-processing** command in global configuration mode. To return to 7171 NULL processing, use the **no** form of this command.

tn3270 null-processing [3270 | 7171]

no tn3270 null-processing [3270 | 7171]

Syntax Description

3270	(Optional) NULLs are compressed out of the string, as on a 3278-x terminal.
7171	(Optional) NULLs are converted to spaces, as on a 7171 controller.

Defaults

7171 NULL processing

Command Modes

Global configuration

Command History

Release	Modification
10.3	This command was introduced.

Usage Guidelines

If a user enters data, uses an arrow key to move the cursor to the right on the screen, and then enters more data, the intervening spaces are filled with NULLs. To specify how NULLs are handled, enter the **tn3270 null-processing** command either with the **3270** argument, where NULLs are compressed out of the string (as on a real 3278-x terminal) or the **7171** argument, where NULLs are converted to spaces as on a 7171 controller. Enter this command in global configuration.

Examples

The following example shows the two available null processing methods:

```
tn3270 null-processing ?
 3270 Use 3270-style null processing
 7171 Use 7171-style null processing
```

tn3270 optimize-cursor-move

To increase performance between a remote user and a TN3270 host by limiting cursor movement information that is sent to user terminals, use the **tn3270 optimize-cursor-move** command in global configuration mode. To ensure that all cursor movement information is sent between the terminal and the TN3270 host, use the **no** form of this command.

tn3270 optimize-cursor-move

no tn3270 optimize-cursor-move

Syntax Description This command has no arguments or keywords.

Defaults Cursor movement escape strings are sent to the terminal.

Command Modes Global configuration

Release	Modification
11.2	This command was introduced.

Usage Guidelines Issuing this command increases the speed of information transfer between users and TN3270 hosts through an access server.

If you do not issue this command, virtually every byte of information between the terminal and the TN3270 host is prepended and trailed by cursor-movement strings.

Examples The following example disables status messages to users connected to 3278 terminals:

```
tn3270 optimize-cursor-move
```

Command	Description
tn3270 status-message	Reenables the display of status messages after they have been disabled.

tn3270 reset-required

To lock a terminal after input error until the user resets the terminal, use the **tn3270 reset-required** command in global configuration mode. To return to the default of no reset required, use the **no** form of this command.

tn3270 reset-required

no tn3270 reset-required

Syntax Description This command has no arguments or keywords.

Defaults No reset is required.

Command Modes Global configuration

Command History	Release	Modification
	10.3	This command was introduced.

Usage Guidelines On a 3278-x terminal, the keyboard is locked and further input is not permitted after input error (due to field overflow, invalid entry, and so on) until the user presses the RESET key. Most TN3270 implementations leave the keyboard unlocked and remove any error message on the next key input after the error. Use this command to lock the keyboard until the user performs a reset.

Examples The following example enables keyboard locking after an input error:

```
tn3270 reset-required
```

tn3270 status-message

To reenable the display of status messages after they have been disabled, use the **tn3270 status-message** command in global configuration mode. To save bandwidth on asynchronous lines by not displaying status messages, use the **no** form of this command.

tn3270 status-message

no tn3270 status-message

Syntax Description This command has no arguments or keywords.

Defaults Status messages appear.

Command Modes Global configuration

Command History	Release	Modification
	11.2	This command was introduced.

Usage Guidelines Status messages appear on the console by default. These messages include “System Locked,” “Field error,” and “System UnLocked” messages. These messages are sent back to the terminal via the TTY line on the access server.

Disabling status messages saves bandwidth on asynchronous lines, which have very low bandwidth.

Examples The following example disables status messages to users connected to 3270 terminals:

```
no tn3270 status-message
```

Related Commands	Command	Description
	tn3270 optimize-cursor-move	Increases performance between a remote user and a TN3270 host by limiting cursor movement information that is sent to user terminals.

tn3270 typeahead

To buffer keyboard data when a 3278 server is in locked mode, use the **tn3270 typeahead** command in global configuration mode. To disable the typeahead function, use the **no** form of this command.

tn3270 typeahead

no tn3270 typeahead

Syntax Description This command has no arguments or keywords.

Defaults Typeahead is disabled.

Command Modes Global configuration

Command History	Release	Modification
	11.2	This command was introduced.

Usage Guidelines When typeahead is enabled, the TN3270 client implementation in the Cisco IOS software permits you to continue typing while the system is trying to obtain a response from the TN3270 server. Information you type while a “System Locked” message appears on the terminal is stored in a buffer. After the “System Locked” message disappears, the information is then used as though it were just typed.

Examples The following example saves user information when “System Locked” messages appear on the screen:

```
tn3270 typeahead
```

Related Commands	Command	Description
	tn3270 reset-required	Locks a terminal after input error until the user resets the terminal.