Protocol Translation Configuration Commands

Protocol translation software provides transparent translation between systems running different protocols. The software supports two-way virtual terminal protocol translation between nodes running X.25, LAT, and Telnet.

This chapter describes the protocol translation commands. For protocol translation configuration information and examples, see the *Communication Server Configuration Guide*.

translate

To cause incoming LAT, TCP, or X.25 requests for connections to a specified destination address or host name to result in automatic conversion to the specified outgoing connection type, use the **translate** global configuration command. The connection request to the address specified is executed.

> **translate** *protocol incoming-address* [*inoptions*] *protocol outgoing-address* [*outoptions*]
> [*globaloptions*]

Syntax Description

Protocol Options—*protocol incoming-address* and *protocol outgoing-address*

lat *servicename*	Specifies LAT and a LAT service name. The application of the service name can differ, depending on whether it is being used on the incoming or the outgoing portion of the command. When used on the incoming portion, the service name is the name of the service that users specify when trying to make a translated connection. This name can, but does not need to, match the name of final destination resource. This can be useful when making remote translated connections.
x25 *X.121address*	Specifies X.25 and an X.121 address. The X.121 address must conform to specifications provided in the *CCITT 1984 Red Book*. This number generally consists of a portion that is administered by the PDN and a portion that is locally assigned. You must be sure that the numbers that you assign are in agreement with addresses assigned to you by the X.25 service provider.
	The X.121 addresses used in the **translate** command will generally be subaddresses of the X.121 address of the X.25 network interface. Typically, the interface address will be a 12 digit number. Any additional digits are interpreted as a subaddress. The PDN still routes these calls to the interface, and the protocol translator itself is responsible for dealing with the extra digits in an appropriate way.
tcp *IP-address*	Specifies TCP/IP Telnet and a standard IP address or host name. The argument *IPaddress* is a standard dotted decimal IP address or the name of an IP host that can be resolved via Domain Name Service, IEN116 name service, or by explicit specification in an **ip host** command.

Telnet/TCP Translation Options—*inoptions* and *outoptions* (Optional)

port *number*   Specifies outgoing TCP connections, or for matching only this port on incoming connections. The default port is port 23 (Telnet). For incoming connections, port zero will match *any* port. The argument *number* specifies the desired port number.

binary   Negotiates Telnet binary mode on the Telnet connection. (This was the default in previous versions of the protocol translator software, and is set automatically when an old format **translate** subcommand is specified.)

stream   Turns on stream processing, which enables a raw TCP stream with no Telnet control sequences. A stream connection does not process Telnet options, and may be appropriate for connections to ports running UUCP or other non-Telnet protocols, or to ports connect to a printer.

printer   Supports LAT and X.25 printing over a TCP network among multiple sites. Causes the protocol translation software to delay the completion of an incoming Telnet connection until after the outgoing protocol connection (to LAT or X.25) has been successfully established. An unsuccessful outgoing connection attempt results in the TCP connection to the protocol translator being refused, rather than being accepted and then closed, which is the default behavior. Note that using this option will force the global option *quiet* to be applied to the translation.

multibyte-iac   Causes any sequence of any number of Telnet IAC characters (0xFF) to be treated as a single IAC. This allows host applications to send Telnet negotiations directly to the system without having them quoted into data by the intervening Telnet protocol on the application's host. This type of behavior may be desirable when an application wants to turn on local echoing by a PAD at the remote end of a slow X.25 link. For example, the application could send the request IAC WONT ECHO, which the TCP host will quote to IAC IAC WONT ECHO. The system interprets this as IAC WONT ECHO and issues an X.29 SET 2:1 option to cause the remote PAD to enter local echoing mode. When this option is configured there is no way to send an IAC character as data across the protocol translation session. This can cause other applications, such as binary mode file transfer, to fail completely. Therefore, you should use this option with caution.

LAT Translation Options—*inoptions* and *outoptions*

node *nodename*   Causes a connection to be made to the specified node (*nodename*) that offers a service. By default, the connection is made to the highest-rated node that offered the service.

port *portname*   Specifies a destination LAT port name (argument *portname*) in the format of the remote system. This parameter is usually ignored in most timesharing systems, but is used by terminal servers that offer reverse-LAT services.

unadvertised   Prevents service advertisements from being broadcast to the network. This can be useful, for example, when you define translations for many printers, and you do not want these services advertised to other LAT terminal servers. (VMS systems will be able to connect to the service even though it is not advertised.)

X.25 Translation Options—*inoptions* and *outoptions*

cud *c-u-data*   Sends the specified Call User Data (CUD) text (*c-u-data*) as part of an outgoing call request after the protocol identification bytes.

profile *profile*   Causes the X.3 PAD parameters to be set as defined in the profile created by the **x29 profile** subcommand.

reverse   Provides reverse charging for X.25 on a per-call rather than a per-interface basis.

printer   Supports LAT and X.25 printing over a TCP network among multiple sites. Provides an "interlock mechanism" between the acceptance of an incoming X.25 connection and the opening of an outgoing LAT or TCP connection. The option causes the communication server to delay the confirmation of the incoming X.25 call request until after the outgoing protocol connection (to TCP or LAT) has been successfully established. An unsuccessful outgoing connection attempt results in the TCP connection to the communication server being refused, rather than being confirmed and cleared, which is the default behavior. Note that using this option will force the global option *quiet* to be applied to the translation.

pvc *number*   Specifies that the incoming connection (identified by the argument *number*) is actually a permanent virtual circuit (PVC).

Global Translation Options—*global-option*s (Optional)

access-class *number*   Allows the incoming call to be used by source hosts that match the access list parameters. The argument *number* is the number (integer) previously assigned to an access list. This feature is supported only for incoming TCP and X.25 connections.

local   Allows Telnet protocol negotiations to *not* be translated.

login   Requires that the user log in before the outgoing connection is made. This type of login is specified on the VTY's using the **login** command.

quiet   Suppresses printing of user-information messages.

max-users *number*   Limits the number of simultaneous users of the translation to *number* (an integer you specify).

swap   Allows X.3 parameters to be set on the protocol translator by the host originating the X.25 call, or by an X.29 profile. This allows incoming and outgoing X.25 connections to be swapped so that the protocol translator is treated like a PAD when it accepts a call. By default, the protocol translator behaves like a PAD for calls that it initiates, and behaves like an X.25 host for calls it accepts. The **swap** keyword allows connections from an X.25 host that wants to connect to the protocol translator, and then treats it like a PAD. For X.25 to TCP translations only.

Default

None

Command Mode

Global Configuration

Usage Guidelines

Table 1-1 provides a visual aid for understanding how to use the **translate** command.

Table 1-1   Translate Command Options

Incoming Protocol	Options		Outgoing Protocol	Options		Global Options
translate	*protocol inaddress*	[*inoptions*]	*protocol outaddress*	[*outoptions*]		[*globaloptions*]
	lat *servicename*	**unadvertised**	**lat** *servicename*	**node** *nodename*		**access-class** *number*
				port *portname*		**max-users** *number*
						local
						login
	x25 *x121 address*	**cud** *c-u-data*	**x25** *x121 address*	**cud** *c-u-data*		**quiet**
		profile *profile*		**profile** *profile*		**swap**
		reverse		**reverse**		
		printer				
		pvc *number*				
	tcp *IPaddress*	**port** *portnumber*	**tcp** *IPaddress*	**port** *portnumber*		
		binary				

As the table illustrates, you define the protocol translation connections—both incoming and outgoing—by choosing a protocol keyword and supplying the appropriate address or service name. The protocol connection information is followed by optional features for that connection, also as appropriate. For example, the **binary** option is only appropriate with TCP/IP connections. The global options, in general, apply to all the connection types, but there are exceptions. The **swap** keyword, for example, is for X.25 to TCP translations only. See the examples for more explanation on how to enter this command.

Examples

Note In the following examples, the lines denote parts of the command, and are for illustration purposes only.

The following example illustrates a simple X.25 to TCP translation command. Packets coming in X.25 address 652365123 arrive via PVC 1 and are translated to TCP packets and transmitted out IP address 131.108.1.1.

```
translate x25 652365123 pvc 1 tcp 131.108.1.1
          incoming      option outgoing
```

The following example illustrates incoming LAT to outgoing TCP translations. The **unadvertised** keyword prevents broadcast of service advertisements to other servers. Outgoing translated packets are transmitted out IP address rubble via TCP port 4005.

```
translate lat pt-printer1 unadvertised tcp rubble port 4005
          incoming        option       outgoing    option
```

The following example illustrates a more complex configuration that calls an X.29 profile and swaps the default PAD operation of the protocol translator to that of an X.25 host.

```
x29 profile fullpackets 2:0 3:0 4:100 7:21
translate x25 217536124 profile fullpackets tcp rubble port 4006 swap
          incoming       option             outgoing    option    global
```

The following example illustrates the use of the TCP incoming protocol option **printer** for an incoming TCP connection.

```
translate tcp 160.89.32.250 printer x25 5678
          incoming          option  outgoing
```

The following example illustrates the use of the X.25 incoming protocol option **printer** for an incoming X.25 connection.

```
translate x25 55555 printer tcp 131.108.1.1
          incoming option   outgoing
```

Related Command
x29 profile

show x25 pad

Use the **show x25 pad** command to display information

x25 pad

Syntax Description

This command has no arguments or keywords.

Command Mode

EXEC

Sample Display

The following is a sample display from the **show x25 pad** output.

```
sloth# 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 1-2 describes significant fields shown in the first line of output in the display.

Table 1-2   Show X.25 Pad Field Description

Field	Description
Total input/output	Displays the number of packets received or sent for this connection.
Control	Displays the number of packets with Qbit set (X.29 control packets).
Bytes	Displays the number of bytes in each direction.
Queued	Displays the number of unread packets waiting for this connection.
Waiting to send	Displays the local data packetized bit not sent (part of a line).
Flags, state, last error	Displays data useful only to Cisco, for detecting errors and tracing initialization status.

Field	Description
Params In	Displays the parameters read from the PAD at the start of the connection.
ParamsOut	Displays the active X.3 parameters. LCI data displays the X.25 state of the connection.
The line beginning LCI:	Starts a display of the status of the X.25 virtual circuit associated with this PAD connection, and is the same display seen when the **show x25 vc** command is executed.