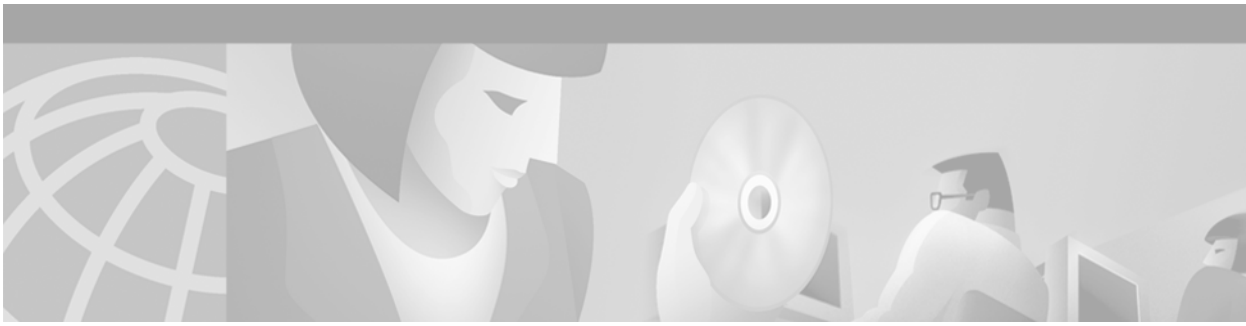

TN3270 Server Commands

Use the commands in this chapter to configure and monitor the Cisco Mainframe Channel Connection (CMCC) products, which include the Channel Interface Processor (CIP) and the Channel Port Adapter (CPA). For hardware technical descriptions and for information about installing the router interfaces, refer to the hardware installation and maintenance publication for your particular product.

Note Unless otherwise specified, all commands in this chapter are supported on the Cisco 7000 with RSP7000, Cisco 7500 and the Cisco 7200 series routers.

For interface configuration information and examples, refer to the "Configuring the TN3270 Server" chapter of the *Cisco IOS Bridging and IBM Networking Configuration Guide*.

For a conversion table of the modular products and Cisco 7000 family processors, refer to the "Platform Support" appendix of the *Cisco IOS Configuration Fundamentals Command Reference.*

allocate lu

To assign logical units (LUs) to a pool, use the **allocate lu** listen-point PU configuration command. To remove LUs assigned to a pool, use the **no** form of this command.

allocate lu *lu-address* **pool** *poolname* **clusters** *count*

no allocate lu *lu-address* **pool** *poolname* **clusters** *count*

Syntax Description

lu-address	Starting number of the LOCADDR to which a cluster of LUs are to be allocated.
pool *poolname*	Pool name to which you want to allocate LUs. The pool name cannot exceed 8 characters.
clusters *count*	Range of LUs in a cluster that are allocated to the specified pool. For example, if the **lu** keyword specifies the beginning of the LOCADDR number, the **cluster** keyword specifies the number of clusters to be included in the pool.

Defaults

No default behavior or values.

Command Modes

Listen-point PU configuration

Command History

Release	Modification
11.2(18)BC	This command was introduced.
12.0(5)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines

The following guidelines apply to the **allocate lu** command:

- The LUs assigned to a pool constitute a cluster. When multiple pools are configured, the LU ranges for different pools on the same PU must not overlap.
- A maximum of 255 LOCADDRs can be allocated to a pool. Configurations with invalid LOCADDRs are deleted. Overlapping LU ranges between different pools are invalid.
- The LOCADDR ranges must not overlap for multiple allocation statements and with existing ranges specified for client nailing statements.
- When LUs are allocated while LUs are in use, existing clients are allowed to complete their sessions unaffected.

Examples

In the following example, the starting LOCADDR is 10. Each cluster has 5 LOCADDRs, therefore 25 LOCADDRs (10 through 34) are allocated to the pool name LOT1.

```
interface channel 0/2
 tn3270-server
  pool LOT1 cluster layout 4s1p
  listen-point 10.20.30.40
   pu PU1
    allocate lu 10 pool LOT1 clusters 5
```

As a result of this configuration, the following LOCADDRs are created in each cluster:

- Cluster 1
  - LOCADDR 10—Screen
  - LOCADDR 11—Screen
  - LOCADDR 12—Screen
  - LOCADDR 13—Screen
  - LOCADDR 14—Printer
- Cluster 2
  - LOCADDR 15—Screen
  - LOCADDR 16—Screen
  - LOCADDR 17—Screen
  - LOCADDR 18—Screen
  - LOCADDR 19—Printer

All of the LUs in these clusters are allocated to pool LOT1.

Related Commands

Command	Description
pool	Defines pool names for the TN3270 server and specifies the number of screens and printers in each logical cluster.
tn3270-server	Starts the TN3270 server on a CMCC adapter and enters TN3270 server configuration mode.
pu (TN3270)	Creates a PU entity that has its own direct link to a host and enters PU configuration mode.
pu dlur (listen-point)	Creates a PU entity that has no direct link to a host and enters listen-point PU configuration mode.

certificate reload

To configure SSL Encryption Support enabled to read the profile security certificate from the file specified in the **servercert** command, use the **certificate reload** profile configuration command.

certificate reload

Syntax Description

This command has no arguments or keywords.

Defaults

No default behavior or values.

Command Modes

Profile configuration

Command History

Release	Modification
12.1(5)T	This command was introduced.

Usage Guidelines

There is not a **no** form for this command.

The TN3270 server must be configured for security.

Examples

The following example configures the TN3270 server with SSL Encryption Support to read the profile security certificate from the file specified in the **servercert** command:

```
certificate reload
```

Related Commands

Command	Description
servercert	Specifies the location of the TN3270 server's security certificate in the Flash memory.

client ip

To add an IP subnet to a client subnet response-time group, use the **client ip** response-time configuration command. To remove an IP subnet from a client subnet response-time group, use the **no** form of this command.

client ip *ip-address* [*ip-mask*]

no client ip *ip-address* [*ip-mask*]

Syntax Description

ip-address	IP subnet being added to the response-time group.
ip-mask	(Optional) Mask applied to a client IP address to determine the client's membership in a client subnet group. When the mask is applied to a connecting client's IP address and the resulting address is equal to the defined IP address, the client becomes a member of the client group. The default mask is 255.255.255.255.

Defaults

No default behavior or values.

Command Modes

Response-time configuration

Command History

Release	Modification
11.2(18)BC	This command was introduced.
12.0(5)T	This command was integrated into Cisco IOS Release 12.0 T.

Examples

Following is an example of the **client ip** command:

```
tn3270-server
response-time group acctg
 client ip 10.1.2.3 255.0.0.0
```

Related Commands

Command	Description
response-time group	Configures a client subnet group for response-time measurements.
show extended channel tn3270-server response-time application	Displays information about application response-time client groups.
show extended channel tn3270-server response-time global	Displays information about the global response-time client group.
show extended channel tn3270-server response-time link	Displays information about host link response-time client groups.
show extended channel tn3270-server response-time listen-point	Displays information about listen point response-time client groups.

Command	Description
show extended channel tn3270-server response-time subnet	Displays information about Subnet response-time client groups.
tn3270-server	Starts the TN3270 server on a CMCC adapter and enters TN3270 server configuration mode.

client ip lu

To define a specific LU or range of LUs to a client at the IP address or subnet, use the **client ip lu** TN3270 PU configuration mode command. To cancel this definition, use the **no** form of this command.

client [**printer**] **ip** *ip-address* [*ip-mask*] **lu** *first-locaddr* [*last-locaddr*]

no client [**printer**] **ip** *ip-address* [*ip-mask*] **lu** *first-locaddr* [*last-locaddr*]

Syntax Description

printer	(Optional) Specifies that a client connection from the nailed IP addresses will be nailed to one of the specified LUs only if the client-session negotiates a model type of 328*n*, where *n* is any alphanumeric character. Moreover, it ensures that a printer matching the IP address condition can only use an LU nailed as a printer LU. If the **printer** keyword is not specified for any **client** statement that has this IP address set, all model types can use this range of LUs.
ip-address	Specifies remote client IP address.
ip-mask	(Optional) The mask applied to the remote device address. Multiple client IP addresses in the same subnet can be nailed to the same range of locaddrs.
first-locaddr	Defines a single locaddr to nail.
last-locaddr	(Optional) Defines the end range of inclusive locaddrs to be nailed from *first-locaddr* to *last-locaddr.*

Defaults

No LUs are nailed. They are all available to any client.

Command Modes

TN3270 PU configuration mode

Command History

Release	Modification
11.3	This command was introduced.

Usage Guidelines

This command is valid only on the virtual channel interface. Multiple statements can be configured for one IP address or nail type either on one PU or multiple PUs. But each LU can only appear in one **client** statement.

A client with a nailed IP address can request one of the nailed LUs via the TN3270 device name. If the requested LU is not available then the connection is rejected.

A client with a nailed IP address cannot request an LU outside the range of nailed LUs for its type (screen or printer).

A client with a nonnailed IP address cannot request an LU that is configured as nailed.

The command will be rejected if some of the locaddrs are already nailed. If the locaddrs are currently in use by other remote clients, the nailing statement will take effect only when the locaddr is made available.

To cancel the definition, the **no client** form of the command must be entered exactly as the **client** command was originally configured. If a range of locaddrs was specified, to cancel this definition the whole range of locaddrs must be specified. There is no way to cancel only one locaddr if a whole range of locaddrs was configured.

Examples

In the following example, locaddrs 1 to 50 are reserved for remote devices in the 171.69.176.0 subnet:

```
interface channel 2/2
 tn3270-server
 pu BAGE4
  client ip 171.69.176.28 255.255.255.0 lu 1 50
```

In the following example, locaddrs 1 to 40 are reserved for screen devices in the 171.69.176.0 subnet, while 41 to 50 are reserved for printers in that subnet:

```
interface channel 2/2
 tn3270-server
 pu BAGE4
  client ip 171.69.176.28 255.255.255.0 lu 1 40
  client printer ip 171.69.176.28 255.255.255.0 lu 41 50
```

In the following example, there is an attempt to cancel a definition but this is rejected because it does not specify the full range of locaddrs and the second attempt fails to specify the correct nail type:

```
interface channel 2/2
 tn3270-server
  pu BAGE4
  client printer ip 171.69.176.50 255.255.255.0 lu 1 100
  no client printer ip 171.69.176.50 255.255.255.0 lu 1
  %Invalid LU range specified
  no client ip 171.69.176.50 255.255.255.0 lu 1 100
  %client ip 171.69.176.50 nail type not matched with configured nail type printer
```

Related Commands

Command	Description
pu (DLUR)	Creates a PU entity that has no direct link to a host and enters DLUR PU configuration mode.

client ip pool

To nail clients to pools, use the **client ip pool** listen-point configuration command. To remove clients from pools, use the **no** form of this command.

client ip *ip-address* [*ip-mask*] **pool** *poolname*

no client ip *ip-address* [*ip-mask*] **pool** *poolname*

Syntax Description

ip-address	Remote client IP address.
ip-mask	(Optional) Mask applied to the remote device address. The mask is part of the matching function that determines whether a client is governed by the nailing statement. The default is 255.255.255.255. Multiple client IP addresses in the same subnet can be nailed to the same range of LOCADDRS.
poolname	Specifies a unique pool name. The pool name cannot exceed 8 characters.

Defaults

No default behavior or values.

Command Modes

Listen-point configuration

Command History

Release	Modification
11.2(18)BC	This command was introduced.
12.0(5)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines

If the pool is configured while LUs are in use, existing clients are allowed to complete their sessions. A pool name can be identical to an LU name. When assigning an LU, the TN3270 server searches the LU name space first for specific requests, such as connections that specify a device name on CONNECT or LU name in the terminal type negotiation. The request is assumed to be directed to the specific LU rather than to the pool. Make sure the name spaces do not clash.

Examples

The following is an example of the **client ip pool** command that nails the client at IP address 10.1.2.3 with an IP mask of 255.255.255.0 to the pool named OMAHA:

```
tn3270-server
 pool OMAHA cluster layout 10s1p
 listen-point 172.18.4.18
  client ip 10.1.2.3 255.255.255.0 pool OMAHA
```

Related Commands

Command	Description
listen-point	Defines an IP address for the TN3270 server.
pool	Defines pool names for the TN3270 server and specifies the number of screens and printers in each logical cluster.
pu dlur (listen-point)	Creates a PU entity that has no direct link to a host and enters listen-point PU configuration mode.
pu (listen-point)	Creates a PU entity that has a direct link to a host and enters listen-point PU configuration mode.
tn3270-server	Starts the TN3270 server on a CMCC adapter and enters TN3270 server configuration mode.

client lu maximum

To limit the number of LU sessions that can be established for each client IP address or IP subnet address, use the **client lu maximum** TN3270 server configuration command. To remove a single LU limit associated with a particular IP address, use the **no** form of this command.

client [*ip* [*ip-mask*]] **lu maximum** *number*

no client [*ip* [*ip-mask*]]

Syntax Description

ip	(Optional) IP address of the client. The value for the *ip* argument is optional when setting the maximum number of LU sessions. If no IP address is specified then the limit is applied to all clients.
ip-mask	(Optional) IP network mask for the client. The default is 255.255.255.255.
number	(Optional) Maximum number of LU sessions. The allowed value is from 0 to 65535.

Defaults

The default is that there is no limit on the number of concurrent sessions from one client IP address.

The default value for the *ip-mask* argument is 255.255.255.255.

In the **no** form of this command, the default value for the *number* argument is 65535.

Command Modes

TN3270 server configuration

Command History

Release	Modification
12.0	This command was introduced.

Usage Guidelines

This command is valid only on the virtual channel interface. An instance of the **client** (lu limit) command on a given **tn3270-server** is uniquely identified by the *ip-mask* and the logical AND of the *ip-address*s with that mask. For example, if the command is entered as the following:

```
client 10.1.1.62 255.255.255.192 lu maximum 2
```

Then it will be stored (and subsequently displayed by **write term**) as:

```
client 10.1.1.0 255.255.255.192 lu maximum 2
```

The maximum specified on the command can be changed simply by reissuing the command with the new value. It is not necessary to remove the command first.

When you use the **no client** command, only the corresponding **client lu maximum** statement is removed, as identified by the IP address and IP address mask combination. You cannot use **no client** to specify an unlimited number of LU sessions. The **lu number** keyword is optional in the no form of the command.

For example, if a service bureau has 8000 clients and each client IP address is limited to four LU sessions, you will never need more than 32000 concurrent LU definitions even when the service is running at 100 percent capacity.

Examples

The following example limits all clients to a maximum of two LU sessions:

```
client lu maximum 2
```

The following example limits a client at IP address 10.1.1.28 to a maximum of three LU sessions:

```
client 10.1.1.28 lu maximum 3
```

The LU limit can be applied to different subnets as shown in the following example. The most exact match to the client IP address is chosen. Clients with IP addresses that reside in the subnet 10.1.1.64 (those with IP addresses in the range of 10.1.1.64 through 10.1.1.127) are limited to a maximum of 5 LU sessions while other clients with IP addresses in the subnet 10.1.1.0 are limited to a maximum of 4 LU sessions.

```
client 10.1.1.0  255.255.255.0 lu maximum 4
client 10.1.1.64 255.255.255.192 lu maximum 5
```

The following example prevents an LU session for the client at IP address 10.1.1.28:

```
client 10.1.1.28 lu maximum 0
```

Related Commands

Command	Description
maximum-lus	Limits the number of LU control blocks that will be allocated for TN3270 server use.

client pool

To nail clients to pools, use the **client pool** listen-point configuration command. To remove clients from pools, use the **no** form of this command.

client {[**ip** *ip-address* [*ip-mask*]] | [**name** *DNS-name* [*DNS-domain-identifier*]] | [**domain-name** *DNS-domain*] | [**domain-id** *DNS-domain-identifier*]} **pool** *poolname*

no client {[**ip** *ip-address* [*ip-mask*]] | [**name** *DNS-name* [*DNS-domain-identifier*]] | [**domain-name** *DNS-domain*] | [**domain-id** *DNS-domain-identifier*]} **pool** *poolname*

Syntax Description

ip *ip-address*	Remote client IP address.
ip-mask	(Optional) Mask applied to the remote device address. The mask is part of the matching function that determines whether a client is governed by the nailing statement. The default is 255.255.255.255. Multiple client IP addresses in the same subnet can be nailed to the same pool.
name *DNS-name*	(Optional) Alphanumeric string that specifies a client machine name. The string can contain up to 24 characters. If a valid *DNS-domain-identifier* is not present, this name must be fully qualified. If this name is not fully qualified, any dot that forms the boundary between the DNS-name and the DNS-domain must be included here if it is not already present in the DNS-domain.
DNS-domain-identifier	(Optional) A numeric identifier that specifies a domain name. The valid value range is 1 to 255. Each **domain-id** command statement can have only one *DNS-domain-identifier* value.
domain-name *DNS-domain*	(Optional) Alphanumeric string that specifies a domain name suffix, including all dots (.) but not delimited by dots. The string can contain up to 80 characters. All dots must be included when the string is appended to a configured DNS-name. If the DNS-domain starts with a dot, then the dot must be included if it is not already at the end of the DNS-name.
domain-id *DNS-domain-identifier*	(Optional) Numeric identifier that specifies that a domain name suffix will be appended to the name configured in the domain-id command. The valid value range is 1 to 255. Each **domain-id** command statement can have only one *DNS-domain-identifier* value. The domain-id is originally specified in the **domain-id** command.
poolname	Specifies a unique pool name. The pool name cannot exceed 8 characters.

Defaults

No default behavior or values.

Command Modes

Listen-point configuration

Command History

Release	Modification
11.2(18)BC	This command was introduced.
12.0(5)T	This command was integrated in Cisco IOS Release 12.0 T.
12.1(5)T	This command was modified to include the **name**, **domain-name**, and **domain-id** keywords. The name of the command was changed from **client ip pool** to **client pool**.

Usage Guidelines

If the pool is configured while LUs are in use, existing clients are allowed to complete their sessions. A pool name can be identical to an LU name. When assigning an LU, the TN3270 server searches the LU name space first for specific requests, such as connections that specify a device name on CONNECT or LU name in the terminal type negotiation. The request is assumed to be directed to the specific LU rather than to the pool. Make sure the LU names do not conflict.

Examples

Nailing Clients to Pools by IP Address

The following is an example of the **client pool** command with the **ip** keyword configured. The command nails the client at IP address 10.1.2.3 with an IP mask of 255.255.255.0 to the pool named OMAHA:

```
tn3270-server
 pool OMAHA cluster layout 10s1p
 listen-point 172.18.4.18
 client ip 10.1.2.3 255.255.255.0 pool OMAHA
```

Nailing Clients to Pools by Device Name

The following is an example of the **client pool** command with the **name** keyword configured. The command nails the client at device name george-isdn29.cisco.com to the pool named GENERAL:

```
tn3270-server
  pool GENERAL  cluster layout 4s1p
  listen-point 172.18.5.168
   pu T240CA   91922363 token-adapter 31 12 rmac 4000.4000.0001
    allocate lu 1 pool GENERAL  clusters 1
  client name george-isdn29.cisco.com pool GENERAL
```

Nailing Clients to Pools by Device Name using a Domain ID

The following is an example of the **client pool** command with the **name** keyword and the optional *DNS-domain-identifier* argument configured. The command nails the client at device name lucy-isdn49.cisco.com to the pool named GENERAL:

```
tn3270-server
 domain-id 23 .cisco.com
  pool GENERAL  cluster layout 4s1p
  listen-point 172.18.5.168
   pu T240CA   91922363 token-adapter 31 12 rmac 4000.4000.0001
    allocate lu 1 pool GENERAL  clusters 1
 client name lucy-isdn49 23 pool GENERAL
```

Nailing Clients to Pools by Domain Name

The following is an example of the **client pool** command with the **domain-name** keyword configured. The command nails any client at domain name .cisco.com to the pool named GENERAL:

```
tn3270-server
  pool GENERAL  cluster layout 4s1p
  listen-point 172.18.5.168
   pu T240CA   91922363 token-adapter 31 12 rmac 4000.4000.0001
    allocate lu 1 pool GENERAL  clusters 1
 client domain-name .cisco.com pool GENERAL
```

Nailing Clients to Pools by Domain Name Using a Domain ID

The following is an example of the **client pool** command with the **domain-id** keyword configured. The command nails any client at domain name cisco.com to the pool named GENERAL:

```
tn3270-server
 domain-id 23 .cisco.com
  pool GENERAL  cluster layout 4s1p
  listen-point 172.18.5.168
   pu T240CA   91922363 token-adapter 31 12 rmac 4000.4000.0001
    allocate lu 1 pool GENERAL  clusters 1
 client domain-id 23 pool GENERAL
```

Related Commands

Command	Description
listen-point	Defines an IP address for the TN3270 server.
pool	Defines pool names for the TN3270 server and specifies the number of screens and printers in each logical cluster.
pu dlur (listen-point)	Creates a PU entity that has no direct link to a host and enters listen-point PU configuration mode.
pu (listen-point)	Creates a PU entity that has a direct link to a host and enters listen-point PU configuration mode.
tn3270-server	Starts the TN3270 server on a CMCC adapter and enters TN3270 server configuration mode.
domain-id	Specifies a domain name suffix that the TN3270 server appends to a configured machine name to form a fully-qualified name when configuring inverse DNS nailing.

default-profile

To specify the name of the profile to be applied as a default to all the listen points, use the **default-profile** security command. To disable the default profile specification, use the **no** form of this command.

default-profile *profilename*

no default-profile *profilename*

Syntax Description

profilename	Profile name should already be configured.

Defaults

No default profile.

Command Modes

Security configuration

Command History

Release	Modification
12.1(5)T	This command was introduced.

Usage Guidelines

If this command is configured, this profile name and all of its attributes will be associated with all listen points that do not specify an individual profile with the **sec-profile** command.

Profile names cannot be duplicated.

Entering the **no** form of this command removes the default specification and any listen points that do not have the **sec-profile** command specified will revert to a non-secure mode.

This command has no retroactive effect. If a listen point is specified using the **listen-point** command, and the **sec-profile** command was already configured for that listen point then all client connections to that listen point will be secure.

If a listen point is specified using the listen-point command, and the **default-profile** command is not configured, then all client connections to that listen point will not be secure. However, if the **default-profile** command is later configured, then all now connections to that listen point will be secure using the specified **default-profile**. This will not affect the non-secure connections.

The following example specifies DOMESTIC as the default profile name for all clients connecting to listen point 10.10.10.1 until the **default-profile LAM** command is configured. Once the **default-profile LAM** command is configured, all new client connections will use LAM as the default profile.

```
tn3270
 security
 profile NOSECURITY none
 default-profile DOMESTIC
pu DIRECT 012ABCDE tok 0 04
 default-profile LAM
listen-point 10.10.10.1
```

Related Commands

Command	Description
sec-profile	Specifies the security profile to be associated with a listen point.
profile	Specifies a name and a security protocol for a security profile and enters profile configuration mode.

disable (TN3270)

To turn off security in the TN3270 server, use the **disable** (TN3270) security configuration command.

disable

Syntax Description

This command has no arguments or keywords.

Defaults

No default behavior or values.

Command Modes

Security configuration

Command History

Release	Modification
12.1(5)T	This command was introduced.

Usage Guidelines

Configuring the **disable** (TN3270) command does not terminate any active secure or non-secure connections. This command specifies that all new connections established with the TN3270 server will be non-secure. If a client initiates a change cipher specification for an existing secure connection then the TN3270 server will process the request.

There is not a **no** form for this command. The **enable** command is equivalent to the **no** form of this command.

Examples

The following example turns off security in the TN3270 server so that all new connections established with the TN3270 server will be non-secure:

```
disable
```

Related Commands

Command	Description
enable (TN3270)	Turns on security in the TN3270 server.

dlur

To enable the Systems Network Architecture (SNA) session switch function on the CMCC adapter and enter dependent logical unit requester (DLUR) configuration mode, use the **dlur** TN3270 server configuration command. To disable the SNA session switch function and discard all parameter values associated with the SNA session switch, use the **no** form of this command.

dlur [*fq-cpname fq-dlusname*]

no dlur

Syntax Description

fq-cpname	(Optional) Fully qualified control point (CP) name used by the SNA session switch and the logical unit (LU) name for the DLUR function. This name must be unique among APPN nodes in the network including other values for the *fq-cpname* argument specified on all other TN3270 servers running under the Cisco IOS software.
fq-dlusname	(Optional) Fully qualified name of the primary choice for the dependent LU server (DLUS). This is the name of an LU, usually a CP, in an APPN host. The value for the *fq-dlusname* argument can be repeated and shared across servers.

Defaults

No DLUR function is enabled.

Command Modes

TN3270 server configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

This command is valid only on the virtual channel interface. If the SNA session switch function is already enabled, the **dlur** command with no arguments puts you in DLUR configuration mode. The session switch function implements an End Node DLUR.

Several parameters in the DLUR configuration mode consist of fully qualified names, as defined by the APPN architecture. Fully qualified names consist of two case-insensitive alphanumeric strings, separated by a period. However, for compatibility with existing APPN products, including VTAM, the characters "#" (pound), "@" (at), and "$" (dollar) are allowed in the fully qualified name strings. Each string is from one to 8 characters long; for example, RA12.NODM1PP. The portion of the name before the period is the NET ID and is shared between entities in the same logical network.

The **no dlur** command hierarchically deletes all resources defined beneath it.

Examples

The following example performs two functions: it enters DLUR configuration mode; and it enables the DLUR function and defines the LU name for the DLUR as SYD.TN3020 and the primary choice for DLUS as SYD.VMG. Note that the NET ID portion of both names is the same:

```
dlur SYD.TN3020 SYD.VMG
```

Related Commands

Command	Description
lsap	Creates a SAP in the SNA session switch and enters DLUR SAP configuration mode.
preferred-nnserver	Specifies a preferred NN as server.
pu (DLUR)	Creates a PU entity that has no direct link to a host and enters DLUR PU configuration mode.

dlus-backup

To specify a backup DLUS for the DLUR function, use the **dlus-backup** DLUR configuration command. To remove a backup DLUS name, use the **no** form of this command.

dlus-backup *dlusname2*

no dlus-backup

Syntax Description

dlusname2	Fully qualified name of the backup DLUS for the DLUR.

Defaults

No backup DLUS is specified.

Command Modes

DLUR configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

This command is valid only on the virtual channel interface. Only one backup DLUS can be specified per CMCC adapter. If the backup DLUS specified in the **dlus-backup** command is in use when a **no dlus-backup** command is issued, the connection is not torn down.

Several parameters in the DLUR configuration mode consist of fully qualified names, as defined by the APPN architecture. Fully qualified names consist of two case-insensitive alphanumeric strings, separated by a period. However, for compatibility with existing APPN products, including VTAM, the characters "#" (pound), "@" (at), and "$" (dollar) are allowed in the fully qualified name strings. Each string is from one to 8 characters long; for example, RA12.NODM1PP. The portion of the name before the period is the NET ID and is shared between entities in the same logical network.

Examples

The following example specifies SYD.VMX as the backup DLUS:

```
dlus-backup SYD.VMX
```

Related Commands

Command	Description
client pool	Nails clients to pools.

domain-id

To specify a domain name suffix that the TN3270 server appends to a configured machine name to form a fully qualified name when configuring inverse DNS nailing, use the **domain-id** TN3270 server configuration command. To disable this specification, use the **no** form of this command.

domain-id *DNS-domain-identifier DNS-domain*

no domain-id *DNS-domain-identifier DNS-domain*

Syntax Description

DNS-domain-identifier	A numeric identifier that specifies the domain name. The valid value range is 1 to 255. Each domain-id statement can have only one *DNS-domain-identifier* value. This identifier is also used in the **client pool** command.
DNS-domain	An alphanumeric string that specifies a domain name suffix, including all dots (.) but not delimited by dots. The string can contain no more than 80 characters. All dots must be included when the string is appended to a configured DNS-name. If the DNS-domain starts with a dot, then the dot must be included if it is not already at the end of the DNS-name.

Defaults

No default behavior or values.

Command Modes

TN3270 server configuration

Command History

Release	Modification
12.1(5)T	This command was introduced.

Usage Guidelines

The user can configure up to 255 domain names, one per statement.

This command must be configured you configure the **client pool** command with either the **domain-id** keyword or the **name** keyword and the optional *DNS-domain-identifier* argument.

Examples

In the following example, the **domain-id** command specifies 23 as the *DNS-domain-identifier* for the .cisco.com domain name. All clients nailed to the pool GENERAL will use .cisco.com as the domain name suffix. For example, the client name ally-isdn1 will become ally-isdn1.cisco.com.

```
tn3270-server
 domain-id 23 .cisco.com
  pool GENERAL  cluster layout 4s1p
  listen-point 172.18.5.168
   pu T240CA   91922363 token-adapter 31 12 rmac 4000.4000.0001
    allocate lu 1 pool GENERAL  clusters 1
 client name ally-isdn1 23 pool GENERAL
```

Related Commands

Command	Description
client pool	Nails clients to pools.

enable (TN3270)

To turn on security in the TN3270 server, use the **enable** (TN3270) security configuration mode command.

enable

Syntax Description

This command has no arguments or keywords.

Defaults

No default behavior or values.

Command Modes

Security configuration

Command History

Release	Modification
12.1(5)T	This command was introduced.

Usage Guidelines

There is not a **no** form for this command.

If the **security** command has been disabled, then issuing this command does not affect existing connections.

This command is not displayed in the **show running configuration** command output because the security functionality is enabled by default.

Examples

The following example turns on security in the TN3270 server:

```
enable
```

Related Commands

Command	Description
security (TN3270)	Enables security on the TN3270 server.
disable (TN3270)	Turns off security in the TN3270 server.

encryptorder

To specify the security encryption algorithm for the SSL Encryption Support, use the **encryptorder** profile configuration command.

encryptorder [**DES**] [**3DES**] [**RC4**] [**RC2**] [**RC5**]

Syntax Description

DES	(Optional) Specifies the DES encryption algorithm.
3DES	(Optional) Specifies the 3DES encryption algorithm.
RC4	(Optional) Specifies the RC4 encryption algorithm.
RC2	(Optional) Specifies the RC2 encryption algorithm.
RC5	(Optional) Specifies the RC5 encryption algorithm.

Defaults

The default encryption order is RC4, RC2, RC5, DES, 3DES for domestic software. The default encryption order is RC4, RC2, DES for exportable software.

Command Modes

Profile configuration

Command History

Release	Modification
12.1(5)T	This command was introduced.

Usage Guidelines

There is not a **no** form for this command.

These algorithms may be entered in any order, but can be specified only once per **encryptorder** command.

Exportable versions of software cannot accept the 3DES or RC5 encryption algorithms.

Examples

The following example specifies RC4, DES, and RC2 as the encryption algorithms:

```
tn3270
 security
 profile DOMESTIC SSL
  encryptorder RC4 DES RC2
```

generic-pool

To specify whether or not leftover LUs will be made available to TN3270 sessions that do not request a specific LU or LU pool through TN3270E, use the **generic-pool** TN3270 server configuration command. To selectively remove the permit or deny condition of generic pool use, use the **no** form of this command.

generic-pool {**permit** | **deny**}

no generic-pool

Syntax Description

permit	Leftover LUs should be made available to TN3270 users wanting generic sessions. This value is the default.
deny	Leftover LUs should not be given to a generic pool. The physical unit (PU) is not automatically fully populated with 255 LOCADDR definitions. The default is the value configured in TN3270 server configuration mode.

Defaults

In TN3270 server configuration mode, generic pool use is permitted.

In PU configuration mode, the default is the value currently configured in TN3270 server configuration mode.

Command Modes

TN3270 server configuration—The **generic-pool** command at this level applies to all PUs supported by the TN3270 server.

Listen-point configuration—The **generic-pool** command at this level applies to all PUs defined at the listen point.

Listen-point PU configuration—The **generic-pool** command at this level applies only to the specified PU.

DLUR PU configuration—The **generic-pool** command at this level applies to all PUs defined under DLUR configuration mode.

PU configuration—The **generic-pool** command at this level applies only to the specified PU.

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

This command is valid only on the virtual channel interface.

A leftover LU is defined as one for which all of the following conditions are true:

- The system services control point (SSCP) did not send an ACTLU during PU start-up.
- The PU controlling the LU is capable of carrying product set ID (PSID) vectors on network management vector transport (NMVT) messages, thus allowing dynamic definition of dependent LU (DDDLU) operation for that LU.

All LUs in the generic pool are, by definition, DDDLU capable.

Values entered for **generic-pool** in TN3270 server configuration mode apply to all PUs for that TN3270 server but can be changed in PU configuration mode.

In PU configuration mode, a **no generic-pool** command will restore the **generic-pool** value entered in TN3270 command mode.

In TN3270 server configuration mode, the **no generic-pool** command reverts to the default, which permits generic pool use.

The command takes effect immediately. If **generic-pool deny** is specified on a PU, no further dynamic connections to it will be allowed. Existing sessions are unaffected, but as they terminate the LUs will not become available for dynamic connections.

Similarly, if **generic-pool permit** is specified, any inactive LUs are immediately available for dynamic connections. Moreover, any active LUs that were dynamic previously (before **generic-pool deny** was issued) return to being dynamic.

Examples

The following example permits generic LU pool use:

```
generic-pool permit
```

Related Commands

Command	Description
client ip lu	Defines a specific LU or range of LUs to a client at the IP address or subnet.

idle-time

To specify how many seconds of LU inactivity, from both host and client, before the TN3270 session is disconnected, use the **idle-time** TN3270 server configuration command. To cancel the idle time period and return to the default, use the **no** form of this command.

idle-time *seconds*

no idle-time

Syntax Description

seconds	Idle time in seconds, from 0 to 65535. A value of 0 means the session is never disconnected.

Defaults

The default in TN3270 server configuration mode is that the session is never disconnected (0).

The default in PU configuration mode is the value currently configured in TN3270 server configuration mode.

Command Modes

TN3270 server configuration—The **idle-time** command at this level applies to all PUs supported by the TN3270 server.

Listen-point configuration—The **idle-time** command at this level applies to all PUs defined at the listen point.

Listen-point PU configuration—The **idle-time** command at this level applies only to the specified PU.

DLUR PU configuration—The **idle-time** command at this level applies to all PUs defined under DLUR configuration mode.

PU configuration—The **idle-time** command at this level applies only to the specified PU.

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

The **idle-time** command is valid only on the virtual channel interface, and can be entered in either TN3270 server configuration mode or PU configuration mode. A value entered in TN3270 mode applies to all PUs for that TN3270 server, except as overridden by values entered in PU configuration mode.

A **no idle-time** command entered in PU configuration mode will restore the idle-time value entered in TN3270 command mode.

The **idle-time** command affects currently active and future TN3270 sessions. For example, if the **idle-time** value is reduced from 900 seconds to 600 seconds, sessions that have been idle for between 600 and 900 seconds are immediately disconnected.

Note For the purposes of idle-time logic, TIMING-MARKs generated by the keepalive logic do not constitute “activity.”

Examples

The following command sets an idle-time disconnect value of 10 minutes:

```
idle-time 600
```

The following command entered in TN3270 server configuration mode sets the default idle-time disconnect value to 0, or never disconnect:

```
no idle-time
```

Related Commands

Command	Description
keepalive (TN3270)	Specifies how many seconds of inactivity elapse before transmission of a DO TIMING-MARK or Telnet no operation (nop) to the TN3270 client.
timing-mark	Selects whether a WILL TIMING-MARK is sent when the host application needs an SNA response (definite or pacing response).

ip precedence (TN3270)

To specify the precedence level for voice over IP traffic in the TN3270 server, use the **ip precedence** TN3270 server configuration command. To remove the precedence value, use the **no** form of this command.

ip precedence {**screen** | **printer**} *value*

no ip precedence {**screen** | **printer**}

Syntax Description

screen	Specifies the precedence is for screen devices.
printer	Specifies the precedence is for printer devices.
value	Sets the precedence priority. A value between 0 and 7, with 7 being the highest priority. The default is 0.

Defaults

The default is a precedence value of 0 for both screens and printers.

Command Modes

TN3270 server configuration—The **ip precedence** (TN3270) command at this level applies to all PUs supported by the TN3270 server.

Listen-point configuration—The **ip precedence** (TN3270) command at this level applies to all PUs defined at the listen point.

DLUR PU configuration—The **ip precedence** (TN3270) command at this level applies to all PUs defined under DLUR configuration mode.

PU configuration—The **ip precedence** (TN3270) command at this level applies only to the specified PU.

Command History

Release	Modification
11.3	This command was introduced.

Usage Guidelines

This command is valid only on the virtual channel interface. Precedence values applied in TN3270 PU configuration mode override values applied in TN3270 server configuration mode.

You can enter new or different values for IP precedence without first using the **no** form of this command.

During initial Telnet negotiations to establish, or bind, the session an IP precedence value of 0 and IP ToS value of 0 is used. These values are used until the bind takes place. When the session is a type 2 bind, the TN3270 client is assumed to be a screen; otherwise the client is assumed to be a printer.

Examples

The following example assigns a precedence value of 3 to printers:

```
ip precedence printer 3
```

Related Commands

Command	Description
ip tos	Specifies the ToS level for IP traffic in the TN3270 server.

ip tos

To specify the Type of Service (ToS) level for IP traffic in the TN3270 server, use the **ip tos** TN3270 server configuration command. To remove the ToS value, use the **no** form of this command.

ip tos {**screen** | **printer**} *value*

no ip tos {**screen** | **printer**}

Syntax Description

screen	Specifies the ToS is for screen devices.
printer	Specifies the ToS is for printer devices.
value	Sets the ToS priority. A value between 0 and 15. The default is 0.

Defaults

The default is a ToS value of 0 for both screens and printers.

Command Modes

TN3270 server configuration—The **ip tos** command at this level applies to all PUs supported by the TN3270 server.

Listen-point configuration—The **ip tos** command at this level applies to all PUs defined at the listen point.

DLUR PU configuration—The **ip tos** command at this level applies to all PUs defined under DLUR configuration mode.

PU configuration—The **ip tos** command at this level applies only to the specified PU.

Command History

Release	Modification
11.3	This command was introduced.

Usage Guidelines

This command is valid only on the virtual channel interface. ToS values applied in TN3270 PU configuration mode override values applied in TN3270 server configuration mode.

The default ToS values for screen and printer are 0. However, RFC 1349 recommends different default values. Specifically, the RFC recommends a default minimize screen delay value of 8 and a default maximize printer throughput value of 4. You must configure these values using the **ip tos** command if you want to comply to the defaults as stated in the RFC.

Table 35 shows the values described in RFC 1349.

Table 35 ToS Defined Values

Value	Definition	Action
0	All normal.	Use default metric.
8	Minimize delay.	Use delay metric.
4	Maximize throughput.	Use default metric.

Table 35 ToS Defined Values (continued)

Value	Definition	Action
2	Maximize reliability.	Use reliability metric.
1	Minimize monetary cost.	Use cost metric.
Other	Not defined.	Reserved for future use.

During initial Telnet negotiations to establish, or bind, the session, an IP precedence value of 0 and IP ToS value of 0 is used. These values are used until the bind takes place. When the session is a type 2 bind, the TN3270 client is assumed to be a screen; otherwise the client is assumed to be a printer.

When you use the **no** form of the command, the ToS value is either set to 0 for that configuration mode or the value set at a previous (higher) configuration mode is used. For example, if you are at the TN3270 PU configuration mode and issue a **no ip tos screen** command, any value you configured previously at the TN3270 server configuration mode will take effect.

You can enter new or different values for ToS without first using the **no** form of this command.

Examples

In the following example, the TN3270 server ToS screen value is set to 10 and a specific PU ToS screen value is set to 0:

```
interface channel 3/2
  tn3270-server
   ip tos screen 8
   ip tos printer 4
  pu PUS2
   ip tos screen 0
```

Related Commands

Command	Description
ip precedence (TN3270)	Specifies the precedence level for IP traffic in the TN3270 server.

keepalive (TN3270)

To specify how many seconds of inactivity elapse before the TN3270 server transmits a DO TIMING-MARK or Telnet no operation (nop) to the TN3270 client, use the **keepalive** TN3270 server configuration command. To cancel the keepalive period and return to the previously configured siftdown value or the default, use the **no** form of this command.

keepalive *seconds* [**send** {**nop** | **timing-mark** [*max-response-time*]}]

no keepalive

Syntax Description

seconds	Number of elapsed seconds (from 0 to 65535) before the TN3270 server sends a DO TIMING-MARK or Telnet **nop** command to the TN3270 client. A value of 0 means no keepalive signals are sent. The default is 1800 seconds (30 minutes).
send nop	(Optional) Sends the Telnet command for no operation to the TN3270 client to verify the physical connection. No response is required by the client.
send timing-mark [*max-response-time*]	(Optional) Number of seconds (from 0 to 32767) within which the TN3270 server expects a response to the DO TIMING-MARK from the TN3270 client. The default is 30 seconds if the keepalive interval is greater than or equal to 30 seconds. If the value of the keepalive interval is less than 30 seconds, then the default *max-response-time* is the value of the interval. The value of the *max-response-time* should be less than or equal to the *interval*.

Defaults

The default behavior is to send timing marks with a keepalive interval of 1800 seconds (30 minutes). If you specify only the keepalive interval, the TN3270 server sends timing-marks.

The default value of the **send timing-mark** *max-response-time* command is 30 seconds if the keepalive interval is greater than or equal to 30 seconds. If the value of the keepalive interval is less than 30 seconds, then the default *max-response-time* is the value of the interval.

Command Modes

TN3270 server configuration—The **keepalive** command at this level applies to all PUs supported by the TN3270 server.

Listen-point configuration—The **keepalive** command at this level applies to all PUs defined at the listen point.

Listen-point PU configuration—The **keepalive** command at this level applies only to the specified PU.

DLUR PU configuration—The **keepalive** command at this level applies to all PUs defined under DLUR configuration mode.

PU configuration—The **keepalive** command at this level applies only to the specified PU.

Command History

Release	Modification
11.2	This command was introduced.
12.0(5)T	The **send** {**nop** | **timing-mark** [*max-response-time*]} keywords were added.

Usage Guidelines

The **keepalive** command is valid only on the virtual channel interface. This command can be entered in one of four command modes (TN3270 configuration, Listen-point configuration, Listen-point PU configuration, or PU configuration mode). A value entered in TN3270 mode applies to all PUs for that TN3270 server, except as overridden by values entered in the other supported configuration modes. A **no keepalive** command entered in a subsequent configuration mode will restore the **keepalive** value entered in the previous command mode.

In Cisco IOS releases prior to 12.0(5)T in which the **keepalive** command is supported, you cannot specify the period of time in which the client must respond to the DO TIMING-MARK before the TN3270 server disconnects the session. By default in prior releases, if the client does not reply within 30 minutes of sending the DO TIMING-MARK, the TN3270 server disconnects the TN3270 session. (The DO TIMING-MARK is a Telnet protocol operation that does not affect the client operation.)

With the addition of the **send timing-mark** *max-response-time* keywords in Cisco IOS release 12.0(5)T, you can specify the period of time in which the client must respond to the DO TIMING-MARK before being disconnected by the server. If you do not specify the *max-response-time* argument, the default value is determined by the size of the keepalive interval. The default is 30 seconds if the keepalive interval is greater than or equal to 30 seconds. If the value of the keepalive interval is less than 30 seconds, then the default *max-response-time* is the value of the interval.

If the IP path to the client is broken, the TCP layer will detect the failure to acknowledge the DO TIMING-MARK and initiate disconnection. This action usually takes much less than 30 seconds.

The **keepalive** command affects currently active and future TN3270 sessions. For example, reducing the keepalive interval to a smaller nonzero value causes an immediate burst of DO TIMING-MARKs on those sessions that have been inactive for a period of time greater than the new, smaller value.

Use the **keepalive send nop** command when you are using older TN3270 clients that do not support TIMING-MARK or are DOS-based clients. When you use the **keepalive send nop** command to monitor the client connection, no response is required by the client to the TN3270 server. However, the TCP/IP stack can detect that the physical connection still exists. This command is useful for those clients that can be swapped out when a DO TIMING-MARK has been sent by the TN3270 server. If the client is swapped out and cannot respond to the DO TIMING-MARK from the TN3270 server, the session is disconnected. However, if the client is swapped out and the Telnet **nop** command is sent by the server, the physical connection is still verifiable by the TCP/IP stack and the client remains connected to the server.

If your client supports the use of timing-marks and is not subject to being swapped out, then using timing-marks is preferable to the Telnet **nop** command for keepalive monitoring. The required response by TN3270 clients to timing-marks sent by the server provides a better indication of the health of the client-server connection.

Examples

The following example specifies that the TN3270 server sends a DO TIMING-MARK in 15-minute (900-second) intervals and the client must respond within 30 seconds (the default value for the **timing-mark** *max-response-time* command when not specified):

```
keepalive 900
```

The following example entered in TN3270 server configuration mode specifies that the TN3270 server sends a DO TIMING-MARK in 30-minute (1800-second) intervals (the default interval) and the client must respond within 30 seconds (the default for the **timing-mark** *max-response-time* command when not specified):

```
no keepalive
```

The following example specifies that the TN3270 server sends a DO TIMING-MARK in 40-minute (2400-second) intervals and the client must respond within 1 minute (60 seconds):

```
keepalive 2400 send timing-mark 60
```

Consider the following example in which the **keepalive** command is configured in more than one command mode. In this example the **keepalive** command is first configured in TN3270 server configuration mode, followed by Listen-point PU configuration mode. The **keepalive** command values specified under the listen-point PU overrides the **keepalive** 300 value specified under the tn3270-server for PU1. In this example, all other PUs except PU1 use the value of the **keepalive 300** command specified in TN3270 server configuration mode.

```
tn3270-server
keepalive 300
listen-point 10.10.10.1 tcp-port 40
  pu PU1 94223456 tok 1 08
    keepalive 10 send timing-mark 5
  pu PU2 94223457 tok 2 12
```

Related Commands

Command	Description
idle-time	Specifies how many seconds of LU inactivity, from both host and client, before the TN3270 session is disconnected.
timing-mark	Selects whether a WILL TIMING-MARK is sent when the host application needs an SNA response (definite or pacing response).

keylen

To specify the maximum bit length for the encryption keys for SSL Encryption Support, use the **keylen 128** profile configuration command. To disable this specification and thereby set the key length to the default of 40 bits, use the **no** form of this command or **keylen 40**.

keylen {**40** | **128**}

no keylen [**40** | **128**]

Syntax Description

40	Specifies the bit length for the encryption keys to 40.
128	Specifies the bit length for the encryption keys to 128.

Defaults

The default encryption key length is 40 bits.

Command Modes

Profile configuration.

Command History

Release	Modification
12.1(5)T	This command was introduced.

Usage Guidelines

Exportable software versions cannot accept encryption key lengths greater than 40 bits.

The length is optional on the **no** form of this command. Entering the **no** form of this command with no length resets the length to the default value of 40 bits.

If the key length is changed, all new connections will use the new value. If an active session renegotiates its security specifications, it will use the new key length value.

Examples

The following example specifies the maximum encryption key length value to 128 bits:

```
tn3270-server
 security
 profile DOMESTIC SSL
  encryptorder RC4 DES RC2
  keylen 128
```

link (TN3270)

To define and activate a link to a host, use the **link** DLUR SAP configuration command. To delete the link definition, use the **no** form of this command.

link *name* [**rmac** *rmac*] [**rsap** *rsap*]

no link *name*

Syntax Description

name	Link name, from one to eight alphanumeric characters. The first character must be alphabetic. The name must be unique within the DLUR function.
rmac *rmac*	(Optional) Remote MAC address of the form *xxxx.xxxx.xxxx* in hexadecimal. If not specified, a loopback link to another SAP on the same internal LAN adapter is assumed.
rsap *rsap*	(Optional) Remote SAP address, 04 to FC in hexadecimal. The *rsap* value must be even and should be a multiple of 4, but this requirement is not enforced. The default value for the *rsap* argument is 04.

Defaults

No DLUR link is defined.

The default remote SAP address is 04 (hexadecimal).

Command Modes

DLUR SAP configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

This command is valid only on the virtual channel interface. The combination of *rmac* and *rsap* must be unique within the DLUR SAP function. These values can only be changed by deleting the link definition, using the **no link** command, and recreating the link definition.

For a link via a channel on this CMCC adapter, the TN3270 server and the hosts should open different adapters. Using different adapters avoids any contention for SAP numbers, and is also necessary if you configure duplicate MAC addresses for fallback CSNA or CMPC access to the host.

Examples

The following example defines a link name and a remote SAP address:

```
link LINK5 rsap 08
```

The following example shows different adapter numbers configured on the same internal LAN to avoid SAP contention. The host uses SAP 4 on Token Ring adapter 0.

```
lan tokenring 0
 adapter 0 4000.0000.0001
 adapter 1 4000.0000.0002
tn3270-server
 dlur ...
 lsap token-adapter 1
  link HOST rmac 4000.0000.0001 rsap 4
```

Related Commands

Command	Description
adapter	Configures internal adapters.
client pool	Nails clients to pools.
lsap	Creates a SAP in the SNA session switch and enters DLUR SAP configuration mode.

listen-point

To define an IP address for the TN3270 server, use the **listen-point** TN3270 server configuration command. To remove a listen point for the TN3270 server, use the **no** form of this command.

listen-point *ip-address* [**tcp-port** *number*]

no listen-point *ip-address* [**tcp-port** *number*]

Syntax Description

ip-address	IP address that the clients should use as the host IP address to map to LU sessions under this PU and listen point.
tcp-port *number*	(Optional) Port number used for the listen operation. The default value is 23.

Defaults

The default **tcp-port** *number* is 23.

Command Modes

TN3270 server configuration

Command History

Release	Modification
11.2(18)BC	This command was introduced.
12.0(5)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines

Use the **listen-point** command to create a unique listen point for every IP address and TCP-port pair. In this mode, the IP address and the TCP port are no longer configured in the PU. Configure the PUs under the appropriate listen point. The other siftdown configuration commands remain the same.

For example, in the old configuration the following statements were used to configure the IP address and TCP port in the PU:

```
tn3270-server
  pu PU1 94223456 10.10.10.1 tok 1 08
   tcp-port 40
   keepalive 10
```

In the new listen-point configuration, the following statements are used to configure the IP address and TCP port at the listen point:

```
tn3270-server
  listen-point 10.10.10.1 tcp-port 40
   pu PU1 94223456 tok 1 08
    keepalive 10
```

You can also use the listen-point configuration to assign the same IP address to multiple PUs. In the old configuration the following statements were used:

```
tn3270-server
  pu PU1 94201231 10.10.10.2 tok 1 10
  pu PU2 94201232 10.10.10.3 tok 1 12
  pu PU3 94201234 10.10.10.3 tok 1 14
  pu PU4 94201235 10.10.10.4 tok 1 16
   tcp-port 40
  pu PU5 94201236 10.10.10.4 tok 2 08
```

In the new listen point configuration, the old statements are replaced by the following configuration commands. In this example, PU2 and PU3 are grouped into one listen point because they have the same IP address. Note that even though PU4's IP address is identical to PU5's IP address, they are not configured within the same listen point because the listen point indicates a unique IP address and TCP port pair. If you do not specify the TCP port, the default port value is 23.

```
tn3270-server
 listen-point 10.10.10.2
  pu PU1 94201231 tok 1 10
 listen-point 10.10.10.3
  pu PU2 94201232 tok 1 12
  pu PU3 94201234 tok 1 14
 listen-point 10.10.10.4
  pu PU5 94201236 tok 2 08
 listen-point 10.10.10.4 tcp-port 40
  pu PU4 94201235 tok 1 16
```

The next example shows how the configuration changes for a DLUR PU. In this mode, the DLUR PU is no longer configured under DLUR, but is configured in the listen point.

In the old configuration, the following statements were used:

```
tn3270-server
 dlur NETA.RTR1 NETA.HOST
  dlus-backup NETA.HOST
  lsap token-adapter 15 08
   link MVS2TN rmac 4000.b0ca.0016
  pu PU1 017ABCDE 10.10.10.6
```

These statements are replaced by the following statements in the new listen-point configuration. The keyword **dlur** differentiates the listen-point direct PU from the listen point DLUR PU. The DLUR configuration must be completed before configuring the PU in the listen point. Any siftdown commands configured within the scope of the listen point are automatically inherited by the PUs that are configured within the scope of that listen point. To override the siftdown configurations, you can explicitly configure the siftdown configuration commands within the scope of the listen-point PU.

```
tn3270-server
 dlur NETA.RTR1 NETA.HOST
  dlus-backup NETA.HOST
  lsap token-adapter 15 08
   link MVS2TN rmac 4000.b0ca.0016
 listen-point 10.10.10.6
  pu PU1 017ABCDE dlur
```

Examples

Following is an example of the **listen-point** command showing PU7 grouped into the listen point at IP address 10.10.10.1 and TCP port 40:

```
tn3270-server
listen-point 10.10.10.1 tcp-port 40
 pu PU7 94201237 tok 1 17
```

Related Commands

Command	Description
tn3270-server	Starts the TN3270 server on a CMCC adapter and enters TN3270 server configuration mode.
pu dlur (listen-point)	Creates a PU entity that has no direct link to a host and enters listen-point PU configuration mode.
pu (listen-point)	Creates a PU entity that has a direct link to a host and enters listen-point PU configuration mode.

lsap

To create a SAP in the SNA session switch and enter DLUR SAP configuration mode, use the **lsap** DLUR configuration command. To delete a SAP and all SNA session switch links using the internal LAN interface, use the **no** form of this command.

lsap *type adapter-number* [*lsap*]

no lsap *type adapter-number* [*lsap*]

Syntax Description

type	Internal adapter type on the CIP card, which corresponds to the value specified in the **lan** internal LAN configuration command. The currently supported value for the *type* argument is **token-adapter**.
adapter-number	Internal adapter interface on the CIP card, which is the same value specified in the **adapter** internal LAN configuration command.
lsap	(Optional) Local SAP number, 04 to FC, in hexadecimal. The value must be even and should normally be a multiple of four. It must be unique within the internal adapter in that no other 802.2 clients of that adapter, in the router or in a host, should be allocated the same SAP. The default value is C0.

Defaults

The default value for the *lsap* argument is hexadecimal C0.

Command Modes

DLUR configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

The **lsap** command is valid only on the virtual channel interface. If the SAP in the SNA session switch function is already created, the **lsap** command with no arguments puts you in DLUR SAP configuration mode.

The **lsap** command can be entered only in DLUR configuration mode.

The **lsap** command uses values that are defined in two other commands: the **lan** internal LAN configuration command and the **adapter** internal LAN configuration command. The **lan** *type* and **adapter** *adapter-number* values configured on the CMCC internal LAN interface are used in the **lsap** command. However, the **lan** *type* keyword is a little different. Where the value for the *type* argument on the **lan** command is **tokenring**, the corresponding value for the *type* argument on **lsap** is **token-adapter**. This emphasizes that the number that follows is an **adapter** number, not a **lan** number.

The **no lsap** command hierarchically deletes any links using it. Any sessions using those links are lost.

Examples

The following example defines an adapter type, an adapter number, and a local SAP:

```
lsap token 0 B0
```

Related Commands

Command	Description
adapter	Configures internal adapters.
client pool	Nails clients to pools.
keylen	Specifies the maximum bit length for the encryption keys for SSL Encryption Support.

lu deletion

To specify whether the TN3270 server sends a REPLY-PSID poweroff request to VTAM to delete the corresponding LU when a client disconnects, use the **lu deletion** TN3270 server configuration command. To remove LU deletion from the current configuration scope, use the **no** form of this command.

lu deletion {**always** | **normal** | **non-generic** | **never | named**}

no lu deletion

Syntax Description

always	Always delete dynamic LUs upon disconnect.
normal	Delete screen LUs only upon disconnect.
non-generic	Delete only specified LUs upon disconnect.
never	Never delete LUs upon disconnect.
named	Delete only named LUs upon disconnect.

Defaults

The default keyword is **never**.

Command Modes

TN3270 server configuration—The **lu deletion** command at this level applies to all PUs supported by the TN3270 server.

Listen-point configuration—The **lu deletion** command at this level applies to all PUs defined at the listen point.

Listen-point PU configuration—The **lu deletion** command at this level applies only to the specified PU.

DLUR PU configuration—The **lu deletion** command at this level applies to all PUs defined under DLUR configuration mode.

PU configuration—The **lu deletion** command at this level applies only to the specified PU.

Note The **lu deletion** command is a siftdown command, so it can be used at any of the configuration command modes shown. The most recent **lu deletion** command in the PU configuration takes precedence.

Command History

Release	Modification
11.2(18)BC	This command was introduced.
12.0(5)T	This command was integrated in to Cisco IOS Release 12.0 T.
12.1(5)T	This command was modified to add the **named** keyword.

Usage Guidelines

Use the **always** keyword of the **lu deletion** command when you have only screen LUs, and they are all different sizes. This prevents screen LUs from attaching to a previously used LU with an incompatible screen size.

Use the **normal** keyword of the **lu deletion** command when you have both screen and printer LUs. This is important because printers are acquired by the host application, and not logged on manually. If VTAM deletes the LU, then there is nothing for a host application (such as CICS) to acquire.

You can use the **non-generic** mode of LU deletion if VTAM can support deletion of specifically-named LUs. (The support of this mode is not currently available in VTAM, as of VTAM version 4.4.1.)

Use the **never** mode of LU deletion when you have only screen LUs and they all use the same screen size.

Use the **named** keyword of the **lu deletion** command when you have configured dynamic LU names from the TN3270 server side.

Examples

Following is an example of the **lu deletion** command specifying that the TN3270 server send a REPLY-PSID poweroff request to delete only screen LUs upon session disconnect for any PUs supported by the TN3270 server:

```
tn3270-server
 lu deletion normal
```

Following is an example of the **lu deletion** command configuring a listen-point PU to define DLUR PUs using dynamic LU naming:

```
tn3270-server
listen-point 172.18.4.18
pu pu1 05D9901 dlur
 lu deletion named
```

Related Commands

Command	Description
pu dlur (listen-point)	Creates a PU entity that has no direct link to a host and enters listen-point PU configuration mode.
pu (listen-point)	Creates a PU entity that has a direct link to a host and enters listen-point PU configuration mode.

lu termination

To specify whether a TERMSELF or UNBIND RU is sent by the TN3270 server when a client turns off his device or disconnects, use the **lu termination** TN3270 server configuration command. To remove LU termination from the current configuration scope, use the **no** form of this command.

lu termination {**termself** | **unbind**}

no lu termination

Syntax Description

termself	Orders termination of all sessions and session requests associated with an LU upon disconnect.
unbind	Requests termination of the session by the application upon LU disconnect. This value is the default.

Defaults

Unbind is the default.

Command Modes

TN3270 server configuration—The **lu termination** command at this level applies to all PUs supported by the TN3270 server.

Listen-point configuration—The **lu termination** command at this level applies to all PUs defined at the listen point.

Listen-point PU configuration—The **lu termination** command at this level applies only to the specified PU.

DLUR PU configuration—The **lu termination** command at this level applies to all PUs defined under DLUR configuration mode.

PU configuration—The **lu termination** command at this level applies only to the specified PU.

Note The **lu termination** command is a siftdown command, so it can be used at any of the configuration command modes shown. The most recent **lu termination** command in the PU configuration takes precedence.

Command History

Release	Modification
11.2(18)BC	This command was introduced.
12.0(5)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines

Use the **termself** keyword when you want to be sure that the application terminates the session when the LU disconnects. This is important for certain applications such as CICS.

If you use the **unbind** keyword for session termination with applications such as CICS, VTAM security problems can arise. When CICS terminates a session from an UNBIND request, the application may reestablish a previous user's session with a new user, who is now assigned to the same freed LU.

Examples

Following is an example of the **lu termination** configuration command to force termination of the session when an LU disconnects for any PUs supported by the TN3270 server:

```
tn3270-server
 lu termination termself
```

maximum-lus

To limit the number of LU control blocks that will be allocated for the TN3270 server, use the **maximum-lus** TN3270 server configuration command. To restore the default value, use the **no** form of this command.

maximum-lus *number*

no maximum-lus

Syntax Description

number	Maximum number of LU control blocks allowed. The allowed range is 0 to 32000. However, the practical upper limit for concurrently operating TN3270 sessions depends on the hardware and usage characteristics. The default is 2100.

Defaults

Because of the license structure, the default is 2100, which represents the limit of the lower-priced license (2000) plus a five percent buffer. If you configure a value greater than the default, a license reminder is displayed.

Command Modes

TN3270 server configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

The **maximum-lus** command is valid only on the virtual channel interface. Although the value may be varied at any time, reducing it below the current number of LU control blocks will not release those blocks until a PU is inactivated by DACTPU or by using the **no pu** command.

If the number of LUs in use reaches 94 percent of the current setting of maximum-lus, a warning message is displayed on the console. To prevent redundant messages, the threshold for generating such messages is raised for a period.

The TN3270 server attempts to allocate one LU control block for each LU activated by the hosts. In the case of dynamic definition of dependent LU (DDDLU) the control block is allocated when the client requests the LU, in anticipation of an ACTLU from the SSCP host.

By limiting the number of LU control blocks allocated, you can make sure enough memory is available to support other CMCC functions. The control blocks themselves take about 1K bytes per LU. During session activity, a further 2K per LU may be needed for data. On a CIP, 32 MB of memory will support 4000 LUs. To support more than 4000 LUs, we recommend 64 MB of memory. On an XCPA, 8 MB of memory supports 1000 LUs.

Examples

The following example allows 5000 LU control blocks to be allocated:

```
maximum-lus 5000
```

Related Commands

Command	Description
client ip	Adds an IP subnet to a client subnet response-time group.
pu (TN3270)	Creates a PU entity that has its own direct link to a host and enters PU configuration mode.
pu (DLUR)	Creates a PU entity that has no direct link to a host and enters DLUR PU configuration mode.

pool

To define pool names for the TN3270 server and specify the number of screens and printers in each logical cluster, use the **pool** TN3270 server configuration command. To remove a client IP pool, use the **no** form of this command.

pool *poolname* [**cluster layout** *layout-spec-string*]

no pool *poolname*

Syntax Description

poolname	Unique pool name which cannot exceed 8 characters. Valid characters are (alphabetic characters are not case sensitive): • 1st character—Alphabetic (A-Z) and national characters '@', '#', and '$' • 2nd-8th characters—Alphabetic (A-Z), numeric (0-9), and national characters '@', '#', and '$'
cluster layout *layout-spec-string*	(Optional) Name for the cluster and to indicate a cluster of LUs such as printers. The sum of the numbers must be less than or equal to 255. No spaces are used between the entries in the *layout-spec-string*. The default value is 1a.

Defaults

The default value for the *layout-spec-string* argument is "1a."

Command Modes

TN3270 server configuration

Command History

Release	Modification
11.2(18)BC	This command was introduced.
12.0(5)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines

The **pool** and **allocate lu** commands enable the TN3270 server to know the relationships between screen and printer LUs. These commands are an alternative to the LU nailing feature that allows clients to be nailed to LUs.

The **pool** command is configured in the TN3270 scope. The **pool** command provides the pool names and the definitions of the number of screens and printers in one logical cluster. Each pool statement must have a unique pool name.

The TN3270 server validates pool names when configuring a pool name and when processing the name received on a CONNECT request from the client. The TN3270 server rejects an invalid name and truncates the name received in the CONNECT request from the client to 8 characters or at an invalid character (whichever comes first) when processing the CONNECT request.

When using a **pool** command to create a cluster, a combination of the following values is used in the *layout-spec-string*:

- s (screen)
- p (printer)
- a (any, or wildcard) [Refers to a printer or a screen]

Use the following format to define the *layout-spec-string*, where *decimal_num* is a decimal number between 1 and 255:

pool *poolname* **cluster layout** {*decimal_num***s**}{*decimal_num***p**}{*decimal_num***a**}

The total sum of the numbers must be less than or equal to 255. No spaces are used between the entries in the *layout-spec-string*. The default is 1a, which defines 1 screen or 1 printer. A screen, printer, or a wildcard definition cannot be followed by a definition of the same type. A screen definition can only be followed by a printer or wildcard. Similarly, a printer definition can be followed only by a wildcard or a screen definition.

The following are examples of invalid *layout-spec-string* values, and the corresponding corrected specification:

- A *layout-spec-string* of 3s6s is invalid. The correct specification is 9s.
- A *layout-spec-string* of 3s6p7a8a is invalid. The correct specification is 3s6p15a.
- A *layout-spec-string* of 255s10p is invalid. Although the decimal number for any portion of the *layout-spec-string* can be between 1 and 255, the total number across all parameters cannot exceed 255. To correct this example, you can reduce the screens to 245 as 245s10p.

The combination of a screen, printer, and wildcard constitute a group. The *layout-spec-string* can support a maximum of 4 groups.

Consider the following example:

```
pool CISCO cluster layout 2s3p4a5s6a7s8p9s
```

There are 4 groups in this definition: 2s3p4a, 5s6a, 7s8p and 9s.

Pools must be defined before any pool references under the listen points are defined. Also, pools must be defined before they are referenced by other statements in the configuration. Failure to define the pool before it is referenced will cause the referencing configuration to be rejected.

Pools that are deleted (using the **no** form of the command) will cause all statements referencing the pool to be deleted.

The following criteria apply to the creation of pool names and LOCADDRs:

- Pool and LU names must be unique; they cannot be identical.
- LOCADDR ranges for pools must not overlap.
- LOCADDR ranges for LU pools must not overlap with the existing client nailing configuration.
- Pool configurations made while LUs are in use do not affect the current LU configuration.

The following example uses the **pool** command to create two pools, *pcpool* and *unixpool*:

```
tn3270-server
 pool pcpool cluster layout 4s1p
 pool unixpool cluster layout 49s1p
listen-point 10.20.30.40
 client ip 10.10.10.2 pool pcpool
 pu PU1 91903315 dlur
  allocate lu 1 pool pcpool clusters 50
 pu PU2 91903345 dlur
  allocate lu 1 pool unixpool clusters 5
```

In this example, the *pcpool* contains a cluster of 4 screens and 1 printer per cluster. The total number of devices in a cluster cannot exceed 255, therefore the pcpool contains a total of 50 clusters with each cluster containing 5 LUs. Note that the remaining 5 LUs automatically go to the generic pool.

The *unixpool* contains 49 screens and 1 printer per cluster. The total number of devices in a cluster cannot exceed 255, therefore the unixpool contains a total of 5 clusters with each cluster containing 50 LUs. Again, note that the last 5 LUs automatically go to the generic pool.

Related Commands

Command	Description
tn3270-server	Starts the TN3270 server on a CMCC adapter and enters TN3270 server configuration mode.

preferred-nnserver

To specify a preferred network node (NN) as server, use the **preferred-nnserver** DLUR configuration command. To remove the preference, use the **no** form of this command.

preferred-nnserver *name*

no preferred-nnserver

Syntax Description

name	Fully qualified name of an NN.

Defaults

No default behavior or values.

Command Modes

DLUR configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

The **preferred-nnserver** command is valid only on the virtual channel interface. Fully qualified names consist of two case-insensitive alphanumeric strings, separated by a period. However, for compatibility with existing APPN products, including VTAM, the characters "#" (pound), "@" (at), and "$" (dollar) are allowed in the fully qualified name strings. Each string is from one to 8 characters long; for example, RA12.NODM1PP. The portion of the name before the period is the NET ID and is shared between entities in the same logical network.

When no preferred server is specified, the DLUR will request NN server support from the first suitable node with which it makes contact. If refused, it will try the next one, and so on.

If a preferred server is specified, then DLUR will wait a short time to allow a link to the preferred server to materialize. If the preferred server is not found in that time, any suitable node can be used, as above.

DLUR will not relinquish the current NN server merely because the preferred server becomes available.

Examples

The following example selects SYD.VMX as the preferred NN server:

```
preferred-nnserver SYD.VMX
```

Related Commands

Command	Description
client pool	Nails clients to pools.

profile

To specify a name and a security protocol for a security profile and enter profile configuration mode, use the **profile** security configuration command. To remove this name and protocol specification, use the **no** form of this command.

Create a new profile:

profile *profilename* {**ssl** | **none**}

Modify an existing profile:

profile *profilename*

Delete a profile:

no profile *profilename* {**ssl** | **none**}

Syntax Description

profilename	String of alphanumeric characters which specify a name for a security profile. The character range is from 1 to 24. Profile names cannot be duplicated.
ssl	Specifies that this profile will use the ssl 3.0 security protocol. This implies that the initial exchange between the client and the server is the "Client Hello" message.
none	Specifies that this profile will not use a security protocol. Sessions using this profile will not use any security.

Defaults

No default behavior or values.

Command Modes

Security configuration

Command History

Release	Modification
12.1(5)T	This command was introduced.

Usage Guidelines

This command creates or modifies a security profile. To create a profile, specify the name of the new profile along with the security type. To modify a security profile, specify the name of the profile without the security type. The security type is only required when creating a profile. Using the security type when modifying a profile will result in an error.

Profile names cannot be duplicated.

Entering the **no** form of this command deletes the profile definition and all of its subcommand definitions **(encryptorder**, **servercert**, **keylen**, **certificate reload** commands). Entering the **no** form of this command deletes the **sec-profile** command specifications on all listen points where it is currently defined.

Entering the profile command moves the user into the profile configuration mode. Entering the **no** form of the command moves the user into the security configuration mode.

This command has no retroactive effect.

Examples

The following example specifies LAM as the profile name and ssl as the security protocol. When the **no profile LAM** command is configured, all new client connections will be non-secure.

```
tn3270-server
 security
 profile LAM ssl
  keylen 40
  servercert slot0:lam
  certificate reload
listen-point 10.10.10.1
 sec-profile LAM
 pu DIRECT 012ABCDE tok 0 04
 no profile LAM
```

Related Commands

Command	Description
security (TN3270)	Enables security on the TN3270 server.
sec-profile	Specifies the security profile to be associated with a listen point.
default-profile	Specifies the name of the profile to be applied to the listen points by default.

pu (DLUR)

To create a PU entity that has no direct link to a host or to enter PU configuration mode, use the **pu** DLUR configuration command. To remove the PU entity, use the **no** form of this command.

pu *pu-name idblk-idnum ip-address*

no pu *pu-name*

Syntax Description

pu-name	Name that uniquely identifies this PU.
idblk-idnum	Value of this argument must match the IDBLK-IDNUM value defined at the host. The value must be unique within the subarea; however, the TN3270 server generally cannot tell which remote hosts are in which subareas, so the server only enforces uniqueness within the set of DLUR PUs.
ip-address	IP address that the clients should use as host IP address to map to LU sessions under this PU.

Defaults

No PU is defined.

Command Modes

DLUR configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

If the PU is already created, the **pu** *pu-name* command with no arguments puts you in PU configuration mode. In this mode you can modify an existing PU DLUR entity.

A typical usage for the IP address is to reserve an IP address per host application. For example, clients wanting to connect to TSO specify an IP address that will be defined with PUs that have LOGAPPL=TSO.

Examples

The following example defines define three PUs. Two of the PUs share the same IP address and the third PU has a separate IP address:

```
pu p0  05D99001 192.195.80.40
pu p1  05D99002 192.195.80.40
pu p2  05D99003 192.195.80.41
```

Related Commands

Command	Description
client pool	Nails clients to pools.
pu dlur (listen-point)	Creates a PU entity that has no direct link to a host and enters listen-point PU configuration mode.

pu (listen-point)

To create a PU entity that has a direct link to a host or to enter listen-point PU configuration mode, use the **pu** listen-point configuration command. To remove the PU entity, use the **no** form of this command.

pu *pu-name idblk-idnum type adapter-number lsap* [**rmac** *rmac*] [**rsap** *rsap*] [**lu-seed** *lu-name-stem*]

no pu *pu-name*

Syntax Description

pu-name	Name that uniquely identifies this PU.
idblk-idnum	Value of this argument must match the IDBLK-IDNUM value defined at the host. The value must be unique within the subarea; however, the TN3270 server cannot tell which remote hosts are in which subareas and does not enforce the unique value requirement.
type	Internal adapter type on the CIP card, which corresponds to the value specified in the **lan** internal LAN configuration command. The currently supported type is **token-adapter**.
adapter-number	Internal adapter interface on the CIP card, which is the same value specified in the **adapter** internal LAN configuration command.
lsap	Local SAP number in hexadecimal, ranging from 04 to DE. The value must be even, and must be unique within the internal adapter so that no other 802.2 clients of that adapter, in the router or in a host, are allocated the same SAP. Other direct links from TN3270 server direct PUs may use the same value on the internal adapter as long as the remote MAC or SAP is different.
rmac *rmac*	(Optional) Remote MAC address. The remote MAC address in the form *xxxx.xxxx.xxxx* hexadecimal, specifying the MAC address of the remote host. If not specified, a loopback link to another SAP on the same internal LAN adapter is assumed.
rsap *rsap*	(Optional) Remote SAP address. The remote SAP address is a one- or two-character hexadecimal string, ranging from 04 to FC, that specifies the SAP address of the remote host. The default is 04.
lu-seed *lu-name-stem*	(Optional) LU name that the client uses when a specific LU name request is needed. The format is *x...x*## or *x...x*### where *x...x* is an alphanumeric string. When ## is specified, it is replaced with the LU LOCADDR in hexadecimal digits to form the complete LU name. When ### is specified, decimal digits are used, padded with leading zeroes to make three characters. The first *x* must be alphabetic and the entire string, including the # symbols, must not exceed 8 characters.

Defaults

The default remote SAP address is 04 (hexadecimal).

Command Modes

Listen-point configuration

Command History

Release	Modification
11.2	This command was introduced.
11.2(18)BC	Listen-point PU configuration was added.
12.0(5)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines

The **pu** *pu-name* command is valid only on the virtual channel interface. If the PU is already created, the **pu** *pu-name* command with no arguments puts you in listen-point PU configuration mode, where you can modify an existing PU entity.

The **pu** listen-point command uses values that are defined in two other commands: the **lan** internal LAN configuration command and the **adapter** internal LAN configuration command. The **lan** *type* and **adapter** *adapter-number* values configured on the CIP internal LAN interface are used in the **pu** command.

For a link via a channel on this CMCC adapter, the TN3270 server and the hosts should open different adapters. Using different adapters avoids contention for SAP numbers and is also necessary if you configure duplicate MAC addresses for fallback CSNA or CMPC access to the host.

Examples

The following example configures the TN3270 server to be active and has one PU, CAPPU1, trying to connect. An LU seed using hexadecimal digits is defined.

```
tn3270-server
pu CAPPU1 05D18101 token-adapter 3 04 rmac 4000.0501.0001 lu-seed CAP01L##
```

The following example shows different adapter numbers configured on the same internal LAN to avoid SAP contention. The host uses SAP 4 on Token Ring adapter 0.

```
lan tokenring 0
 adapter 0 4000.0000.0001
 adapter 1 4000.0000.0002
tn3270-server
 listen-point 10.20.30.40
  pu PU1 05d00001 token-adapter 1 8 rmac 4000.0000.0001 rsap 4
```

Related Commands

Command	Description
adapter	Configures internal adapters.
lan	Configures an internal LAN on a CMCC adapter interface and enters internal LAN configuration mode.
listen-point	Defines an IP address for the TN3270 server.
show extended channel tn3270-server	Displays current server configuration parameters and the status of the PUs defined for the TN3270 server.

pu (TN3270)

To create a PU entity that has its own direct link to a host and enter PU configuration mode, use the **pu** TN3270 server configuration command. To remove the PU entity, use the **no** form of this command.

pu *pu-name idblk-idnum ip-address type adapter-number lsap* [**rmac** *rmac*] [**rsap** *rsap*] [**lu-seed** *lu-name-stem*]

no pu *pu-name*

Syntax Description

pu-name	Name that uniquely identifies this PU.
idblk-idnum	The value for this argument must match the IDBLK-IDNUM value defined at the host. The value must be unique within the subarea; however, the TN3270 Server cannot tell which remote hosts are in which subareas and does not enforce the unique value requirement.
ip-address	IP address that the clients should use as host IP address to map to LU sessions under this PU.
type	Internal adapter type on the CIP card, which corresponds to the value specified in the **lan** internal LAN configuration command. The currently supported type is **token-adapter.**
adapter-number	Internal adapter interface on the CIP card, which is the same value specified in the **adapter** internal LAN configuration command.
lsap	Local SAP number in hexadecimal, ranging from 04 to FC. The value must be even, and must be unique within the internal adapter so that no other 802.2 clients of that adapter, in the router or in a host, should be allocated the same SAP. Other direct links from TN3270 server direct PUs may use the same value on the internal adapter as long as the remote MAC or SAP is different.
rmac *rmac*	(Optional) Remote MAC address. The remote MAC address of the form *xxxx.xxxx.xxxx* hexadecimal, specifying the MAC address of the remote host. If not specified, a loopback link to another SAP on the same internal LAN adapter is assumed.
rsap *rsap*	(Optional) Remote SAP address. The remote SAP address is a one- or two-character hexadecimal string, ranging from 04 to FC, specifying the SAP address of the remote host. The default is 04.
lu-seed *lu-name-stem*	(Optional) Provides an LU name that the client can use when a specific LU name request is needed. The format can be *x...x##* or *x...x###* where *x...x* is an alphanumeric string. When ## is specified, it is replaced with the LU LOCADDR in hexadecimal digits to form the complete LU name. When ### is specified, decimal digits are used, padded with leading zeroes to make three characters. The first *x* must be alphabetic and the entire string, including the # symbols, must not exceed 8 characters.

Defaults

No PU is defined.

The default remote SAP address is 04 (hexadecimal).

Command Modes

TN3270 server configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

The **pu** *pu-name* command is valid only on the virtual channel interface. If the PU is already created, the **pu** *pu-name* command with no arguments puts you in PU configuration mode, where you can modify an existing PU entity.

The **pu** (TN3270) command uses values that are defined in two other commands: the **lan** internal LAN configuration command and the **adapter** internal LAN configuration command. The **lan** *type* and **adapter** *adapter-number* values configured on the CIP internal LAN interface are used in the **pu** command.

For a link via a channel on this CMCC adapter, the TN3270 server and the hosts should open different adapters. Using different adapters avoids any contention for SAP numbers, and is also necessary if you configure duplicate MAC addresses for fallback CSNA or CMPC access to the host.

Examples

The following example configures the TN3270 server to be active, and has one PU, CAPPU1, trying to connect in. An LU seed using hexadecimal digits is defined.

```
tn3270-server
pu CAPPU1 05D18101 10.14.20.34 token-adapter 3 rmac 4000.0501.0001 lu-seed CAP01L##
```

The following example shows different adapter numbers configured on the same internal LAN to avoid SAP contention. The host uses SAP 4 on token ring adapter 0.

```
lan tokenring 0
 adapter 0 4000.0000.0001
 adapter 1 4000.0000.0002
tn3270-server
 pu PU1 05d00001 10.0.0.1 token-adapter 1 8 rmac 4000.0000.0001 rsap 4
```

Related Commands

Command	Description
adapter	Configures internal adapters.
keylen	Specifies the maximum bit length for the encryption keys for SSL Encryption Support.
tn3270-server	Starts the TN3270 server on a CMCC adapter and enters TN3270 server configuration mode.

pu dlur (listen-point)

To create a PU entity that has no direct link to a host or to enter listen-point PU configuration mode, use the **pu dlur** listen-point configuration command. To remove the PU entity, use the **no** form of this command.

pu *pu-name idblk-idnum* **dlur** [**lu-seed** *lu-name-stem*]

no pu *pu-name idblk-idnum* **dlur** [**lu-seed** *lu-name-stem*]

Syntax Description

pu-name	Name that uniquely identifies this PU.
idblk-idnum	Value for this argument must match the IDBLK-IDNUM value defined at the host. The value must be unique within the subarea; however, the TN3270 server generally cannot tell which remote hosts are in which subareas, so the server only enforces uniqueness within the set of DLUR PUs.
lu-seed *lu-name-stem*	(Optional) LU name that the client uses when a specific LU name request is needed. The format is *x...x*## or *x...x*### where *x...x* is an alphanumeric string. When ## is specified, it is replaced with the LU LOCADDR in hexadecimal digits to form the complete LU name. When ### is specified, decimal digits are used, padded with leading zeroes to make three characters. The first *x* must be alphabetic (A through Z), or one of the following symbols: $, #, @. The entire string, including the # symbols, must not exceed 8 characters. The # symbols are allowed in the middle of the lu-seed string. For example, NC##RAL or USA###NC are valid strings. The # symbols cannot be the first characters in the string. For example, ##CISCO is not valid because the first character of the LU name cannot be a number. But ####DOT is valid because the # symbols in the second, third and fourth place are used for LU names. There must be at least two to three consecutive # symbols in the string. For example, SH# or CD#D is not valid. A string without # symbols is not valid. For example, CISCONC is not valid. You must not split the # symbols. For example, SH#NC# and SH#D#NC# are not valid. **Note** The # sign can signify a value or be used as a symbol.

Defaults

No PU is defined.

Command Modes

Listen-point configuration

Command History

Release	Modification
11.2	This command was introduced.
11.2(18)BC	Listen-point PU configuration was added.
12.0(5)T	This command was integrated in Cisco IOS Release 12.0 T.
12.1(5)T	This command was modified to add the **lu-seed** option and *lu-name-stem* argument. The lu-seed naming format was modified.

Usage Guidelines

If the PU is already created, the **pu dlur** command without any arguments starts listen-point PU configuration mode. In this mode you can modify an existing listen-point DLUR PU entity.

You should define the DLUR before you configure the listen-point DLUR PU.

A typical usage for the IP address is to reserve an IP address for each application. For example, clients wanting to connect to TSO specify an IP address that is defined with PUs that have LOGAPPL=TSO.

If the **lu-seed** option is not configured, the PU name is used as the implicit lu-seed to generate the LU name. If the **lu-seed** option is configured, then there is an explicit LU name.

If the explicit LU names conflict, the TN3270 server will reject the PU configuration. If the implicit LU names (i.e., the PU names) conflict, the TN3270 server will accept the PU definitions, but the LU names will consist of a modified, truncated version of the PU name and the LOCADDR.

Table 36 LU Seed Name Examples

Valid LU Seed Syntax	Invalid LU Seed Syntax
NC##RAL	NC#RAL
USA##NC	#GEORGE
#####	

Examples

The following example defines three PUs in the listen point with an IP address of 172.18.4.18:

```
tn3270-server
listen-point 172.18.4.18
 pu p0  05D99001 dlur
 pu p1  05D99002 dlur
 pu p2  05D99003 dlur
```

The following is an example of the TN3270 server configured with LU pooling. A listen-point PU is configured to define DLUR PUs using the dynamic LU naming. Note that the **lu deletion** command must be configured with the **named** option. The PU pu1 is defined with lu-seed abc##pqr. Using hexadecimal numbers for ##, the LU names for this PU are ABC01PQR, ABC02PQR, ABC0APQR.... up to ABCFFPQR. Similarly, the PU pu2 is defined with lu-seed pqr###. Using decimal numbers for ###, the LU names for this PU are PQR001, PQR002... up to PQR255.

The LUs ABC01PQR through ABC32PQR and PQR100 through PQR199 are allocated to the pool SIMPLE. The LUs ABC64PQR through ABC96PQR and PQR010 through PQR035 are allocated to the pool PCPOOL. The remaining LUs are in the generic pool.

```
tn3270-server
 pool simple cluster layout 1s
 pool pcpool cluster layout 4s1p
 lu deletion named
 dlur neta.shek neta.mvsd
  lsap tok 15 04
    link she1 rmac 4000.b0ca.0016
 listen-point 172.18.4.18
 pu pu1 91903315 tok 16 08 lu-seed abc##pqr
   allocate lu 1 pool simple clusters 50
   allocate lu 100 pool pcpool clusters 10
 pu pu2 91913315 dlur lu-seed pqr###
   allocate lu 10 pool pcpool clusters 5
   allocate lu 100 pool simple clusters 100
```

Related Commands

Command	Description
dlur	Enables the SNA session switch function on the CMCC adapter and enters DLUR configuration mode.
listen-point	Defines an IP address for the TN3270 server.

response-time group

To configure a client subnet group for response-time measurements, use the **response-time group** TN3270 server configuration command. To remove a client subnet group from response-time measurements, use the **no** form of this command.

response-time group *name* [**bucket boundaries** *t1 t2 t3 t4...*] [**multiplier** *m*]

no response-time group *name*

Syntax Description

name	Alphanumeric string for the response-time group name. The maximum length of the name is 24 characters. Lower or uppercase letters can be used.
bucket boundaries *t1 t2 t3 t4*	(Optional) Unsigned 32-bit quantity that defines a bucket boundary in tenths of seconds. For other types of client groups, the bucket boundaries and multiplier values are fixed to the following defaults: • Bucket boundaries—10, 20, 50, 100 • Multiplier—30
multiplier *m*	(Optional) Number in the range of 1 to 5760, which when multiplied by the sample interval of 20 seconds, determines the collection interval.

Defaults

Bucket boundaries and the multiplier value are fixed to the following defaults:

- Bucket boundaries—10, 20, 50, 100
- Multiplier—30

Command Modes

TN3270 server configuration

Command History

Release	Modification
11.2(18)BC	This command was introduced.
12.0(5)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines

Multiple response-time groups can be configured within the scope of available memory. When using this command, up to 1024 IP subnets can be defined per response-time group with the **client ip** command. All TN3270 clients belonging to subnets configured within a specific response-time group are added to the response-time group when they connect as clients.

If the IP address and mask combination already exists within any response-time group, the following error message is displayed:

```
Subnet 10.1.1.0 255.255.255.248 already exists in client group MYSUBNET
```

In the following example, the response-time group MYSUBNET is configured:

```
tn3270-server
response-time group MYSUBNET bucket boundaries 15 25 60 120 multiplier 35
 client ip 10.1.1.0 255.255.255.248
 client ip 10.1.2.0 255.255.255.248
```

Related Commands

Command	Description
client ip	Adds an IP subnet to a client subnet response-time group.
show extended channel tn3270-server response-time application	Displays information about application response-time client groups.
show extended channel tn3270-server response-time global	Displays information about the global response-time client group.
show extended channel tn3270-server response-time link	Displays information about host link response-time client groups.
show extended channel tn3270-server response-time listen-point	Displays information about listen point response-time client groups.
show extended channel tn3270-server response-time subnet	Displays information about Subnet response-time client groups.

sec-profile

To specify a security profile to be associated with a listen point, use the **sec-profile** listen-point configuration command. To remove this specification, use the **no** form of this command.

sec-profile *profilename*

no sec-profile *profilename*

Syntax Description

profilename	Name originally specified in the **profile** command. It consists of a string of alphanumeric characters that specify the security profile name to be associated with a listen point. The valid character range is from 1 to 24.

Defaults

No default behavior or values.

Command Modes

TN3270 listen-point configuration

Command History

Release	Modification
12.1(5)T	This command was introduced.

Usage Guidelines

If this command is not entered or if the **no** form of the command is entered, the security profile reverts to the profile configured in the **default-profile** command. If no default profile is specified, the listen point accepts only nonsecure connections

This command has no retroactive effect.

Examples

The following example specifies LAM as the security profile name for all new clients connecting to listen point 10.10.10.1 until the **sec-profile LAM1** command is configured. Once the **sec-profile LAM1** command is configured, all new client connections to 10.10.10.1 will use LAM1 as the profile name.

```
tn3270-server
 security
 profile LAM ssl
  keylen 128
  servercert slot0:lam
  certificate reload
 profile LAM1 ssl
  keylen 40
  servercert slot0:lam1
  certificate reload
 listen-point 10.10.10.1
 sec-profile LAM
 pu DIRECT 012ABCDE tok 0 04
Sec-profile LAM1
```

Related Commands

Command	Description
profile	Specifies a name and a security protocol for a security profile and enters profile configuration mode.
default-profile	Specifies the name of the profile to be applied to the listen points by default.

security (TN3270)

To enable security on the TN3270 server, use the **security** command. To turn off security on the TN3270 server, use the **no** form of this command.

security

no security

Syntax Description

This command has no arguments or keywords.

Defaults

The default is to have security enabled.

Command Modes

TN3270 server configuration

Command History

Release	Modification
12.1(5)T	This command was introduced.

Usage Guidelines

If the **no** form of this command is configured, any listen points that contain a security profile definition are reconfigured and are no longer secure. Sessions already established on the listen point will continue to run in the same mode (secure or non-secure) as originally configured. If sessions are active on a listen point, a message will be sent to the console stating that the listen point has sessions running with an outdated security specification. A shutdown/restart sequence must be performed on the listen point if the user wants the sessions on the listen point to use the new specification.

Entering the **security** command moves the user into the security configuration mode. Entering the **no** form of this command moves the user to a TN3270 server configuration mode.

This command has no retroactive effect.

Examples

In the following example, security is enabled on the TN3270 server:

```
tn3270-server
 security
```

servercert

To specify the location of the TN3270 server's security certificate in the router's Flash memory, use the **servercert** profile configuration command.

servercert *location*

Syntax Description

location	Hexadecimal string of up to 63 characters specifying the location of the server's certificate in the Flash memory.

Defaults

No default behavior or values.

Command Modes

Profile configuration

Command History

Release	Modification
12.1(5)T	This command was introduced.

Usage Guidelines

The certificate is in X.509 format, signed by a Certificate Authority (CA). The certificate must be created offline. It cannot be created using using the Cisco IOS software. Use third-party software or a Windows-based utility. The certificate should be in PEM or Base 64 format. The output from the certificate generation contains two parts: the certificate and the private key. Concatenate these two files to create a single certificate file in PEM or Base 64 format.

Store the concatenated file in Flash memory using TFIP and the location entered using the **servercert** *location* command. If the file does not exist in the Flash memory when the command is entered, an error message is displayed indicating that the file does not exist. The first time this command is configured the certificate is automatically loaded from the specified location. Subsequent changes to the location file do not cause the certificate to be read automatically into system's memory. The **certificate reload** command must be entered to read the certificate into memory. If the user exits from the profile configuration mode without configuring the **servercert** command, a warning message is displayed. The warning message indicates that it is mandatory to configure a certificate using the **servercert** command.

The following example specifies that slot0:lam is the location of the security certificate:

```
tn3270-server
 security
 profile LAM ssl
  keylen 512
  servercert slot0:lam
  certificate reload
```

Related Commands

Command	Description
profile	Specifies a name and a security protocol for a security profile and enters profile configuration mode.

show extended channel tn3270-server

To display current server configuration parameters and the status of the PUs defined for the TN3270 server, use the **show extended channel tn3270-server** EXEC command.

show extended channel *slot*/*port* **tn3270-server**

Syntax Description

slot	Specifies a particular CMCC adapter in the router where *slot* is the slot number.
port	Port value for a TN3270 server will always be 2.

Defaults

No default behavior or values.

Command Modes

EXEC

Command History

Release	Modification
11.2	This command was introduced.
12.0(5)T	The following fields were added to the output display: • lu-termination • lu-deletion
12.2	The **Named** value was added for the lu-deletion field in the output display.

Examples

The following is sample output from the **show extended channel tn3270-server** command:

```
Router# show extended channel 3/2 tn3270-server

<current stats> < connection stats >  <response time(ms)>
server-ip:tcp        lu in-use   connect disconn fail   host     tcp
172.28.1.106:23     510     1       12       11     0     54     40
172.28.1.107:23     511     0        0        0     0      0      0
172.28.1.108:23     255     0        0        0     0      0      0
total              1276     1
configured max_lu 20000  unbind-action disconnect
idle-time 0  keepalive 1800 (send nop)
tcp-port 23  generic-pool permit no timing-mark
lu-termination unbind lu-deletion never
dlur MPX.GOANCP                              status SHUT
dlus MPX.NGMVMPC
name(index)    ip:tcp              xid   state     link   destination   r-lsap
EXT2(1)      172.28.1.106:23     05D18092 ACTIVE    tok 0  4000.7470.00e7 08 04
PUS10(2)     172.28.1.107:23     05D19010 ACTIVE    tok 0  4000.7470.00e7 08 2C
PUS11(3)     172.28.1.107:23     05D19011 ACTIVE    tok 0  4000.7470.00e7 08 28
PUS12(4)     172.28.1.108:23     05D19012 ACTIVE    tok 0  4000.7470.00e7 08 24
PUS9(5)      172.28.1.109:23     05D18509 SHUT      tok 0  4001.3745.1088 04 40
SDTF(7)      172.28.1.107:23     12345678 ACTIVE    tok 0  0800.5a4b.1cbc 04 08
TEST(8)      172.28.1.106:23     05D18091 ACTIVE    tok 0  4000.7470.00e7 08 30
INT1(6)      172.28.1.106:23     05D18091 SHUT      dlur
```

Table 37 describes significant fields in the display. Those fields not described correspond to configured values.

Table 37 show extended channel tn3270-server Field Descriptions

Field	Description
server pickup	IP address and TCP port number, listen point, configured on one or more PUs.
lu *number*	Total number of LUs available for this listen point.
in-use *number*	Number of LUs currently in use.
connect *number*	Total number of connect ins since the TN3270 feature was started.
disconn *number*	Total number of disconnects since the TN3270 feature was started.
fail *number*	Total number of failed connects since the TN3270 feature was started.
response time, host *number*	The average response time from the host across all sessions through this server IP address. This is measured from sending CD to the host to receiving the reply.
response time, tcp *number*	Average response time from the clients on this server IP address. This is measured only when TIMING MARKs are sent. If **no timing-mark** is configured, they are only sent on special occasions, such as Bind.
idle-time *number*	Configured idle-time for this PU.
keepalive *number* (*action*)	Configured keepalive time for this PU. *action* is one of the following: • **send nop**—The Telnet command for no operation is sent to the TN3270 client to verify the physical connection. • **send timing mark** *number*—Number of seconds within which the TN3270 server expects a response to the DO TIMING-MARK from the TN3270 client.
unbind-action *type*	Configured unbind action for LUs on this PU.
tcp-port *number*	Configured TCP port number.
generic-pool *type*	Configured generic-pool for LUs on this PU.
lu-termination	Displays the value configured for the **lu termination** siftdown command for the PUs supported by the TN3270 server. The **lu termination** command specifies whether a TERMSELF or UNBIND RU is sent by the TN3270 server when a client turns off the device or disconnects. The possible values are: • Termself—Termination of all sessions and session requests associated with an LU is ordered upon disconnect. • Unbind—Termination of the session by the application is requested upon LU disconnect.

Table 37 show extended channel tn3270-server Field Descriptions (continued)

Field	Description
lu-deletion	Displays the value configured for the **lu deletion** siftdown command for the PUs supported by the TN3270 server. The **lu deletion** command specifies whether the TN3270 server sends a REPLY-PSID poweroff request to VTAM to delete the corresponding LU when a client disconnects. The possible values are: • Always—Dynamic LUs for this PU are always deleted upon disconnect. • Named—Only named LUs for this PU are deleted upon disconnect. • Normal—Only screen LUs for this PU are deleted upon disconnect. • Non-generic—Only specified LUs for this PU are deleted upon disconnect. • Never—None of the LUs for this PU are ever deleted upon disconnect.
dlur *fq-cpname*	Configured fully qualified DLUR CP name(fq-cpname).
status *status-value state-value*	Shows the status of the DLUR-DLUS pipe followed by the state of the pipe. Possible values for the status are: • RESET—The pipe is reset. • PND-ACTV—The pipe is pending active. • ACTIVE—The pipe is active. • PND-INAC—The pipe is pending inactive. • OTHER—Status is an undefined value. • WAIT—Waiting for status from the CMCC adapter. • SHUT—The TN3270 server is shut down. • NOTKNOWN—Status cannot be obtained.
dlus *fq-dlusname*	Currently active DLUS.
name *pu-name*	This is the name of the PU as configured.
ip:tcp *ip-addr:tcpport*	IP address and TCP port number configured for the PU.
xid *number*	Configured XID—idblk and idnum.

Table 37 show extended channel tn3270-server Field Descriptions (continued)

Field	Description
STATE *value*	Possible STATE values and their meanings are: • SHUT—The PU is configured but in shut state. • RESET—The link station of this PU is not active. • TEST—PU is sending a TEST to establish link. • XID—TEST is responded, XID is sent. • P-ACTPU—The link station is up but no ACTPU is received. • ACTIVE—ACTPU is received and acknowledged positively. • ACT/BUSY—Awaiting host to acknowledge the SSCP-PU data. • WAIT—Waiting for PU status from CMCC adapter. • OTHER—PU in undefined state. • P-RQACTPU-R—DLUR PU is pending request ACTPU response. • P-ACTIVE—ACTPU received by DLUR but not yet passed to PU. • P-DACTPU—PU is pending DACTPU. • UNKNOWN—State cannot be obtained.
LINK *type*	LINK type is either internal adapter type and internal adapter number or dlur if it is a SNA Session Switch PU.
DESTINATION *mac-address or PU-name*	If a direct PU, then it is the destination MAC address, otherwise, it is the name of the partner PU.
R-LSAP *number number*	Remote and local SAP values.

show extended channel tn3270-server client-ip-address

To display information about all clients at a specific IP address, use the **show extended channel tn3270-server client-ip-address** EXEC command.

show extended channel *slot*/*port* **tn3270-server client-ip-address** *ip-address* [**disconnected** | **in-session** | **pending**]

Syntax Description

slot	Slot number.
port	Port number.
ip-address	IP address of the client.
disconnected	(Optional) Displays all clients with *ip-address* in disconnected state. Disconnected state refers to an LU session state of ACTIVE or INACTIVE. In this case, the *ip-address* refers to the client that last used the LU.
in-session	(Optional) Displays all clients with *ip-address* in active session state. Active session state refers to an LU session state of ACT/SESS.
pending	(Optional) Displays all clients with *ip-address* in pending state. Pending session state refers to an LU session state of P-SDT, P-ACTLU, P-NTF/AV, P-NTF/UA, P-RESET, P-PSID, P-BIND, P-UNBIND, WT-UNBND, WT-SDT or UNKNOWN.

Command Modes

EXEC

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

The **show extended channel tn3270-server client-ip-address** command is valid only on the virtual channel interface. Note that this command does not show information about LUs that have never been connected.

Examples

The following is sample output from the **show extended channel tn3270-server client-ip-address** command. The example shows only active sessions because no other session types exist at this client IP address.

```
Router# show extended channel 3/2 tn3270-server client-ip 192.195.80.40
lu    name   client-ip:tcp        nail state    model   frames in out   idle for
1   PUS11001 192.195.80.40:3169    Y   ACT/SESS 327804   5       5       0:5:47

pu is PUS11, lu is DYNAMIC type 2, negotiated TN3270
bytes 155 in, 1758 out; RuSize 1024 in, 3840 out; NegRsp 0 in, 0 out
pacing window 0 in, 1 out; credits 0 in, queue-size 0 in, 0 out
```

The following is sample output using the **disconnected** keyword:

```
Router# show extended channel 2/2 tn3270 client-ip 10.14.1.21 disconnected
Total 2 clients found using 10.14.1.21
```

The following is sample output using the **in-session** keyword:

```
Router# show extended channel 2/2 tn3270 client-ip 10.14.1.21 in-session
Note: if state is ACT/NA then the client is disconnected

lu    name   client-ip:tcp       nail state    model   frames in out   idle for
3    PU1L03 10.14.1.21:35215      N   ACT/SESS 327804    317     316     0:0:1

pu is PU1, lu is DYNAMIC type 2, negotiated TN3270
bytes 12167 in, 225476 out; RuSize 2048 in, 1536 out; NegRsp 0 in, 0 out
pacing window 0 in, 1 out; credits 0 in, queue-size 0 in, 0 out
Note: if state is ACT/NA then the client is disconnected

lu    name   client-ip:tcp       nail state    model   frames in out   idle for
4    PU1L04 10.14.1.21:35216      N   ACT/SESS 327804   317     316     0:0:1

pu is PU1, lu is DYNAMIC type 2, negotiated TN3270
bytes 12167 in, 225476 out; RuSize 2048 in, 1536 out; NegRsp 0 in, 0 out
pacing window 0 in, 1 out; credits 0 in, queue-size 0 in, 0 out
Note: if state is ACT/NA then the client is disconnected
Total 2 clients found using 10.14.1.21
```

The following is sample output using the **pending** keyword:

```
Router# show extended channel 2/2 tn3270 client-ip 10.14.1.21 pending
Total 2 clients found using 10.14.1.21
```

Table 38 describes significant fields in the display.

Table 38 show extended channel tn3270-server client-ip-address Field Descriptions

Field	Description
lu *locaddr*	LOCADDR of the LU.
name *lu-name*	If the PU is directly connected, then the name shown is the one generated by the seed. If DLUR, then only the unqualified portion is shown. The NET ID portion will be the same as the current DLUS.
client-ip:tcp *ip-address:port*	Client's IP address and TCP port number.
nail	Status of LU nailing, either Y or N.
state *lu-state*	LU state and their meanings are: • UNKNOWN—LU in an undefined state • INACTIVE—LU did not receive ACTLU • ACT/NA—LU received ACTLU and acknowledged positively • P-SDT—LU is bound but there is no SDT yet • ACT/SESS—LU is bound and in session • P-ACTLU—Telnet connects in and is waiting for ACTLU • P-NTF/AV—Awaiting host notify-available response • P-NTF/UA—Awaiting host notify-unavailable response • P-RESET—Awaiting a buffer to send DACTLU response • P-PSID—Awaiting NMVT Reply PSID response • P-BIND—Waiting for host to send bind

Table 38 show extended channel tn3270-server client-ip-address Field Descriptions (continued)

Field	Description
state *lu-state* (continued)	• P-UNBIND—Awaiting host unbind response • WT-UNBND—Waiting for client to acknowledge disconnection • WT-SDT—Waiting for client to acknowledge SDT
model model	IBM 3278 model type of client; blank if STATIC LU.
frames in *number*	Number of frames sent inbound to the host.
frames out *number*	Number of frames sent outbound from the host.
idle for *time*	Time the client has been idle. The time is in HH:MM:SS.
pu is *pu-name*	Name of the PU.
lu is *type*	Whether LU is DYNAMIC or STATIC.
negotiated *type*	Whether client is TN3270 or TN3270E.
bytes in / out *number/number*	Total number of bytes sent to/received from the host.
RuSize in / out *number/number*	RU size as configured in the bind.
NegRsp in / out *number/number*	Number of SNA negative responses sent to/received from the host.
pacing window in / out *number/number*	SNA pacing window as configured in the bind.
credits in *number*	Number of frames that can be sent inbound without requiring an isolated pacing response.
queue size in *number*	Indicates the number of SNA frames waiting to be sent to the host that are blocked and are waiting for a pacing response.
queue-size out *number*	SNA frames not yet acknowledged by an isolated pacing response by the TN3270 server.

Related Commands

Command	Description
client ip lu	Defines a specific LU or range of LUs to a client at the IP address or subnet.

show extended channel tn3270-server client-name

To display information about all connected clients with a specific machine name, use the **show extended channel tn3270-server client-name** EXEC command.

show extended channel *slot*/*virtual channel* **tn3270-server client-name** *name*

Syntax Description

slot	Specifies a particular CMCC adapter in the router where *slot* is the slot number.
virtual channel	Virtual channel number.
name	Specifies the client machine name. This name is specified originally in the **client pool** command.

Defaults

No default behavior or values.

Command Modes

EXEC

Command History

Release	Modification
12.1(5)T	This command was introduced.

Usage Guidelines

There is not a **no** form for this command.

Examples

The following is sample output from the **show extended channel tn3270-server client-name** command:

```
Router# show extended channel 4/2 tn3270-server client-name dhcp-rtp-34-40.cisco.com
Note: if state is ACT/NA then the client is disconnected

lu    name   client-name           nail state    model    frames in out   idle for
6            dhcp-rtp-34-40.cisco. N    P-ACTLU  3278S2E  1         0     0:1:59

pu is T240CA, lu is DYNAMIC unbound, negotiated TN3270E
bytes 101 in, 0 out; RuSize 256 in, 256 out; NegRsp 0 in, 0 out
pacing window 0 in, 0 out; credits 0 in, queue-size 0 in, 0 out
response time buckets 0 0 0 0 0
average total response time 0 average IP response time 0
number of transactions 0
Note: if state is ACT/NA then the client is disconnected
lu    name   client-name         nail   state    model frames in out   idle for
7   T240DA07 dhcp-rtp-34-40.cisco. N   P-BIND   3278S2E  4       3       0:1:32
pu is T240CA, lu is DYNAMIC unbound, negotiated TN3270E
bytes 199 in, 407 out; RuSize 256 in, 256 out; NegRsp 0 in, 0 out
pacing window 0 in, 0 out; credits 0 in, queue-size 0 in, 0 out
response time buckets 0 0 0 0 0
average total response time 0 average IP response time 0
number of transactions 0
Total 2 clients found using dhcp-rtp-34-40.cisco.com
```

Table 38 describes significant fields in the display.

Table 39 show extended channel tn3270-server client-name Field Descriptions

Field	Description
lu *locaddr*	LOCADDR of the LU.
name *lu-name*	If the PU is directly connected, then the name shown is the one generated by the seed. If DLUR, then only the unqualified portion is shown. The NET ID portion will be the same as the current DLUS.
client-name *name*	Client's machine name.
nail	Status of LU nailing, either Y or N.
state *lu-state*	LU state values and their meanings: • UNKNOWN—LU in an undefined state • INACTIVE—LU did not receive ACTLU • ACT/NA—LU received ACTLU and acknowledged positively • P-SDT—LU is bound but there is no SDT yet • ACT/SESS—LU is bound and in session • P-ACTLU—Telnet has connected and is waiting for ACTLU • P-NTF/AV—Awaiting host notify-available response • P-NTF/UA—Awaiting host notify-unavailable response • P-RESET—Awaiting a buffer to send DACTLU response • P-PSID—Awaiting NMVT Reply PSID response • P-BIND—Waiting for host to send bind • P-UNBIND—Awaiting host unbind response • WT-UNBND—Waiting for client to acknowledge disconnection • WT-SDT—Waiting for client to acknowledge SDT
model *model*	IBM 3278 model type of client; blank if STATIC LU.
frames in *number*	Number of frames sent inbound to the host.
frames out *number*	Number of frames sent outbound from the host.
idle for *time*	Time the client has been idle. The time is in HH:MM:SS.
pu is *pu-name*	Name of the PU.
lu is *type*	Whether LU is DYNAMIC or STATIC.
negotiated *type*	Whether client is TN3270 or TN3270E.
bytes in / out *number/number*	Total number of bytes sent to/received from the host.
RuSize in / out *number/number*	RU size as configured in the bind.
NegRsp in / out *number/number*	Number of SNA negative responses sent to/received from the host.
pacing window in / out *number/number*	SNA pacing window as configured in the bind.

Table 39 show extended channel tn3270-server client-name Field Descriptions (continued)

Field	Description
credits in *number*	Number of frames that can be sent inbound without requiring an isolated pacing response.
queue- size in *number*	Number of SNA frames waiting to be sent to the host that are blocked and are waiting for a pacing response.
queue-size out *number*	SNA frames not yet acknowledged by an isolated pacing response by the TN3270 server.
response time buckets	Number of transactions in each response-time "bucket" for the specified LU. The bucket boundaries are defined using the **response-time group** command.
average total response time	Average response time (in tenths of seconds) for the total number of response-time transactions.
average IP response time	Average IP transit response time (in tenths of seconds) for the total number of response-time transactions.
number of transactions	Total number of response-time transactions across all response-time buckets.

show extended channel tn3270-server dlur

To display information about the SNA session switch, use the **show extended channel tn3270-server dlur** EXEC command.

show extended channel *slot*/*port* **tn3270-server dlur**

Syntax Description

slot	Slot number.
port	Port number.

Command Modes

EXEC

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

The show extended channel tn3270-server dlur command is valid only on the virtual channel interface.

Examples

The following is sample output from the **show extended channel tn3270-server dlur** command:

```
Router# show extended channel 3/2 tn3270-server dlur

dlur MPX.GOANCP
current dlus MPX.NGMVMPC                dlur-dlus status ACTIVE
preferred dlus MPX.NGMVMPC              backup dlus MPX.NGMVMPB
preferred server MPX.NGMVMPA
lsap token-adapter   0 5C     vrn MPX.LAN4           status ACTIVE
link P390                 remote 4000.7470.00e7 08  status ACTIVE
```

Table 40 describes significant fields in the display.

Table 40 show extended channel tn3270-server dlur Field Descriptions

Field	Description
dlur *fq-luname*	Fully qualified CP name used by the SNA session switch and the LU name for the DLUR function configured as the *fq-cpname* on the dlur statement.
current dlus *fq-luname*	Name of the currently active DLUS, either the primary DLUS or the backup DLUS.

Table 40 show extended channel tn3270-server dlur Field Descriptions (continued)

Field	Description
dlur-dlus status *dlur-status*	Possible values for the status of the DLUR-DLUS pipe and their meanings are: • RESET—The pipe is reset. • PND-ACTV—The pipe is pending active. • ACTIVE—The pipe is active. • PND-INAC—The pipe is pending inactive. • OTHER—Status is an undefined value. • WAIT—Waiting for status from the CMCC adapter. • SHUT—The TN3270 server is shut down. • NOTKNOWN—Status cannot be obtained.
preferred dlus *fq-luname*	Name of the DLUS as configured on the DLUR statement.
backup dlus *fq-luname*	Name of the DLUS that is used if the preferred DLUS is unavailable.
preferred server *fq-luname*	Fully qualified name of the preferred network node server.
lsap	Configured value for the local SAP on the configured internal adapter. Token-adapter specifies the type of internal adapter used.
vrn *fq-name*	Name of the connection network as configured by the vrn statement for this LSAP and internal adapter pair.
lsap...status status	Possible *sap-status* values and their meanings are: • ACTIVE—The SAP is open. • INACTIVE—Not connected to the adapter. • PDN-ACTV—SAP activation in progress. • PND-INAC—SAP deactivation in progress. • OTHER—Status is an undefined value. • WAIT—Waiting for status from the CMCC adapter. • SHUT—The TN3270 server is shut down. • NOTKNOWN—Status cannot be obtained.
link *name*	Name of the configured link. If not a configured link, then the name is an invented name, @DLUR*nn*.

Table 40 show extended channel tn3270-server dlur Field Descriptions (continued)

Field	Description
remote *mac sap*	Remote MAC and SAP for this link.
link...status *status*	Possible *link-status* values and their meanings are: • ACTIVE—Link is active. • INACTIVE—Not connected to host. • PND-ACTV—Link activation in progress. • PND-INAC—Link deactivation in progress. • OTHER—Status is an undefined value. • WAIT—Waiting for status from the CMCC adapter. • SHUT—The TN3270 server is shut down. • NOTKNOWN—Status cannot be obtained.

show extended channel tn3270-server dlurlink

To display information about the DLUR components, use the **show extended channel tn3270-server dlurlink** EXEC command.

show extended channel *slot*/*port* **tn3270-server dlurlink** *name*

Syntax Description

slot	Specifies a particular CMCC adapter in the router where slot is the slot number.
port	Port number.
name	Name of the SNA session switch link to be displayed.

Command Modes

EXEC

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

The **show extended channel tn3270-server dlurlink** command is valid only on the virtual channel interface.

Examples

The following is sample output from the **show extended channel tn3270-server dlurlink** command:

```
Router# show extended channel 3/2 tn3270-server dlurlink P390

lsap token-adapter  0 5C  vrn MPX.LAN4              status ACTIVE
link P390                 remote 4000.7470.00e7 08  status ACTIVE
partner MPX.NGMVMPC       tgn 1                     maxdata   1033
```

Table 41 describes significant fields in the display.

Table 41 show extended channel tn3270-server dlurlink Field Descriptions

Field	Description
lsap...vrn...status *status*	Possible *lsap-status* values and their meanings are: • ACTIVE—The SAP is open. • INACTIVE—Not connected to the adapter. • PDN-ACTV—SAP activation in progress. • PND-INAC—SAP deactivation in progress. • OTHER—Status is an undefined value. • WAIT—Waiting for status from the CMCC adapter. • SHUT—The TN3270 server is shut down. • NOTKNOWN—Status cannot be obtained.
link *name*	Name is an invented name, @DLUR*nn*, if not a configured link.
link...status *status*	Possible *link-status* values and their meanings are: • ACTIVE—The SAP is open. • INACTIVE—Not connected to the adapter. • PDN-ACTV—SAP activation in progress. • PND-INAC—SAP deactivation in progress. • OTHER—Status is an undefined value. • WAIT—Waiting for status from the CMCC adapter. • SHUT—The TN3270 server is shut down. • NOTKNOWN—Status cannot be obtained.
partner *name*	CP name of the remote node for this link.
tgn *tg-number*	Transmission group (TG) number for this link. Because the SNA session switch only supports 1 TG per pair of CP names, it is typically 0 or 1.
maxdata *maxdata*	Maximum frame size allowed on this link.

Related Commands

Command	Description
client pool	Nails clients to pools.

show extended channel tn3270-server nailed-domain

To list all nailing statements with a specific nailed-domain name, use the **show extended channel tn3270-server nailed-domain** EXEC command.

show extended channel *slot/virtual channel* **tn3270-server nailed-domain** *name*

Syntax Description

slot	Specifies a particular CMCC adapter in the router where *slot* is the slot number.
virtual channel	Virtual channel number.
name	Specifies the *exact* nailed-domain name, as specified originally in the **client pool** command. Output is displayed for the nailed-domain name *exactly* as specified. That is, specifying “cisco.com” is different from specifying “.ciosco.com.”

Defaults

No default behavior or values.

Command Modes

EXEC

Command History

Release	Modification
12.1(5)T	This command was introduced.

Usage Guidelines

There is not a **no** form for this command.

Examples

The following is sample output from the **show extended channel tn3270-server nailed-domain** command:

```
Router# show extended channel 1/2 tn3270-server nailed-domain .cisco.com
.CISCO.COM  listen-point 172.18.4.18  pool PCPOOL
```

Table 42 describes significant fields in the display.

Table 42 show extended channel tn3270-server nailed-domain Field Descriptions

Field	Description
.CISCO.COM	Nailed domain name.
listen point *ipaddress*	Listen point IP address under which the **client pool** command was configured.
pool *poolname*	Pool name to which the client is nailed.

show extended channel tn3270-server nailed-ip

To display mappings between a nailed client IP address and nailed LUs, use the **show extended channel tn3270-server nailed-ip** EXEC command.

show extended channel *slot*/*port* **tn3270-server nailed-ip** *ip-address*

Syntax Description

slot	Slot number.
port	Port number.
ip-address	Remote client IP address.

Command Modes

EXEC

Command History

Release	Modification
12.0	This command was introduced.

Usage Guidelines

The **show extended channel tn3270-server nailed-ip** command is valid only on the virtual channel interface.

Examples

The following is sample output from the **show extended channel tn3270-server nailed-ip** command:

```
Router# show extended channel 3/2 tn3270-server nailed-ip 172.28.0.0
172.28.1.0  255.255.255.192    pu BAGE1  lu 1     50
172.28.1.80 255.255.255.248    pu BAGE2  lu 100  200    printer
172.28.1.83                    pu BAGE3  lu 1     60    printer
172.28.1.82                    pu BAGE1  lu 100  200
```

Table 43 describes significant fields in the display.

Table 43 show extended channel tn3270-server nailed-ip Field Descriptions

Field	Description
172.28.1.0	IP address of the nailed client.
255.255.255.192	Network mask for the range of configured nailed clients.
pu BAGE1	PU name under which the **client** command was configured.
lu 1 50	LU LOCADDR range showing first LOCADDR and last LOCADDR. There need not be a last LOCADDR if only a single LOCADDR rather than a range is configured.
printer	Type of device being nailed to the LOCADDRs. If printer is specified, only clients which are printers are nailed to the LOCADDRs. If screen is specified, only clients that are screens are nailed to the LOCADDRs. If neither is specified, both screens and printers can use the LOCADDRs. A printer client is any client with a device type of “328*”. A screen client is a client with any other device type.

Related Commands

Command	Description
client ip lu	Defines a specific LU or range of LUs to a client at the IP address or subnet.

show extended channel tn3270-server nailed-name

To list all nailing statements with a specific nailed machine name, use the **show extended channel tn3270-server nailed-name** EXEC command.

show extended channel *slot/virtual channel* **tn3270-server nailed-name** *name*

Syntax Description

slot	Specifies a particular CMCC adapter in the router where *slot* is the slot number.
virtual channel	Virtual channel number.
name	Specifies the nailed machine name. This name is specified originally in the **client pool** command.

Defaults

No default behavior or values.

Command Modes

EXEC

Command History

Release	Modification
12.1(5)T	This command was introduced.

Usage Guidelines

There is not a **no** form for this command.

Examples

The following is sample output from the **show extended channel tn3270-server nailed-name** command:

```
Router# show extended channel 1/2 tn3270-server nailed-name myclient.cisco.com
MYCLIENT.CISCO.COM     listen-point 172.18.4.18  pool PCPOOL
HISCLIENT.CISCO.COM    listen-point 172.18.4.18  pool UNIXPOOL
HERCLIENT.CISCO.COM    listen-point 172.18.4.19  pool GENERALPOOL
```

Table 44 describes significant fields in the display.

Table 44 show extended channel tn3270-server nailed-name Field Descriptions

Field	Description
MYCLIENT.CISCO.COM	Fully qualified domain name of nailed client.
listen point *ipaddress*	Listen point IP address under which the **client pool** command was configured.
pool *poolname*	Pool name to which the client is nailed.

show extended channel tn3270-server pu

To display configuration parameters for a PU and all the LUs currently attached to the PU, including the LU cluster layout and pool name, use the **show extended channel tn3270-server pu** EXEC command.

show extended channel *slot/virtual channel* **tn3270-server pu** *pu-name* [**cluster | client-name**]

Syntax Description

slot	Specifies a particular CMCC adapter in the router where *slot* is the slot number.
virtual channel	Virtual channel number.
pu-name	Name that uniquely identifies this PU.
cluster	(Optional) Displays cluster information for the LUs within the pool.
client-name	(Optional) Displays client name information for the LUs within the pool.

Defaults

No default behavior or values.

Command Modes

EXEC

Command History

Release	Modification
11.2	This command was introduced.
11.2(2.1)	ACT/NA replaced ACTIVE status for LU states. A note was added to the output to describe its meaning.
11.2(18)BC	The **cluster** keyword was added.
12.0(5)T	The following fields were added to the output display: • lu-termination • lu-deletion
12.1(5)T	The **client-name** optional keyword was added.
12.2	The **Named** value was added for the lu-deletion field in the output display.

Usage Guidelines

The **show extended channel tn3270-server pu** command is valid only on the virtual channel interface. The display shown depends on whether the PU is a direct PU or a SNA session switch PU.

The output for the **show extended channel tn3270-server pu** command varies based on using the optional **cluster** keyword. Without the **cluster** keyword, the output column headings for the LU information appear as “model,” “frames in out,” and “idle for.”

When you use the **cluster** keyword, the output column headings for the LU information appear as “cluster,” “pool,” and “count.” The cluster heading lists the specific cluster within the pool to which the LU belongs along with the specific cluster layout after the slash.

The pool heading identifies the corresponding pool name, and the count heading identifies the cluster number out of the total number of clusters in the pool.

There is not a **no** form for this command.

Examples

This example shows a sample router configuration and the corresponding output using the **show extended channel tn3270-server pu** command:

```
interface Channel6/1
 no ip address
 no keepalive
 csna E160 40
!
interface Channel6/2
 ip address 172.18.4.17 255.255.255.248
 no keepalive
 lan TokenRing 15
  source-bridge 15 1 500
  adapter 15 4000.b0ca.0015
 lan TokenRing 16
  source-bridge 16 1 500
  adapter 16 4000.b0ca.0016
 tn3270-server
  pool PCPOOL   cluster layout 4s1p
  pool SIMPLE   cluster layout 1a
  pool UNIXPOOL cluster layout 49s1p
  dlur NETA.SHEK NETA.MVSD
   lsap token-adapter 15 04
    link SHE1     rmac 4000.b0ca.0016
  listen-point 172.18.4.18 tcp-port 23
   pu PU1      91903315 dlur
    allocate lu 1 pool PCPOOL   clusters 10
    allocate lu 51 pool UNIXPOOL clusters 2
    allocate lu 200 pool SIMPLE   clusters 50
  listen-point 172.18.4.19 tcp-port 2023
   pu PU2      91913315 token-adapter 16 08
    allocate lu 1 pool UNIXPOOL clusters 2
    allocate lu 101 pool SIMPLE   clusters 100
    allocate lu 201 pool PCPOOL   clusters 10
```

Following is an example of the output from the **show extended channel tn3270-server pu** command without the cluster keyword for a PU named PU1:

```
Router# show extended channel 6/2 tn3270-server pu pu1

name(index)    ip:tcp               xid   state     link   destination r-lsap
PU1(1)       172.18.4.18:23      91903315 ACTIVE    dlur   NETA.SHPU1

idle-time 0  keepalive 1800 (send nop)  unbind-act disconnect  generic-poolperm
ip-preced-screen 0  ip-preced-printer 0  ip-tos-screen 0  ip-tos-printer 0
lu-termination unbind  lu-deletion never
bytes 27019 in, 73751 out; frames 1144 in, 869 out; NegRsp 0 in, 0 out
actlus 5, dactlus 0, binds 5
Note: if state is ACT/NA then the client is disconnected

lu    name   client-ip:tcp       nail state    model   frames in out  idle for
1   SHED1001 161.44.100.162:1538   N   ACT/SESS 3278S2E  228     172    0:0:2
51  SHED1051 161.44.100.162:1539   N   ACT/SESS 3278S2E  240     181    0:0:2
151 SHED1151 161.44.100.162:1536   N   ACT/SESS 327802E  212     160    0:0:5
152 SHED1152 161.44.100.162:1537   N   ACT/SESS 3278S2E  220     166    0:0:4
200 SHED1200 161.44.100.162:1557   N   ACT/SESS 3278S2E  244     184    0:0:2
```

Following is an example of the output from the **show extended channel tn3270-server pu** command with the cluster keyword for a PU named PU1. In the example below, 1/1a identifies cluster 1 with a layout of 1a, which contains 1 LU of any type.

```
Router# show extended channel 6/2 tn3270-server pu pu1 cluster

name(index)    ip:tcp               xid   state     link   destination  r-lsap
PU1(1)       172.18.4.18:23      91903315 ACTIVE    dlur   NETA.SHPU1

idle-time 0  keepalive 1800 (send nop)  unbind-act discon  generic-poolperm
ip-preced-screen 0  ip-preced-printer 0  ip-tos-screen 0  ip-tos-printer 0
lu-termination unbind lu-deletion never
bytes 27489 in, 74761 out; frames 1164 in, 884 out; NegRsp 0 in, 0 out
actlus 5, dactlus 0, binds 5
Note: if state is ACT/NA then the client is disconnected

lu    name   client-ip:tcp       nail state    cluster   pool  count
1   SHED1001 161.44.100.162:1538   N   ACT/SESS 1/4s1p  PCPOOL   1/5
51  SHED1051 161.44.100.162:1539   N   ACT/SESS 1/49s1p UNIXPOOL 1/50
151 SHED1151 161.44.100.162:1536   N   ACT/SESS 1/1a    :GENERIC 1/1
152 SHED1152 161.44.100.162:1537   N   ACT/SESS 1/1a    :GENERIC 1/1
200 SHED1200 161.44.100.162:1557   N   ACT/SESS 1/1a    SIMPLE   1/1
```

Note If the cluster layout is very long, only the first 8 bytes are displayed under the cluster column. The pool called: GENERIC is shown for all LUs that are not allocated to any specific pool name.

Following is an example of the output from the **show extended channel tn3270-server pu** command with the **client-name** keyword for a PU named JADOEPU:

```
Router# show extended channel 1/2 tn3270-server pu jadoepu client-name

  name(index)    ip:tcp               xid   state     link   destination   r-lsap
  JADOEPU(1)   172.18.5.168:23     91922362 ACTIVE    tok 31 4000.4000.0001 04 10

  idle-time    0      keepalive   30      unbind-act discon   generic-pool perm
  ip-preced-screen 0 ip-preced-printer 0 ip-tos-screen  0 ip-tos-printer  0
  lu-termination unbind lu-deletion never
  bytes 824 in, 2619 out; frames 36 in, 39 out; NegRsp 0 in, 0 out
  actlus 4, dactlus 0, binds 3
  Note: if state is ACT/NA then the client is disconnected

  lu    name   client-name            nail  state    model frames in out  idle for
  1   VINCDP01 never connected          Y  ACT/NA           1       1       2:31:43
  2   VINCDP02 never connected          Y  ACT/NA           1       1       2:31:43
  5   VINDG005 HERCLIENT.CISCO.COM      Y  ACT/SESS 327904E 22      21      0:0:6
  6   VINDG006 HISCLIENT.CISCO.COM      Y  ACT/NA   327904E 12      12      1:44:47

  client-ip        mask             nail-type   lu-first  lu-last
  10.20.30.40                       screen      1         2
  20.30.40.50                       screen      9         10

  client-name                       nail-type   lu-first  lu-last
  MYCLIENT.CISCO.COM                screen      5         10
  .CISCO.COM                        screen      11        15
```

Table 45 describes significant fields in the display.

Table 45 show extended channel tn3270-server pu Field Descriptions

Field	Description
name (index) *pu-name* (*index*)	Name and index of the PU as configured.
ip:tcp *ip-addr:tcp-port*	IP address and TCP port number configured for the PU.
xid *number*	Configured XID—idblk and idnum.
state *pu-state*	Possible pu-state values and their meanings: • SHUT—PU is configured but in shut state. • RESET—Link station of this PU is not active. • TEST—PU is sending a TEST to establish link. • XID—TEST is responded, XID is sent. • P-ACTPU—Link station is up but no ACTPU is received. • ACTIVE—ACTPU is received and acknowledged positively. • ACT/BUSY—Awaiting host to acknowledge the SSCP-PU data. • WAIT—Waiting for PU status from CMCC adapter. • UNKNOWN—Direct PU in undefined state. • P-RQACTPU-R—PU is pending request ACTPU response. • P-ACTIVE—DLUR PU and direct PU states disagree. • P-DACTPU—PU is pending DACTPU. • OTHER—State is an undefined value.
link *type*	LINK type is either internal adapter type and internal adapter number, or dlur if it is a SNA Session Switch PU.
destination *mac-address or pu-name*	If a direct PU, then it is the destination MAC address, otherwise, it is the name of the partner PU.
r-lsap *number number*	Remote and local SAP values.
idle-time *number*	Configured idle-time for this PU.
keepalive *number* (*action*)	Configured keepalive time for this PU. The *action* is one of the following: • **send nop**—The Telnet command for no operation is sent to the TN3270 client to verify the physical connection. • **send timing mark** *number*—Number of seconds within which the TN3270 server expects a response to the DO TIMING-MARK from the TN3270 client.
unbind-act *type*	Configured unbind action for LUs on this PU.
generic-pool *type*	Configured generic-pool for LUs on this PU.
ip-preced-screen *number*	IP precedence value for screen LUs on this PU.
ip-preced-printer *number*	IP precedence value for printer LUs on this PU.
ip-tos-screen *number*	IP Type of Service (ToS) value for screen LUs on this PU.

Table 45 show extended channel tn3270-server pu Field Descriptions (continued)

Field	Description
ip-tos-printer *number*	IP ToS value for printer LUs on this PU.
lu-termination	Value configured in the PU for the **lu termination** siftdown command. The **lu termination** command specifies whether a TERMSELF or UNBIND RU is sent by the TN3270 server when a client turns off the device or disconnects. The possible values are: • Termself—Termination of all sessions and session requests associated with an LU is ordered upon disconnect. • Unbind—Termination of the session by the application is requested upon LU disconnect.
lu-deletion	Value configured in the PU for the **lu deletion** siftdown command. The **lu deletion** command specifies whether the TN3270 server sends a REPLY-PSID poweroff request to VTAM to delete the corresponding LU when a client disconnects. The possible values are: • Always—Dynamic LUs for this PU are always deleted upon disconnect. • Named—Only named LUs for this PU are deleted upon disconnect. • Normal—Only screen LUs for this PU are deleted upon disconnect. • Non-generic—Only specified LUs for this PU are deleted upon disconnect. • Never—None of the LUs for this PU are ever deleted upon disconnect.
bytes in / out *number/number*	Total number of bytes sent to/received from the host for this PU.
frames in / out *number/number*	Total number of frames sent to/received from the host for this PU.
NegRsp in / out *number/number*	Total number of SNA negative responses sent to/received from the host.
actlus *number*	Total number of ACTLUs received from the host.
dactlus *number*	Total number of DACTLUs received from the host.
binds *number*	Total number of BINDs received from the host.
lu *number*	LOCADDR of the LU.
name *lu-name*	Name of the TN3270 LU.
client-name *ip-addr:tcpport*	Client's IP address and TCP port number.
nail	Status of LU nailing, either Y or N

Table 45 show extended channel tn3270-server pu Field Descriptions (continued)

Field	Description
state *lu-state*	LU states and their meanings: • UNKNOWN—LU in an undefined state. • INACTIVE—LU didn't receive ACTLU. • ACT/NA—LU received ACTLU and acknowledged positively. If a client ip address is shown then the client is disconnected. • P-SDT—LU is bound but there is no SDT yet. • ACT/SESS—LU is bound and in session. • P-ACTLU—Telnet has connected and is awaiting ACTLU. • P-NTF/av—Awaiting host notify-available response. • P-NTF/UA—Awaiting host notify-unavailable response. • P-RESET—Waiting for a buffer to send DACTLU response. • P-PSID—Waiting for NMVT Reply psid response. • P-BIND—Waiting for host to send bind. • P-UNBIND—Awaiting host unbind response. • WT-UNBND—Waiting for client to acknowledge disconnection. • WT-SDT—Waiting for client to acknowledge SDT.
model *model*	IBM 3278 model type of client.
frames in *number*	Number of frames sent inbound to the host.
frames out *number*	Number of frames sent outbound from the host.
idle for *time*	Time the client has been idle. The time is in HH:MM:SS.
client-ip	Remote client IP address.
mask	Current network mask.
nail-type	LU nailing type, screen or printer.
lu-first	First LU address in the range.
lu-last	Last LU address in the range, if one is specified in the **client** configuration command.
client-name	Client machine name or domain name.
nail-type	LU nailing type, screen or printer.
lu-first	First LU address in the range.
lu-last	Last LU address in the range, if one is specified in the **client** configuration command.

Related Commands

Command	Description
pu (listen-point)	Creates a PU entity that has a direct link to a host and enters listen-point PU configuration mode.
pu dlur (listen-point)	Creates a PU entity that has no direct link to a host and enters listen-point PU configuration mode.
allocate lu	Assigns LUs to a pool.

show extended channel tn3270-server pu lu

To display information about the TN3270 server LUs running on CMCC adapter interface, use the **show extended channel tn3270-server pu lu** EXEC command.

show extended channel *slot*/*port* **tn3270-server pu** *pu-name* **lu** *locaddr* [**history**]

Syntax Description

slot	Specifies a particular CMCC adapter in the router where *slot* is the slot number. The port value for a TN3270 server will always be 2.
port	Port value for a TN3270 server will always be 2.
pu-name	PU name that uniquely identifies this PU.
locaddr	LU LOCADDR that uniquely identifies the LU.
history	(Optional) Displays the LU trace history.

DefaultsDefaults

No default behavior or values.

Command Modes

EXEC

Command History

Release	Modification
11.2	This command was introduced.
11.2(2.1)	ACT/NA replaced ACTIVE status for LU states. A note was added to the output to describe its meaning.
11.2(18)BC	The response time buckets, average total response time, average IP response time, and the number of transactions fields were added to the output display.
12.0(5)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines

The **show extended channel tn3270-server pu lu** command is valid only on the virtual channel interface.

Examples

The following is sample output from the **show extended channel tn3270-server pu lu** command for a SNA session switch PU:

```
Router# show extended channel 3/2 tn3270 pu int1 lu 1
Note: if state is ACT/NA then the client is disconnected

lu    name   client-ip:tcp       nail  state      model   frames in out   idle for
1   GOAN1X01 171.69.176.77:3828    N    ACT/NA               4       4       0:4:51

pu is INT1, lu is STATIC type 0, negotiated TN3270E
bytes 74 in, 1219 out; RuSize 0 in, 0 out; NegRsp 0 in, 0 out
pacing window 0 in, 0 out; credits 0 in, queue-size 0 in, 0 out
```

The following is sample output from the **show extended channel tn3270-server pu lu history** command:

```
Router# show extended channel 3/2 tn3270 pu pus20 lu 1 history
Note: if state is ACT/NA then the client is disconnected

lu    name   client-ip:tcp       nail  state      model   frames in out   idle for
1   PUS20001 192.195.80.40:2480    N    ACT/SESS  327804    5       4       0:0:8

pu is PUS20, lu is DYNAMIC type 2, negotiated TN3270
bytes 155 in, 1752 out; RuSize 1024 in, 3840 out; NegRsp 0 in, 0 out>pacing window 0 in,
1 out; credits 0 in, queue-size 0 in, 0 out
traces:
         Client connect req
         Reply PSID pos rsp
         actlu req
         bind req
         sdt req
OUT len=12   2Dxxxxxxxx456B80000D0201
IN  len=25   xxxxxxxxxx45EB80000D0201000000
OUT len=53   2Dxxxxxxxx466B800031010303B1
IN  len=10   2D0001010646EB800031
OUT len=10   2D00010106476B8000A0
IN  len=10   2D0001010647EB8000A0
OUT len=1677 2Cxxxxxxxx010381C07EC7114040
IN  len=9    2C0001010001838100
```

This example shows the response-time information using the **show extended channel tn3270-server pu lu** command for the LU at LOCADDR 1 associated with the PU named vincdpu:

```
sydney# show extended channel 1/2 tn3270-server pu vincdpu lu 1
Note: if state is ACT/NA then the client is disconnected

lu    name   client-ip:tcp       nail   state    model frames in out   idle for
1   VINDG001 161.44.100.210:1315   N   ACT/NA   3278S2E  12      11      0:0:18

pu is VINCDPU, lu is DYNAMIC unbound, negotiated TN3270E
bytes 253 in, 954 out; RuSize 0 in, 0 out; NegRsp 1 in, 0 out
pacing window 0 in, 1 out; credits 0 in, queue-size 0 in, 0 out
response time buckets 14 31 15 3 1
average total response time 19 average IP response time 8
number of transactions 64
```

Table 46 describes significant fields in the display.

Table 46 show extended channel tn3270-server pu lu Field Descriptions

Field	Description
lu *locaddr*	LOCADDR of the LU.
name *lu-name*	Name of the TN3270 LU.
client-ip:tcp *ip-addr:tcpport*	Client's IP address and TCP port number.

Table 46 show extended channel tn3270-server pu lu Field Descriptions (continued)

Field	Description
state *lu-state*	LU states and their meanings are: • UNKNOWN—LU in an undefined state. • INACTIVE—LU didn't receive ACTLU. • ACT/NA—LU received ACTLU and acknowledged positively. If a client ip address is shown then the client is disconnected. • P-SDT—LU is bound but there is no SDT yet. • ACT/SESS—LU is bound and in session. • P-ACTLU—Telnet connects in and is awaiting ACTLU. • P-NTF/AV—Awaiting host notify-available response. • P-NTF/UA—Awaiting host notify-unavailable response. • P-RESET—Waiting for a buffer to send DACTLU response. • P-PSID—Waiting for NMVT Reply psid response. • P-BIND—Waiting for host to send bind. • P-UNBIND—Awaiting host unbind response. • WT-UNBND—Waiting for client to acknowledge disconnection. • WT-SDT—Waiting for client to acknowledge SDT.
model *model*	3278 model type of client; blank if STATIC LU.
frames in *number*	Number of frames sent inbound to the host.
frames out *number*	Number of frames sent outbound from the host.
idle for *time*	Time the client has been idle. The time is in HH:MM:SS.
pu is *pu-name*	Name of the PU.
lu is *type*	Whether LU is DYNAMIC or STATIC.
negotiated *type*	Whether client is TN3270 or TN3270E.
bytes in/out *number/number*	Total number of bytes sent to or received from the host.
RuSize in/out *number/number*	RU size as configured in the bind.
NegRsp in/out *number/number*	Number of SNA negative responses sent to/received from the host.
response time buckets	Displays the number of transactions in each response-time "bucket" for the specified LU. The bucket boundaries are defined using the **response-time group** command.
average total response time	Displays the average response time (in tenths of seconds) for the total number of response-time transactions.
average IP response time	Displays the average response time in tenths of seconds (including IP transit time) for the total number of response-time transactions.
number of transactions	Displays the total number of response-time transactions across all response-time buckets.

Table 46 show extended channel tn3270-server pu lu Field Descriptions (continued)

Field	Description
pacing window in/out *number/number*	SNA pacing window as configured in the bind.
credits in *number*	Number of frames that can be sent inbound without requiring an isolated pacing response.
queue-size in *number*	If non-zero, indicates the number of SNA frames waiting to be sent to the host which are blocked, waiting for a pacing response.
queue-size out *number*	SNA frames not yet acknowledged by an isolated pacing response by the TN3270 server.

Related Commands

Command	Description
pu (listen-point)	Creates a PU entity that has a direct link to a host and enters listen-point PU configuration mode.
pu dlur (listen-point)	Creates a PU entity that has no direct link to a host and enters listen-point PU configuration mode.
response-time group	Configures a client subnet group for response-time measurements.

show extended channel tn3270-server response-time application

To display information for application client groups, use the **show extended channel tn3270-server response-time application** privileged EXEC command.

show extended channel *slot/virtual channel* **tn3270-server response-time application** [*appl-name* [**detail**]]

Syntax Description

slot	Slot number.
virtual channel	Virtual channel number.
appl-name	(Optional) Display only the client group corresponding to the VTAM application name.
detail	(Optional) List client members and their response-time statistics following the client group entry.

Defaults

No default behavior or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.2(18)BC	This command was introduced.
12.0(5)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines

If optional keywords are not used for the **show extended channel tn3270-server response-time application** command, a complete list of currently existing per-application client groups is displayed along with their collection control parameters. If you specify the *appl-name* keyword, only the client group corresponding to that application is displayed. If you specify the **detail** keyword, the client group entry is followed by a list of its client members and their response-time statistics.

Examples

Following is an example of output for the **show extended channel tn3270-server response-time application**:

```
Router# show extended channel 3/2 tn3270-server response-time application MYAPPL
group APPL MYAPPL
  aggregate NO excludeip NO dynamic definite response NO
  sample period multiplier 30
  bucket boundaries 10 20 50 100
```

Table 47 provides descriptions of the output fields for the **show extended channel tn3270-server response-time application** command.

Note The aggregate, excludeip, and dynamic definite response field values are MIB parameters that are currently configured automatically by the TN3270 server according to the type of response-time group. These values are not configurable in the TN3270 server.

Table 47 show extended channel tn3270-server response-time application Field Descriptions

Field	Description
aggregate	Displays whether the response time statistics for the clients in this response-time group are reported collectively for the group (YES) or individually by client (NO). This value is automatically set to NO by the TN3270 server for application client response-time groups.
excludeip	Displays whether the IP component (the client/server path) is included in the response time for any transaction (NO) or if only the SNA component (the server/host path) is included in the response time for any transaction (YES). This value is automatically set to NO by the TN3270 server for application client response-time groups.
dynamic definite response	Displays whether the server adds a Definite Response request to the First-in-chain (FIC) reply in each transaction, to get a response from the client so that the IP component can be included in the response time. The value is automatically set to NO by the TN3270 server for all types of response-time groups.
sample period multiplier	Displays the number that is multiplied by an interval of 20 seconds to determine the collection interval for the response-time group. The multiplier value is defined using the **response-time group** command. For example, a sample period multiplier of 30 results in a collection interval of 600 seconds (30 x 20 seconds), or 10 minutes, for this client group.
response time buckets	Displays the number of transactions in each response-time “bucket” for the specified application group. The bucket boundaries are defined using the **response-time group** command.
average total response time	Displays the average response time (in tenths of seconds) for the total number of response-time transactions.
average IP response time	Displays the average response time in tenths of seconds (including IP transit time) for the total number of response-time transactions.
number of transactions	Displays the total number of response-time transactions across all response-time buckets.

Related Commands

Command	Description
response-time group	Configures a client subnet group for response-time measurements.
show extended channel tn3270-server response-time global	Displays information about the global response-time client group.
show extended channel tn3270-server response-time link	Displays information about host link response-time client groups.
show extended channel tn3270-server response-time listen-point	Displays information about listen point response-time client groups.
show extended channel tn3270-server response-time subnet	Displays information about Subnet response-time client groups.

show extended channel tn3270-server response-time global

To display information about the global client group, use the **show extended channel tn3270-server response-time global** privileged EXEC command.

show extended channel *slot/virtual channel* **tn3270-server response-time global**

Syntax Description

slot	Slot number.
virtual channel	Virtual channel number.

Defaults

No default behavior or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.2(18)BC	This command was introduced.
12.0(5)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines

The **show extended channel tn3270-server response-time global** command displays collection control parameters for the global client group.

Examples

Following is an example of output for the **show extended channel tn3270-server response-time global** command:

```
Router# show extended channel 3/2 tn3270-server response-time global
group CLIENT GLOBAL
  aggregate YES excludeip NO dynamic definite response NO
  sample period multiplier 30
  bucket boundaries 10 20 50 100
  buckets 105 118 211 109 104
  average total response time 33 average IP response time 24
  number of transactions 647
```

Table 48 provides descriptions of the output fields for the **show extended channel tn3270-server response-time global** command.

Note The aggregate, excludeip, and dynamic definite response field values are MIB parameters that are currently configured automatically by the TN3270 server according to the type of response-time group. These values are not configurable in the TN3270 server.

Table 48 show extended channel tn3270-server response-time global Field Descriptions

Field	Description
aggregate	Displays whether the response time statistics for the clients in this response-time group are reported collectively for the group (YES) or individually by client (NO). This value is automatically set to YES by the TN3270 server for global client response-time groups.
excludeip	Displays whether the IP component (the client/server path) is included in the response time for any transaction (NO) or if only the SNA component (the server/host path) is included in the response time for any transaction (YES). This value is automatically set to NO by the TN3270 server for global client response-time groups.
dynamic definite response	Displays whether the server adds a Definite Response request to the First-in-chain (FIC) reply in each transaction, to get a response from the client so that the IP component can be included in the response time. The value is automatically set to NO by the TN3270 server for all types of response-time groups.
sample period multiplier	Displays the number that is multiplied by an interval of 20 seconds to determine the collection interval for the response-time group. The multiplier value is defined using the **response-time group** command. For example, a sample period multiplier of 30 results in a collection interval of 600 seconds (30 x 20 seconds), or 10 minutes, for this client group.
bucket boundaries	Displays the value of the response-time bucket boundaries in tenths of seconds. The bucket boundaries are defined using the **response-time group** command.
buckets	Displays the number of transactions in each response-time bucket for the specified application group.
average total response time	Displays the average response time (in tenths of seconds) for the total number of response-time transactions.
average IP response time	Displays the average response time in tenths of seconds (including IP transit time) for the total number of response-time transactions.
number of transactions	Displays the total number of response-time transactions across all response-time buckets.

Related Commands

Command	Description
response-time group	Configures a client subnet group for response-time measurements.
show extended channel tn3270-server response-time application	Displays information about application response-time client groups.
show extended channel tn3270-server response-time link	Displays information about host link response-time client groups.
show extended channel tn3270-server response-time listen-point	Displays information about listen point response-time client groups.
show extended channel tn3270-server response-time subnet	Displays information about Subnet response-time client groups.

show extended channel tn3270-server response-time link

To display information about host link client groups, use the **show extended channel tn3270-server response-time link** privileged EXEC command.

show extended channel *slot/virtual channel* **tn3270-server response-time link** [*link-name*]

Syntax Description

slot	Slot number.
virtual channel	Port number.
link-name	(Optional) PU name for a direct PU or link name for a DLUR PU.

Defaults

No default behavior or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.2(18)BC	This command was first introduced.
12.0(5)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines

This command displays information clients groups by host link. If no optional keywords are specified, a complete list of currently existing client groups by host link is displayed along with their collection control parameters and aggregate response-time statistics. If a value for the *link-name* argument is specified, only the client group corresponding to that link is displayed.

Examples

Following is an example of the output for the **show extended channel tn3270-server response-time link** command without optional keywords, which shows all current client groups by host link:

```
Router# show extended channel 3/2 tn3270-server response-time link
group DIRECT LINK MYLINK
  aggregate YES excludeip YES dynamic definite response NO
  sample period multiplier 30
  bucket boundaries 10 20 50 100
  buckets 10 18 21 10 10
  average total response time 37 average IP response time 23
  number of transactions 69
group DLUR LINK HISLINK
  aggregate YES excludeip YES dynamic definite response NO
  sample period multiplier 30
  bucket boundaries 10 20 50 100
  buckets 14 31 15 3 1
  average total response time 19 average IP response time 8
  number of transactions 64
```

Following is an example of the output for the **show extended channel tn3270-server response-time link** command for the link named DIRECT LINK MYLINK:

```
Router# show extended channel 3/2 tn3270-server response-time link direct link mylink
group DIRECT LINK MYLINK
  aggregate YES excludeip YES dynamic definite response NO
  sample period multiplier 30
  bucket boundaries 10 20 50 100
  buckets 10 18 21 10 10
  average total response time 37 average IP response time 23
  number of transactions 69
```

Table 49 provides descriptions of the output fields for the **show extended channel tn3270-server response-time link** command.

Note The aggregate, excludeip, and dynamic definite response field values are MIB parameters that are currently configured automatically by the TN3270 server according to the type of response-time group. These values are not configurable in the TN3270 server.

Table 49 show extended channel tn3270-server response-time link Field Descriptions

Field	Description
aggregate	Displays whether the response time statistics for the clients in this response-time group are reported collectively for the group (YES) or individually by client (NO). This value is automatically set to YES by the TN3270 server for link client response-time groups.
excludeip	Displays whether the IP component (the client/server path) is included in the response time for any transaction (NO) or if only the SNA component (the server/host path) is included in the response time for any transaction (YES). This value is automatically set to YES by the TN3270 server for link client response-time groups.
dynamic definite response	Displays whether the server adds a Definite Response request to the First-in-chain (FIC) reply in each transaction, to get a response from the client so that the IP component can be included in the response time. The value is automatically set to NO by the TN3270 server for all types of response-time groups.
sample period multiplier	Displays the number that is multiplied by an interval of 20 seconds to determine the collection interval for the response-time group. The multiplier value is defined using the **response-time group** command. For example, a sample period multiplier of 30 results in a collection interval of 600 seconds (30 x 20 seconds), or 10 minutes, for this client group.
bucket boundaries	Displays the value of the response-time bucket boundaries in tenths of seconds. The bucket boundaries are defined using the **response-time group** command.
buckets	Displays the number of transactions in each response-time bucket for the specified application group.
average total response time	Displays the average response time (in tenths of seconds) for the total number of response-time transactions.

Table 49 show extended channel tn3270-server response-time link Field Descriptions (continued)

Field	Description
average IP response time	Displays the average response time in tenths of seconds (including IP transit time) for the total number of response-time transactions.
number of transactions	Displays the total number of response-time transactions across all response-time buckets.

Related Commands

Command	Description
response-time group	Configures a client subnet group for response-time measurements.
show extended channel tn3270-server response-time application	Displays information about application response-time client groups.
show extended channel tn3270-server response-time global	Displays information about the global response-time client group.
show extended channel tn3270-server response-time listen-point	Displays information about listen point response-time client groups.
show extended channel tn3270-server response-time subnet	Displays information about Subnet response-time client groups.

show extended channel tn3270-server response-time listen-point

To display information about listen point client groups, use the **show extended channel tn3270-server response-time listen-point** privileged EXEC command.

show extended channel *slot/virtual channel* **tn3270-server response-time listen-point**

Syntax Description

slot	Slot number.
virtual channel	Virtual channel number.

Defaults

No default behavior or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.2(18)BC	This command was first introduced.
12.0(5)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines

The **show extended channel tn3270-server response-time listen-point** command displays information about groups of clients summarized by listen point. A complete list of currently existing listen-point client groups is displayed along with their collection control parameters and aggregate response-time statistics.

Examples

Following is an example of the output for the **show extended channel tn3270-server listen-point** command:

```
Router# show extended channel 3/2 tn3270-server response-time listen-point
group LP 10.20.30.40:23
  aggregate YES excludeip NO dynamic definite response NO
  sample period multiplier 30
  bucket boundaries 10 20 50 100
  buckets 10 18 21 10 10
  average total response time 37 average IP response time 23
  number of transactions 69
group LP 50.60.70.80:23
  aggregate YES excludeip NO dynamic definite response NO
  sample period multiplier 30
  bucket boundaries 10 20 50 100
  buckets 310 418 521 510 210
  average total response time 27 average IP response time 20
  number of transactions 1969
```

Table 50 provides descriptions of the output fields for the **show extended channel tn3270-server response-time listen-point** command.

Note The aggregate, excludeip, and dynamic definite response field values are MIB parameters that are currently configured automatically by the TN3270 server according to the type of response-time group. These values are not configurable in the TN3270 server.

Table 50 show extended channel tn3270-server response-time listen-point Field Descriptions

Field	Description
aggregate	Displays whether the response time statistics for the clients in this response-time group are reported collectively for the group (YES) or individually by client (NO). This value is automatically set to YES by the TN3270 server for link client response-time groups.
excludeip	Displays whether the IP component (the client/server path) is included in the response time for any transaction (NO) or if only the SNA component (the server/host path) is included in the response time for any transaction (YES). This value is automatically set to NO by the TN3270 server for link client response-time groups.
dynamic definite response	Displays whether the server adds a Definite Response request to the First-in-chain (FIC) reply in each transaction, to get a response from the client so that the IP component can be included in the response time. The value is automatically set to NO by the TN3270 server for all types of response-time groups.
sample period multiplier	Displays the number that is multiplied by an interval of 20 seconds to determine the collection interval for the response-time group. The multiplier value is defined using the **response-time group** command. For example, a sample period multiplier of 30 results in a collection interval of 600 seconds (30 x 20 seconds), or 10 minutes, for this client group.
bucket boundaries	Displays the value of the response-time bucket boundaries in tenths of seconds. The bucket boundaries are defined using the **response-time group** command.
buckets	Displays the number of transactions in each response-time bucket for the specified application group.
average total response time	Displays the average response time (in tenths of seconds) for the total number of response-time transactions.
average IP response time	Displays the average response time in tenths of seconds (including IP transit time) for the total number of response-time transactions.
number of transactions	Displays the total number of response-time transactions across all response-time buckets.

Related Commands

Command	Description
response-time group	Configures a client subnet group for response-time measurements.
show extended channel tn3270-server response-time application	Displays information about application response-time client groups.
show extended channel tn3270-server response-time global	Displays information about the global response-time client group.
show extended channel tn3270-server response-time link	Displays information about host link response-time client groups.
show extended channel tn3270-server response-time subnet	Displays information about Subnet response-time client groups.

show extended channel tn3270-server response-time subnet

To display information about Subnet client groups, use the **show extended channel tn3270-server response-time subnet** privileged EXEC command.

show extended channel *slot*/*virtual channel* **tn3270-server response-time subnet** [**ip-address** *ip-mask* [**detail**]]

Syntax Description

slot	Slot number.
virtual channel	Virtual channel number.
ip-address	(Optional) Subnet IP address.
ip-mask	(Optional) Subnet mask.
detail	(Optional) Each client group entry is followed by a list of its client members and their respective response-time statistics.

Defaults

No default behavior or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.2(18)BC	This command was first introduced.
12.0(5)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines

This command shows information about client subnet client groups. This includes all configured groups plus the CLIENT SUBNET OTHER group. If no optional parameters are specified, a complete list of client subnet client groups is displayed along with their collection control parameters. If you specify values for the *ip-address* and *ip-mask* arguments, only client groups containing that subnet are displayed. If you specify the **detail** keyword, each client group entry is followed by a list of its client members and their response-time statistics.

Examples

Following is an example of the output for all configured client groups using the **show extended channel tn3270-server response-time subnet** command:

```
Router# show extended channel 3/2 tn3270-server response-time subnet
group SUBNETGROUP1
  subnet 10.10.10.0 255.255.255.192
  aggregate NO excludeip NO dynamic definite response NO
  sample period multiplier 30
  bucket boundaries 10 20 50 100
group SUBNETGROUP2
  subnet 10.10.10.128 255.255.255.192
  subnet 10.10.10.192 255.255.255.192
  aggregate NO exclude ip NO dynamic definite response NO
  sample period multiplier 40
  bucket boundaries 20 30 60 120
group CLIENT SUBNET OTHER
  aggregate NO exclude ip NO dynamic definite response NO
  sample period multiplier 30
  bucket boundaries 10 20 50 100
```

Following is an example of the output for subnet 10.10.10.0 with IP mask 255.255.255.192, which shows a list of the client members and their response-time statistics:

```
Router# show extended channel 3/2 tn3270-server response-time subnet
10.10.10.0 255.255.255.192 detail

group SUBNETGROUP1
  subnet 10.10.10.0 255.255.255.192
  aggregate NO excludeip NO dynamic definite response NO
  sample period multiplier 30
  bucket boundaries 10 20 50 100
  client 10.10.10.129:23
    buckets 5 8 11 9 4
    average total response time 33 average IP response time 24
    number of transactions 37
  client 10.10.10.130:23
    buckets 6 9 10 10 2
    average total response time 32 average IP response time 25
    number of transactions 37
  client 10.10.10.131:23
    buckets 11 14 10 8 7
    average total response time 27 average IP response time 19
    number of transactions 50
```

Table 51 provides descriptions of the output fields for the **show extended channel tn3270-server response-time subnet** command.

Note The aggregate, excludeip, and dynamic definite response field values are MIB parameters that are currently configured automatically by the TN3270 server according to the type of response-time group. These values are not configurable in the TN3270 server.

Table 51 show extended channel tn3270-server response-time subnet Field Descriptions

Field	Description
subnet	Displays the IP address and IP mask of the client subnet group for which response-time statistics are being shown.
aggregate	Displays whether the response time statistics for the clients in this response-time group are reported collectively for the group (YES) or individually by client (NO). This value is automatically set to NO by the TN3270 server for subnet client response-time groups.
excludeip	Displays whether the IP component (the client/server path) is included in the response time for any transaction (NO) or if only the SNA component (the server/host path) is included in the response time for any transaction (YES). This value is automatically set to NO by the TN3270 server for subnet client response-time groups.
dynamic definite response	Displays whether the server adds a Definite Response request to the First-in-chain (FIC) reply in each transaction, to get a response from the client so that the IP component can be included in the response time. The value is automatically set to NO by the TN3270 server for all types of response-time groups.
sample period multiplier	Displays the number that is multiplied by an interval of 20 seconds to determine the collection interval for the response-time group. The multiplier value is defined using the **response-time group** command. For example, a sample period multiplier of 30 results in a collection interval of 600 seconds (30 x 20 seconds), or 10 minutes, for this client group.
bucket boundaries	Displays the value of the response-time bucket boundaries in tenths of seconds. The bucket boundaries are defined using the **response-time group** command.
buckets	Displays the number of transactions in each response-time bucket for the specified application group.
average total response time	Displays the average response time (in tenths of seconds) for the total number of response-time transactions.
average IP response time	Displays the average response time in tenths of seconds (including IP transit time) for the total number of response-time transactions.
number of transactions	Displays the total number of response-time transactions across all response-time buckets.

Related Commands

Command	Description
response-time group	Configures a client subnet group for response-time measurements.
show extended channel tn3270-server response-time application	Displays information about application response-time client groups.
show extended channel tn3270-server response-time global	Displays information about the global response-time client group.
show extended channel tn3270-server response-time link	Displays information about host link response-time client groups.
show extended channel tn3270-server response-time listen-point	Displays information about listen point response-time client groups.

show extended channel tn3270-server security

To display information about the TN3270 security enhancement, use the **show extended channel tn3270-server security** EXEC command.

show extended channel *slot/virtual channel* **tn3270-server security** [[**sec-profile** *profilename*] [**listen-point** *ipaddress* [**tcp-port** *number*]]]

Syntax Description

slot	Specifies a particular CMCC adapter in the router where *slot* is the slot number.
virtual channel	Virtual channel number.
sec-profile *profilename*	(Optional) Alphanumeric name which specifies the security profile name to be associated with a listen point. The character range is from 1 to 24. This name is specified originally in the **profile** command.
listen-point *ipaddress*	(Optional) IP address that the clients should use as the host IP address to map to LU sessions under this PU and listen point.
tcp-port *number*	(Optional) Port number used for the listen operation. The default value is 23.

Defaults

The default **tcp-port** value is 23.

Command Modes

EXEC

Command History

Release	Modification
12.1(5)T	This command was introduced.

Usage Guidelines

There is not a **no** form for this command.

Examples

The following is sample output from the **show extended channel tn3270-server security** command with the optional **Sec-profile** keyword configured:

```
Router# show extended channel 3/2 tn3270-server security sec-profile cert40
status:ENABLE Default Profile: (Not Configured)
Name               Active LUs  keylen encryptorder           Mechanism
CERT40                     0     40    RC4 RC2 RC5 DES 3DES    SSL
Servercert:slot0:coach188.pem
Certificate Loaded:YES Default-Profile:NO
```

The following is sample output from the **show extended channel tn3270-server security** command with the optional **listen-point** keyword configured:

```
Router# show extended channel 3/2 tn3270-server security listen-point 172.18.5.188
status:ENABLE Default Profile: (Not Configured)
IPaddress      tcp-port   Security-Profile   active-sessions  Type    State
172.18.5.188    23        CERT40               0              Secure  ACTIVE
Active Sessions using Deleted Profile:0
```

Table 52 describes significant fields in the display.

Table 52 show extended channel tn3270-server security Field Descriptions

Field	Description
status *ENABLE/DISABLE*	Status of TN3270 server security. Enable or Disable.
Default Profile (*Not configured/configured)*	Shows if a default profile is configured. (Not Configured) or (Configured).
Name	Name of the security profile as specified in the **profile** command.
Active LUs *number*	Number of active LUs.
keylen *bits*	Maximum encryption key length in bits.
encryptorder	Order of encryption algorithms. Choices are DES, 3DES, RC4, RC2 or RC5.
Mechanism	Type of security protocol being used. Choices are SSL or none.
Servercert	Location of the TN3270 server's security certificate status in the Flash memory.
Certificate Loaded	Security certificate is loaded. YES or NO.
Default-Profile	Default profile is configured. YES or NO.
IPaddress	IP address that the clients should use as the host IP address to map to LU sessions under this PU and listen point.
tcp-port	Port number used for the listen operation. The default value is 23.
Security-Profile	Name of the security profile as specified in the **profile** command.
active-sessions	Number of active sessions.
Type	Type of connection.
State	State of the listen point.
Active Sessions using Deleted Profile:	Number of sessions using a security profile that has been deleted.

Related Commands

Command	Description
sec-profile	Specifies the security profile to be associated with a listen point.
listen-point	Defines an IP address for the TN3270 server.

shutdown (TN3270)

To shut down TN3270 entities, such as PU, DLUR, and DLUR SAP, use the **shutdown** command in one of the TN3270 server command modes. The **shutdown** TN3270 command shuts down the TN3270 entities according to which configuration mode you are in when the command is issued. To restart the interface or entity, use the **no** form of this command.

shutdown

no shutdown

Syntax Description

This command has no arguments or keywords.

Defaults

The interface or entity is enabled.

Command Modes

TN3270 server configuration

PU configuration

DLUR configuration

DLUR PU configuration

DLUR SAP configuration

Listen-point configuration

Listen-point PU configuration

Command History

Release	Modification
10.2	This command was introduced.
11.2	Support for the following configuration modes was added: • TN3270 • PU • DLUR • DLUR SAP
11.2(18)BC	Support for the following configuration modes was added: • Listen-point • Listen-point PU
12.0(5)T	This command was integrated into Cisco IOS Release 12.0 T.

Usage Guidelines

In TN3270 server configuration mode, the command shuts down the entire TN3270 server function.

In PU configuration mode, the command shuts down an individual PU entity within the TN3270 server.

In DLUR configuration mode, the command shuts down the whole DLUR subsystem within the TN3270 server.

In DLUR PU configuration mode, the command shuts down an individual PU within the SNA session switch configuration in the TN3270 server.

In DLUR SAP configuration mode, the command shuts down the local SAP and its associated links within the SNA session switch configuration.

Examples

The following example issued in TN3270 server configuration mode shuts down the entire TN3270 server:

```
shutdown
```

tcp-port

To override the default TCP port setting of 23, use the **tcp-port** TN3270 server configuration command. To restore the default, use the **no** form of this command.

tcp-port *port-number*

no tcp-port

Syntax Description

port-number	A valid TCP port number in the range of 0 to 65534. The default is 23, which is the IETF standard. The value 65535 is reserved by the TN3270 server.

Defaults

In TN3270 server configuration mode, the default is 23.

In PU configuration mode the default is the value currently configured in TN3270 server configuration mode.

Command Modes

TN3270 server configuration—The **tcp-port** command at this level applies to all PUs supported by the TN3270 server.

DLUR PU configuration—The **tcp-port** command at this level applies to all PUs defined under DLUR configuration mode.

PU configuration—The **tcp-port** command at this level applies only to the specified PU.

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

The **tcp-port** command is valid only on the virtual channel interface, and it can be entered in either TN3270 server configuration mode or PU configuration mode. A value entered in TN3270 mode applies to all PUs for that TN3270 server, except as overridden by values entered in PU configuration mode. The **tcp-port** command affects only future TN3270 sessions.

The **no tcp-port** command entered in PU configuration mode removes the override.

Examples

The following example entered in TN3270 server configuration mode returns the TCP port value to 23:

```
no tcp-port
```

Related Commands

Command	Description
pu (listen-point)	Creates a PU entity that has a direct link to a host and enters listen-point PU configuration mode.
pu dlur (listen-point)	Creates a PU entity that has no direct link to a host and enters listen-point PU configuration mode.

timing-mark

To select whether a WILL TIMING-MARK is transmitted when the host application needs an SNA response (definite or pacing response), use the **timing-mark** TN3270 server configuration command. To turn off WILL TIMING-MARK transmission except as used by the keepalive function, use the **no** form of this command.

timing-mark

no timing-mark

Syntax Description

This command has no arguments or keywords.

Defaults

No WILL TIMING-MARKS are sent except by keepalive.

Command Modes

TN3270 server configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

If the **timing-mark** command is configured the TN3270 server will send WILL TIMING-MARK as necessary to achieve an end-to-end response protocol. Specifically, TIMING-MARK will be sent if either of the following conditions is true:

- The host application has requested a pacing response.
- The host application has requested a Definite Response, and either the client is not using TN3270E, or the request is not Begin Chain.

The use of the **timing-mark** command can degrade performance. Some clients do not support the **timing-mark** command used in this way. Therefore, the **timing-mark** command should be configured only when both of the following conditions are true:

- All clients support this usage.
- The application benefits from end-to-end acknowledgment.

Examples

The following example enables the sending of the TIMING-MARK:

```
timing-mark
```

Related Commands

Command	Description
idle-time	Specifies how many seconds of LU inactivity, from both host and client, before the TN3270 session is disconnected.
keepalive (TN3270)	Specifies how many seconds of inactivity elapse before transmission of a DO TIMING-MARK or Telnet no operation (nop) to the TN3270 client.

tn3270-server

To start the TN3270 server on a CMCC adapter or to enter TN3270 server configuration mode, use the **tn3270-server** interface configuration command. To remove the existing TN3270 server configuration, use the **no** form of this command.

tn3270-server

no tn3270-server

Syntax Description

This command has no arguments or keywords.

Defaults

No TN3270 server function is enabled.

Command Modes

Interface configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

The **tn3270-server** command is valid only on the virtual channel interface. Only one TN3270 server can run on a CMCC adapter. It will always be configured on a virtual channel interface.

The **no tn3270-server** command shuts down TN3270 server immediately. All active sessions will be disconnected and all DLUR and PU definitions deleted from the router configuration. To restart a TN3270 server, you must reconfigure all parameters.

Examples

The following example starts the TN3270 server and enters TN3270 server configuration mode:

```
tn3270-server
```

unbind-action

To select what action to take when the TN3270 server receives an UNBIND request, use the **unbind-action** TN3270 server configuration command. To restore the default, use the **no** form of this command.

unbind-action {**keep** | **disconnect**}

no unbind-action

Syntax Description

keep	No automatic disconnect will be made by the server on receipt of an UNBIND.
disconnect	Session will be disconnected upon receipt of an UNBIND.

Defaults

In TN3270 server configuration mode, the default is disconnect.

In PU configuration mode the default is the value currently configured in TN3270 server configuration mode.

Command Modes

TN3270 server configuration—The **unbind-action** command at this level applies to all PUs supported by the TN3270 server.

Listen-point configuration—The **unbind-action** command at this level applies to all PUs defined at the listen point.

Listen-point PU configuration—The **unbind-action** command at this level applies only to the specified PU.

DLUR PU configuration—The **unbind-action** command at this level applies to all PUs defined under DLUR configuration mode.

PU configuration—The **unbind-action** command at this level applies only to the specified PU.

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

The **unbind-action** command is valid only on the virtual channel interface. This command can be entered in either TN3270 server configuration mode or PU configuration mode. A value entered in TN3270 mode applies to all PUs for that TN3270 server, except as overridden by values entered in PU configuration mode. The **unbind-action** command affects currently active and future TN3270 sessions.

The **no unbind-action** command entered in PU configuration mode removes the override.

The **unbind-action** command affects currently active and future TN3270 sessions.

Examples

The following example prevents automatic disconnect:

```
unbind-action keep
```

vrn

To tell the SNA session switch the connection network to which the internal adapter interface on the CMCC adapter belongs, use the **vrn** DLUR SAP configuration command. To remove a network name, use the **no** form of this command.

vrn *vrn-name*

no vrn

Syntax Description

vrn-name	Fully qualified name of the connection network.

Defaults

The adapter is not considered to be part of a connection network.

Command Modes

DLUR SAP configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

The **vrn** command is valid only on the virtual channel interface. This command is used to discover routes without having to configure all possible links.

A connection network is also known as a shared-access transport facility (SATF). This means, at the MAC level, that all nodes in the network can reach each other using the same addressing scheme and without requiring the services of SNA session routing. A bridged LAN (whether source-route or transparent) is an example. Such a network is represented in the APPN topology as a kind of node, termed a virtual routing node (VRN).

To make use of this function, all APPN nodes must use the same VRN name for the SATF.

Refer to the VTAM operating system documentation for your host system for additional information regarding the VTAM VNGROUP and VNNAME parameters on the PORT statement of an XCA major node.

Several parameters in the DLUR configuration mode consist of fully qualified names, as defined by the APPN architecture. Fully qualified names consist of two case-insensitive alphanumeric strings, separated by a period. However, for compatibility with existing APPN products, including VTAM, the characters “#” (pound), “@” (at), and “$” (dollar) are allowed in the fully qualified name strings. Each string is from one to 8 characters long; for example, RA12.NODM1PP. The portion of the name before the period is the NET ID and is shared between entities in the same logical network.

Examples

The following example sets a VRN name:

```
vrn SYD.BLAN25
```

Related Commands

Command	Description
client pool	Nails clients to pools.
adapter	Configures internal adapters.
lan	Configures an internal LAN on a CMCC adapter interface and enters the internal LAN configuration mode.
lsap	Creates a SAP in the SNA session switch and enters DLUR SAP configuration mode.