

Protocol Translation Session Commands

The protocol translation software attempts to provide transparent translation between systems running disparate protocols. The software fully supports two-way virtual terminal protocol translation between nodes running X.25, Local Area Transport (LAT), SLIP or PPP, and Telnet, a remote terminal protocol that is part of the Transmission Control Protocol/Internet Protocol (TCP/IP) protocol suite.

To provide fully transparent protocol conversion, the router masquerades as two or more hosts on the same network. When a connection is made to the router, the router determines which host the connection is for and what protocol that host is using. The router then establishes a new network connection using the networking protocol required by that host. This network connection is more efficient and allows the router to act upon greater knowledge of the protocols in use because the router acts as a network connection rather than a terminal.

This chapter describes the commands used to configure protocol translation connections. For protocol translation configuration information and examples, refer to the chapter “Configuring Protocol Translation Sessions” earlier in this publication.

For information about protocol translation EXEC commands, such as the **pad** EXEC command, refer to the *Cisco Access Connection Guide*.

show translate

To view translation sessions that have been configured on a router, enter the following command in privileged EXEC mode:

show translate

Syntax Description

This command has no arguments or keywords.

Command Mode

Privileged EXEC

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 as well as the outgoing device and protocol.

Sample Display

The **show translate** output in this sample display is based on the following **translate** command configured on the router:

```
translate lat ramble ppp 172.21.10.10 0 keepalive

CS# show translate

Translate From: LAT ramble
           To:   PPP 172.21.10.10  keepalive 0
           1/1 users active, 1 peak, 1 total, 0 failures
```

Table 11-1 describes fields shown in the display.

Table 11-1 Show Translate Field Descriptions

| Field | Description |
|----------------------------|---|
| Translate From: LAT ramble | The virtual terminal protocol (LAT) and hostname (ramble) of the incoming device. |
| To: PPP 172.21.10.10 | The virtual terminal protocol (PPP) and IP address (172.21.10.10) of the outgoing device. |
| 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. |
| 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. |

translate

To automatically convert incoming LAT, TCP, or X.25 requests for connections to a specified destination address or host name to the specified outgoing connection type, use the **translate** global configuration command.

```
translate protocol incoming-address [in-options] protocol outgoing-address [out-options]
[global-options]
```

Syntax Description

protocol incoming-address
protocol outgoing-address

Name of a protocol followed by a service name or address.
These arguments can have the following values:

- **lat** *service-name*—LAT and a LAT service name. The application of *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, *service-name* is the name of the service that users specify when trying to make a translated connection. This name can match the name of final destination resource, but this is not required. This can be useful when making remote translated connections.
- **x25** *X.121-address*—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 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 router itself is responsible for dealing with the extra digits appropriately.
- **tcp** *ip-address*—TCP/IP Telnet and a standard IP address or host name. The argument *ip-address* is a standard, four-part dotted decimal IP address or the name of an IP host that can be resolved by the Domain Name System (DNS) or explicit specification in an **ip host** command.
- **slip** *ip-address*—The argument *ip-address* is a standard, four-part dotted decimal IP address or the name of an IP host that can be resolved by the Domain Name System (DNS). The **slip** argument applies only to outgoing connections; SLIP is not supported on incoming protocol translation connections.

in-options
out-options

- **ppp** *ip-address*—The argument *ip-address* is a standard, four-part dotted decimal IP address or the name of an IP host that can be resolved by the Domain Name System (DNS). The **ppp** argument applies only to outgoing connections; PPP is not supported for incoming protocol translation connections.

(Optional) Incoming and outgoing connection request options. These arguments can have the following values:

For LAT translation options:

- **node** *node-name*—Outgoing connection request which connects to the specified node (*node-name*) that offers a service. By default, the connection is made to the highest-rated node that offers the service.
- **port** *port-name*—Destination LAT port name (*port-name*) 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. Outgoing connection request only.
- **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.)

For X.25 translation options:

- **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*—Sets the X.3 PAD parameters as defined in the profile created by the **x29 profile** command.
- **reverse**—Provides reverse charging for X.25 on a per-call rather than a per-interface basis. Requests reverse charges on a specified X.121 address, even if the serial interface is not configured to request reverse charge calls. This is an outgoing option only.
- **accept-reverse**—Accepts reverse charged calls on an X.121 address even if the serial interface is not configured to accept reverse charged calls. This is an incoming option only.

- **printer**—Supports LAT and TCP printing over an X.25 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 router to delay the call confirmation of an incoming X.25 call request until the outgoing protocol connection (to TCP or LAT) has been successfully established. An unsuccessful outgoing connection attempt results in the incoming X.25 connection to the router being refused, rather than being confirmed and then cleared, which is the default behavior. Note that using this option will force the global option *quiet* to be applied to the translation. Incoming connection request only.
- **pvc number**—Specifies that the incoming connection (identified by the argument *number*) is actually a permanent virtual circuit (PVC). Incoming connection request only.

For Telnet TCP translation options:

- **port number**—For incoming connections, number of the port to match. The default is port 0 (any port). For outgoing connections, number of the port to use. The default is port 23 (Telnet).
- **binary**—Negotiates Telnet binary mode on the Telnet connection. (This was the default in previous versions of the protocol translation software and is set automatically when you enter at **translate** command in the old format.)
- **stream**—Performs stream processing, which enables a raw TCP stream with no Telnet control sequences. A stream connection does not process or generate any Telnet options, and prevents Telnet processing of the data stream as well. This option might be useful for connections to ports running UUCP or other non-Telnet protocols, or to ports connected to printers. For ports connected to printers using Telnet, the stream option prevents some of usual problems associated with using Telnet for printers, such as strange things happening to bare carriage returns or line feeds and echoing of data back to VMS systems.
- **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 router 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.

For SLIP and PPP translation options: These variables apply to *out-options* only; SLIP and PPP are not supported on incoming protocol translation connections

- **headercompressed** [**passive**]—Implements header compression on IP packets only. The option **passive** permits compression on outgoing packets only if incoming TCP packets on the same virtual asynchronous interface are compressed. The default (without the **passive** option) permits compression on all traffic.
- **routing**—Permits routing updates between connections. This option is required if the destination device is not on a subnet connected to one of the interfaces on the router running protocol translation software.
- **keepalive** *number-of-seconds*—Permits you to specify the interval at which keepalive packets are sent on SLIP and PPP lines. By default, keepalives are enabled and are sent every 10 seconds. To disable keepalives, use a value of 0. The active keepalive interval is 1 through 32767 seconds.
- **mtu** *bytes*—Permits you to change the maximum transmission unit (MTU) of packets that the virtual asynchronous interface supports. The default MTU is 1500 bytes on a virtual asynchronous interface. The acceptable range is 64 through 1000000 bytes.
- **ppp authentication** {**chap** | **pap**}—Use CHAP or PAP authentication for PPP on virtual asynchronous interfaces. Refer to the “Configuring SLIP and PPP” chapter in the *Router Products Configuration Guide Addendum* for more information about enabling authentication on virtual asynchronous interfaces.
- **ppp use-tacacs**—Enable TACACS authentication for CHAP or PAP on virtual asynchronous interfaces (for PPP only; TACACS authentication is not supported for SLIP).

global-options

(Optional) Translation options that can be used by any connection type. It can be one or more of the following:

- **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.
- **max-users** *number*—Limits the number of simultaneous users of the translation to *number* (an integer you specify).
- **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 virtual terminal lines using the **login** command.
- **quiet**—Suppresses printing of user-information messages.
- **swap**—Allows X.3 parameters to be set on the router 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 router is treated like a PAD when it accepts a call. By default, the router 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 router, and then treats it like a PAD. For X.25-to-TCP translations only.

Default

No default translation parameters

Command Mode

Global configuration

Usage Guidelines

Table 11-2 provides a visual aid for understanding how to use the **translate** command. 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 explanations on how to enter this command.

Table 11-2 Translate Command Options

| | Incoming Protocol | Options | Outgoing Protocol | Options | Global Options |
|------------------|----------------------------------|-------------------------------|----------------------------------|-------------------------------|-----------------------------------|
| translate | <i>protocol incoming-address</i> | [<i>in-options</i>] | <i>protocol outgoing-address</i> | [<i>out-options</i>] | [<i>global-options</i>] |
| | lat <i>service-name</i> | unadvertised | lat <i>service-name</i> | node <i>node-name</i> | access-class <i>number</i> |
| | | | | port <i>port-name</i> | max-users <i>number</i> |
| | | | | | local |
| | | | | | login |
| | x25 <i>x.121-address</i> | cud <i>c-u-data</i> | x25 <i>x.121-address</i> | cud <i>c-u-data</i> | quiet |
| | | profile <i>profile</i> | | profile <i>profile</i> | swap |
| | | accept-reverse | | reverse | |
| | | printer | | | |

translate

| Incoming Protocol | Options | Outgoing Protocol | Options | Global Options |
|-----------------------|--------------------|------------------------|---|----------------|
| | <i>pvc number</i> | | | |
| <i>tcp ip-address</i> | <i>port number</i> | <i>tcp ip-address</i> | <i>port number</i> | |
| | binary | | | |
| | stream | | | |
| | printer | | | |
| | | <i>slip ip-address</i> | headercompressed [passive] | |
| | | | routing | |
| | | | keepalive <i>number-of-seconds</i> | |
| | | | <i>mtu bytes</i> | |
| | | <i>ppp ip-address</i> | headercompressed [passive] | |
| | | | routing | |
| | | | keepalive <i>number-of-seconds</i> | |
| | | | <i>mtu bytes</i> | |
| | | | ppp authentication { pap chap } | |
| | | | ppp use-tacacs | |

Examples

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 router 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
```

The following example translates LAT on an incoming line to SLIP on an outgoing line. It uses header compression only if incoming TCP packets on the same interface are compressed.

```
translate lat rudolph slip 1.0.0.4 headercompressed
          incoming outgoing option
```

The following example translates X.25 packets to PPP. It enables routing updates between the two connections.

```
translate x25 12345678 ppp 1.0.0.2 routing
          incoming outgoing option
```

The following example first shows the command to disable keepalives on a PPP line, then shows sample output from the **show translate** command when keepalives have been turned off on the line.

```
translate lat ramble ppp 172.21.2.2 keepalive 0
.
.
.
router# show translate

Translate From: LAT ramble
          To:   PPP 172.21.2.2 no-keepalive
          1/0 users active, 1 peak, 1 total, 0 failures
```

x25 host

Use the **x25 host** global configuration command to define a static host name for address mapping. Use the **no x25 host** command to remove the host name.

```
x25 host name x.121-address [ cud call-user-data]  
no x25 host name
```

Syntax Description

| | |
|-----------------------------------|--|
| <i>name</i> | Host name. |
| <i>x.121-address</i> | X.121 address. |
| cud <i>call-user-data</i> | (Optional) Specifies the Call User Data (CUD) field in the X.25 Call Request packet. |

Default

No static address mapping is defined.

Command Mode

Global configuration

Usage Guidelines

This command permits you to map an X.121 address to an easily recognizable name. You can later use this host name instead of the X.121 address when you issue the **translate** command for X.25.

Examples

The following example specifies a static address mapping:

```
x25 host Willard 4085551212
```

The following example removes a static address mapping:

```
no x25 host Willard
```

The following example specifies static address mapping from the X.121 address 12345678 to the host name masala. It then uses the name masala in the **translate** command in place of the X.121 address when translating from the X.25 host to the PPP host with address 1.0.0.2.

```
x25 host masala 12345678  
translate x25 masala ppp 1.0.0.2 routing
```

Related Command

translate

x29 access-list

To limit access to the router from certain X.25 hosts, use the **x29 access-list** global configuration command. To delete an entire access list, use the **no** form of this command.

```
x29 access-list access-list-number { permit | deny } regular-expression
no x29 access-list access-list-number
```

Syntax Description

| | |
|---------------------------|--|
| <i>access-list-number</i> | Number of the access list. It can be a value between 1 and 199. |
| deny | Denies access and clears call requests immediately. |
| permit | Permits access to the router. |
| <i>regular-expression</i> | Usually the X.121 address, with or without regular expression pattern-matching characters, with which to compare for access. |

Default

No default access list is defined.

Command Mode

Global configuration

Usage Guidelines

An access list can contain any number of access list items. The list are processed in the order in which you entered them, with the first match causing the permit or deny condition. If an X.121 address does not match any of the regular expression in the access list, access will be denied.

Access lists take advantage of the message field defined by Recommendation X.29, which describes procedures for exchanging data between two PADs or a PAD and a DTE device.

The UNIX-style regular expression characters allow for pattern matching of characters and character strings in the address. Various pattern-matching constructions are available that will allow many addresses to be matched by a single regular expressions. Refer to the appendix “X.3 PAD Parameters” later in this publication for more information.

Example

The following example permits connections to hosts with addresses beginning with the string 31370:

```
x29 access-list 2 permit ^31370
```

x29 profile

To create a PAD profile script for use by the **translate** command, use the **x29 profile** global configuration command.

```
x29 profile name parameter:value [parameter:value]
```

Syntax Description

| | |
|------------------------|---|
| <i>name</i> | Name of the PAD profile script. |
| <i>parameter:value</i> | (Optional) X.3 PAD parameter number and value separated by a colon. You can specify multiple parameter-value pairs. |

Default

No default PAD profile script defined.

Command Mode

Global configuration

Usage Guidelines

When an X.25 connection is established, the router acts as if an X.29 SET PARAMETER packet had been sent containing the parameters and values set by the **x29 profile** command and sets the router accordingly.

Example

The following profile script turns local edit mode on when the connection is made and establishes local echo and line termination upon receipt of a Return. The name *linemode* is used with the **translate** global configuration command to effect use of this script.

```
x29 profile linemode 2:1 3:2 15:1
```

Related Command

translate