



## Cisco Mainframe Channel Connection Commands

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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**

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

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For interface configuration information and examples, refer to the “Configuring Cisco Mainframe Channel Connection Adapters” chapter of the *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 *Configuration Fundamentals Command Reference*.

# adapter

Use the **adapter** internal LAN configuration command to configure internal adapters. Use the **no** form of this command to remove an internal adapter.

**adapter** *adapter-number* [*mac-address*]

**no adapter** *adapter-number* [*mac-address*]

## Syntax Description

<i>adapter-number</i>	Number in the range 0 to 31 that uniquely identifies the internal adapter (relative adapter number) for all internal LANs of the same type on the CMCC adapter. When configuring CSNA, this value corresponds to the ADAPNO parameter defined in the Virtual Telecommunications Access Method (VTAM) Extended Communications Adapter (XCA) Major Node.
<i>mac-address</i>	(Optional) Media access control (MAC) address for this internal adapter. This is a hexadecimal value in the form <i>xxxx.xxxx.xxxx</i> .

## Defaults

This command has no defaults.

## Command Modes

Internal LAN interface configuration

## Command History

Release	Modification
11.0	This command was introduced.

## Usage Guidelines

This command is valid only on the virtual channel interface. Internal adapters are used to provide LAN gateway MAC addresses for the following CMCC adapter features: CSNA, CMPC, and TN3270-Server.

Up to 18 internal adapters can be configured on a CMCC adapter. Internal adapters are configured on internal LANs. The only limit to the number of internal adapters you can configure on a single internal LAN is the limit of up to 18 total internal adapters per CMCC.

When removing an internal adapter configuration command or modifying an existing internal adapter, the *mac-address* parameter is not required. When in internal adapter configuration mode, the router prompt appears as follows:

```
router(cfg-adap-type n-m) #
```

In this syntax, *type* is the internal LAN type, *n* is the lan-id, and *m* is the adapter-number.

**Examples**

Following is an example:

```
interface channel 1/2
  lan tokenring 20
    adapter 3 4000.7500.0003
    adapter 4 4000.7500.0004
  lan tokenring 10
    source-bridge 100 1 2000
    adapter 1 4000.7500.1111
```

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>lan</b>	Configures an internal LAN on a CMCC adapter interface and enters the internal LAN configuration mode.
<b>name</b>	Assigns a name to the internal adapter.
<b>source-bridge</b>	Configures an interface for SRB.
<b>show extended channel lan</b>	Displays the internal LANs and adapters configured on a CMCC adapter.
<b>show extended channel llc2</b>	Displays information about the LLC2 sessions running on the CMCC adapter interfaces.
<b>show extended channel connection-map llc2</b>	Displays the number of active LLC2 connections for each SAP and the mapping of the internal MAC adapter and the SAP to the resource that activated the SAP.

# channel-protocol

Use the **channel-protocol** interface configuration command to define a data rate of either 3 megabytes per second or 4.5 megabytes per second for Parallel Channel Interfaces. Use the **no** form of the command to return to the default rate of 3 MBps.

**channel-protocol** [s | s4]

**no channel-protocol**

## Syntax Description

<b>s</b>	(Optional) Specifies a data rate of 3 megabytes per second.
<b>s4</b>	(Optional) Specifies a data rate of 4.5 megabytes per second.

## Defaults

If no value is specified, the default data rate for the PCA is 3 megabytes per second.

## Command Modes

Interface configuration

## Command History

Release	Modification
10.2	This command was introduced.

## Usage Guidelines

This command is valid on Parallel Channel Interfaces.

## Examples

The following example specifies a data rate of 4.5 megabytes per second for the interface:

```
channel-protocol s4
```

## claw (interface)

Use the **claw** interface configuration command to configure a CLAW device (read and write subchannel) for communication with a mainframe TCP/IP stack in IP Datagram mode. This command can also be used to configure individual members of a CLAW backup group for the IP Host Backup feature. Use the **no** form of the command to remove the CLAW device.

```
claw path device-address ip-address host-name device-name host-app device-app [broadcast]  
      [backup]
```

```
no claw path device-address
```

Syntax Description	
<i>path</i>	Hexadecimal value in the range 0000 to FFFF. This value specifies the logical channel path and consists of two digits for the physical connection (either on the host or on the ESCON director), one digit for the channel logical address, and one digit for the control unit logical address. If the path is not specified in the IOCP, the default values for channel logical address and control unit logical address is 0.
<i>device-address</i>	Hexadecimal value in the range 00 to FE. This is the unit address associated with the control unit number and path as specified in the host IOCP file. The device address must have an even value.
<i>ip-address</i>	IP address specified in the HOME statement of the host TCP/IP application configuration file.
<i>host-name</i>	Host name specified in the device statement in the host TCP/IP application configuration file.
<i>device-name</i>	CLAW workstation name specified in the device statement in the host TCP/IP application configuration file.
<i>host-app</i>	Host application name as specified in the host application file. If connected to the IBM TCP host offerings, or if the CLAW packing feature is not enabled on the mainframe TCPIP stack, this value will be <b>tcpip</b> , which is the constant specified in the host TCP/IP application file. When attached to other applications, this value must match the value hard coded in the host application. <b>PACKED</b> is another value that can be used for the <i>host-app</i> parameter to enable the CLAW packing feature.
<i>device-app</i>	CLAW workstation application specified in the host TCPIP application. If connected to the IBM TCP host offerings, or if the CLAW packing feature is not enabled on the mainframe TCPIP stack, this value will be <b>tcpip</b> , which is the constant specified in the host TCP/IP application file. When attached to other applications, this value must match the value hard coded in the host application. <b>PACKED</b> is another value that can be used for the <i>device-app</i> parameter to enable the CLAW packing feature.
<b>broadcast</b>	(Optional) Enables broadcast processing for this subchannel.
<b>backup</b>	(Optional) Enables this CLAW connection to be used as part of a backup group of CLAW connections for the specified IP address.

**claw (interface)****Defaults**

This command has no defaults.

**Command Modes**

Interface configuration

**Command History**

Release	Modification
10.2	This command was introduced.
12.0	These options were added: <ul style="list-style-type: none"> <li>• <b>packed</b></li> <li>• <b>backup</b></li> </ul>

**Usage Guidelines**

This command defines information that is specific to the hardware interface and the IBM channels supported on the interface. When used with the **path** command, the claw command provides a quick way to configure a CLAW backup group.

CLAW devices are used to switch IP packets between a mainframe and a channel-attached router.

At most, 128 statements can be configured per interface because each interface is limited to 256 subchannels. Each CLAW device uses a read channel and a write channel. There is also a restriction of 64 unique paths.

A limit of 32 CLAW device configuration commands is recommended.

Duplicate IP addresses are invalid for nonbackup configurations.

Duplicate IP addresses are permitted if they appear within a backup group of only **claw** or **offload** interface configuration commands. All configuration commands in one backup group must specify the **backup** keyword.

You can use the **path** interface configuration command to specify a number of paths that belong to a backup group. In that case, a **claw** IP host backup configuration command is used that needs no *path* variable or **backup** keyword.

**Examples**

The following example shows how to enable IBM channel attach routing on channel interface 3/0, which is supporting an ESCON direct connection to the mainframe:

```
interface channel 3/0
ip address 172.18.4.49 255.255.255.248
claw c020 F4 172.18.4.52 HOSTB RTRA TCPIP TCPIP
```

The following example shows how to enable CLAW packing:

```
interface Channel 3/0
ip address 172.18.4.49 255.255.255.248
claw c010 F2 172.18.4.50 HOSTA RTRA PACKED PACKED
```

The following example shows how an IP host backup group is specified using the **backup** keyword:

```
interface Channel3/0
no ip address
no keepalive
no shutdown
```

```

claw 0100 C0 10.30.1.2 CISCOVM EVAL TCPIP TCPIP backup
claw 0110 C0 10.30.1.2 CISCOVM EVAL TCPIP TCPIP backup
claw 0120 C0 10.30.1.2 CISCOVM EVAL TCPIP TCPIP backup
claw 0110 C2 10.30.1.3 CISCOVM EVAL TCPIP TCPIP

```

Related Commands	Command	Description
	<b>claw (IP-host-backup)</b>	Configures a CLAW device (read and write subchannel) for communication with a mainframe TCP/IP stack in Offload mode. Can also be used to configure individual members of a CLAW backup group for the IP Host Backup feature.
	<b>offload (interface)</b>	Configures an Offload device (read and write subchannel) for communication with a mainframe TCP/IP stack in Offload mode. Also can be used to configure individual members of an Offload backup group for the IP Host Backup feature.
	<b>offload (IP-host-backup)</b>	Specifies one or more data paths for the IP host backup.
	<b>show extended channel packing names</b>	Displays CLAW packing names and their connection state.
	<b>show extended channel packing stats</b>	Displays CLAW packing statistics.
	<b>show extended channel subchannel</b>	Displays information about the CMCC adapter physical interfaces and displays information that is specific to the interface channel connection. The information displayed generally is useful only for diagnostic tasks performed by technical support personnel.
	<b>show extended channel statistics</b>	Displays statistical information about subchannels on the physical interface of a CMCC adapter and displays information that is specific to the interface channel devices. The information generally is useful only for diagnostic tasks performed by technical support personnel.

## claw (IP-host-backup)

Use the **claw (IP-host-backup)** configuration command to configure a CLAW device (read and write subchannel) for communication with a mainframe TCP/IP stack in Offload mode. This command can also be used to configure individual members of a CLAW backup group for the IP Host Backup feature. Use the **no** form of the command to remove the CLAW device.

**claw** *device-address ip-address host-name device-name host-app device-app* [**broadcast**]

**no claw** *device-address*

Syntax Description		
	<i>path</i>	Hexadecimal value in the range 0000 to FFFF. This value specifies the logical channel path and consists of two digits for the physical connection (either on the host or on the ESCON director), one digit for the channel logical address, and one digit for the control unit logical address. If the path is not specified in the IOCP, the default values for channel logical address and control unit logical address is 0.
	<i>device-address</i>	Hexadecimal value in the range 00 to FE. This is the unit address associated with the control unit number and path as specified in the host IOCP file. The device address must have an even value.
	<i>host-name</i>	Host name specified in the device statement in the host TCP/IP application configuration file.
	<i>device-name</i>	CLAW workstation name specified in the device statement in the host TCP/IP application configuration file.
	<i>host-app</i>	Host application name as specified in the host application file. When connected to the IBM TCP host offerings, this value will be <b>tcpip</b> , which is the constant specified in the host TCP/IP application file. When attached to other applications, this value must match the value hard coded in the host application.
	<i>device-app</i>	CLAW workstation application specified in the host TCPIP application. When connected to the IBM TCP host offerings, this value will be <b>tcpip</b> , which is the constant specified in the host TCP/IP application file. When attached to other applications, this value must match the value hard coded in the host application.
	<b>broadcast</b>	(Optional) Enables broadcast processing for this subchannel.

### Defaults

This command has no defaults.

### Command Modes

IP host backup configuration

### Command History

Release	Modification
12.0	This command was introduced.

**Usage Guidelines**

This command defines information that is specific to the hardware interface and the IBM channels supported on the interface.

CLAW devices are used to switch IP packets between a mainframe and a channel-attached router.

At most, 128 statements can be configured per interface because each interface is limited to 256 subchannels. Each CLAW device uses a read channel and a write channel. There is also a restriction of 64 unique paths.

A limit of 32 CLAW device configuration commands is recommended.

Duplicate IP addresses are invalid for non-backup configurations.

Duplicate IP addresses are permitted if they appear within a backup group of only **claw** or **offload** interface configuration commands. All configuration commands in one backup group must specify the **backup** keyword.

You can use the **path** interface configuration command to specify a number of paths that belong to a backup group. In that case, a **claw** IP host backup configuration command is used that needs no *path* variable or **backup** keyword.

**Examples**

The following examples show two methods for entering the same IP host backup group information. The first group of commands is the long form, using the **claw** interface configuration command. The second group is the shortcut, using the **path** interface configuration command and a **claw** IP host backup configuration command.

Long form:

```
claw c000 00 198.92.10.5 sysa router1 tcpip tcpip backup
claw c100 00 198.92.10.5 sysa router1 tcpip tcpip backup
claw c200 00 198.92.10.5 sysa router1 tcpip tcpip backup
```

Shortcut form:

```
path c000 c100 c200
  claw 00 198.92.10.5 sysa router1 tcpip tcpip
```

**Related Commands**

Command	Description
<b>claw (interface)</b>	Configures a CLAW device (read and write subchannel) for communication with a mainframe TCP/IP stack in IP Datagram mode. Can also be used to configure individual members of a CLAW backup group for the IP Host Backup feature.
<b>offload (interface)</b>	Configures an Offload device (read and write subchannel) for communication with a mainframe TCP/IP stack in Offload mode. Also can be used to configure individual members of an Offload backup group for the IP Host Backup feature.
<b>offload (IP-host-backup)</b>	Specifies one or more data paths for the IP host backup.
<b>show extended channel packing names</b>	Displays CLAW packing names and their connection state.

<b>Command</b>	<b>Description</b>
<b>show extended channel packing stats</b>	Displays CLAW packing statistics.
<b>show extended channel subchannel</b>	Displays information about the CMCC adapter physical interfaces and displays information that is specific to the interface channel connection. The information displayed generally is useful only for diagnostic tasks performed by technical support personnel.
<b>show extended channel statistics</b>	Displays statistical information about subchannels on the physical interface of a CMCC adapter and displays information that is specific to the interface channel devices. The information generally is useful only for diagnostic tasks performed by technical support personnel.

# clear extended counters

Use the **clear extended counters** EXEC command to clear the extended interface counters associated with CMCC features.

```
clear extended counters [channel slot/port [csna | icmp-stack | ip-stack | llc2 | statistics |
tcp-connections | tcp-stack | tg | tn3270-server | udp-stack]]
```

Syntax Description		
<b>channel</b>	(Optional)	Specify a channel interface.
<i>slot</i>	(Optional)	Slot number.
<i>port</i>	(Optional)	Port number.
<b>csna</b>	(Optional)	Clear CSNA feature counters.
<b>icmp-stack</b>	(Optional)	Clear ICMP stack counters.
<b>ip-stack</b>	(Optional)	Clear IP stack counters.
<b>llc2</b>	(Optional)	Clear LLC2 counters.
<b>statistics</b>	(Optional)	Clear subchannel statistic counters.
<b>tcp-connections</b>	(Optional)	Clear TCP connection counters.
<b>tcp-stack</b>	(Optional)	Clear TCP stack counters.
<b>tg</b>	(Optional)	Clear TG counters.
<b>tn3270-server</b>	(Optional)	Clear TN3270 Server counters.
<b>udp-stack</b>	(Optional)	Clear UDP stack counters.

**Command Modes** Privileged EXEC.

Command History	Release	Modification
	11.3	This command was introduced.

**Usage Guidelines** This command is valid on both the physical and virtual channel interfaces. To clear counters for a selected CMCC feature, you must specify the channel interface on which the feature is configured or running.

Counters displayed using the **show extended channel** EXEC command are cleared using this command.

Entering any form of this command will prompt the user for a confirmation before clearing any counters. A “CLEAR-5-EXT\_COUNT” message is displayed to indicate successful completion of the command.

These counters will be cleared in the show commands and remain uncleared when obtained via the SNMP interface.

**Examples** The following is an example of the command:

```
clear extended counters
```

Related Commands	Command	Description
	<b>show extended channel csna</b>	Displays information about the CSNA subchannels configured on the specified CMCC interface.
	<b>show extended channel icmp-stack</b>	Displays information about the ICMP stack running on the CMCC channel interfaces.
	<b>show extended channel ip-stack</b>	Displays information about the IP stack running on CMCC channel interfaces.
	<b>show extended channel lan</b>	Displays the internal LANs and adapters configured on a CMCC adapter.
	<b>show extended channel llc2</b>	Displays information about the LLC2 sessions running on the CMCC adapter interfaces.
	<b>show extended channel statistics</b>	Displays statistical information about subchannels on the physical interface of a CMCC adapter and displays information that is specific to the interface channel devices. The information generally is useful only for diagnostic tasks performed by technical support personnel.
	<b>show extended channel tcp-connections</b>	Displays information about the TCP sockets on a channel interface.
	<b>show extended channel tcp-stack</b>	Displays information about the TCP stack running on CMCC adapter interfaces.
	<b>show extended channel tg</b>	Displays configuration, operational information, and statistics information for CMPC transmission groups configured on the virtual interface of the specified CMCC adapter.
	<b>show extended channel tn3270-server</b>	Displays current server configuration parameters and the status of the PUs defined for the TN3270 server.
	<b>show extended channel udp-stack</b>	Displays information about the UDP stack running on the CMCC adapter interfaces.

## client (lu limit)

Use the **client** TN3270 server configuration command to limit the number of LU sessions that can be established from a client IP address. Use the **no** form of this command to remove a single LU limit associated with a particular IP address.

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

**no client** [*ip* [*ip-mask*]] [**lu maximum** *number*]

### Syntax Description

<i>ip</i>	(Optional) IP address of the client. The <i>ip</i> value is optional when setting the maximum number of LU sessions. If no IP address is specified then the limit is applied to all clients.
<i>ip-mask</i>	(Optional) IP network mask for the client. The default is 255.255.255.255
<i>number</i>	(Optional and ignored in <b>no</b> form of the command). 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. In the **no** form of this command, the default *number* 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* 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.

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
<b>maximum-lus</b>	Limits the number of LU control blocks that will be allocated for TN3270 server use.

## client (lu nailing)

Use the **client** TN3270 PU configuration mode command to define a range of locaddr to be reserved for remote devices. Use the **no** form of this command to cancel this definition.

**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 <i>n</i> , where <i>n</i> 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 <b>printer</b> keyword is not specified for any <b>client</b> statement that has this IP address set, all model types can use this range of LUs.
	<i>ip-address</i>	Specifies remote client IP address.
	<i>ip-mask</i>	(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 locaddr.
	<i>first-locaddr</i>	Defines a single locaddr to nail.
	<i>last-locaddr</i>	(Optional) Defines the end range of inclusive locaddr to be nailed from <i>first-locaddr</i> to <i>last-locaddr</i> .

**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 locaddr are already nailed. If the locaddr 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 locaddr was specified, to cancel this definition the whole range of locaddr must be specified. There is no way to cancel only one locaddr if a whole range of locaddr was configured.

## Examples

In the following example, locaddr 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, locaddr 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 locaddr 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
<b>pu (DLUR)</b>	Creates a PU entity that has no direct link to a host, or enters PU configuration mode.

# cmpr

Use the **cmpr** interface configuration command to configure a CMPC read subchannel and a CMPC write subchannel. Use the **no** form of this command to remove a subchannel definition and to deactivate the transmission group.

```
cmpr path device tg-name {read | write}
```

```
no cmpr path device
```

## Syntax Description

<i>path</i>	Hexadecimal value in the range 0000 to FFFF. This value specifies the logical channel path and consists of two digits for the physical connection (either on the host or on the ESCON director), one digit for the channel logical address, and one digit for the control unit logical address. If the path is not specified in the IOCP, the default values for channel logical address and control unit logical address is 0.
<i>device</i>	Hexadecimal value in the range of 00 to FF. This is the unit address associated with the control unit number and path as specified in the host IOCP file.
<i>tg-name</i>	The name of the CMPC transmission group. The maximum length of the name is 8 characters.
<b>read</b>	The same value read, as specified in the TRL major node.
<b>write</b>	The same value write, as specified in the TRL major node.

## Defaults

No default is specified.

## Command Modes

Interface configuration.

## Command History

Release	Modification
11.3	This command was introduced.

## Usage Guidelines

Each **cmpr** configuration command in a given CMPC transmission group specifies the same transmission group name. The corresponding **tg** command specifies the same transmission group name. Together, the **cmpr** and **tg** commands make up the transmission group specification.

The **cmpr** command defines the read/write subchannel addresses that CMPC uses to connect to the host. The command corresponds to the definitions in the TRL major node on the host. Configure the CMPC command on a CMCC adapter physical interface. Configure one read subchannel and one write subchannel. If CMPC is configured on a CMCC adapter with two physical interfaces, the read and write CMPC subchannels may be configured on separate physical interfaces.

The **no cmpc** command deactivates the CMPC subchannel. If the transmission group is used for a non-HPR connection, all sessions using the TG will be terminated immediately. If the transmission group is an HPR connection, all sessions using the transmission group will be terminated if no other HPR connection is available to the host.

---

**Examples**

The following example configures a read and a write subchannel on path C020 for the CMPC transmission group named CONFIGE:

```
cmpr C020 F8 CONFIGE READ
cmpr C020 F9 CONFIGE WRITE
```

---

**Related Commands**

Command	Description
<b>tg</b>	Defines LLC connection parameters for the CMPC transmission group.
<b>show extended channel cmpr</b>	Displays information about each CMPC subchannel configured on the specified channel interface.
<b>show extended channel tg</b>	Displays configuration, operational information, and statistics information for CMPC transmission groups configured on the virtual interface of the specified CMCC adapter.
<b>show extended channel subchannel</b>	Displays information about the CMCC adapter physical interfaces and displays information that is specific to the interface channel connection. The information displayed generally is useful only for diagnostic tasks performed by technical support personnel.
<b>show extended channel statistics</b>	Displays statistical information about subchannels on the physical interface of a CMCC adapter and displays information that is specific to the interface channel devices. The information generally is useful only for diagnostic tasks performed by technical support personnel.

## csna

Use the **csna** interface configuration command to configure SNA support on a CMCC physical channel interface. This command is used to specify the path and device/subchannel on a physical channel of the router to communicate with an attached mainframe. Use the **no** form of this command to delete the CSNA device path.

```
csna path device [maxpiu value] [time-delay value] [length-delay value]
```

```
no csna path device
```

Syntax Description		
<i>path</i>		Hexadecimal value in the range 0000 to FFFF. This value specifies the logical channel path and consists of two digits for the physical connection (either on the host or on the ESCON director), one digit for the channel logical address, and one digit for the control unit logical address. If the path is not specified in the IOCP, the default values for channel logical address and control unit logical address is 0.
<i>device</i>		Hexadecimal value in the range 00 to FF. This is the unit address associated with the control unit number and path as specified in the host IOCP file.
<b>maxpiu value</b>		(Optional) Maximum channel I/O block size in bytes that is transmitted across the physical channel from the CMCC adapter to the attached mainframe. The range is 4096 to 65535 bytes. The default is 20470 bytes.
<b>time-delay value</b>		(Optional) Number of milliseconds a host-bound SNA frame may be delayed in order to maximize the channel I/O block size. The range is 0 to 100 ms. The default is 10 ms.
<b>length-delay value</b>		(Optional) Amount of SNA frame data in bytes the CSNA subchannel accumulates before transmitting the accumulated channel I/O block to the attached mainframe. The range is 0 to 65535 bytes. The default is 20470 bytes.

Defaults	
	<b>maxpiu value:</b> 20470 (0x4ff6) bytes
	<b>time-delay value:</b> 10 ms
	<b>length-delay value:</b> 20470 (0x4ff6) bytes

Command Modes	
	Interface configuration

Command History	Release	Modification
	11.0	This command was introduced.

**Usage Guidelines**

The parameters **maxpiu**, **time-delay** and **length-delay** control the characteristics of host-bound traffic for the CSNA subchannel. The channel protocol used by CSNA allows multiple SNA frames to be blocked into one channel I/O block, reducing the channel bandwidth utilization and mainframe and CMCC adapter process utilization.

The **maxpiu** parameter allows you to set the maximum size of a host-bound channel I/O block.

The **time-delay** parameter instructs the CSNA subchannel to delay sending the channel I/O block for the specified time in milliseconds, from the time the first SNA packet is blocked. This can increase the network latency for an SNA packet by up to the specified time delay.

The length-delay parameter instructs the CSNA subchannel to delay sending the channel I/O block until it contains the number of bytes specified by the length-delay parameter. An accumulated block is sent to the mainframe if one of the following conditions is true:

- the time-delay expires
- the channel I/O block reaches the length-delay size
- channel I/O block reaches the maxpiu size.

A time-delay value of 0 instructs the CSNA subchannel to send SNA packets to the mainframe as soon as they are received from the network. A length-delay value of 0 instructs the CSNA subchannel to ignore this parameter.

The **no csna** command deactivates and removes the CSNA subchannel configuration. It also deactivates all LLC2 sessions established over the subchannel.

**Examples**

The following example shows CSNA, offload, and CLAW configured on a channel interface. CSNA has no dependencies to CLAW, Offload, or CMPC.

```
interface channel 1/0
  no ip address
  no keepalive
  offload c700 c0 172.18.1.127 TCPIP OS2TCP TCPIP TCPIP TCPIP API
  claw C700 c2 172.18.1.219 EVAL CISCVM AAA BBB
  csna c700 c4
  csna c700 c5 maxpiu 65535 time-delay 100 length-delay 65535
  csna c700 c6 maxpiu 65535 time-delay 100
```

**Related Commands**

Command	Description
<b>lan</b>	Configures an internal LAN on a CMCC adapter interface and enters the internal LAN configuration mode.
<b>adapter</b>	Configures internal adapters.
<b>show extended channel csna</b>	Displays information about the CSNA subchannels configured on the specified CMCC interface.

<b>Command</b>	<b>Description</b>
<b>show extended channel connection-map llc2</b>	Displays the number of active LLC2 connections for each SAP and the mapping of the internal MAC adapter and the SAP to the resource that activated the SAP.
<b>show extended channel subchannel</b>	Displays information about the CMCC adapter physical interfaces and displays information that is specific to the interface channel connection. The information displayed generally is useful only for diagnostic tasks performed by technical support personnel.
<b>show extended channel statistics</b>	Displays statistical information about subchannels on the physical interface of a CMCC adapter and displays information that is specific to the interface channel devices. The information generally is useful only for diagnostic tasks performed by technical support personnel.

## dlur (TN3270)

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

**dlur** [*fq-cpname fq-dlusname*]

**no dlur**

Syntax Description		
	<i>fq-cpname</i>	(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 <i>fq-cpname</i> values specified on all other TN3270 servers running under the Cisco IOS software.
	<i>fq-dlusname</i>	(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 <i>fq-dlusname</i> value 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 eight characters long; for example, RA12.NODM1PP. The portion of the name before the period is the NETID 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 NETID portion of both names is the same:

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

---

**Related Commands**

Command	Description
<b>dlur (TN3270)</b>	Specifies a backup DLUS for the DLUR function.
<b>lsap</b>	Creates a SAP in the SNA session switch, or enters DLUR SAP configuration mode.
<b>preferred-nserver</b>	Specifies a preferred NN as server.
<b>pu (DLUR)</b>	Creates a PU entity that has no direct link to a host, or enters PU configuration mode.

# dlus-backup

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

**dlus-backup** *dlusname2*

**no dlus-backup**

Syntax Description	<i>dlusname2</i>	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 <b>dlus-backup</b> command is in use when a <b>no dlus-backup</b> 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 eight characters long; for example, RA12.NODM1PP. The portion of the name before the period is the NETID 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
	<b>dlur (TN3270)</b>	Enables the SNA session switch function on the CMCC adapter, or enters DLUR configuration mode.

# exception slot

Use the **exception slot** global configuration command to provide a core dump of a CMCC adapter. This command is only supported on the Cisco 7000 with RSP7000 and Cisco 7500 series. Use the **no** form of the command to disable the core dump.

**exception slot** [*slot*] *protocol://host/filename*

**no exception slot** [*slot*] *protocol://host/filename*

## Syntax Description

<i>slot</i>	(Optional) Slot number of the CMCC adapter. If no <i>slot</i> is specified, all installed CMCC adapters will output a core dump when they halt unexpectedly.
<i>protocol</i>	Protocol for transferring the file. Currently, the only allowed value is FTP.
<i>host</i>	Name or IP address of the host that receives the core dump information.
<i>filename</i>	Filename on the host that receives the core dump information. The maximum name length is 31 characters. When written to the host, <i>slot</i> is automatically appended, where <i>slot</i> is the slot number.

## Defaults

This command has no defaults.

## Command Modes

Global configuration

## Command History

Release	Modification
11.2	This command was introduced.

## Usage Guidelines

You must configure FTP services on the router before you can create a CMCC adapter core dump. Do not exceed your host limits on filename length. An additional two characters are added to the filename, *.slot*, where *slot* is the slot number.

## Examples

The following example shows how to configure a router to perform a CMCC adapter core dump. Assuming the CIP is installed in slot 3, the filename `cipdump.3` will be written to the host.

```
ip domain-name cisco.com
ip name-server 168.69.161.21
ip ftp username tech1
ip ftp password tech1
exception slot ftp://168.18.2.196/cipdump
```

■ exception slot

Related Commands	Command	Description
	<b>ip domain-name</b>	Defines a default domain name to complete unqualified host names (names without a dotted-decimal domain name).
	<b>ip name-server</b>	Specifies the address of one or more name servers to use for name and address resolution.
	<b>ip ftp username</b>	Configures the username for FTP connections.
	<b>ip ftp password</b>	Specifies the password to be used for FTP connections.

# generic-pool

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

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

**no generic-pool**

Syntax Description	permit	deny
	Left-over LUs should be made available to TN3270 users wanting generic sessions. This value is the default.	Left-over 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. PU configuration

## Command History

Release	Modification
11.2	This command was introduced.

## Usage Guidelines

This command is valid only on the virtual channel interface.

A left-over 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; and
- 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.

## ■ generic-pool

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
<b>client (lu nailing)</b>	Defines a range of locaddr's to be reserved for remote devices.

# idle-time

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

**idle-time** *seconds*

**no idle-time**

## Syntax Description

<i>seconds</i>	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. PU configuration

## 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
	<b>keepalive (TN3270)</b>	Specifies how many seconds of inactivity elapse before transmission of a DO TIMING-MARK to the TN3270 client.
	<b>timing-mark</b>	Selects whether a WILL TIMING-MARK is sent when the host application needs an SNA response (definite or pacing response).

# interface channel

Use the **interface channel** global configuration command to specify a channel attach interface and enter interface configuration mode.

**interface channel** *slot/port*

## Syntax Description

<i>slot</i>	Slot number where the CMCC adapter is located.
<i>port</i>	Interface where the CMCC adapter is located.

## Defaults

This command has no defaults.

## Command Modes

Global configuration

## Command History

Release	Modification
10.2	This command was introduced.

## Examples

The following example shows how to enter interface configuration mode for a CIP in slot 2 and begin configuring port 0:

```
interface channel 2/0
```

## Related Commands

Command	Description
<b>channel-protocol</b>	Defines a data rate of either 3 MBps or 4.5 MBps for PCIs.
<b>claw (interface)</b>	Configures a CLAW device (read and write subchannel) for communication with a mainframe TCP/IP stack in IP Datagram mode. Can also be used to configure individual members of a CLAW backup group for the IP Host Backup feature.
<b>client (lu limit)</b>	Configures a CMPC read subchannel and a CMPC write subchannel.
<b>csna</b>	Configures SNA support on a CMCC physical channel interface and specifies the path and device/subchannel on a physical channel of the router to communicate with an attached mainframe.
<b>lan</b>	Configures an internal LAN on a CMCC adapter interface and enters the internal LAN configuration mode.
<b>max-llc2-sessions</b>	Specifies the maximum number of LLC2 sessions supported on the CMCC adapter.
<b>offload (interface)</b>	Configures an Offload device (read and write subchannel) for communication with a mainframe TCP/IP stack in Offload mode. Also can be used to configure individual members of an Offload backup group for the IP Host Backup feature.

<b>Command</b>	<b>Description</b>
<b>offload (IP-host-backup)</b>	Specifies one or more data paths for the IP host backup.
<b>tg</b>	Defines LLC connection parameters for the CMPC transmission group.
<b>tn3270-server</b>	Starts the TN3270 server on a CMCC adapter or enters TN3270 server configuration mode.

# ip precedence (TN3270)

Use the **ip precedence (TN3270)** command to specify the precedence level for voice over IP traffic in the TN3270 server. Use the **no** form of this command to remove the precedence value.

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

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

Syntax Description	Parameter	Description
	<b>screen</b>	Specifies the precedence is for screen devices.
	<b>printer</b>	Specifies the precedence is for printer devices.
	<i>value</i>	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 mode. 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. 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
	<b>ip tos</b>	Specifies the TOS level for IP traffic in the TN3270 server.

# ip tos

Use the **ip tos** command to specify the TOS level for IP traffic in the TN3270 server. Use the **no** form of this command to remove the TOS value.

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

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

## Syntax Description

<b>screen</b>	Specifies the TOS is for screen devices.
<b>printer</b>	Specifies the TOS is for printer devices.
<i>value</i>	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 mode. 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. 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 62 shows the values described in RFC 1349

**Table 62 TOS Defined Values**

Value	Definition	Action
0	All normal.	Use default metric.
8	Minimize delay.	Use delay metric.
4	Maximize throughput.	Use default metric.
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
<b>ip precedence (TN3270)</b>	Specifies the precedence level for IP traffic in the TN3270 server.

## keepalive (TN3270)

Use the **keepalive** TN3270 configuration command to specify how many seconds of inactivity elapse before transmission of a DO TIMING-MARK to the TN3270 client. Use the **no** form of this command to cancel the keepalive period and return to the default.

**keepalive** *seconds*

**no keepalive**

<b>Syntax Description</b>	<i>seconds</i>	Number of seconds, from 0 to 65535. A value of 0 means no keepalive signals are sent. The default is 1800 seconds (30 minutes).
---------------------------	----------------	---

<b>Defaults</b>	The default in TN3270 configuration mode is 1800 seconds (30 minutes). The default in PU configuration mode is the value currently configured in TN3270 configuration mode.
-----------------	--

<b>Command Modes</b>	TN3270 configuration. PU configuration
----------------------	--

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	11.2	This command was introduced.

<b>Usage Guidelines</b>	<p>The <b>keepalive</b> (TN3270) command is valid only on the virtual channel interface. This command can be entered in either TN3270 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 <b>no keepalive</b> command entered in PU configuration mode will restore the <b>keepalive</b> value entered in TN3270 command mode.</p>
-------------------------	--

The default behavior of the TN3270 server is to send timing marks every 30 minutes if there is no other traffic flowing between the TN3270 client and server. The TN3270 server disconnects a session if the client does not respond within 30 seconds. (The DO TIMING-MARK is a Telnet protocol operation that does not affect the client operation.)

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 will usually take much less than 30 minutes.

The **keepalive** command affects currently active and future TN3270 sessions. For example, reducing the value to a smaller nonzero value will cause 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.

The **keepalive** command can be used to determine whether power-off Reply product set ID (PSID) network management vector transport (NMVT) is sent to the host. With the default value, the power-off Reply PSID NMVT is not sent. Increasing the value to 50000 or above will enable the sending of power-off Reply PSID NMVT. If the configured value is greater than 50000, the keepalive function uses a value equal to 50000 less than the configured value.

### Using the Idle Time and Keepalive Options

There are two TN3270 server options that can affect when a session is disconnected—idle time and keepalive. These two options operate independently of each other and both can be used to clean up partially disconnected sessions. Whichever option first detects that a session is eligible for disconnect immediately causes the TN3270 server to disconnect that session. If you are specifying both the idle time and keepalive options, then you might consider how the values for these options determine when client sessions are disconnected to achieve the response that you want.

The amount of time that the TN3270 server waits for a keepalive response is the value (in seconds) that is the lesser of the the following values:

- [30 seconds + (**keepalive** value/4)]
- **idle-time** value in seconds

### Examples

The following example sets keepalive disconnect value of 15 minutes (900 seconds):

```
keepalive 900
```

The following example entered in TN3270 configuration mode sets the keepalive disconnect value to 51800 seconds, a value greater than 50000, and enables the sending of power-off Reply product set ID (PSID) network management vector transport (NMVT) to the host.

```
keepalive 51800
```

The following example entered in TN3270 configuration mode sets the keepalive disconnect value to 1800 seconds, the default:

```
no keepalive
```

### Related Commands

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

# lan

Use the **lan** interface configuration command to configure an internal LAN on a CMCC adapter interface and enter the internal LAN configuration mode. Use the **no** form of the command to remove an internal LAN interface.

**lan** *type lan-id*

**no lan** *type lan-id*

Syntax Description	<i>type</i>	Interface type for this internal LAN: <b>tokenring</b> .
	<i>lan-id</i>	A number 0 to 31 that uniquely identifies this internal LAN on this CMCC adapter. This value must be unique between all internal LANs of the same interface type on a CMCC adapter.

**Defaults** This command has no defaults.

**Command Modes** Interface configuration

Command History	Release	Modification
	11.0	This command was introduced.

**Usage Guidelines** Token Ring is the only type of internal LAN that is supported.

This command is valid only on the virtual channel interface. All internal adapters configured on the internal LAN must be removed first before the internal LAN can be removed.

A CMCC internal LAN can be configured as a SRB LAN. This allows LLC packets to be bridged between the CMCC adapter and IOS, providing a means to link the internal LAN to IOS SNA features such as SRB, DLSw+, RSRB, SDLLc, QLLC, APPN, and SR/TLB.

An internal LAN can only be configured on a virtual channel interface of a CMCC adapter. You enter the internal LAN configuration mode by issuing the command for an internal LAN that already exists or when you configure an internal LAN for the first time. In the internal LAN configuration mode, the router prompt appears as follows:

```
router (cfg-lan-type n) #
```

In this syntax, *type* is the specified internal LAN type and *n* is the specified lan-id.

**Examples** The following example shows how to configure an internal LAN Token Ring with a LAN ID of 20 on the channel interface 1/2:

```
interface channel 1/2
 lan tokenring 20
```

<b>Related Commands</b>	<b>Command</b>	<b>Description</b>
	<b>adapter</b>	Configures internal adapters.
	<b>locaddr-priority</b>	Assigns an RSRB priority group to an input interface.
	<b>sap-priority</b>	Defines a priority list on an interface.
	<b>show extended channel lan</b>	Displays the internal LANs and adapters configured on a CMCC adapter.
	<b>source-bridge</b>	Configures an interface for SRB.

# link

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

**link** *name* [**r***mac* *rmac*] [**r***sap* *rsap*]

**no link** *name*

Syntax Description		
<i>name</i>		Link name, from one to eight alphanumeric characters. The first character must be alphabetic. The name must be unique within the DLUR function.
<i>rmac</i>		(Optional) Remote MAC address of the form <i>xxxx.xxxx.xxxx</i> in hexadecimal. If not specified, a loopback link to another SAP on the same internal LAN adapter is assumed.
<i>rsap</i>		(Optional) Remote SAP address, 04 to FC in hexadecimal. The <i>rsap</i> value must be even and should be a multiple of 4, but this requirement is not enforced. The <i>rsap</i> value default 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
<b>adapter</b>	Configures internal adapters.
<b>dlur (TN3270)</b>	Enables the SNA session switch function on the CMCC adapter, or enters DLUR configuration mode.
<b>lan</b>	Configures an internal LAN on a CMCC adapter interface and enters the internal LAN configuration mode.
<b>lsap</b>	Creates a SAP in the SNA session switch, or enters DLUR SAP configuration mode.

# Isap

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

**Isap** *type adapter-number* [*Isap*]

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

Syntax Description		
<i>type</i>		Internal adapter type on the CIP card, which corresponds to the value specified in the <b>lan</b> internal LAN configuration command. The currently supported type is <b>token-adapter</b> .
<i>adapter-number</i>		Internal adapter interface on the CIP card, which is the same value specified in the <b>adapter</b> internal LAN configuration command.
<i>Isap</i>		(Optional) Local SAP number, 04 to FC, in hex. 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 *Isap* is hexadecimal C0.

**Command Modes** DLUR configuration

Command History	Release	Modification
	11.2	This command was introduced.

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

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

The **Isap** 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 **Isap** command. However, the **lan type** keyword is a little different. Where the *type* on the **lan** command is **tokenring**, the corresponding *type* on **Isap** is **token-adapter**. This emphasizes that the number that follows is an **adapter** number, not a **lan** number.

The **no Isap** 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
<b>adapter</b>	Configures internal adapters.
<b>dlur (TN3270)</b>	Enables the SNA session switch function on the CMCC adapter, or enters DLUR configuration mode.
<b>lan</b>	Configures an internal LAN on a CMCC adapter interface and enters the internal LAN configuration mode.

## max-llc2-sessions

Use the **max-llc2-sessions** interface configuration command to specify the maximum number of LLC2 sessions supported on the CMCC adapter. Use the **no** form of this command to remove the current value and change back to the default value.

**max-llc2-sessions** *number*

**no max-llc2-sessions** *number*

<b>Syntax Description</b>	<i>number</i>	A value in the range 1 to 6000 LLC sessions. If this command is not configured, the default is 256 sessions.
---------------------------	---------------	--

**Defaults** The default number of sessions is 256.

**Command Modes** Interface configuration.

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	11.0	This command was introduced.

**Usage Guidelines** This command is configured on the virtual interface of a CIP, and the physical interface of a CPA. If you do not configure this parameter on the CMCC adapter, then the limit of LLC2 sessions is 256. This command will fail if there is not enough memory currently available on the CMCC adapter to support the specified number of LLC2 sessions.



**Note** A value of 0 sets the maximum number of LLC2 sessions to the default value of 256. In this case, the value does not appear in your configuration when you use the **show run** command.

**Examples** The following example limits the maximum number of LLC2 sessions to 212:

```
max-llc2-sessions 212
```

# maximum-lus

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

**maximum-lus** *number*

**no maximum-lus**

## Syntax Description

<i>number</i>	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% 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
	<b>client (lu limit)</b>	Limits the number of LU sessions that can be established from a client IP address.
	<b>pu (direct)</b>	Creates a PU entity that has its own direct link to a host, or enters PU configuration mode.
	<b>pu (DLUR)</b>	Creates a PU entity that has no direct link to a host, or enters PU configuration mode.

# name

Use the **name** internal adapter configuration command to give a name to the internal adapter. Use the **no name** form of the command to remove the name assigned to an internal adapter.

**name** *name*

**no name** *name*

Syntax Description	<i>name</i>	Name that identifies this internal adapter. Consists of up to 8 characters that does not include blanks.
--------------------	-------------	--

**Defaults** This command has no defaults.

**Command Modes** Internal adapter configuration

Command History	Release	Modification
	11.0	This command was introduced.

**Examples** The following example assigns a name to an internal adapter interface:

```
name VTAM_B14
```

Related Commands	Command	Description
	<b>adapter</b>	Configures internal adapters.

## offload (interface)

Use the **offload** interface configuration command to configure an Offload device (read and write subchannel) for communication with a mainframe TCP/IP stack in Offload mode. This command can also be used to configure individual members of an Offload backup group for the IP Host Backup feature. Use the **no** form of this command to cancel the offload task on the CMCC adapter.

**offload** *path device-address ip-address host-name device-name host-ip-link device-ip-link host-api-link device-api-link* [**broadcast**] [**backup**]

**no offload** *path device-address*

Syntax Description	
<i>path</i>	Hexadecimal value in the range 0000 to FFFF. This value specifies the logical channel path and consists of two digits for the physical connection (either on the host or on the ESCON director), one digit for the channel logical address, and one digit for the control unit logical address. If the path is not specified in the IOCP, the default values for channel logical address and control unit logical address is 0.
<i>device-address</i>	Hexadecimal value in the range 00 to FE. This is the unit address associated with the control unit number and path as specified in the host IOCP file. The device address must have an even value.
<i>ip-address</i>	IP address specified in the host TCP/IP application configuration file.
<i>host-name</i>	Host name specified in the device statement in the host TCP/IP application configuration file.
<i>device-name</i>	CLAW workstation name specified in the device statement in the host TCP/IP application configuration file.
<i>host-ip-link</i>	CLAW host link name for the IP link as specified by the host application. For IBM VM and VMS TCP/IP stacks, this value is <b>tcpip</b> . When used with other applications, this value must match the value coded in the host application.
<i>device-ip-link</i>	CLAW workstation link name for the IP link as specified by the host application. For IBM VM and MVS TCP/IP stacks, this value is <b>tcpip</b> . When used with other applications, this value must match the value coded in the host application.
<i>host-api-link</i>	CLAW host link name for the API link as specified by the host application. For IBM VM and MVS TCP/IP stacks, this value is <b>tcpip</b> . When used with other applications, this value must match the value coded in the host application.
<i>device-api-link</i>	Offload link name for the API link as specified by the host application. For IBM VM and MVS TCP/IP stacks, this value is <b>api</b> . When used with other applications, this value must match the value coded in the host application.
<b>broadcast</b>	(Optional) Enables broadcast processing for this subchannel.
<b>backup</b>	(Optional) Enables this offload connection to be used as part of a backup group of offload connections for the specified IP address.

**Defaults** This command has no defaults.

**Command Modes** Interface configuration

Command History	Release	Modification
	11.0	This command was introduced.
	12.0	The <b>backup</b> option was added.

**Usage Guidelines** Offload devices provide IP connectivity to a mainframe while at the same time offloading a large part of the TCP/IP processing to the CMCC adapter. Not every mainframe TCP/IP stack supports offload. The **offload** command uses the same underlying configuration parameters as does the **claw** command.

**Examples** The following example shows how to enable IBM channel attach offload processing on a CMCC adapter's physical channel interface which is supporting a directly connected ESCON channel:

```
interface channel 3/0
ip address 198.92.0.1 255.255.255.0
offload 0100 00 198.92.0.21 CISCOVM EVAL TCPIP TCPIP TCPIP API
```

The following example shows how an IP host backup group is specified using the **backup** keyword:

```
interface Channel3/0
no ip address
no keepalive
shutdown
offload 0100 C0 10.30.1.2 TCPIP OS2TCP TCPIP TCPIP TCPIP API backup
offload 0110 C0 10.30.1.2 TCPIP OS2TCP TCPIP TCPIP TCPIP API backup
offload 0120 C0 10.30.1.2 TCPIP OS2TCP TCPIP TCPIP TCPIP API backup
offload 0110 C2 10.30.1.3 TCPIP OS2TCP TCPIP TCPIP TCPIP API
```

Related Commands	Command	Description
	<b>offload (IP-host-backup)</b>	Specifies one or more data paths for the IP host backup.
	<b>show extended channel icmp-stack</b>	Displays information about the ICMP stack running on the CMCC channel interfaces.
	<b>show extended channel ip-stack</b>	Displays information about the IP stack running on CMCC channel interfaces.
	<b>show extended channel statistics</b>	Displays statistical information about subchannels on the physical interface of a CMCC adapter and displays information that is specific to the interface channel devices. The information generally is useful only for diagnostic tasks performed by technical support personnel.
	<b>show extended channel subchannel</b>	Displays information about the CMCC adapter physical interfaces and displays information that is specific to the interface channel connection. The information displayed generally is useful only for diagnostic tasks performed by technical support personnel.

<b>Command</b>	<b>Description</b>
<b>show extended channel tcp-connections</b>	Displays information about the TCP sockets on a channel interface.
<b>show extended channel tcp-stack</b>	Displays information about the TCP stack running on CMCC adapter interfaces.
<b>show extended channel udp-listeners</b>	Displays information about the UDP listener sockets running on the CMCC adapter interfaces.
<b>show extended channel udp-stack</b>	Displays information about the UDP stack running on the CMCC adapter interfaces.

## offload (IP-host-backup)

Use the **offload** IP Host Backup configuration mode to configure a backup group of Offload devices. Along with the path command, the offload command provides a quick way to configure an Offload backup group. Use the **no** form of this command to cancel the offload task on the CMCC adapter.

```
offload device-address ip-address host-name device-name host-ip-link device-ip-link host-api-link  
device-api-link [broadcast]
```

```
no offload path device-address
```

Syntax	Description
<i>device-address</i>	Hexadecimal value in the range 0000 to FFFF. This value specifies the logical channel path and consists of two digits for the physical connection (either on the host or on the ESCON director), one digit for the channel logical address, and one digit for the control unit logical address. If the path is not specified in the IOCP, the default values for channel logical address and control unit logical address is 0.
<i>ip-address</i>	Hexadecimal value in the range 00 to FE. This is the unit address associated with the control unit number and path as specified in the host IOCP file. The device address must have an even value.
<i>host-name</i>	Host name specified in the device statement in the host TCP/IP application configuration file.
<i>device-name</i>	CLAW workstation name specified in the device statement in the host TCP/IP application configuration file.
<i>host-ip-link</i>	Host link name for the IP link as specified by the host application. For IBM VM and MVS TCP/IP stacks, this value is <b>tcpip</b> . When used with other applications, this value must match the value coded in the host application.
<i>device-ip-link</i>	Workstation link name for the IP link as specified by the host application. For IBM VM and MVS TCP/IP stacks, this value is <b>tcpip</b> . When used with other applications, this value must match the value coded in the host application.
<i>host-api-link</i>	Host link name for the API link as specified by the host application. For IBM VM and MVS TCP/IP stacks, this value is <b>tcpip</b> . When used with other applications, this value must match the value coded in the host application.
<i>device-api-link</i>	Offload link name for the API link as specified by the host application. For IBM VM and MVS TCP/IP stacks, this value is <b>api</b> . When used with other applications, this value must match the value coded in the host application.
<b>broadcast</b>	(Optional) Enables broadcast processing for this subchannel.

**Defaults** This command has no defaults.

**Command Modes** IP host backup configuration.

**Command History**

Release	Modification
12.0	This command was introduced.

**Usage Guidelines**

Offload devices provide IP connectivity to a mainframe while at the same time offloading a large part of the TCP/IP processing to the CMCC adapter. Not every mainframe TCP/IP stack supports offload.

The **offload** command uses the same underlying configuration parameters as does the **claw** command.

**Examples**

The following examples show two methods for entering the same IP host backup group information. The first group of commands is the long form, using the **offload** interface configuration command. The second group is the shortcut, using the **path** interface configuration command and a **offload** IP host backup configuration command.

Long form:

```
offload c000 00 198.92.10.5 sysa router1 tcpip tcpip tcpip api backup
offload c100 00 198.92.10.5 sysa router1 tcpip tcpip tcpip api backup
offload c200 00 198.92.10.5 sysa router1 tcpip tcpip tcpip api backup
```

Shortcut form:

```
path c000 c100 c200
  offload 00 198.92.10.5 sysa router1 tcpip tcpip tcpip api
```

**Related Commands**

Command	Description
<b>show extended channel ip-stack</b>	Displays information about the IP stack running on CMCC channel interfaces.
<b>show extended channel statistics</b>	Displays statistical information about subchannels on the physical interface of a CMCC adapter and displays information that is specific to the interface channel devices. The information generally is useful only for diagnostic tasks performed by technical support personnel.
<b>show extended channel subchannel</b>	Displays information about the CMCC adapter physical interfaces and displays information that is specific to the interface channel connection. The information displayed generally is useful only for diagnostic tasks performed by technical support personnel.
<b>show extended channel tcp-connections</b>	Displays information about the TCP sockets on a channel interface.
<b>show extended channel tcp-stack</b>	Displays information about the TCP stack running on CMCC adapter interfaces.
<b>offload (interface)</b>	Configures an Offload device (read and write subchannel) for communication with a mainframe TCP/IP stack in Offload mode. Also can be used to configure individual members of an Offload backup group for the IP Host Backup feature.

<b>Command</b>	<b>Description</b>
<b>offload (IP-host-backup)</b>	Specifies one or more data paths for the IP host backup.
<b>show extended channel icmp-stack</b>	Displays information about the ICMP stack running on the CMCC channel interfaces.
<b>show extended channel udp-listeners</b>	Displays information about the UDP listener sockets running on the CMCC adapter interfaces.
<b>show extended channel udp-stack</b>	Displays information about the UDP stack running on the CMCC adapter interfaces.

# path

Use the **path** interface configuration command to specify one or more data paths for the IP host backup. Use the **no path** form of this command to delete a single path.

**path** *path* [*path*]

**no path** *path*

<b>Syntax Description</b>	<i>path</i>	Hexadecimal value in the range 0000 to FFFF. This value specifies the logical channel path and consists of two digits for the physical connection (either on the host or on the ESCON director), one digit for the channel logical address, and one digit for the control unit logical address. If the path is not specified in the IOCP, the default values for channel logical address and control unit logical address is 0.
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**Defaults** This command has no defaults.

**Command Modes** Interface configuration

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	12.0	This command was introduced.

**Usage Guidelines** Up to 16 *path* values can be specified in the **path** command. The path command places you in IP host backup configuration mode, where you can enter additional commands to define backup groups for CLAW and offload connections.

**Examples** The following examples show two methods for entering the same IP host backup group information. The first group is the long form, using the **offload** interface configuration command. The second group of commands is the shortcut, using the **path** interface configuration command and a **offload** IP host backup configuration command.

Long form:

```
offload c000 00 198.92.10.5 sysa router1 tcpip tcpip backup
offload c100 00 198.92.10.5 sysa router1 tcpip tcpip backup
offload c200 00 198.92.10.5 sysa router1 tcpip tcpip backup
```

Shortcut form:

```
path c000 c100 c200
  offload 00 198.92.10.5 sysa router1 tcpip tcpip
```

Related Commands	Command	Description
	<b>claw (IP-host-backup)</b>	Configures a CLAW device (read and write subchannel) for communication with a mainframe TCP/IP stack in Offload mode. Can also be used to configure individual members of a CLAW backup group for the IP Host Backup feature.
	<b>offload (IP-host-backup)</b>	Specifies one or more data paths for the IP host backup.

# preferred-nnserver

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

**preferred-nnserver** *name*

**no preferred-nnserver**

Syntax Description	<i>name</i>	A fully qualified name of an NN.
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Defaults	This command has no defaults.
----------	-------------------------------

Command Modes	DLUR configuration
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Command History	Release	Modification
	11.2	This command was introduced.

Usage Guidelines	<p>The <b>preferred-nnserver</b> 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 eight characters long; for example, RA12.NODM1PP. The portion of the name before the period is the NETID and is shared between entities in the same logical network.</p>
------------------	--

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
	<b>dlur</b> (TN3270)	Enables the SNA session switch function on the CMCC adapter, or enters DLUR configuration mode.

## pu (direct)

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

```
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

<i>pu-name</i>	Name that uniquely identifies this PU.
<i>idblk-idnum</i>	This value 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.
<i>ip-address</i>	IP address that the clients should use as host IP address to map to LU sessions under this PU.
<i>type</i>	Internal adapter type on the CIP card, which corresponds to the value specified in the <b>lan</b> internal LAN configuration command. The currently supported type is <b>token-adapter</b> .
<i>adapter-number</i>	Internal adapter interface on the CIP card, which is the same value specified in the <b>adapter</b> internal LAN configuration command.
<i>lsap</i>	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.
<b>rmac</b> <i>rmac</i>	(Optional) Remote MAC address. The remote MAC address of the form <i>xxxx.xxxx.xxxx</i> 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.
<b>rsap</b> <i>rsap</i>	(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.
<b>lu-seed</b> <i>lu-name-stem</i>	(Optional) Provides an LU name that the client can use when a specific LU name request is needed. The format can be <i>x...x##</i> or <i>x...x###</i> where <i>x..x</i> is an alphanumeric string. When <b>##</b> is specified, it is replaced with the LU LOCADDR in hexadecimal digits to form the complete LU name. When <b>###</b> is specified, decimal digits are used, padded with leading zeroes to make three characters. The first <i>x</i> must be alphabetic and the entire string, including the # symbols, must not exceed 8 characters.

**pu (direct)****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 (direct)** 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
<b>adapter</b>	Configures internal adapters.
<b>lan</b>	Configures an internal LAN on a CMCC adapter interface and enters the internal LAN configuration mode.
<b>tn3270-server</b>	Starts the TN3270 server on a CMCC adapter or enters TN3270 server configuration mode.

# pu (DLUR)

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

```
pu pu-name idblk-idnum ip-address
```

```
no pu pu-name
```

Syntax Description	
<i>pu-name</i>	Name that uniquely identifies this PU.
<i>idblk-idnum</i>	This value must match the <i>idblk-idnum</i> 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.
<i>ip-address</i>	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 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
	<b>dlur (TN3270)</b>	Enables the SNA session switch function on the CMCC adapter, or enters DLUR configuration mode.

# show controllers channel

Use the **show controllers channel EXEC** command to display CPA-specific information, including the currently loaded microcode.

**show controllers channel** [*slot/port*]

## Syntax Description

<i>slot</i>	(Optional) Slot number.
<i>port</i>	(Optional) Interface number.

## Command Modes

EXEC

## Command History

Release	Modification
11.3T	This command was introduced.

## Examples

The following is sample output from the **show controllers channel** command:

```
Router# show controllers channel 5/0

ECPA 5, hardware version 1.0, microcode version 26.0
  Mailbox commands: 0 forevers, 0 max elapsed usecs
  Microcode loaded from flash slot0:xcpa26-0_kernel_xcpa
  Loaded:seg_eca          Rev. 0   Compiled by cip-release on 01-Apr-98
  EPROM version 1.0, VPLD version 1.1
  ECA0: hw version 255, microcode version C50602D1
  Load metrics:
    Memory      sram 2964552/4096K, dram 11552952/16M
    CPU         1m  0%, 5m  0%, 60m  0%
    DMA         1m  0%, 5m  0%, 60m  0%
    ECA0        1m  0%, 5m  0%, 60m  0%

Interface Channel5/0
Hardware is Escon Channel
HW Registers control status=0x0001EC07 LED control=0x00045DD5
HW Poll Register 4B05D4E0:[00000001]
Free buffer queues
  queue=0 max_entries=128 size=600 head=39 ring=4B095F00
  queue=1 max_entries=32 size=4520 head=31 ring=4B095E40
  queue=2 max_entries=64 size=4520 head=63 ring=4B096140
Tx Queues
  queue=0 head=0 tail=0 tx_cnt=0 tx_pakcnt=0
  max_entries=128 type=1 poll_index=0 ring=4B0963C0
  fspak buffers swapped out=0
  queue=1 head=31 tail=31 tx_cnt=0 tx_pakcnt=0
  max_entries=32 type=2 poll_index=1 ring=4B096280
  fspak buffers swapped out=0
Rx Queues
  max_entries=221 poll_index=3 head=57 ring=4B096800
  max packets per interrupt count = 0
```

# show extended channel backup

Use the **show extended channel backup** privileged EXEC command to display information about the CLAW and offload commands for each backup group configured on CMCC channel interfaces.

**show extended channel *slot/port* backup [*ip-address*]**

Syntax Description	
<i>slot</i>	Slot number.
<i>port</i>	Port number.
<b>backup</b>	Display all CLAW or OFFLOAD commands associated with the backup group.
<i>ip-address</i>	(Optional) Display information about all devices in the backup group defined by <i>ip-address</i> .

**Command Modes** Privileged EXEC

Command History	Release	Modification
	12.0	This command was introduced.

**Examples** The following is sample output from the **show extended channel backup** command:

```
Router# show extended channel 0/1 backup
```

```
Mode      Path Device IP Address: 80.11.198.2
OFFLOAD E200  50 CISCOVM RISPIX TCPIP TCPIP TCPIP API
OFFLOAD E300  50 CISCOVM RISPIX TCPIP TCPIP TCPIP API
Last statistics 4 seconds old, next in 6 seconds
```

Related Commands	Command	Description
	<b>claw (IP-host-backup)</b>	Configures a CLAW device (read and write subchannel) for communication with a mainframe TCP/IP stack in Offload mode. Can also be used to configure individual members of a CLAW backup group for the IP Host Backup feature.
	<b>offload (IP-host-backup)</b>	Specifies one or more data paths for the IP host backup.

## show extended channel cmpc

Use the **show extended channel cmpc** privileged EXEC command to display information about each CMPC subchannel configured on the specified channel interface.

**show extended channel *slot/port* cmpc [*path* [*device*]]**

Syntax Description	
<i>slot</i>	Slot number.
<i>port</i>	Physical channel interface port number.
<i>path</i>	(Optional) The logical channel path.
<i>device</i>	(Optional) A 2-digit hexadecimal value that specifies a device address of the CPMC subchannel. If specified, only status for that CMPC device will be displayed. If not specified, status for all CMPC devices for the specified path will be displayed.

**Command Modes** Privileged EXEC

Command History	Release	Modification
	11.3	This command was introduced.

**Usage Guidelines** This command is valid only on the CMCC adapter physical interfaces.

**Examples** The following is sample output on a Cisco 7500 router from the **show extended channel cmpc** command:

```
Router# show extended channel 3/0 cmpc c020

      Path Dv  TGName   Dir   Bfrs  Status
CMPC C020 46  MVS2ISRA  READ  10    Active
CMPC C020 47  MVS2ISRA  WRITE 16    Active
CMPC C020 4A  MVS2ISR1  READ  7     Active
CMPC C020 4B  MVS2ISR1  WRITE 16    Active
CMPC C020 4C  MVS2ISR2  READ  7     Active
CMPC C020 4D  MVS2ISR2  WRITE 16    Active
CMPC C020 4E  MVS2TN    READ  0     Inactive
CMPC C020 4F  MVS2TN    WRITE 0     Inactive
```

Table 63 describes the fields shown in the display

**Table 63** *show extended channel cmpc* Field Descriptions

Field	Description
Path	CMPC channel path configured.
Dv	CMPC subchannel device configured.
TGName	Transmission group name configured for the CMPC subchannel.

**Table 63** *show extended channel cmpc Field Descriptions (continued)*

Field	Description
Dir	Identifies this CMPC subchannel as READ or WRITE.
Bfrs	On the read subchannel, this is the number of 4 KB-size pages that VTAM has allocated for each Read. This will match the MAXBFRU value configured in the VTAM TRL major node. On the write subchannel, this is the maximum number of 4 KB pages VTAM can write to the CMCC adapter for a single channel I/O. The value will always be 16 for the write subchannel because the CIP always allows VTAM to write up to 64 KB per channel I/O.
Status	State of the CMPC subchannel. Valid values are: <ul style="list-style-type: none"> <li>• Shutdown—CMCC adapter interface for this CMPC subchannel is shutdown. In this state, the Bfrs value is not available and will be displayed as zeros.</li> <li>• Inactive—CMPC subchannel is not active.</li> <li>• XID2 Pending—XID2 handshaking in progress.</li> <li>• Active—XID2 exchange completed; CMPC subchannel is active.</li> </ul>

**Related Commands**

Command	Description
<b>client (lu limit)</b>	Configures a CMPC read subchannel and a CMPC write subchannel.
<b>tg</b>	Defines LLC connection parameters for the CMPC transmission group.

# show extended channel connection-map llc2

Use the **show extended channel connection-map llc2** privileged EXEC command to display the number of active LLC2 connections for each SAP and the mapping of the internal MAC adapter and the SAP to the resource that activated the SAP.

**show extended channel *slot/port* connection-map llc2**

## Syntax Description

<i>slot</i>	Slot number.
<i>port</i>	Port number.
<b>connection-map llc2</b>	Displays a connection map of LLC2 connections.

## Command Modes

Privileged EXEC

## Command History

Release	Modification
11.0(3)	This command was introduced.

## Usage Guidelines

The **show extended channel connection-map llc2** command is valid only on the virtual channel interfaces.

## Examples

The following is sample output from the **show extended channel connection-map llc2** command.

```
Router# show extended channel 1/2 connection-map llc2

LAN Token 0 Adapter 0 4000.7000.0747
Local SAP=08 LLC2 Connections=4 CSNA Port=1 Path=C200 Device=60
Local SAP=0C LLC2 Connections=4 CSNA Port=1 Path=C200 Device=60
Local SAP=10 LLC2 Connections=2 CSNA Port=1 Path=C200 Device=60
Local SAP=14 LLC2 Connections=0 CSNA Port=1 Path=C200 Device=60

LAN Token 1 Adapter 1 4000.7000.0767
Local SAP=08 LLC2 Connections=3 CSNA Port=1 Path=C200 Device=61
Local SAP=0C LLC2 Connections=3 CSNA Port=1 Path=C200 Device=61
Local SAP=10 LLC2 Connections=2 CSNA Port=1 Path=C200 Device=61
Local SAP=14 LLC2 Connections=2 CSNA Port=1 Path=C200 Device=61

LAN Token 2 Adapter 2 4000.7000.0737
No SAPs open on this interface

Total : SAPs opened = 8      Connections active = 20
```

# show extended channel csna

Use the **show extended channel csna** privileged EXEC command to display information about the CSNA subchannels configured on the specified CMCC interface.

**show extended channel slot/port slot/port csna [path [device]] [admin | oper | stats]**

Syntax Description	
<i>slot</i>	Slot number.
<i>port</i>	Port number.
<i>path</i>	(Optional) A hexadecimal value in the range of 0x0000 – 0xFFFF. This specifies the data path and consists of two digits for the physical connection (either on the host or on the ESCON Director switch), one digit for the control unit address, and one digit for the channel logical address. If not specified, information is displayed for all CSNA subchannels configured on the selected interface.
<i>device</i>	(Optional) A hexadecimal value in the range of 0x00 – 0xFE. This is the unit address associated with the control unit number and path as specified in the host IOCP file. If not specified, information is displayed for all CSNA subchannels configured with the specified path on the selected interface.
<b>admin</b>	(Optional) Displays configured values for CSNA channel devices. If neither <b>admin</b> , <b>oper</b> , or <b>stats</b> is specified, <b>admin</b> is the default.
<b>oper</b>	(Optional) Displays operational values for CSNA channel devices.
<b>stats</b>	(Optional) Displays statistics for CSNA channel devices.

**Command Modes** Privileged EXEC

Command History	Release	Modification
	11.0(3)	This command was introduced.

**Usage Guidelines** The information that is displayed by this command is generally useful for diagnostic tasks performed by technical support personnel only.

**Examples** The following is sample output from the **show extended channel csna** command. Three examples are provided, one for each type of output as specified by the **admin**, **oper**, and **stats** keywords.

The following example displays the configured values for all CSNA devices on interface channel 1/0.

```
Router# show extended channel 1/0 csna admin
      Path Dv  maxpiu      time-delay  length-delay
CSNA C200 60  64000      100         64000
CSNA C200 61  64000      100         64000
CSNA C200 62  64000      100         64000
```

Table 64 describes the fields shown in the display.

The following example displays operational data for all CSNA devices configured on interface channel 1/0. The channel interface must be up (no shut) for this information to be displayed.

```
Router# show extended channel 1/0 csna oper
```

```

      Path Dv Status      SlowDown maxpiu      time-delay  length-delay
CSNA C200 60 setupComple off      64000      100         64000
CSNA C200 61 setupComple off      64000      100         64000
CSNA C200 62 setupComple off      64000      100         64000

```

Table 64 describes the fields shown in the display.

The following example displays CSNA statistics for subchannel path c200, device 60. The channel interface must be up (no shut) for this information to be displayed. If the maxpiu value is reconfigured while the CSNA subchannel is active (setupComplete) then the maxpiu value displayed by the **oper** keyword is the old, operational value.

```
Router# show extended channel 1/0 csna c200 60 stats
```

```

CSNA      C200 60
Blocks Transmitted = 38979079 Received = 38979075
Bytes Transmitted = 79251477K Received = 13554
Slow downs Sent = 0 Received = 0
Txd by maxpiu      : Blocks = 0 Bytes = 0
Txd by time-delay  : Blocks = 222 Bytes = 12522
Txd by length-delay: Blocks = 0 Bytes = 0

```

Table 64 describes the fields shown in the display

**Table 64** show extended channel csna Field Descriptions

Field	Description
Path	Path from the CSNA configuration.
Dev	Device address from the CSNA configuration.
Status	State of the CSNA device. One of the following values: <ul style="list-style-type: none"> <li>closed—Subchannel is closed.</li> <li>pendingOpen—An Open Subchannel command has been received from VTAM.</li> <li>open—Subchannel is open.</li> <li>pendingSetup—VTAM has queried CIP for all configured MAC adapters.</li> <li>setupComplete —All internal MAC adapter information has been responded to the CIP. The CSNA subchannel is operational.</li> <li>pendingClose—A Close Subchannel command has been received from VTAM.</li> <li>unknown—Current state of the CSNA subchannel cannot be determined.</li> </ul>

**Table 64** *show extended channel csna Field Descriptions (continued)*

Field	Description
SlowDown	<p>Status of flow control for the CSNA device.</p> <ul style="list-style-type: none"> <li>• off—Subchannel is normal (both CSNA and VTAM are able to send data).</li> <li>• sent— CSNA has put VTAM into a slow down state for this CSNA subchannel.</li> <li>• received—VTAM has put the CSNA subchannel into a slow down state.</li> <li>• both—Both VTAM and the CSNA subchannel are in a slow down state.</li> <li>• unknown—Current state of flow control on this CSNA subchannel cannot be determined.</li> </ul>
maxpiu	<p>Maximum size of a channel i/o block that the CSNA subchannel can send to the host. This value may differ from the configured maxpiu value if the value is reconfigured while the CSNA subchannel is active (setupComplete).</p> <p>CSNA blocks SNA frames into channel i/o blocks which must not exceed the maxpiu value. A length-delay value less than the maxpiu value can cause the channel i/o blocks to be limited to the lower value.</p> <p>The maxpiu value may be reconfigured while the subchannel is operational but the new maxpiu value does not take effect until the subchannel is reinitialized (in other words, until the XCA major node is recycled). In this case, the maxpiu value displayed with the <b>admin</b> keyword will be the new, configured value while the maxpiu displayed by the <b>oper</b> keyword will be the old, operational value.</p>
time-delay	<p>CSNA blocks SNA frames destined for VTAM for time-delay milliseconds from the time the first SNA frame within a channel i/o block is blocked for transmission. This can increase the overall throughput of CSNA by minimizing the number of channel i/o operations. However, blocking can induce response time latency of a transaction by up to the time-delay value. If time-delay=0, CSNA ignores length-delay and puts each frame into the channel i/o block for transmission to the host. Even with a time-delay=0, CSNA may still block frames while waiting for a previous channel i/o to complete.</p>

**Table 64** *show extended channel csna Field Descriptions (continued)*

Field	Description
length-delay	<p>CSNA blocks SNA frames destined for VTAM when the current block reaches the length-delay value in size (bytes). This will increase the chance of using larger block sizes for CSNA channel i/o. SNA frames are blocked up to either time-delay milliseconds or until the block reaches the length-delay size, at which time CSNA starts the channel i/o.</p> <p>The length-delay is ignored if larger than the maxpiu value. It can be used to force CSNA blocking to generate smaller i/o blocks than specified by maxpiu. In general, however, larger blocks result in better channel throughput and efficiency. A value of zero causes the length-delay value to be ignored; blocking is then controlled by the maxpiu and time-delay parameters.</p>
Blocks Transmitted	Number of channel i/o blocks sent to VTAM from this CSNA subchannel. The Blocks Transmitted value may be higher than the total blocks for the Txd by maxpiu, Txd by time-delay, and Txd by length-delay counters. This is due to NULL blocks (8 bytes each with no data) that CSNA transmits. The channel program used for LSA traffic consists of a write/read CCW chain. When VTAM has data for CSNA it sends it with the write CCW. When the chained read CCW is executed CSNA will respond with any pending inbound data. If CSNA has no pending inbound data the read CCW is satisfied with an 8-byte header indicating no data.
Blocks Received	Number of channel i/o blocks received from VTAM by this CSNA subchannel.
SlowDowns Sent	Number of times CSNA put VTAM into a slow down (flow control) for this subchannel device.
SlowDowns Received	Number of times VTAM put CSNA into a slow down (flow control) for this subchannel.
Txd by maxpiu Blocks/Bytes	Number of channel i/o blocks and bytes transmitted to VTAM by this CSNA subchannel because the size of the channel i/o block reached the maxpiu value configured for this subchannel.
Txd by time-delay Blocks/Bytes	Number of channel i/o blocks and bytes transmitted to VTAM by this CSNA subchannel because blocking time-delay configured for this subchannel expired.
Txd by length-delay Blocks/Bytes	Number of channel i/o blocks and bytes transmitted to VTAM by this CSNA subchannel because blocking length-delay configured for this subchannel was reached.

**Related Commands**

Command	Description
<b>csna</b>	Configures SNA support on a CMCC physical channel interface and specifies the path and device/subchannel on a physical channel of the router to communicate with an attached mainframe.

# show extended channel icmp-stack

Use the **show extended channel icmp-stack** EXEC command to display information about the Internet Control Message Protocol (ICMP) stack running on the CMCC channel interfaces.

**show extended channel** *slot/port icmp-stack* [*ip-address*]

Syntax Description	
<i>slot</i>	Slot number.
<i>port</i>	Port number.
<i>ip-address</i>	(Optional) IP address specified by the <b>offload</b> interface configuration command or the <b>tn3270-server pu</b> command.

**Command Modes** EXEC

Command History	Release	Modification
	11.0	This command was introduced.

**Usage Guidelines** The **show extended channel icmp-stack** command is valid on both physical and virtual channel interfaces.

**Examples** The following is sample output from the **show extended channel icmp-stack** command:

```
Router# show extended channel 0/1 icmp-stack

ICMP Statistics for IP Address 80.11.198.2
  InMsgs      : 3          InErrors      : 0          InDestUnreachs: 0
  InTimeExcds : 0          InParmProbs   : 0          InSrcQuenchs  : 0
  InRedirects : 0          InEchos       : 3          OutEchoReps   : 3
  OutTimestamps : 0       OutTimestampReps: 0       OutAddrMasks  : 0
  OutAddrMaskReps: 0

ICMP Statistics for IP Address 80.11.198.3
  InMsgs      : 1          InErrors      : 0          InDestUnreachs: 0
  InTimeExcds : 0          InParmProbs   : 0          InSrcQuenchs  : 0
  InRedirects : 0          InEchos       : 1          OutEchoReps   : 1
  OutTimestamps : 0       OutTimestampReps: 0       OutAddrMasks  : 0
  OutAddrMaskReps: 0
```

Table 65 describes the fields shown in the display.

**Table 65** *show extended channel icmp-stack Field Descriptions*

Field	Description
InMsgs	Total number of ICMP messages which the entity received. Note that this counter includes all those counted by icmpInErrors.
InErrors	Number of ICMP messages which the entity received but determined as having ICMP-specific errors (bad ICMP checksums, bad length, etc.).
InDestUnreachs	Number of ICMP Destination Unreachable messages received.
InTimeExcds	Number of ICMP Time Exceeded messages received.
InParmPrbs	Number of ICMP Parameter Problem messages received.
InSrcQuenchs	Number of ICMP Source Quench messages received.
InRedirects	Number of ICMP Redirect messages received.
InEchos	Number of ICMP Echo (request) messages received.
OutEchoReps	Number of ICMP Echo Reply messages sent.
OutTimestamps	Number of ICMP Timestamp (request) messages sent.
OutTimestampReps	Number of ICMP Timestamp Reply messages sent.
OutAddrMasks	Number of ICMP Address Mask Request messages sent.
OutAddrMaskReps	Number of ICMP Address Mask Reply messages sent.

#### Related Commands

Command	Description
<b>offload (interface)</b>	Configures an Offload device (read and write subchannel) for communication with a mainframe TCP/IP stack in Offload mode. Also can be used to configure individual members of an Offload backup group for the IP Host Backup feature.
<b>pu (direct)</b>	Creates a PU entity that has its own direct link to a host, or enters PU configuration mode.
<b>pu (DLUR)</b>	Creates a PU entity that has no direct link to a host, or enters PU configuration mode.

# show extended channel ip-stack

Use the **show extended channel ip-stack** EXEC command to display information about the IP stack running on CMCC channel interfaces.

**show extended channel** *slot/port* **ip-stack** [*ip-address*]

Syntax Description	
<i>slot</i>	Slot number.
<i>port</i>	Port number.
<i>ip-address</i>	(Optional) IP address specified by the <b>offload</b> interface configuration command or the <b>tn327-server pu</b> command.

**Command Modes** EXEC

Command History	Release	Modification
	11.0	This command was introduced.

**Usage Guidelines** The **show extended channel ip-stack** command is valid on both physical and virtual channel interfaces.

**Examples** The following is sample output from the **show extended channel ip-stack** command:

```
Router# show extended channel 0/1 ip-stack

IP Statistics for IP Address 80.11.198.2
  Forwarding      : no           DefaultTTL      : 64           InReceives     : 165
  InHdrErrors    : 0            InAddrErrors    : 0           ForwDatagrams  : 0
  InUnknownProtos: 0           InDiscards     : 0           InDelivers     : 165
  OutRequests    : 157         OutDiscards    : 0           OutNoRoutes    : 0
  ReasmTimeout   : 60         ReasmReqds     : 0           ReasmOKs       : 0
  ReasmFails     : 0           FragOKs        : 0           FragFails      : 0
  FragCreates    : 0           RoutingDiscards: 0

IP Statistics for IP Address 80.11.198.3
  Forwarding      : no           DefaultTTL      : 64           InReceives     : 77
  InHdrErrors    : 0            InAddrErrors    : 0           ForwDatagrams  : 0
  InUnknownProtos: 0           InDiscards     : 0           InDelivers     : 77
  OutRequests    : 78         OutDiscards    : 0           OutNoRoutes    : 0
  ReasmTimeout   : 60         ReasmReqds     : 0           ReasmOKs       : 0
  ReasmFails     : 0           FragOKs        : 0           FragFails      : 0
  FragCreates    : 0           RoutingDiscards: 0
```

Table 66 describes the fields shown in the display.

**Table 66** *show extended channel ip-stack Field Descriptions*

Field	Description
Forwarding	Indication of whether this entity is acting as an IP gateway in respect to the forwarding of datagrams received by, but not addressed to, this entity. IP gateways forward datagrams. IP hosts do not (except those source-routed via the host).  Note that for some managed nodes, this object may take on only a subset of the values possible. Accordingly, it is appropriate for an agent to return a `badValue' response if a management station attempts to change this object to an inappropriate value.
DefaultTTL	The default value inserted into the Time-To-Live field of the IP header of datagrams originated at this entity, whenever a TTL value is not supplied by the transport layer protocol.
InReceives	Total number of input datagrams received from interfaces, including those received in error, for this IP Address instance.
InHdrErrors	Number of input datagrams discarded due to errors in their IP headers, including bad checksums, version number mismatch, other format errors, time-to-live exceeded, errors discovered in processing their IP options, etc.
InAddrErrors	Number of input datagrams discarded because the IP address in their IP header's destination field was not a valid address to be received at this entity. This count includes invalid addresses (e.g., 0.0.0.0) and addresses of unsupported Classes (e.g., Class E). For entities which are not IP Gateways and therefore do not forward datagrams, this counter includes datagrams discarded because the destination address was not a local address.
ForwDatagrams	Number of input datagrams for which this entity was not their final IP destination, as a result of which an attempt was made to find a route to forward them to that final destination. In entities which do not act as IP Gateways, this counter will include only those packets which were Source-Routed via this entity, and the Source-Route option processing was successful.
InUnknownProtos	Number of locally-addressed datagrams received successfully but discarded because of an unknown or unsupported protocol.
InDiscards	Number of input IP datagrams for which no problems were encountered to prevent their continued processing, but which were discarded (for example, for lack of buffer space). Note that this counter does not include any datagrams discarded while awaiting re-assembly.
InDelivers	Total number of input datagrams successfully delivered to IP user-protocols (including ICMP)
OutRequests	Total number of IP datagrams which local IP user-protocols (including ICMP) supplied to IP in requests for transmission. Note that this counter does not include any datagrams counted in ipForwDatagrams.

**Table 66** *show extended channel ip-stack Field Descriptions (continued)*

<b>Field</b>	<b>Description</b>
OutDiscards	Number of output IP datagrams for which no problem was encountered to prevent their transmission to their destination, but which were discarded (for example, for lack of buffer space). Note that this counter would include datagrams counted in ipForwDatagrams if any such packets met this (discretionary) discard criterion.
OutNoRoutes	Number of IP datagrams discarded because no route could be found to transmit them to their destination. Note that this counter includes any packets counted in ipForwDatagrams which meet this 'no-route' criterion. Note that this includes any datagrams which a host cannot route because all of its default gateways are down.
ReasmTimeout	Maximum number of seconds which received fragments are held while they are awaiting reassembly at this entity.
ReasmReqds	Number of IP fragments received which needed to be reassembled at this entity.
ReasmOKs	Number of IP datagrams successfully reassembled.
ReasmFails	Number of failures detected by the IP reassembly algorithm (for whatever reason: timed out, errors, etc). Note that this is not necessarily a count of discarded IP fragments since some algorithms (notably the algorithm in RFC 815) can lose track of the number of fragments by combining them as they are received.
FragOKs	Number of IP datagrams that have been successfully fragmented at this entity.
FragFails	Number of IP datagrams that have been discarded because they needed to be fragmented at this entity but could not be, for example, because their Don't Fragment flag was set.
FragCreates	Number of IP datagram fragments that have been generated as a result of fragmentation at this entity.
RoutingDiscards	Number of routing entries which were chosen to be discarded even though they are valid. One possible reason for discarding such an entry could be to free-up buffer space for other routing entries.

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>offload (interface)</b>	Configures an Offload device (read and write subchannel) for communication with a mainframe TCP/IP stack in Offload mode. Also can be used to configure individual members of an Offload backup group for the IP Host Backup feature.
<b>pu (direct)</b>	Creates a PU entity that has its own direct link to a host, or enters PU configuration mode.
<b>pu (DLUR)</b>	Creates a PU entity that has no direct link to a host, or enters PU configuration mode.

## show extended channel lan

Use the **show extended channel lan** EXEC command to display the internal LANs and adapters configured on a CMCC adapter.

**show extended channel slot/port lan** [*tokenring* [*lan-id* [*adapno*]]]

Syntax Description	
<i>slot</i>	Slot number.
<i>port</i>	Port number.
<i>tokenring</i>	(Optional) Specify CMCC internal LAN type to be displayed.
<i>lan-id</i>	(Optional) Specify the CMCC internal LAN number to be displayed.
<i>adapno</i>	(Optional) Specify the CMCC internal adapter number on the selected internal LAN to be displayed.

**Defaults** Display all internal LANs and adapters on the selected channel interface.

**Command Modes** Privileged EXEC

Command History	Release	Modification
	11.0	This command was introduced.

**Usage Guidelines** This command is valid only on the virtual channel interface.

**Examples** The following is sample output from the **show extended channel lan** command:

```
Router# show extended channel 3/2 lan

Lan TokenRing 0
  Adapno Mac Address      Name      Vcnum
    0 4000.1111.1112      544
    20 4000.1111.2200     564
    30 4000.3030.0101     574
Lan TokenRing 1
  source-bridge 207 1 2002
  Adapno Mac Address      Name      Vcnum
    1 4000.2222.2222      545
Lan TokenRing 2
  source-bridge 50 1 1500
  Adapno Mac Address      Name      Vcnum
    2 4000.3333.2222      546
```

```

Lan TokenRing 5
  source-bridge 112 1 3000
  Adapno Mac Address      Name      Vcnum
    5 4000.1234.5656          549
Lan TokenRing 9
  source-bridge 111 1 3000
  Adapno Mac Address      Name      Vcnum
    9 4000.9999.1111          553
Lan TokenRing 10
  source-bridge 110 1 3000
  Adapno Mac Address      Name      Vcnum
    10 4000.aaaa.1111          554
Lan TokenRing 20
  source-bridge 20 1 2002
  Adapno Mac Address      Name      Vcnum
    21 4000.2020.2020          565

```

**Related Commands**

Command	Description
<b>adapter</b>	Configures internal adapters.
<b>lan</b>	Configures an internal LAN on a CMCC adapter interface and enters the internal LAN configuration mode.

## show extended channel llc2

Use the **show extended channel llc2** EXEC command to display information about the LLC2 sessions running on the CMCC adapter interfaces.

```
show extended channel slot/port llc2 [admin | oper | stats] [lmac [lsap [rmac [rsap]]]]
```

Syntax Description	
<i>slot</i>	Slot number.
<i>port</i>	Port number.
<b>admin</b>	(Optional) Shows configured values. This is the default.
<b>oper</b>	(Optional) Shows operational values for: <ul style="list-style-type: none"> <li>• Internal adapters</li> <li>• SAPs opened on the internal adapters</li> <li>• LLC2 connections on the internal adapters</li> </ul>
<b>stats</b>	(Optional) Shows statistics for: <ul style="list-style-type: none"> <li>• Internal adapters</li> <li>• SAPs opened on the internal adapters</li> <li>• LLC connections on the internal adapters</li> </ul>
<i>lmac</i>	(Optional) Local MAC address.
<i>lsap</i>	(Optional) Local service access point (SAP) address, 0 to 256.
<i>rmac</i>	(Optional) Remote MAC address.
<i>rsap</i>	(Optional) Remote SAP address, 0 to 256.

Command Modes	
	EXEC

Command History	Release	Modification
	11.0(3)	This command was introduced.

### Usage Guidelines

The **show extended channel llc2** command is valid on virtual channel interfaces.

To specify LLC information for internal adapters:

- Specify the *lmac* to get information for a specific internal adapter.
- Omit the *lmac* parameter to display information for all internal adapters on the specified channel interface.

To display LLC information for SAPs opened on an internal adapter:

- Specify the *lmac* and *lsap* parameters to display information for a particular SAP.
- Specify the *lmac* parameter and '\*' to display information for all SAPs opened on the specified channel adapter.

To display information for LLC2 connections on a channel interface:

- Specify the *lmac*, *lsap*, *rmac*, and *rsap* parameters to display information for a particular active LLC2 connection.
- Specify the *lmac*, *lsap*, and *rmac* parameters to display information for all LLC2 connections active between the specified remote MAC address and the specified local SAP opened on the specified internal adapter.
- Specify the *lmac* and *lsap* parameters, and '\*' to display information for all LLC2 connections active on the specified local SAP and the specified internal adapter and any remote MAC address the connections are active with.
- Specify the *lmac*, '\*' for the local SAP, and *rmac* to display information for all LLC2 connections active between the specified internal adapter and the remote MAC address.
- Specify the *lmac*, '\*' for the local SAP, and '\*' for the remote MAC address to display information for all active LLC2 connections on the specified internal adapter.

## Examples

The following is sample output from the **show extended channel llc2** command. Three examples are provided, one for each type of output as specified by the **admin**, **oper**, and **stats** keywords.

The following sample displays the configured values for all LLC2 connections on channel 2/2.

```
Router# show extended channel 2/2 llc2 admin

      Lan Token adapter   0 0004.0004.0004
t1-time   = 1000  tpf-time = 1000  trej-time = 3200  tbusy-tim = 9600
idle-time =60000  local-win =    7  recv-wind =    7  N2         =    8
N1        = 1033  ack-delay =  100  ack-max   =    3  nw          =    0
```

Table 67 describes the fields shown in the display.

**Table 67** show extended channel llc2 Admin Field Descriptions for all LLC2 Connections

Field	Description
t1-time	Length of time the CMCC LLC2 link station waits for an acknowledgment to a transmitted I-frame before polling the remote LLC2 station.
tpf-time	Amount of time the CMCC LLC2 link station waits for a final response to a poll before resending the original poll frame.
trej-time	Amount of time the CMCC LLC2 link station waits for a correct frame after sending a reject command to a remote LLC2 station.
tbusy-time	Amount of time the CMCC LLC2 link station waits before repolling a busy LLC2 station.
idle-time	Frequency of polls during periods of idle traffic.
local-win	Maximum number of I-frames that the CMCC LLC2 link station connection can send to the remote LLC2 station without receiving an acknowledgment.
recv-wind	Maximum number of I-frames that the CMCC LLC2 link station connection can receive without receiving an acknowledgment.

**Table 67** show extended channel llc2 Admin Field Descriptions for all LLC2 Connections

Field	Description
N2	Number of times the CMCC LLC2 link station connection will resend an unacknowledged I-frame
N1	Maximum size of LLC frames supported by the CMCC LLC2 link station. The maximum size LLC frame supported on the CMCC is controlled by other factors including the largest interface MTU between the CMCC and the remote network device, and configured values at VTAM and at the end station.
ack-delay	Maximum amount of time the CMCC LLC2 link station allows received I-frames to remain unacknowledged. The CMCC LLC2 connection will acknowledge received I-frames within the ack-delay time.
ack-max	Maximum number of I-frames the CIP LLC2 link station receives before sending an acknowledgment.
Nw	Working send window size. When I-frames sent by the CMCC are rejected by the remote LLC2 station, the CMCC LLC2 connection reduces its working send window size to 1. Then, for every subsequent I-frame sent by the CMCC LLC2 connection that is positively acknowledged by the remote LLC2 station, the CMCC LLC2 connection increases its working send window by the Nw value until the working send window reaches the configured local-window value.

The following sample displays the operational values for all LLC2 connections on channel 2/2.

```
Router# show extended channel 5/2 llc oper
```

```
LAN Token 0 Adapter 0 4000.1010.2020
Open SAPs=1
Max SAPs Opened=1
```

*Open SAPs* is the number of SAPs currently opened on this internal MAC adapter. *Max SAPs Opened* is the number of SAPs concurrently opened on this internal MAC adapter since the last reset of the channel adapter of channel interface.

The following sample displays operational information for the specified SAP opened on a CMCC internal adapter:

```
Router# show extended channel 5/2 llc stat
```

```
LAN Token 0 Adapter 0 4000.1010.2020
PDUIn = 223339 PDUOut = 9564
OctetsIn = 6949875 OctetsOut = 307448
TESTCmdsIn = 213293 TESTRspOut = 2
LocalBusies= 0 UnknownSAPs = 0
```

Table 68 describes the fields shown in the display. These statistics are available on the adapter because when LLC2 connections are deactivated, users can no longer retrieve the information per LLC2 connection.

**Table 68** *show extended channel llc2 Stats Field Descriptions for all LLC2 Connections*

Field	Description
PDUIn	Protocol Data Units received by the internal adapter.
PDUOut	Protocol Data Units sent by the internal adapter.
OctetsIn	PDU bytes received by the internal adapter.
OctetsOut	PDU bytes sent by the internal adapter.
TESTCmdsIn	Number of TEST commands received destined for this MAC address.
TESTRspOut	Number of TEST responses sent by this MAC address repoding to TEST commands received.
Local Busies	Number of times LLC2 connection stations on this adapter entered a busy state, send RNRs to the remote LLC2 station.
UnknownSAPs	Number of frames received that are destined for a SAP that does not exist on this adapter.

The following sample displays operational information for the specified SAP opened on the internal adapter, 4000.1010.2020 configured on channel interface 5/2.

```
Router# show extended channel 5/2 llc2 oper 4000.1010.2020 04
```

```
LAN Token 0 Adapter 0 4000.1010.2020
Local SAP=04
Open Connections=2
Max Connections Opened=2
```

The following table describes the fields shown in the display.

Field	Description
Open Connections	Number of LLC2 connections active on the SAP.
Max Connections	Highest number of LLC2 connections concurrently active on that SAP since the SAP has been active.

The following sample displays statistics for the specified SAP on the internal adapter, 4000.1010.2020 configured on channel interface 5/2.

```
Router# show extended channel 5/2 llc2 stats 4000.1010.2020 04
```

```
LAN Token 0 Adapter 0 4000.1010.2020
Local SAP=04
TESTRspIn = 0 TESTCmdsOut = 0
XIDCmdsIn = 14 XIDCmdsOut = 16
XIDRspIn = 4 XIDRspOut = 0
UIFramesIn = 0 UIFramesOut = 0
UIOctetsIn = 0 UIOctetsOut = 0
ConnectOk = 2 ConnectFail = 0
```

## show extended channel llc2

```

DiscNorm      =          0  DiscByTmr      =          0
DiscByFRMRSent =          0  DiscByFRMRRCvd =          0
DMsInABM     =          0  SABMEsInABM  =          0

```

Table 69 describes the fields shown in the display. All statistics for SAPs are based on the time the SAP was last opened

**Table 69** *show extended channel llc2 stats Field Descriptions for Specified Interface*

Field	Description
TESTRspIn	Number of TEST responses received on this SAP for TEST commands sent by VTAM (connect out).
TESTCmdsOut	Number of TEST commands sent by this SAP to explore for a remote MAC address (VTAM connect out).
XIDCmdsIN	Number of XID commands received by this SAP from a remote link station.
XIDCmdsOut	Number of XID commands sent by this SAP to a remote link station.
XIDRspIn	Number of XID responses received by this SAP from a remote link station.
XIDRspOut	Number of XID responses sent by this SAP to a remote link station.
UIFramesIn	Number of Unnumbered I-frames received by this SAP from a remote link station.
UIFramesOut	Number of Unnumbered I-frames sent by this SAP to a remote link station.
UIOctetsIn	Number of Unnumbered I-frame bytes received by this SAP from a remote link station.
UIOctetsOut	Number of Unnumbered I-frame bytes sent by this SAP to a remote link station.
ConnectOk	Number of successful LLC2 connection attempts on this SAP.
ConnectFail	Number of LLC2 connections that failed.
DiscNorm	Number of normal LLC2 connection disconnections.
DisByTmr	Number of LLC2 connections disconnected due to the CMCC LLC2 link station not getting responses to polls from the remote LLC2 station, typically due to the remote station being powered off or a severe network failure/congestion. The CMCC LLC2 stack generates an event each time it detects this condition. The event can be configured to generate a NetView alert, SNMP trap, and a router console message.
DiscByFRMRSent	Number of times a CMCC LLC2 connection disconnected after detecting a protocol violation and sending a FRNR to the remote LLC2 station. The CMCC LLC2 link station generates an event each time it detects this condition. The event can be configured to generate a NetView alert, SNMP trap, and a router console message.

**Table 69** *show extended channel llc2 stats Field Descriptions for Specified Interface (continued)*

Field	Description
DiscByFRMRrcvd	Number of times the CMCC LLC2 connection disconnected after the remote LLC2 station detected a protocol violation and sent a FRMR to the CMCC LLC2 link station. The CMCC LLC2 stack generates an event each time it detects this condition. The event can be configured to generate a NetView alert, SNMP trap, and a router console message.
DMsInABM	Number of times the CMCC LLC2 link station went into disconnect mode after receiving a DM. The CMCC LLC2 stack generates an event each time it detects this condition. The event can be configured to generate a NetView alert, SNMP trap, and a router console message.
SABMEDsInABM	Number of times the CMCC LLC2 link station went into disconnect mode after receiving a SABME from the LLC2 station. The CMCC LLC2 stack generates an event each time it detects this condition. The event can be configured to generate a NetView alert, SNMP trap, and a router console message.

The following sample displays operation information for the specified CMCC link station:

```
Router# show extended channel 5/2 llc2 oper 4000.1010.2020 04 4000.1234.1030 18

LAN Token 0 Adapter 0 4000.1010.2020
Local SAP=04 Remote MAC=4000.1234.1030 Remote SAP=18 State=normal
t1-time = 1000 tpf-time = 1000 trej-time = 3200 tbusy-tim = 9600
idle-time =60000 local-win = 7 recv-wind = 7 N2 = 8
N1-Send = 4105 N1-Rcv = 4105 ack-delay = 100 ack-max = 3
Nw = 0 Ww = 7
Last Ww Cause = neverInvoked
Connection Time: 17:50:11
Last modified: never
```

Table 70 explains parameters in use by the LLC2 connection. These parameters are the ones configured on the internal adapter 4000.0000.0001 at the time the LLC2 connection was established. If the LLC2 parameters on the internal adapter are changed while this connection is active, the connection will not reflect the changes to the adapter

**Table 70** *show extended channel llc2 Field Descriptions for Internal LAN Adapter*

Field	Description
State	<ul style="list-style-type: none"> <li>• aDM</li> <li>• setup</li> <li>• conn</li> <li>• normal</li> <li>• busy</li> <li>• reject</li> <li>• await</li> <li>• awaitBusy</li> <li>• awaitReject</li> <li>• discConn</li> <li>• reset</li> <li>• error</li> <li>• pendDiscRsp</li> </ul> <p>The descriptions for each state can be found in Section 7.8.3, IOS 8802-2 : 1989, ANSI/IEEE Std 802.2 - 1989.</p>
t1-time	Length of time the CMCC LLC2 link station waits for an acknowledgment to a transmitted I-frame before polling the remote LLC2 station.
tpf-time	Amount of time the CMCC LLC2 link station waits for a final response to a poll before resending the original poll frame.
trej-time	Amount of time the CMCC LLC2 link station waits for a correct frame after sending a reject command to a remote LLC2 station.
tbusy-tim	Amount of time the CMCC LLC2 link station waits before repolling a busy LLC2 station.
idle-time	Frequency of polls during periods of idle traffic.
local-win	Maximum number of I-frames that the CMCC LLC2 link station can send to the remote LLC2 station without receiving an acknowledgment.
recv-wind	Maximum number of I-frames that a CMCC LLC2 link station can receive without receiving an acknowledgment.
N2	Number of times a CMCC LLC2 link station will resend an unacknowledged I-frame
N1-Send	Largest frame size this CMCC LLC2 link station is allowed to send.

**Table 70** show extended channel llc2 Field Descriptions for Internal LAN Adapter (continued)

Field	Description
N1-Rcv	Largest frame size this CMCC LLC2 link station can receive.
ack-delay	Maximum amount of time the CMCC LLC2 link station allows received I-frames to remain unacknowledged. The CIP LLC2 connection will acknowledge received I-frames within the ack-delay time.
ack-max	Maximum number of I-frames a CMCC LLC2 link station receives before sending an acknowledgment.
Nw	Working send window size. When I-frames sent by a CMCC LLC2 link station are rejected by the remote LLC2 station, the CMCC LLC2 link station reduces its working send window size to 1. Then, for every subsequent I-frame sent by the CMCC LLC2 connection that is positively acknowledged by the remote LLC2 station, the CMCC LLC2 link station increases its working send window by the Nw value until the working send window reaches the configured local-window value.
Ww	Current working window size for this LLC2 link station. This is the current number of unacknowledged I-frames that this LLC2 link station will send.
Last Ww Cause	Last event that caused the working window to change values. Valid values are: <ul style="list-style-type: none"> <li>neverInvoked - This LLC2 station has not detected a condition to change the working window from the initial value at activation time.</li> <li>lostData - The current working window value was changed due to loss of data by the remote LLC2 link station</li> <li>macLayerCongestion - The current working window value was changed due to the remote end station sending this LLC2 link station a RNR frame.</li> </ul>
Connection Time	Length of time this LLC2 connection has been active.
Last modified	Length of time since one of the LLC2 parameters for this connection was last modified.

The following sample displays statistics for the CMCC LLC2 link station connection between LMAC 4000.1010.2020 LSAP 04 and RMAC 4000.1234.1030 RSAP 18.

```
Router# show extended channel 5/2 llc2 stats 4000.1010.2020 04 4000.1234.1030 18
```

```
LAN Token 0 Adapter 0 4000.1010.2020
Local SAP=04 Remote MAC=4000.1234.1030 Remote SAP=18
LocalBusies = 0 RemoteBusies = 0
IFramesIn = 1 IFramesOut = 1
IOctetsIn = 19 IOctetsOut = 21
SFramesIn = 0 SFramesOut = 0
REJsIn = 0 REJsOut = 0
RetransmitsOut = 0 WwCountChanges = 0
```

Table 71 describes the fields shown in the display

**Table 71** show extended channel llc2 stats Field Descriptions

Field	Description
LocalBusies	Number of times the CMCC LLC2 link station entered the busy state. This occurs for a CMCC LLC2 link station when there are n I-Frames received from the remote LLC2 station on the CMCC queued to be sent over the channel to VTAM. Where n is 2 times the rcv-wind. The CMCC LLC2 link station will also enter into busy state whenever it receives a flow control command from VTAM.
RemoteBusies	Number of times the remote LLC2 link station entered into busy state.
IFramesIn	Number of LLC2 Information Frames received by the CMCC LLC2 link station from the remote link station.
IFramesOut	Number of LLC2 Information Frames sent by the CMCC link station to the remote link station.
IOctetsIn	Number of LLC2 Information Frame bytes received by the CMCC LLC2 link station from the remote link station.
IOctetsOut	Number of LLC2 Information Frame bytes sent by the CMCC link station to the remote link station.
SFramesIn	Number of LLC2 supervisory frames received by the CMCC link station from the remote link station. These include RRs, RNRs and REJs.
SFramesOut	Number of LLC2 supervisory frames sent by the CMCC link station to the remote link station. These include RRs, RNRs and REJs.
REJsIn	Number of LLC2 REJ frames received by the CMCC link station from the remote link station. This indicates the number of times the remote link station detected dropped I-Frames sent from the CMCC LLC2 station.
REJsOut	Number of LLC2 REJ frames sent by the CMCC link station to the remote link station. This indicates the number of times the CMCC link station detected dropped I-Frames sent by the remote link station.
RetransmitsOut	Number of I-Frames the CMCC link station was required to retransmit.
WwCountChanges	Number of times the CMCC LLC2 link station changed its working send window (local-win). See Nw above for a description of when the LLC2 link stations working send window is changed.

**Related Commands**

Command	Description
adapter	Configures internal adapters.

# show extended channel max-llc2-sessions

Use the **show extended channel max-llc2-sessions** privileged EXEC command to display information about the number of LLC2 sessions supported on the CMCC adapter.

**show extended channel *slot/port* max-llc2-sessions**

Syntax Description	
<i>slot</i>	Slot number.
<i>port</i>	Port number.
<i>max-llc2-sessions</i>	Display the maximum number of LLC2 sessions supported on the CMCC adapter.

**Command Modes** Privileged EXEC

Command History	Release	Modification
	11.0(3)	This command was introduced

**Usage Guidelines** This command is valid only on the virtual channel interface.

**Examples** The following is sample output from the **show extended channel max-llc2-sessions** command:

```
Router# show extended channel 1/2 max-llc2-sessions

Administrative max-llc2-sessions = 1000
Operational max-llc2_sessions = 1000
Highest concurrent LLC2 sessions = 30
LLC2 session allocation failures = 0
```

Table 72 describes the fields shown in the display.

**Table 72** *show extended channel max-llc2-sessions* Field Descriptions

Field	Description
Administrative max-llc2-sessions	Maximum number of LLC2 sessions configured.
Operational max-llc2-sessions	Maximum number of LLC2 sessions configured on the CMCC adapter. This value differs from the value for the administrative max-llc2-sessions if the maximum number of LLC2 sessions is decreased by configuring a new value while the CMCC adapter's virtual interface is up. If the CMCC adapter's virtual interface is reset (shut / no shut), both the administrative and operational max-llc2-sessions numbers will match.

**Table 72** *show extended channel max-llc2-sessions Field Descriptions (continued)*

Field	Description
Highest concurrent llc2 sessions	Highest number of LLC2 sessions active concurrently since the CMCC adapter LLC2 was started. When the CMCC adapter llc2 is initiated, the following message displays:  %CIP1-6-MSG: %MSG802-6-LLC_START: Starting LLC-2 with a session capacity of 1000
LLC2 session allocation failure	Number of times network devices tried to establish an LLC2 connection with the CMCC adapter and failed because the operational max-llc2-sessions limit was reached when the connection was attempted

**Related Commands**

Command	Description
<b>adapter</b>	Configures internal adapters.
<b>show extended channel connection-map llc2</b>	Displays the number of active LLC2 connections for each SAP and the mapping of the internal MAC adapter and the SAP to the resource that activated the SAP.

# show extended channel packing names

Use the **show extended channel packing names EXEC** command to display CLAW packing names and their connection state.

**show extended channel *slot/port* packing names [*path* [*device-address*]]**

Syntax Description	
<i>slot</i>	Slot number.
<i>port</i>	Port number.
<i>path</i>	Hexadecimal value in the range 0000 to FFFF. This value specifies the logical channel path and consists of two digits for the physical connection (either on the host or on the ESCON director), one digit for the channel logical address, and one digit for the control unit logical address. If the path is not specified in the IOCP, the default values for channel logical address and control unit logical address is 0.
<i>device-address</i>	Hexadecimal value in the range 00 to FE. This is the unit address associated with the control unit number and path as specified in the host IOCP file. The device address must have an even value.

**Command Modes** EXEC

Command History	Release	Modification
	12.0	This command was introduced.

**Examples** The following is sample output from the **show extended channel packing names** command:

```
Router# show extended channel 3/0 packing names
```

```
Path: C010 Devices: F2,F3 CLAW Link: 1
```

```

Sublink      Link Names
  0           CONTROL
  1           IP       IP
  2           CKSUM    CKSUM

```

```
Path: C030 Devices: F6,F7 CLAW Link: N
```

```

Sublink      Link Names
DISCONNECTED CONTROL
DISCONNECTED IP       IP
DISCONNECTED CKSUM    CKSUM

```

Table 73 describes the fields shown in the display

**Table 73** *show extended channel packing names Field Descriptions*

Field	Description
Path	The path from the CLAW configuration. It indicates which port on the switch is used by the channel side of the configuration.
Devices	The device address for each device. One CLAW connection requires 2 devices. You need only specify the even address.
CLAW Link	The established CLAW link number used for all CLAW packing messages. A number value indicates that a CONTROL sublink is connected. "N" indicates that a control sublink is disconnected.
Sublink	<ul style="list-style-type: none"> <li>• DISCONNECTED indicates that a sublink connection for a particular link name is not established.</li> <li>• 0 indicates that the CONTROL sublink is established.</li> <li>• 1 - 15 indicates the negotiated sublink number for each application pair.</li> </ul>
Link Names	<p>The name used to represent the type of traffic that flows over a particular sublink.</p> <ul style="list-style-type: none"> <li>• CONTROL indicates the sublink used to transport CLAW packing control messages.</li> <li>• IP indicates the sublink used to transmit IP datagrams whose TCP checksum is handled by the host.</li> </ul> <p>CKSUM indicates the sublink used to transmit IP datagrams that use the CMCC checksum assist feature.</p>

#### Related Commands

Command	Description
<b>claw (interface)</b>	Configures a CLAW device (read and write subchannel) for communication with a mainframe TCP/IP stack in IP Datagram mode. Can also be used to configure individual members of a CLAW backup group for the IP Host Backup feature.
<b>offload (interface)</b>	Configures an Offload device (read and write subchannel) for communication with a mainframe TCP/IP stack in Offload mode. Also can be used to configure individual members of an Offload backup group for the IP Host Backup feature.

# show extended channel packing stats

Use the **show extended channel packing stats EXEC** command to display CLAW packing statistics.

**show extended channel *slot/port* packing stats [*path* [*device-address*]]**

Syntax Description	
<i>slot</i>	Slot number.
<i>port</i>	Port number.
<i>path</i>	(Optional) Hexadecimal value in the range 0x0000 to 0xFFFF. This specifies the data path and consists of two digits for the physical connection (either on the host or on the ESCON Director switch): one digit for the control unit address, and one digit for the channel logical address. If not specified, the control unit address and channel logical address default to 0.
<i>device-address</i>	(Optional) Hexadecimal value in the range 0x00 to 0xFE. This value is the unit address associated with the control unit number and path as specified in the host IOCP file. For CLAW and offload support, the device address must have an even value.

**Command Modes** EXEC

Command History	Release	Modification
	12.0	This command was introduced.

## Examples

The following is sample output from the **show extended channel packing stats** command:

```
Router# show extended channel 3/0 packing stats
```

```
Path: C010 Devs: F2,F3 CLAW Link: 1 Read Blks: 4584 Wrt Blks: 15054
      Packets          Bytes          Drops
Linkname  Read    Write    Read    Write    Read    Write    Err C
CONTROL   4       2       128     64       0       0       0 Y
IP        5       5       500     500     0       0       0 Y
CKSUM    4694   93584   187854  53889648 0       0       0 Y
  Total:  4703   93591   188482  53890212 0       0       0
```

```
Path: C030 Devs: F6,F7 CLAW Link: N Read Blks: UNKNOWN Wrt Blks: UNKNOWN
      Packets          Bytes          Drops
Linkname  Read    Write    Read    Write    Read    Write    Err C
CONTROL   0       0       0       0       0       0       0 N
IP        0       0       0       0       0       0       0 N
CKSUM    0       0       0       0       0       0       0 N
  Total:  0       0       0       0       0       0       0
```

Table 74 describes the fields shown in the display

**Table 74** *show extended channel packing stats Field Descriptions*

Field	Description
Path	The path from the CLAW, offload, or CSNA configuration.
Devs	The device address for each device. One CLAW connection requires 2 devices. You need only specify the even address.
CLAW Link	The established CLAW link number used for all CLAW packing messages. A number value indicates that a CONTROL sublink is connected. "N" indicates that a control sublink is disconnected.
Read Blks	The number of CLAW channel blocks read.
Write Blks	The number of CLAW channel blocks written.
Linkname	The name used to represent the type of traffic that flows over a particular sublink. <ul style="list-style-type: none"> <li>CONTROL indicates the sublink used to transport CLAW packing control messages.</li> <li>IP indicates the sublink used to transmit IP datagrams whose TCP checksum is handled by the host.</li> </ul> CKSUM indicates the sublink used to transmit IP datagrams that use the CMCC checksum assist feature.
Packets Read Write	The total number of packets read and written for each sublink.
Bytes Read Write	The total number of bytes read and written for each sublink.
Drops Read Write	The total number of dropped read and write packets for each sublink.
Err	The number of errors. Each error produces an error message at the router console.
C	Connection state of a sublink. 'Y' indicates connected. 'N' indicates not connected.
Total	The total for each of the recorded statistics.

#### Related Commands

Command	Description
<b>claw (interface)</b>	Configures a CLAW device (read and write subchannel) for communication with a mainframe TCP/IP stack in IP Datagram mode. Can also be used to configure individual members of a CLAW backup group for the IP Host Backup feature.
<b>offload (interface)</b>	Configures an Offload device (read and write subchannel) for communication with a mainframe TCP/IP stack in Offload mode. Also can be used to configure individual members of an Offload backup group for the IP Host Backup feature.

# show extended channel statistics

Use the **show extended channel statistics EXEC** command to display statistical information about subchannels on the physical interface of a CMCC adapter. This command displays information that is specific to the interface channel devices. The information is generally useful only for diagnostic tasks performed by technical support personnel.

**show extended channel** *slot/port* **statistics** [*path* [*device-address*]] [**connected**]

Syntax Description	
<i>slot</i>	Slot number.
<i>port</i>	Port number.
<i>path</i>	(Optional) Hexadecimal value in the range 0x0000 to 0xFFFF. This specifies the data path and consists of two digits for the physical connection (either on the host or on the ESCON Director switch): one digit for the control unit address, and one digit for the channel logical address. If not specified, the control unit address and channel logical address default to 0.
<i>device-address</i>	(Optional) Hexadecimal value in the range 0x00 to 0xFE. This value is the unit address associated with the control unit number and path as specified in the host IOCP file. For CLAW and offload support, the device address must have an even value.
<b>connected</b>	(Optional) For each backup group, only display information about the active subchannel or the first subchannel defined in the group if none are active.

**Command Modes** EXEC

Command History	Release	Modification
	10.2	This command was introduced.

**Examples** The following is sample output for the **show extended channel statistics** command from a CMCC adapter configured with CLAW, Offload, CSNA, and CMPC:

```
Router# show extended channel 0/1 statistics E010
```

```
Path: E010 -- ESTABLISHED
          Command
Dev  Connects  Retries  Cancels  Selective  System  Device  CU
      4459    4459      0        0         Reset    Reset   Errors  Busy
D0   4459    4459      0        0         0        0       0       0
D1   4950      0        0        0         0        0       0       0
D2   2529    2526      0        0         0        0       0       0
D3   2600      0        0        0         0        0       0       0
D9   2211      0        0        0         0        0       0       0
DA   4048    2024      0        0         0        0       0       0
          Blocks          Bytes          Dropped Blk  Memd
```

## ■ show extended channel statistics

```

Dev-Lnk      Read      Write      Read      Write      Read      Write  wait  Con
D0-00        0          0          0          0          0          0      0     0   Y
D0-01       5017        0     1215457      0          0          0      0     0   Y
Total:       5017        0     1215457      0          0          0      0     0
D1-00        0          0          0          0          0          0      0     0   Y
D1-01        0        5039        0     1247307      0          0      0     0   Y
Total:        0        5039        0     1247307      0          0      0     0
D2-00        0          0          0          0          0          0      0     0   Y
D2-01        0          0          0          0          0          0      0     0   Y
D2-02       2671        0     661621        0          0          0      0     0   Y
Total:       2671        0     661621        0          0          0      0     0
D3-00        0          0          0          0          0          0      0     0   Y
D3-01        0          0          0          0          0          0      0     0   Y
D3-02        0        2680        0     653285        0          0      0     0   Y
Total:        0        2680        0     653285        0          0      0     0
D9-00        0        2214        0     223418        0          0      0     0   Y
DA-00       2024        0     124587        0          0          0      0     0   Y
Path E010
Total:       9712       9933     2001665     2124010        0          0      0     0
  Last statistics 5 seconds old, next in 5 seconds

```

Table 75 describes the fields shown in the display.

**Table 75** *show extended channel statistics Field Descriptions*

Field	Description
Path	The path from the CLAW, offload, CMPC, or CSNA configuration.
Dev	The device address for each device. For CLAW and offload, you get two device addresses. In the configuration statement, you only specify the even address. Both CSNA and CMPC get one device.
Connects	The number of times the channel started a channel program on the device.
Command Retries	The number of times the CMCC adapter either had no data to send to the channel (for the read subchannel) or the number of times the CMCC adapter had no buffers to hold data from the channel (for the write subchannel). Every command retry that is resumed results in a connect. A command retry may be ended via a cancel.
Cancel	The host requested any outstanding operation to be terminated. It is a measure of the number of times the host program was started.
Selective Reset	Selective reset affects only one device, whereas a system reset affects all devices on the given channel. It is a reset of the device. On VM this will occur whenever you have a device attached and issue a CP IPL command.
System Reset	The number of times the system Initial Program Load (IPL) command was issued. The command is always issued when the ECA is initialized, and when the channel is taken off line.
Device Errors	Errors detected by the ESCON or Parallel interface due to problems on the link. This value should always be 0.

**Table 75** show extended channel statistics Field Descriptions (continued)

Field	Description
CU Busy	The number of times the adapter returned a control unit busy indication to the host. This occurs after a cancel or reset if the host requests an operation before the CMCC adapter has finished processing the cancel or reset.
Dev-Lnk	The first number is the device address. The second number is the logical link. Link 0 is always used for CLAW control messages. For IP datagram mode, link 1 is for actual datagram traffic.  For offload, link 2 is for API traffic. For CSNA and CMPC, the Dev-Lnk is not relevant.
Blocks Read/Blocks Write	A count of channel blocks that are read and written from the mainframe.
Bytes Read/Bytes Write	Bytes is the sum of the bytes in the blocks.
Dropped Blk Read/Write	If the route processor sends data to the CMCC adapter faster than it can send it to the channel, then the block is dropped. High values mean the host is not running fast enough. There are drops on write too. A write drop will occur if the CMCC adapter fails to get a router processor buffer <i>n</i> times for a given block. See Memd wait counter.
Memd wait	The number of times the CMCC adapter could not obtain a buffer. The Memd wait information does not apply to CSNA devices.
Con	For link 0, connect of Y means the system validation has completed. For all other links, it means the connection request sequence has completed. Con is an abbreviation for connected. For CSNA devices, a value of Y is displayed when the CSNA device status becomes setupComplete. For all other states, the Con shows a value of N.

The following is sample output for the CSNA path, using the **show extended channel statistics** command:

```
Router# show extended channel 0/1 statistics E200
```

```
Path: E200 -- ESTABLISHED
          Command          Selective   System   Device   CU
Dev  Connects  Retries  Cancels   Reset    Reset    Errors   Busy
D0    217440    108293     1         0         0         0         0
D1    59530     19800     1         0         0         0         0
D2    1065       252       2         0         0         0         0
D3    1329       16        2         0         0         0         0
D4    1066       251       2         0         0         0         0
D5    887        29        2         0         0         0         0
DA    1073       17        2         0         0         0         373
DB    410       174       2         0         0         0         0
DC    1154      14        2         0         0         0         459
DD    254       17        2         0         0         0         0
```

## ■ show extended channel statistics

Dev-Lnk	Blocks		Bytes		Dropped Blk		Memd	
	Read	Write	Read	Write	Read	Write	wait	Con
D0-00	109096	109095	237799616	880468	0	0	0	Y
D1-00	19877	19875	160688	237876362	0	0	0	Y
D2-00	9	12842	801	52554701	0	0	0	Y
D3-00	1315	8	30378114	1052	0	0	0	Y
D4-00	9	12842	801	52554701	0	0	0	Y
D5-00	860	8	17003956	1052	0	0	0	Y
DA-00	687	8	14617852	1052	0	0	0	Y
DB-00	9	3578	801	14613989	0	0	0	Y
DC-00	682	8	14513604	1052	0	0	0	Y
DD-00	9	3594	801	14679517	0	0	0	Y
Path E200								
Total:	132553	161858	314477034	373163946	0	0	0	
Last statistics 3 seconds old, next in 7 seconds								

## Related Commands

Command	Description
<b>claw (interface)</b>	Configures a CLAW device (read and write subchannel) for communication with a mainframe TCP/IP stack in IP Datagram mode. Can also be used to configure individual members of a CLAW backup group for the IP Host Backup feature.
<b>client (lu limit)</b>	Configures a CMPC read subchannel and a CMPC write subchannel.
<b>csna</b>	Configures SNA support on a CMCC physical channel interface and specifies the path and device/subchannel on a physical channel of the router to communicate with an attached mainframe.
<b>offload (interface)</b>	Configures an Offload device (read and write subchannel) for communication with a mainframe TCP/IP stack in Offload mode. Also can be used to configure individual members of an Offload backup group for the IP Host Backup feature.

# show extended channel subchannel

Use the **show extended channel subchannel EXEC** command to display information about the CMCC adapter physical interfaces. This command displays information that is specific to the interface channel connection. The information displayed is generally useful only for diagnostic tasks performed by technical support personnel.

**show extended channel *slot/port* subchannel [connected]**

Syntax Description	
<i>slot</i>	Slot number.
<i>port</i>	Port number.
<b>connected</b>	(Optional) For each backup group, only display information about the active subchannel or the first subchannel defined in the group if none are active.

**Command Modes** EXEC

Command History	Release	Modification
	10.2	This command was introduced.

## Examples

The following is sample output from the **show extended channel subchannel connected** command used on a CMCC adapter configured for CLAW, Offload, and CSNA:

```
Router# show extended channel 1/0 subchannel

Channell1/0:state up
  Flags:VALID ESCON LOADED ENABLED SIGNAL
  Link:E9, Buffers 0, CRC errors 1, Load count 1
  Link Incident Reports
    implicit 0, bit-error 0, link failed 1,
    NOS 0, sequence timeout 0, invalid sequence 0
  Neighbor Node - VALID
    Class:Switch           Type Number :009032           Tag:E9
    Model:002              Manufacturer:IBM
    Plant:02               Sequence      :000000010685
  Local Node - VALID
    Class:CTCA-standalone  Type Number :C7200           Tag:10
    Model:6                Manufacturer:CSC
    Plant:A                Sequence      :8083599
```

## show extended channel subchannel

```

Mode      Path Device
CLAW      E020 90 172.18.55.12 CISCOMVS TRAILMIX TCPIP TCPIP 0000 Flags:RESET_EVENT
CLAW      E020 91 172.18.55.12 CISCOMVS TRAILMIX TCPIP TCPIP 0000 Flags:RESET_EVENT
CSNA      E020 94 maxpiu 20470 time-delay 10 length-delay 20470 0000 Flags:RESET_EVENT
OFFLOAD   E140 90 172.18.55.11 CISCOMVS TRAILMIX TCPIP TCPIP 0080 TCPIP API Flags:CMD_RETRY
OFFLOAD   E140 91 172.18.55.11 CISCOMVS TRAILMIX TCPIP TCPIP 0080 TCPIP API Flags:CMD_RETRY
CLAW      E150 90 172.18.55.13 CISCOMVS TRAILMIX TCPIP TCPIP 0080 Flags:CMD_RETRY
CLAW      E150 91 172.18.55.13 CISCOMVS TRAILMIX TCPIP TCPIP 0080 Flags:CMD_RETRY
CLAW      E150 96 172.18.55.22 CISCOMVS TRAILMIX TCPIP TCPIP 0080
CLAW      E150 97 172.18.55.22 CISCOMVS TRAILMIX TCPIP TCPIP 0080
CLAW      E160 90 172.18.55.14 CISCOMVS TRAILMIX TCPIP TCPIP 0080 Flags:CMD_RETRY
CLAW      E160 91 172.18.55.14 CISCOMVS TRAILMIX TCPIP TCPIP 0080 Flags:CMD_RETRY
CLAW      E170 90 172.18.55.15 CISCOMVS TRAILMIX TCPIP TCPIP 0080 Flags:CMD_RETRY
CLAW      E170 91 172.18.55.15 CISCOMVS TRAILMIX TCPIP TCPIP 0080 Flags:CMD_RETRY
CLAW      E180 90 172.18.55.20 VMV2R3 TRAILMIX TCPIP TCPIP 0000 Flags:CMD_RETRY
CLAW      E180 91 172.18.55.20 VMV2R3 TRAILMIX TCPIP TCPIP 0000 Flags:CMD_RETRY
CLAW      E180 92 172.18.55.21 TSOMAIN TRAILMIX TCPIP TCPIP 0000 Flags:CMD_RETRY
CLAW      E180 93 172.18.55.21 TSOMAIN TRAILMIX TCPIP TCPIP 0000 Flags:CMD_RETRY
CLAW      E190 90 172.18.55.17 CISCOMVS TRAILMIX TCPIP TCPIP 0000 Flags:RESET_EVENT
CLAW      E190 91 172.18.55.17 CISCOMVS TRAILMIX TCPIP TCPIP 0000 Flags:RESET_EVENT
CLAW      E1E0 90 172.18.55.18 CISCOMVS TRAILMIX TCPIP TCPIP 0080 Flags:CMD_RETRY
CLAW      E1E0 91 172.18.55.18 CISCOMVS TRAILMIX TCPIP TCPIP 0080 Flags:CMD_RETRY
CLAW      E1F0 90 172.18.55.19 CISCOMVS TRAILMIX TCPIP TCPIP 0080 Flags:CMD_RETRY
CLAW      E1F0 91 172.18.55.19 CISCOMVS TRAILMIX TCPIP TCPIP 0080 Flags:CMD_RETRY

```

Last statistics 6 seconds old, next in 4 seconds

Table 76 describes the fields shown in the display.

**Table 76** show extended channel subchannel connected Field Descriptions

Field	Description
Channelx/y: state	State can be up, down, or administratively down.
Flags	<ul style="list-style-type: none"> <li>• BUF_WAIT—Mainframe attempts to write data to the CMCC adapter and the CMCC adapter has no buffers for all of the write operation.</li> <li>• BUSY—Processing resets.</li> <li>• CMD_RETRY—Mainframe attempts to write data to the CMCC adapter when the CMCC adapter has no buffers for it, or the mainframe performs a read operation and the CMCC adapter has no data to send.</li> <li>• ENABLED—Interface is allowed to send and receive datagrams.</li> <li>• ESCON—Channel interface is an ESCON interface.</li> <li>• FBL_WAIT—Mainframe attempts to write data to the CMCC adapter and the CMCC adapter has no buffers for all of the write operation.</li> </ul>

**Table 76** *show extended channel subchannel connected Field Descriptions (continued)*

Flags (continued)	<ul style="list-style-type: none"> <li>• <b>GO-OFF</b>—CMCC adapter is trying to shut down the channel interface. This state should not persist for more than a few seconds. This flag is not applicable to the virtual channel interface.</li> <li>• <b>INVALID</b>—All displays for virtual channel interfaces should contain this flag. On physical channel interfaces, it indicates a problem with the CMCC adapter microcode.</li> <li>• <b>LOADED</b>—Channel firmware for the physical channel interface is loaded. The channel firmware is loaded only if the interface configuration contains at least one device configuration statement and is not shut down. This flag matches the state of the “loaded” LED. This flag is not applicable to the virtual channel interface.</li> <li>• <b>LOVE</b>—Note indicating an interface state change (up-down or down-up) is pending on this interface. This state should not persist for more than a few seconds.</li> <li>• <b>OFFLINE</b>—For an ESCON channel interface, this flag indicates that no mainframe has established an ESCON logical path corresponding to the paths specified in any device configuration statement (claw, offload, csna, or cmpc). For a Parallel channel interface, this flag indicates that the x'0100' path is not defined in any device configuration statement or SIGNAL is not present.</li> <li>• <b>ONLINE</b>—For an ESCON Channel interface, this flag indicates that at least one mainframe has established an ESCON logical path corresponding to the paths specified in one of the device configuration statements (CLAW, offload, CSNA, CMPC, or CMPC+). For a Parallel Channel interface, this flag indicates that the x'0100' path is defined in at least one device configuration statement and SIGNAL is present.</li> </ul>
-------------------	---

**Table 76** *show extended channel subchannel connected Field Descriptions (continued)*

Flags (continued)	<ul style="list-style-type: none"> <li>• RQC_PEND—CMCC adapter is attempting to send status to the channel on this interface. This state should not persist for more than a few seconds. This flag is not applicable to the virtual channel interface.</li> <li>• RESET_EVENT—Indicates that a reset event has been received.</li> <li>• SIGNAL—For an ESCON channel interface, this flag indicates that light is detected. For a Parallel channel interface, this flag indicates that the “operational out” signal is detected. This flag matches the state of the “signal” LED. It will only be set if the LOADED flag is set as well. This flag is not applicable to the virtual channel interface.</li> <li>• STAT_PEND—CMCC adapter has status to present for this device. The indication is cleared when the mainframe accepts the status.</li> <li>• SUSPEND—Indicates that the CMCC device task has decided to suspend data transfer for a particular device.</li> <li>• VALID—A physical interface is installed. All displays for physical channel interfaces should contain this. This flag matches the state of the “present” LED.</li> </ul>
Link: xx	Director Port number to which the physical channel is connected. If the physical channel is directly connected, then this value is host dependent.
Buffers	Number of times the CMCC adapter has dropped a packet bound for the route processor because no packet switching buffer was available on the route processor.
CRC errors	Number of CRC errors detected on the channel for ESCON. Number of parity errors detected on the channel for Parallel.

**Table 76** *show extended channel subchannel connected Field Descriptions (continued)*

Load count	For a CMCC physical channel interface, the number of times the channel adapter microcode has been loaded.
Link Incident Reports	<p>Link incidents are errors on an ESCON channel. These errors are reported to the host operating system and are recorded here for additional information.</p> <ul style="list-style-type: none"> <li>• Implicit incidents—Recoverable error occurred in the ECA.</li> <li>• Bit errors—Bit error rate threshold was reached. The bit error rate threshold is 15 error bursts within 5 minutes. An error burst is defined as a time period of 1.5 +/- .5 seconds during which one or more code violations occurred. A code violation error is caused by an incorrect sequence of 10 bit characters.</li> <li>• Link failed—Loss of synchronization or light has occurred.</li> <li>• NOS—Channel or switch transmitted the Not Operational Sequence.</li> <li>• Sequence timeout—Connection recovery timeout has occurred or the router is waiting for the appropriate response while in the transmit off-line sequence (OLS) state.</li> <li>• Invalid Sequence—Unconditional disconnect (UD) or unconditional disconnect response (UDR) is recognized in the wait for offline sequence state.</li> </ul>
Neighbor node	<p>Describes the channel or switch. Valid values are:</p> <ul style="list-style-type: none"> <li>• VALID—Information has been exchanged between the router and channel or switch.</li> <li>• Class—Switch or channel depending on whether the connection is a switched point-to-point connection or a point-to-point connection.</li> <li>• Type number—Model of switch or processor.</li> <li>• TAG—Physical location of the connector.</li> <li>• Model—A further classification of type.</li> <li>• Manufacturer—Identifies who made switch or processor.</li> <li>• Plant and sequence—Manufacturer-specific information to uniquely define this one device.</li> </ul>

**Related Commands**

Command	Description
<b>claw (interface)</b>	Configures a CLAW device (read and write subchannel) for communication with a mainframe TCP/IP stack in IP Datagram mode. Can also be used to configure individual members of a CLAW backup group for the IP Host Backup feature.
<b>client (lu limit)</b>	Configures a CMPC read subchannel and a CMPC write subchannel.

Command	Description
<b>csna</b>	Configures SNA support on a CMCC physical channel interface and specifies the path and device/subchannel on a physical channel of the router to communicate with an attached mainframe.
<b>offload (interface)</b>	Configures an Offload device (read and write subchannel) for communication with a mainframe TCP/IP stack in Offload mode. Also can be used to configure individual members of an Offload backup group for the IP Host Backup feature.

# show extended channel tcp-connections

Use the **show extended channel tcp-connections** EXEC command to display information about the Transmission Control Protocol (TCP) sockets on a channel interface.

```
show extended channel slot/port tcp-connections [[loc-ip-addr [loc-port [rem-ip-addr
rem-port]]]] [detail | summary]
```

Syntax	Description
<i>slot</i>	Slot number.
<i>port</i>	Port number.
<b>tcp-connections</b>	Specifies TCP connections display.
<i>loc-ip-addr</i>	(Optional) Local IP address. IP address of the local connection endpoint. Restricts the output to those connections with a matching local IP address.
<i>loc-port</i>	(Optional) Local TCP port. This is the TCP port of the local connection endpoint. Restricts the output to those connections with a matching local TCP port. An asterisk (*) is a wildcard that matches every port.
<i>rem-ip-addr</i>	(Optional) Remote IP address. IP address of the remote connection endpoint. Restricts the output to those connections with a matching remote IP address.
<i>rem-port</i>	(Optional) Remote TCP port. TCP port of the remote connection endpoint. Restricts the output to those connections with a matching remote TCP port.
<b>detail</b>	(Optional) Prints detailed information about every matching connection.
<b>summary</b>	(Optional) This is the default. Prints a summary of all matching connections.

**Command Modes** EXEC for summary and Privileged EXEC for detail.

Command History	Release	Modification
	11.0	This command was introduced.

**Usage Guidelines** The **show extended channel tcp-connections** command is valid on both physical and virtual channel interfaces. If no IP addresses or TCP ports are specified, all TCP connections are displayed in a summary for the specified interface.

The command displays detailed information about a large number of sessions that can take a long time. Consider restricting the output by IP address and TCP port to connections of interest.

**Examples**



The following is sample output for the **show extended channel tcp-connections detail** command:

```
Router# show extended channel 0/1 tcp-connections detail
```

Local IP Addr	Port	Remote IP Addr	Port	State	In Bytes	Out Bytes
80.11.198.2	21	0.0.0.0	0	listen	0	0
80.11.198.2	21	172.18.48.194	38668	establish	62	298
80.11.198.2	23	0.0.0.0	0	listen	0	0
80.11.198.2	23	172.18.48.194	38666	establish	124	11966
80.11.198.2	1025	0.0.0.0	0	listen	0	0
80.11.198.2	1025	172.18.48.194	38705	closeWait	24	1
80.11.198.3	7	0.0.0.0	0	listen	0	0
80.11.198.3	9	0.0.0.0	0	listen	0	0
80.11.198.3	19	0.0.0.0	0	listen	0	0
80.11.198.3	21	0.0.0.0	0	listen	0	0
80.11.198.3	23	0.0.0.0	0	listen	0	0
80.11.198.3	23	172.18.48.194	38667	establish	85	446

Table 77 describes the fields shown in the display.

**Table 77** show extended channel tcp-connections Field Descriptions

Field	Description
State	<p>The state of this TCP connection.</p> <p>The only value which may be set by a management station is deleteTCB(12). Accordingly, it is appropriate for an agent to return a 'badValue' response if a management station attempts to set this object to any other value.</p> <p>If a management station sets this object to the value deleteTCB(12), then this has the effect of deleting the TCB (as defined in RFC 793) of the corresponding connection on the managed node, resulting in immediate termination of the connection.</p> <p>As an implementation-specific option, a RST segment may be sent from the managed node to the other TCP endpoint (note however that RST segments are not sent reliably).</p>
In Bytes	<p>Number of bytes sent for this TCP connection.</p> <p> <b>Note</b> To support SNMP Version 1 Managers, this variable is supplied as a 32 bit value which can wrap very frequently.</p>
Out Bytes	<p>Number of bytes received for this TCP connection.</p> <p> <b>Note</b> To support SNMP Version 1 Managers, this variable is supplied as a 32 bit value which can wrap very frequently.</p>

The following is sample output for the **show extended channel tcp-connections summary** command:

```
Router# show extended channel 0/1 tcp-connections summary
```

```
TCP Connections=12  Input Bytes=      294  Output Bytes=    13049
```

#### Related Commands

Command	Description
<b>offload (interface)</b>	Configures an Offload device (read and write subchannel) for communication with a mainframe TCP/IP stack in Offload mode. Also can be used to configure individual members of an Offload backup group for the IP Host Backup feature.
<b>pu (direct)</b>	Creates a PU entity that has its own direct link to a host, or enters PU configuration mode.
<b>pu (DLUR)</b>	Creates a PU entity that has no direct link to a host, or enters PU configuration mode.
<b>show extended channel tcp-stack</b>	Displays information about the TCP stack running on CMCC adapter interfaces.

# show extended channel tcp-stack

Use the **show extended channel tcp-stack** EXEC command to display information about the TCP stack running on CMCC adapter interfaces.

**show extended channel *slot/port* tcp-stack [*ip-address*]**

Syntax Description	
<i>slot</i>	Slot number.
<i>port</i>	Port number.
<b>tcp-stack</b>	Specifies <b>tcp stack</b> display.
<i>ip-address</i>	(Optional) IP address specified by the <b>offload</b> interface configuration command or the <b>tn327-server pu</b> command.

**Command Modes** EXEC

Command History	Release	Modification
	11.0	This command was introduced.

**Usage Guidelines** The **show extended channel tcp-stack** command is valid on both physical and virtual channel interfaces. If no *ip-address* argument is specified, then information is displayed for all IP addresses configured on the specified interface.

**Examples** The following is sample output from the **show extended channel tcp-stack** command:

```
Router# show extended channel 0/1 tcp-stack

TCP Statistics for IP Address 80.11.198.2
  RtoAlgorithm: vanj      RtoMin      : 1000      RtoMax      : 64000
  MaxConn      : -1      ActiveOpens : 1        PassiveOpens: 17
  AttemptFails: 0      EstabResets : 0        CurrEstab   : 5
  InSegs       : 181     OutSegs     : 147     RetransSegs : 0
  InErrs       : 0      OutRsts     : 0
TCP Statistics for IP Address 80.11.198.3
  RtoAlgorithm: vanj      RtoMin      : 1000      RtoMax      : 64000
  MaxConn      : -1      ActiveOpens : 0        PassiveOpens: 1
  AttemptFails: 0      EstabResets : 0        CurrEstab   : 6
  InSegs       : 25     OutSegs     : 23     RetransSegs : 0
  InErrs       : 0      OutRsts     : 0
```

Table 78 describes the fields shown in the display.

**Table 78** *show extended channel tcp-stack Field Descriptions*

Field	Description
RtoAlgorithm	The algorithm used to determine the timeout value used for retransmitting unacknowledged octets.
RtoMin	The minimum value permitted by a TCP implementation for the retransmission timeout, measured in milliseconds. More refined semantics for objects of this type depend upon the algorithm used to determine the retransmission timeout. In particular, when the timeout algorithm is rsre(3), an object of this type has the semantics of the LBOUND quantity described in RFC 793.
RtoMax	The maximum value permitted by a TCP implementation for the retransmission timeout, measured in milliseconds. More refined semantics for objects of this type depend upon the algorithm used to determine the retransmission timeout. In particular, when the timeout algorithm is rsre(3), an object of this type has the semantics of the UBOUND quantity described in RFC 793.”
MaxConn	The limit on the total number of TCP connections the entity can support. In entities where the maximum number of connections is dynamic, this object should contain the value -1.
ActiveOpens	Number of times TCP connections have made a direct transition to the SYN-SENT state from the CLOSED state.
PassiveOpens	Number of times TCP connections have made a direct transition to the SYN-RCVD state from the LISTEN state.
AttemptFails	Number of times TCP connections have made a direct transition to the CLOSED state from either the SYN-SENT state or the SYN-RCVD state, plus the number of times TCP connections have made a direct transition to the LISTEN state from the SYN-RCVD state.
EstabResets	Number of times TCP connections have made a direct transition to the CLOSED state from either the ESTABLISHED state or the CLOSE-WAIT state.
CurrEstab	Number of TCP connections for which the current state is either ESTABLISHED or CLOSE- WAIT.
InSegs	Total number of segments received, including those received in error. This count includes segments received on currently established connections.
OutSegs	Total number of segments sent, including those on current connections but excluding those containing only retransmitted octets.
RetransSegs	Total number of segments retransmitted - that is, the number of TCP segments transmitted containing one or more previously transmitted octets.

**Table 78** *show extended channel tcp-stack Field Descriptions (continued)*

Field	Description
InErrs	Total number of segments received in error (for example, bad TCP checksums).
OutRsts	Number of TCP segments sent containing the RST flag.

**Related Commands**

Command	Description
<b>offload (interface)</b>	Configures an Offload device (read and write subchannel) for communication with a mainframe TCP/IP stack in Offload mode. Also can be used to configure individual members of an Offload backup group for the IP Host Backup feature.
<b>pu (direct)</b>	Creates a PU entity that has its own direct link to a host, or enters PU configuration mode.
<b>pu (DLUR)</b>	Creates a PU entity that has no direct link to a host, or enters PU configuration mode.
<b>show extended channel tcp-connections</b>	Displays information about the TCP sockets on a channel interface.

# show extended channel tg

Use the **show extended channel tg** EXEC command to display configuration, operational information, and statistics information for CMPC transmission groups configured on the specified CMCC adapter's virtual interface.

```
show extended channel slot/port tg [oper | stats] [detailed] [tg-name]
```

Syntax Description	
<i>slot</i>	Slot number.
<i>port</i>	Port number.
<b>oper</b>	(Optional) Operational parameters for the CMPC transmission group values.
<b>stats</b>	(Optional) Statistical values for the CMPC transmission group.
<b>detailed</b>	(Optional) Additional LLC information about the CMPC transmission group.
<i>tg-name</i>	(Optional) Information for the specified <i>tg-name</i> .

**Command Modes** EXEC

Command History	Release	Modification
	11.3	This command was introduced.

**Usage Guidelines** The **show extended channel tg** command is valid only on the virtual channel interface. If *tg-name* argument is not specified, information about all *tgs* configured on the specified interface is displayed. If neither the **oper** or **stats** arguments are specified, operational values are displayed.

**Examples** The following is sample output from the **show extended channel tg oper** command:

```
Router# show extended channel 3/2 tg oper detailed MVS2-TG1

CMPC-TG: MVS2-TG1 Status: ACTIVE
  Adapter:token    1  RMAC:4000.4040.1996      LSAP:04      RSAP:04
  TGN      :21      Local CP: NETA.MVS2      Remote CP: NETA.CALEB
  MaxIn   :4105     MaxOut  :4105
  HPR     :NO      HPR LSAP:04             HPR RSAP :00
  RIF     :0830.1FF1.0041.00A0

Connection LLC2 Information:
  t1-time   = 1000  tpf-time  = 1000  trej-time = 3200  tbusy-tim = 9600
  idle-time =60000  local-win =   7   recv-wind =   7   N2         =   8
  N1-Send   = 1033  N1-Rcv   = 1033  ack-delay  = 100  ack-max    =   3
  Nw        =    0  Ww         =    7
```

## ■ show extended channel tg

```

Last Ww Cause = other
Connection Time: 00:00:00 UTC Jan 1 1970
Last modified: 00:00:00 UTC Jan 1 1970

```

Table 79 describes the fields shown in the display

**Table 79** *show extended channel tg oper Field Descriptions*

Field	Description
Status	<p>Connection status of the CMPC transmission group. Valid values are:</p> <ul style="list-style-type: none"> <li>• Shutdown—CMCC virtual interface is shutdown. In this state, all nonconfigurable values will not be displayed and the LLC connection operational values displayed when the detailed argument is specified also are not displayed.</li> <li>• Inactive—CMPC transmission group is reset ready to activate.</li> <li>• LocatingRemoteLinkStation—Exploring network for configured CMPC transmission group peer.</li> <li>• RemoteLinkStationLocated—CMPC transmission group network peer found. Waiting for connection negotiation to start.</li> <li>• XID3Negotiation—XID negotiation in progress.</li> <li>• PendingActive—Connect station pending.</li> <li>• Active—CMPC transmission group connection active.</li> </ul>
Adapter	Identifies the CMCC adapter's internal MAC adapter configured for this CMPC transmission group. The MAC address configured for this adapter is the local MAC address for the CMPC transmission group LLC connection.
RMAC	Remote MAC address configured for the CMPC transmission group LLC connection.
LSAP	Local SAP configured for the CMPC transmission group LLC connection.
RSAP	Remote SAP configured for the CMCP transmission group LLC connection.
TGN	Transmission group number for this CMPC transmission group LLC connection. This value is extracted from the XID3 negotiation exchange.
Local CP	Control point name for VTAM. The name is extracted from XID3s received from VTAM.
Remote CP	Control point name for the remote node connected by this CMPC transmission group. The name is extracted from XID3 received from the remote node.
MaxIn	Maximum PIU the remote node is allowed to send to VTAM. The value is the max PIU field in the XID3s received from VTAM.
MaxOut	Maximum PIU VTAM is allowed to send to the remote node. The value is the lowest of the max PIU field in the XID3 received from the remote node, the LF (length field) size in the RIF and the CMCC virtual interface MTU size.

**Table 79** show extended channel tg oper Field Descriptions (continued)

Field	Description
HPR	Valid values are YES and NO. If HPR is active on this CMPC transmission group, then the value will display YES.
HPR LSAP	Local SAP value used for HPR traffic. This value will be the same as the configured local SAP value.
HPR RSAP	Remote SAP value used for HPR traffic. This value is extracted from the XID3s during the connection negotiation between VTAM and the remote node.
RIF	Routing information field. If the CMPC transmission group LLC connection is established using source-route bridging, then the RIF used for the connection is displayed here.

The following is sample output on a Cisco 7500 router from the **show extended channel tg stats** command:

```
Router# show extended channel 3/2 tg stats detail MVS2-TG1
```

```
CMPC-TG:MVS2ISR1
  IFramesIn   :51           IFramesOut   :41
  IBytesIn    :4378        IBytesOut    :51803
  UIFramesIn  :0           UIFramesOut  :0
  UIBytesIn   :0           UIBytesOut   :0
  TESTRspsIn :1           TESTCmdsOut :1
  XIDCmdsIn  :3           XIDCmdsOut  :3
  XIDRspsIn  :0           XIDRspsOut  :0
  ConnectReqs :2          ConnectInds  :0
  ConnectRsps :2          ConnectCnfms:0
  DISCReqs   :1           DISCInds    :0
  SweepReqsIn :0          SweepReqsOut:0
  SweepRspsIn :0          SweepRspsOut:0
  Wraps      :0
  LastSeqNoIn :9          LastSeqNoOut:7
  LastSeqNoFailureCause : None
TimeSinceLastSeqNoFailure : never
LLC2 Connection Statistics:
LAN Token 0 Adapter 1 4000.cdcd.cdcd
Local SAP=04 Remote MAC=4000.4040.1996 Remote SAP=04
  LocalBusies   = 0 RemoteBusies = 0
  IFramesIn     = 51 IFramesOut  = 41
  IOctetsIn     = 4378 IOctetsOut = 51803
  SFramesIn     = 0 SFramesOut  = 0
  REJsIn       = 0 REJsOut    = 0
  RetransmitsOut = 0 WwCountChanges = 0
```

Table 80 describes the fields shown in the display.

**Table 80** show extended channel tg stats Field Descriptions

Field	Description
IFramesIn	Number of connection-oriented PIUs received by this CMPC transmission group from the remote network node.
IFramesOut	Number of connection-oriented PIUs sent by this CMPC transmission group to the remote network node.

**Table 80** *show extended channel tg stats Field Descriptions (continued)*

<b>Field</b>	<b>Description</b>
UIFramesIn	Number of connectionless PIUs (HPR frames) received by this CMPC transmission group from the remote network node.
UIFramesOut	Number of connectionless PIUs (HPR frames) sent by this CMPC transmission group to the remote network node.
TestRspsIn	Number of TEST responses received for this CMPC transmission group.
TestCmdsOut	Number of TEST commands sent by this CMPC transmission group to the configured remote MAC address.
XidCmdsIn	Number of XID commands received for this CMPC transmission group.
XidCmdsOut	Number of XID commands sent by this CMPC transmission group.
XidRspsIn	Number of XID responses received for this CMPC transmission group.
XidRspsOut	Number of XID responses sent by this CMPC transmission group.
SweepReqsIn	Number of CMPC sweep requests received from VTAM on this CMPC transmission group.
SweepReqsOut	Number of CMPC sweep requests sent to VTAM on the CMPC transmission group.
SweepRspsIn	Number of CMPC responses received from VTAM on this CMPC transmission group.
SweepRspsOut	Number of CMPC responses sent to VTAM on this CMPC transmission group.
IBytesIn	Number of bytes for connection-oriented PIUs received by this CMPC transmission group from the remote network node.
IBytesOut	Number of bytes for connection-oriented PIUs sent by this CMPC transmission group to the remote network node.
UIBytesIn	Number of bytes for connectionless PIUs received by this CMPC transmission group from the remote network node.
UIBytesOut	Number of bytes for connectionless PIUs sent by this CMPC transmission group to the remote network node.
ConnectReqs	Number of connect requests received from the host by this CMPC transmission group.
ConnectInds	Number of connect indications sent to the host by this CMPC transmission group.
ConnectRsps	Number of connect responses received from the host by this CMPC transmission group.
ConnectCnfms	Number of connect confirms sent to the host by this CMPC transmission group.
DISCReqs	Number of disconnect requests received from the host by this CMPC transmission group.

**Table 80** *show extended channel tg stats Field Descriptions (continued)*

Field	Description
DISCInds	Number of disconnect indications sent to the host by this CMPC transmission group.
Wraps	The number of times the sequence numbers wrapped for this CMPC transmission group.
LastSeqNoIn	The sequence number on the last CMPC data block sent to the host from this CMPC transmission group.
LastSeqNoOut	The sequence number on the last CMPC data block received from the host for this CMPC transmission group.
LastSeqNoFailureCause	The cause of the last sequence number failure for this CMPC transmission group. Valid values are as follows: <ul style="list-style-type: none"> <li>• None—No sequence number failures have occurred on this CMPC transmission group since it was configured or the interface was last “no shut”.</li> <li>• Block—The sequence number failure occurred on a MPC data block received from the host for this CMPC transmission group.</li> <li>• Sweep—The sequence number failure occurred on a sweep command received from the host for this CMPC transmission group.</li> </ul>
TimeSinceLastSeqNoFailure	Time since the last CMPC sequence number failure for this CMPC transmission group. If there have been no failures, “never” is displayed.

The following is sample output on a Cisco 7500 router from the **show extended channel tg stats** command when the interface is shut down:

```
Router# show extended channel 3/2 tg stats detail MVS2-TG1
CIP LLC-TG:MVS2ISR1 -Statistics Not Available
```

**Related Commands**

Command	Description
<b>client (lu limit)</b>	Configures a CMPC read subchannel and a CMPC write subchannel.
<b>tg</b>	Defines LLC connection parameters for the CMPC transmission group.

## show extended channel tn3270-server

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

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

Syntax Description	<i>slot</i>	Slot number.
	<i>port</i>	Port number.

**Command Modes** EXEC

Command History	Release	Modification
	11.2	This command was introduced.

### 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
idle-time 0      keepalive 1800      unbind-action disconnect
tcp-port 23      generic-pool permit no timing-mark
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 81 describes significant fields in the display. Those fields not described correspond to configured values.

**Table 81** *show extended channel tn3270-server Field Descriptions*

Field	Description
<i>server pickup</i>	IP address and TCP port number, listening point, configured on one or more PUs.
<i>lu number</i>	Total number of LUs available for this listening point.
<i>in-use number</i>	Number of LUs currently in use.
<i>connect number</i>	Total number of connect ins since the TN3270 feature was started.
<i>disconn number</i>	Total number of disconnects since the TN3270 feature was started.
<i>fail number</i>	Total number of failed connects since the TN3270 feature was started.
<i>response time, host number</i>	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.
<i>response time, tcp number</i>	Average response time from the clients on this server IP address. This is measured only when TIMING MARKs are sent. If <b>no timing-mark</b> is configured, they are only sent on special occasions, such as Bind.
<i>idle-time number</i>	Configured idle-time for this PU.
<i>keepalive number</i>	Configured keepalive for this PU.
<i>unbind-action type</i>	Configured unbind action for LUs on this PU.
<i>tcp-port number</i>	Configured TCP port number.
<i>generic-pool type</i>	Configured generic-pool for LUs on this PU.
<i>dlur fq-cpname</i>	Configured fully qualified DLUR CP name.
<i>status status-value state-value</i>	Shows the status of the DLUR-DLUS pipe followed by the state of the pipe. Possible values for the status are: <ul style="list-style-type: none"> <li>• RESET—The pipe is reset.</li> <li>• PND-ACTV—The pipe is pending active.</li> <li>• ACTIVE—The pipe is active.</li> <li>• PND-INAC—The pipe is pending inactive.</li> <li>• OTHER—Status is an undefined value.</li> <li>• WAIT—Waiting for status from the CMCC adapter.</li> <li>• SHUT—The TN3270 server is shut down.</li> <li>• NOTKNOWN—Status cannot be obtained.</li> </ul>
<i>dlus fq-dlusname</i>	Currently active DLUS.
<i>name pu-name</i>	This is the name of the PU as configured.
<i>ip:tcp ip-addr:tcpport</i>	IP address and TCP port number configured for the PU.

**Table 81** *show extended channel tn3270-server Field Descriptions (continued)*

<b>Field</b>	<b>Description</b>
<i>xid number</i>	Configured XID - idblk and idnum.
<i>STATE value</i>	<p>Possible STATE values and their meanings are:</p> <ul style="list-style-type: none"> <li>• SHUT—The PU is configured but in shut state.</li> <li>• RESET—The link station of this PU is not active.</li> <li>• TEST—PU is sending a TEST to establish link.</li> <li>• XID—TEST is responded, XID is sent.</li> <li>• P-ACTPU—The link station is up but no ACTPU is received.</li> <li>• ACTIVE—ACTPU is received and acknowledged positively.</li> <li>• ACT/BUSY—Awaiting host to acknowledge the SSCP-PU data.</li> <li>• WAIT—Waiting for PU status from CMCC adapter.</li> <li>• OTHER—PU in undefined state.</li> <li>• P-RQACTPU-R—DLUR PU is pending request ACTPU response.</li> <li>• P-ACTIVE—ACTPU received by DLUR but not yet passed to PU.</li> <li>• P-DACTPU—PU is pending DACTPU.</li> <li>• UNKNOWN—State cannot be obtained.</li> </ul>
<i>LINK type</i>	LINK type is either internal adapter type and internal adapter number or dlur if it is a SNA Session Switch PU.
<i>DESTINATION mac-address or PU-name</i>	If a direct PU, then it is the destination MAC address, otherwise, it is the name of the partner PU.
<i>R-LSAP number number</i>	Remote and local SAP values.

# show extended channel tn3270-server client-ip-address

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

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

Syntax Description	
<i>slot</i>	The slot number.
<i>port</i>	The port number.
<i>ip-address</i>	IP address of the client.
<b>disconnected</b>	(Optional) Shows all clients with <i>ip-address</i> in disconnected state. Disconnected state refers to an LU session state of ACTIVE or INACTIVE. In this case, the <i>ip-address</i> refers to the client that last used the LU.
<b>in-session</b>	(Optional) Shows all clients with <i>ip-address</i> in active session state. Active session state refers to an LU session state of ACT/SESS.
<b>pending</b>	(Optional) Shows all clients with <i>ip-address</i> 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
```

### show extended channel tn3270-server client-ip-address

```
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** argument:

```
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** argument:

```
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** argument:

```
Router# show extended channel 2/2 tn3270 client-ip 10.14.1.21 pending
```

```
Total 2 clients found using 10.14.1.21
```

Table 82 describes significant fields in the display.

**Table 82** show extended channel tn3270-server client-ip-address Field Descriptions

Field	Description
lu <i>locaddr</i>	LOCADDR of the LU.
name <i>lu-name</i>	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 NETID portion will be the same as the current DLUS.
client-ip:tcp <i>ip-address:port</i>	Client's IP address and TCP port number
nail	Status of LU nailing, either Y or N

**Table 82** *show extended channel tn3270-server client-ip-address Field Descriptions (continued)*

Field	Description
state <i>lu-state</i>	The LU state and their meanings are: <ul style="list-style-type: none"> <li>• UNKNOWN—LU in an undefined state.</li> <li>• INACTIVE—LU did not receive ACTLU.</li> <li>• ACT/NA—LU received ACTLU and acknowledged positively.</li> <li>• P-SDT—LU is bound but there is no SDT yet.</li> <li>• ACT/SESS—LU is bound and in session.</li> <li>• P-ACTIU—Telnet connects in and is waiting for ACTLU.</li> <li>• P-NTF/AV—Awaiting host notify-available response.</li> <li>• P-NTF/UA—Awaiting host notify-unavailable response.</li> <li>• P-RESET—Awaiting a buffer to send DACTLU response.</li> <li>• P-PSID—Awaiting NMVT Reply PSID response.</li> <li>• P-BIND—Waiting for host to send bind.</li> <li>• P-UNBIND—Awaiting host unbind response.</li> <li>• WT-UNBND—Waiting for client to acknowledge disconnection.</li> <li>• WT-SDT—Waiting for client to acknowledge SDT.</li> </ul>
<i>model model</i>	IBM 3278 model type of client; blank if STATIC LU.
frames in <i>number</i>	Number of frames sent inbound to the host.
frames out <i>number</i>	Number of frames sent outbound from the host.
idle for <i>time</i>	Time the client has been idle. The time is in HH:MM:SS.
pu is <i>pu-name</i>	Name of the PU.
lu is <i>type</i>	Whether LU is DYNAMIC or STATIC.
negotiated <i>type</i>	Whether client is TN3270 or TN3270E.
bytes in / out <i>number/number</i>	Total number of bytes sent to/received from the host.
RuSize in / out <i>number/number</i>	RU size as configured in the bind.
NegRsp in / out <i>number/number</i>	Number of SNA negative responses sent to/received from the host.
pacing window in / out <i>number/number</i>	SNA pacing window as configured in the bind.
credits in <i>number</i>	Number of frames that can be sent inbound without requiring an isolated pacing response.
queue size in <i>number</i>	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 <i>number</i>	SNA frames not yet acknowledged by an isolated pacing response by the TN3270 server.

■ show extended channel tn3270-server client-ip-address

---

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>client (lu nailing)</b>	Defines a range of locaddr to be reserved for remote devices.

---

# show extended channel tn3270-server dlur

Use the **show extended channel tn3270-server dlur** EXEC command to display information about the SNA session switch.

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

## Syntax Description

<b>slot</b>	The slot number.
<b>port</b>	The 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.NGMVMMPA
lsap token-adapter 0 5C          vrn MPX.LAN4          status ACTIVE
link P390                remote 4000.7470.00e7 08 status ACTIVE
```

Table 83 describes significant fields in the display.

**Table 83** show extended channel tn3270-server dlur Field Descriptions

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

Table 83 show extended channel tn3270-server dlur Field Descriptions (continued)

Field	Description
dlur-dlus status <i>dlur-status</i>	Possible values for the status of the DLUR-DLSU pipe and their meanings are: <ul style="list-style-type: none"> <li>• RESET—The pipe is reset.</li> <li>• PND-ACTV—The pipe is pending active.</li> <li>• ACTIVE—The pipe is active.</li> <li>• PND-INAC—The pipe is pending inactive.</li> <li>• OTHER—Status is an undefined value.</li> <li>• WAIT—Waiting for status from the CMCC adapter.</li> <li>• SHUT—The TN3270 server is shut down.</li> <li>• NOTKNOWN—Status cannot be obtained.</li> </ul>
preferred dlus <i>fq-luname</i>	Name of the DLUS as configured on the DLUR statement.
backup dlus <i>fq-luname</i>	Name of the DLUS that is used if the preferred DLUS is unavailable.
preferred server <i>fq-luname</i>	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 <i>fq-name</i>	Name of the connection network as configured by the vrn statement for this LSAP and internal adapter pair.
lsap...status status	Possible <i>sap-status</i> values and their meanings are: <ul style="list-style-type: none"> <li>• ACTIVE—The SAP is open.</li> <li>• INACTIVE—Not connected to the adapter.</li> <li>• PDN-ACTV—SAP activation in progress.</li> <li>• PND-INAC—SAP deactivation in progress.</li> <li>• OTHER—Status is an undefined value.</li> <li>• WAIT—Waiting for status from the CMCC adapter.</li> <li>• SHUT—The TN3270 server is shut down.</li> <li>• NOTKNOWN—Status cannot be obtained.</li> </ul>
link <i>name</i>	Name of the configured link. If not a configured link, then the name is an invented name, @DLURnn.

**Table 83** *show extended channel tn3270-server dlur Field Descriptions (continued)*

Field	Description
remote <i>mac sap</i>	Remote MAC and SAP for this link.
link...status <i>status</i>	Possible <i>link-status</i> values and their meanings are: <ul style="list-style-type: none"><li>• ACTIVE—Link is active.</li><li>• INACTIVE—Not connected to host.</li><li>• PND-ACTV—Link activation in progress.</li><li>• PND-INAC—Link deactivation in progress.</li><li>• OTHER—Status is an undefined value.</li><li>• WAIT—Waiting for status from the CMCC adapter.</li><li>• SHUT—The TN3270 server is shut down.</li><li>• NOTKNOWN—Status cannot be obtained.</li></ul>

## show extended channel tn3270-server dlurlink

Use the **show extended channel tn3270-server dlurlink EXEC** command to display information about the DLUR components.

**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	The 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 84 describes significant fields in the display.

**Table 84** show extended channel tn3270-server dlurlink Field Descriptions

Field	Description
lsap...vrn...status <i>status</i>	Possible <i>lsap-status</i> values and their meanings are: <ul style="list-style-type: none"> <li>ACTIVE—The SAP is open.</li> <li>INACTIVE—Not connected to the adapter.</li> <li>PDN-ACTV—SAP activation in progress.</li> <li>PND-INAC—SAP deactivation in progress.</li> <li>OTHER—Status is an undefined value.</li> <li>WAIT—Waiting for status from the CMCC adapter.</li> <li>SHUT—The TN3270 server is shut down.</li> <li>NOTKNOWN—Status cannot be obtained.</li> </ul>
link <i>name</i>	Name is an invented name, @DLUR <i>nn</i> , if not a configured link.
link...status <i>status</i>	Possible <i>link-status</i> values and their meanings are: <ul style="list-style-type: none"> <li>ACTIVE—The SAP is open.</li> <li>INACTIVE—Not connected to the adapter.</li> <li>PDN-ACTV—SAP activation in progress.</li> <li>PND-INAC—SAP deactivation in progress.</li> <li>OTHER—Status is an undefined value.</li> <li>WAIT—Waiting for status from the CMCC adapter.</li> <li>SHUT—The TN3270 server is shut down.</li> <li>NOTKNOWN—Status cannot be obtained.</li> </ul>
partner <i>name</i>	CP name of the remote node for this link.
tgn <i>tg-number</i>	Transmission group number for this link. Because the SNA session switch only supports 1 transmission group per pair of CP names, it is typically 0 or 1.
maxdata <i>maxdata</i>	Maximum frame size allowed on this link.

#### Related Commands

Command	Description
<b>dlur (TN3270)</b>	Enables the SNA session switch function on the CMCC adapter, or enters DLUR configuration mode.

## show extended channel tn3270-server nailed-ip

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

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

Syntax Description		
<i>slot</i>	The slot number.	
<i>port</i>	The port number.	
<i>ip-address</i>	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 86 describes significant fields in the display.

**Table 85** *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 <b>client</b> command was configured.

**Table 85** *show extended channel tn3270-server nailed-ip Field Descriptions (continued)*

Field	Description
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 (lu nailing)	Defines a range of locaddr to be reserved for remote devices.

## show extended channel tn3270-server pu

Use the **show extended channel tn3270-server pu EXEC** command to display the PU configuration parameters, statistics and all the LUs currently attached to the PU.

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

Syntax Description	Parameter	Description
	<i>slot</i>	Specifies a particular CMCC adapter in the router where <i>slot</i> is the slot number.
	<i>port</i>	The port value for a TN3270 server will always be 2.
	<i>pu-name</i>	PU name that uniquely identifies this PU.

**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.

**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.

**Examples** The following is sample output from the **show extended channel tn3270-server pu** command for a direct PU named BAGE:

```
Router# show extended channel 3/2 tn3270-server pu BAGE1

name(index)  ip:tcp          xid      state    link  destination  r-lsap
BAGE1(1)    172.28.1.82:23  05D18081 ACTIVE   tok 0  4000.7470.00e7 08 10
idle-time    0      keepalive 1800    unbind-act discon  generic-pool perm
ip-preced-screen 0 ip-preced-printer 0 ip-tos-screen 0 ip-tos-printer 0
bytes 560 in, 3765 out; frames 20 in, 27 out; NegRsp 0 in, 0 out
actlus 12, dacltus 0, binds 2
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   BAGE1001  never connected  Y    ACT/NA  327804  1 1 4:50:44
2   BAGE1002  never connected  Y    ACT/NA  327804  1 1 4:50:44
3   BAGE1003  192.195.80.40:2077 Y    ACT/SESS 327804  5 5 5:4:36
4   BAGE1004  192.195.80.40:2644 Y    ACT/SESS 327804  5 5 0:36:7

client ip      mask          nail-type  lu first  lu last
192.195.80.40  255.255.255.0 screen     1        2
192.195.80.40  255.255.255.0 printer    4
```

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

```
Router# show extended channel 3/2 tn3270-server pu INT1

name(index)   ip:tcp          xid  state   link  destination  r-lsap
INT1(5)       172.28.1.106:23 05D18091 ACTIVE dlur  MPX.GOAN1

idle-time    0      keepalive    0      unbind-act discon  generic-pool perm
ip-preced-screen 0 ip-preced-printer 0 ip-tos-screen 0 ip-tos-printer 0
bytes 50 in, out; frames 87 in, 2 out; NegRsp 3 in, 0 out
actlus 2, dactlus 0, binds 0
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 never connected  N   ACT/NA  1     1     0:32:14
2   GOAN1X02 never connected  N   ACT/NA  1     1     0:32:14
```

Table 86 describes significant fields in the display.

**Table 86** show extended channel tn3270-server pu Field Descriptions

Field	Description
name (index) <i>pu-name</i> ( <i>index</i> )	Name and index of the PU as configured.
ip:tcp <i>ip-addr:tcpport</i>	IP address and TCP port number configured for the PU.
xid <i>number</i>	Configured XID - idblk and idnum.
state <i>pu-state</i>	Possible state values and their meanings are as follows: <ul style="list-style-type: none"> <li>• SHUT—PU is configured but in shut state.</li> <li>• RESET—Link station of this PU is not active.</li> <li>• TEST—PU is sending a TEST to establish link.</li> <li>• XID—TEST is responded, XID is sent.</li> <li>• P-ACTPU—Link station is up but no ACTPU is received.</li> <li>• ACTIVE—ACTPU is received and acknowledged positively.</li> <li>• ACT/BUSY—Awaiting host to acknowledge the SSCP-PU data.</li> <li>• WAIT—Waiting for PU status from CMCC adapter.</li> <li>• UNKNOWN—Direct PU in undefined state.</li> <li>• P-RQACTPU-R—PU is pending request ACTPU response.</li> <li>• P-ACTIVE—DLUR PU and direct PU states disagree.</li> <li>• P-DACTPU—PU is pending DACTPU.</li> <li>• OTHER—State is an undefined value.</li> </ul>
link <i>type</i>	LINK type is either internal adapter type and internal adapter number or dlur if it is a SNA Session Switch PU.
destination <i>mac-address or pu-name</i>	If a direct PU, then it is the destination MAC address, otherwise, it is the name of the partner PU.
r-lsap <i>number number</i>	Remote and local SAP values.

**Table 86** *show extendedc channel tn3270-server pu Field Descriptions (continued)*

<b>Field</b>	<b>Description</b>
<i>idle-time number</i>	Configured idle-time for this PU.
<i>keepalive number</i>	Configured keepalive for this PU.
<i>unbind-act type</i>	Configured unbind action for LUs on this PU.
<i>generic-pool type</i>	Configured generic-pool for LUs on this PU.
<i>ip-preced-screen number</i>	IP precedence value for screen LUs on this PU.
<i>ip-preced-printer number</i>	IP precedence value for printer LUs on this PU.
<i>ip-tos-screen number</i>	IP Type of Service (TOS) value for screen LUs on this PU.
<i>ip-tos-printer number</i>	IP TOS value for printer LUs on this PU.
<i>bytes in / out number/number</i>	Total number of bytes sent to/received from the host for this PU.
<i>frames in / out number/number</i>	Total number of frames sent to/received from the host for this PU.
<i>NegRsp in / out number/number</i>	Total number of SNA negative responses sent to/received from the host.
<i>actlus number</i>	Total number of ACTLUs received from the host.
<i>dactlus number</i>	Total number of DACTLUs received from the host.
<i>binds number</i>	Total number of BINDs received from the host.
<i>lu number</i>	LOCADDR of the LU.
<i>name lu-name</i>	Name of the TN3270 LU.
<i>client-ip:tcp ip-addr:tcpport</i>	Client's IP address and TCP port number.
<i>nail</i>	Status of LU nailing, either Y or N

**Table 86** show extended channel tn3270-server pu Field Descriptions (continued)

Field	Description
state <i>lu-state</i>	The LU states and their meanings are: <ul style="list-style-type: none"> <li>• UNKNOWN—LU in an undefined state.</li> <li>• INACTIVE—LU didn't receive ACTLU.</li> <li>• ACT/NA—LU received ACTLU and acknowledged positively. If a client ip address is shown then the client is disconnected.</li> <li>• P-SDT—LU is bound but there is no SDT yet.</li> <li>• ACT/SESS—LU is bound and in session.</li> <li>• P-ACTLU—Telnet connects in and is awaiting ACTLU.</li> <li>• P-NTF/av—Awaiting host notify-available response.</li> <li>• P-NTF/UA—Awaiting host notify-unavailable response.</li> <li>• P-RESET—Waiting for a buffer to send DACTLU response.</li> <li>• P-PSID—Waiting for NMVT Reply psid response.</li> <li>• P-BIND—Waiting for host to send bind.</li> <li>• P-UNBIND—Awaiting host unbind response.</li> <li>• WT-UNBND—Waiting for client to acknowledge disconnection.</li> <li>• WT-SDT—Waiting for client to acknowledge SDT.</li> </ul>
<i>model model</i>	IBM 3278 model type of client.
frames in <i>number</i>	Number of frames sent inbound to the host.
frames out <i>number</i>	Number of frames sent outbound from the host.
idle for <i>time</i>	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 <b>client</b> configuration command.

**Related Commands**

Command	Description
<b>pu (direct)</b>	Creates a PU entity that has its own direct link to a host, or enters PU configuration mode.
<b>pu (DLUR)</b>	Creates a PU entity that has no direct link to a host, or enters PU configuration mode.

## show extended channel tn3270-server pu lu

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

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

### Syntax Description

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

### 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.

### 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 direct PU:

```
Router# show extended channel 3/2 tn3270 pu ext2 lu 3
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   EXT2003  171.69.176.77:3829  N   ACT/SESS  327902E  8     9     0:4:43

pu is EXT2, lu is DYNAMIC type 0, negotiated TN3270
bytes 203 in, 2954 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
```

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      model  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  xxxxxxxxxxx45EB80000D0201000000
OUT len=53  2Dxxxxxxxx466B800031010303B1
IN  len=10  2D0001010646EB800031
OUT len=10  2D00010106476B8000A0
IN  len=10  2D0001010647EB8000A0
OUT len=1677 2Cxxxxxxxx010381C07EC7114040
IN  len=9   2C0001010001838100
```

Table 87 describes significant fields in the display.

**Table 87** *show extended channel tn3270-server pu lu Field Descriptions*

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

**Table 87** show extended channel tn3270-server pu lu Field Descriptions (continued)

Field	Description
state <i>lu-state</i>	The LU state and their meanings are: <ul style="list-style-type: none"> <li>• UNKNOWN—LU in an undefined state.</li> <li>• INACTIVE—LU didn't receive ACTLU.</li> <li>• ACT/NA—LU received ACTLU and acknowledged positively. If a client ip address is shown then the client is disconnected.</li> <li>• P-SDT—LU is bound but there is no SDT yet.</li> <li>• ACT/SESS—LU is bound and in session.</li> <li>• P-ACTIU—Telnet connects in and is awaiting ACTLU.</li> <li>• P-NTF/AV—Awaiting host notify-available response.</li> <li>• P-NTF/UA—Awaiting host notify-unavailable response.</li> <li>• P-RESET—Waiting for a buffer to send DACTLU response.</li> <li>• P-PSID—Waiting for NMVT Reply psid response.</li> <li>• P-BIND—Waiting for host to send bind.</li> <li>• P-UNBIND—Awaiting host unbind response.</li> <li>• WT-UNBND—Waiting for client to acknowledge disconnection.</li> <li>• WT-SDT—Waiting for client to acknowledge SDT.</li> </ul>
model <i>model</i>	3278 model type of client; blank if STATIC LU.
frames in <i>number</i>	Number of frames sent inbound to the host.
frames out <i>number</i>	Number of frames sent outbound from the host.
idle for <i>time</i>	Time the client has been idle. The time is in HH:MM:SS.
pu is <i>pu-name</i>	Name of the PU.
lu is <i>type</i>	Whether LU is DYNAMIC or STATIC.
negotiated <i>type</i>	Whether client is TN3270 or TN3270E.
bytes in/out <i>number/number</i>	Total number of bytes sent to/received from the host.
RuSize in/out <i>number/number</i>	RU size as configured in the bind.
NegRsp in/out <i>number/number</i>	Number of SNA negative responses sent to/received from the host.
pacing window in/out <i>number/number</i>	SNA pacing window as configured in the bind.
credits in <i>number</i>	Number of frames that can be sent inbound without requiring an isolated pacing response.

**Table 87** *show extended channel tn3270-server pu lu Field Descriptions (continued)*

Field	Description
queue-size in <i>number</i>	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 <i>number</i>	SNA frames not yet acknowledged by an isolated pacing response by the TN3270 server.

**Related Commands**

Command	Description
<b>pu (direct)</b>	Creates a PU entity that has its own direct link to a host, or enters PU configuration mode.
<b>pu (DLUR)</b>	Creates a PU entity that has no direct link to a host, or enters PU configuration mode.

## show extended channel udp-listeners

Use the **show extended channel udp-listeners** EXEC command to display information about the User Datagram Protocol (UDP) listener sockets running on the CMCC adapter interfaces.

```
show extended channel slot/port udp-listeners [ip-address]
```

Syntax Description		
<i>slot</i>		Slot number.
<i>port</i>		Port number.
<b>udp-listeners</b>		Specifies UDP listener port display.
<i>ip-address</i>		(Optional) IP address specified by the <b>offload</b> interface configuration command or the <b>tn3270-server pu</b> command.

**Command Modes** EXEC

Command History	Release	Modification
	11.0	This command was introduced.

**Usage Guidelines** The **show extended channel tn3270-server udp-listeners** command is valid on both physical and virtual channel interfaces.

**Examples** The following is sample output from the **show channel udp-listeners** command:

```
Router# show extended channel 0/1 udp-listeners

UDP Listener: IP Address 80.11.198.3      LocalPort 7
UDP Listener: IP Address 80.11.198.3      LocalPort 9
UDP Listener: IP Address 80.11.198.3      LocalPort 19
```

Related Commands	Command	Description
	<b>offload (interface)</b>	Configures an Offload device (read and write subchannel) for communication with a mainframe TCP/IP stack in Offload mode. Also can be used to configure individual members of an Offload backup group for the IP Host Backup feature.
	<b>pu (direct)</b>	Creates a PU entity that has its own direct link to a host, or enters PU configuration mode.
	<b>pu (DLUR)</b>	Creates a PU entity that has no direct link to a host, or enters PU configuration mode.

# show extended channel udp-stack

Use the **show extended channel udp-stack** EXEC command to display information about the UDP stack running on the CMCC adapter interfaces.

```
show extended channel slot/port udp-stack [ip-address]
```

Syntax Description	
<i>slot</i>	Slot number.
<i>port</i>	Port number.
<b>udp-stack</b>	Selects UDP stack display.
<i>ip-address</i>	(Optional) IP address specified by the <b>offload</b> interface configuration command or the <b>tn3270-server pu</b> command.

**Command Modes** EXEC

Command History	Release	Modification
	11.0	This command was introduced.

**Usage Guidelines** The **show extended channel udp-stack** command is valid on both physical and virtual channel interfaces.

**Examples** The following is sample output from the **show extended channel udp-stack** command:

```
Router# show extended channel udp-stack

rispix#show extended channel 0/1 udp-stack
UDP Statistics for IP Address 80.11.198.2
  InDatagrams : 6          NoPorts      : 6
  InErrors    : 0          OutDatagrams: 0
UDP Statistics for IP Address 80.11.198.3
  InDatagrams : 6          NoPorts      : 6
  InErrors    : 0          OutDatagrams: 1
```

Table 88 describes the fields shown in the display

**Table 88** *show extended channel udp-stack Field Descriptions*

Field	Description
InDatagrams	Total number of UDP datagrams delivered to UDP users.
NoPorts	Total number of received UDP datagrams for which there was no application at the destination port.

**Table 88** *show extended channel udp-stack Field Descriptions (continued)*

Field	Description
InErrors	Number of received UDP datagrams that could not be delivered for reasons other than the lack of an application at the destination port.
OutDatagrams	Total number of UDP datagrams sent from this entity.

**Related Commands**

Command	Description
<b>offload (interface)</b>	Configures an Offload device (read and write subchannel) for communication with a mainframe TCP/IP stack in Offload mode. Also can be used to configure individual members of an Offload backup group for the IP Host Backup feature.
<b>pu (direct)</b>	Creates a PU entity that has its own direct link to a host, or enters PU configuration mode.
<b>pu (DLUR)</b>	Creates a PU entity that has no direct link to a host, or enters PU configuration mode.

# show interfaces channel

Use the **show interfaces channel** privileged EXEC command to display information about the CMCC adapter interfaces. This command displays information that is specific to the interface hardware. The information displayed is generally useful for diagnostic tasks performed by technical support personnel only.

**show interfaces channel** *slot/port* [**accounting**]

Syntax Description	
<i>slot</i>	Slot number.
<i>port</i>	Port number.
<b>accounting</b>	(Optional) Shows interface accounting information.

**Command Modes** Privileged EXEC

Command History	Release	Modification
	10.2	This command was introduced.

## Examples

The following is sample output from the **show interfaces channel** command:

```
Router# show interfaces channel 3/0

Channel3/0 is up, line protocol is up
  Hardware is cxBus IBM Channel
  Internet address is 198.92.1.145, subnet mask is 255.255.255.248
  MTU 4096 bytes, BW 0 Kbit, DLY 0 usec, rely 255/255, load 1/255
  Encapsulation CHANNEL, loopback not set, keepalive not set
  ECA type daughter card
  Data transfer rate 12 Mbytes  Number of subchannels 1
  Last input never, output never, output hang never
  Last clearing of "show interface" counters 0:00:04
  Output queue 0/0, 0 drops; input queue 0/75, 0 drops
  Five minute input rate 0 bits/sec, 0 packets/sec
  Five minute output rate 0 bits/sec, 0 packets/sec
    0 packets input, 0 bytes, 0 no buffer
    Received 0 broadcasts, 0 runts, 0 giants
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
    0 packets output, 0 bytes, 0 underruns
    0 output errors, 0 collisions, 0 interface resets, 0 restarts
```

Table 89 describes the fields shown in the display

**Table 89** *show interfaces channel Field Descriptions*

Field	Description
Channel... is {up   down   administratively down}	Indicates whether the interface hardware is currently active (whether synchronization is achieved on an ESCON channel, or whether operational out is enabled on a parallel channel) and whether it has been taken down by an administrator.
line protocol is {up   down   administratively down}	Indicates whether the software processes that handle the line protocol think the line is usable (that is, whether keepalives are successful).
Hardware is	Hardware type.
Internet address is	IP address and subnet mask.
MTU	Maximum transmission unit of the interface.
BW	Bandwidth of the interface in kilobits per second.
DLY	Delay of the interface in microseconds.
rely	Reliability of the interface as a fraction of 255 (255/255 is 100% reliability), calculated as an exponential average over 5 minutes.
load	Load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes. The calculation uses the value from the <b>bandwidth</b> interface configuration command.
Encapsulation	Encapsulation method assigned to interface.
loopback	Indicates whether loopbacks are set or not.
keepalive	Indicates whether keepalives are set or not.
daughter card	Type of adapter card.
Data transfer rate	Rate of data transfer.
Number of subchannels	Number of subchannels.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by an interface. Useful for knowing when a dead interface failed. This counter is updated only when packets are process switched, not when packets are fast switched.
Last output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by an interface. This counter is updated only when packets are process switched, not when packets are fast switched.
output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because of a transmission that took too long. When the number of hours in any of the “last” fields exceeds 24 hours, the number of days and hours is printed. If that field overflows, asterisks are printed.

**Table 89** *show interfaces channel Field Descriptions (continued)*

Field	Description
Last clearing	The time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. These asterisks (***) indicate the elapsed time is too large to be displayed. 0:00:00 indicates the counters were cleared more than $2^{31}$ ms (and less than $2^{32}$ ms) ago.
Output queue, drops input queue, drops	Number of packets in output and input queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped due to a full queue.
Five minute input rate, Five minute output rate	Average number of bits and packets transmitted per second in the last 5 minutes.
packets input	Total number of error-free packets received by the system.
bytes input	Total number of bytes, including data and MAC encapsulation, in the error free packets received by the system.
no buffer	Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernets and bursts of noise on serial lines are often responsible for no input buffer events.
broadcasts	Total number of broadcast or multicast packets received by the interface.
runts	Number of packets that are discarded because they are smaller than the medium's minimum packet size.
giants	Number of packets that are discarded because they exceed the medium's maximum packet size.
input errors	Total number of no buffer, runts, giants, CRCs, frame, overrun, ignored, and abort counts. Other input-related errors can also increment the count, so that this sum may not balance with the other counts.
CRC	Number of code violation errors seen on the ESCON interface, where a received transmission character is recognized as invalid. On a parallel interface, the number of parity errors seen.
frame	Number of packets received incorrectly having a CRC error and a noninteger number of octets. This value is always 0.
overrun	Number of times the serial receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data. This value is always 0.

**Table 89** *show interfaces channel Field Descriptions (continued)*

Field	Description
ignored	Number of received packets ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different than the system buffers mentioned previously in the buffer description. Broadcast storms and bursts of noise can cause the ignored count to be incremented.
abort	Illegal sequence of one bits on a serial interface. This usually indicates a clocking problem between the serial interface and the data link equipment. This value is always 0.
packets output	Total number of messages transmitted by the system.
bytes	Total number of bytes, including data and MAC encapsulation, transmitted by the system.
underruns	Sum of all errors that prevented the final transmission of datagrams out of the interface being examined. Note that this may not balance with the sum of the enumerated output errors, as some datagrams may have more than one error, and others may have errors that do not fall into any of the specifically tabulated categories.
output errors	Number of output errors.
collisions	Number of collisions detected. This value is always 0.
interface resets	Number of times an interface has been completely reset. This can happen if packets queued for transmission were not sent within several seconds. On a serial line, this can be caused by a malfunctioning modem that is not supplying the transmit clock signal, or by a cable problem. If the system notices that the carrier detect line of a serial interface is up, but the line protocol is down, it periodically resets the interface in an effort to restart it. Interface resets can also occur when an interface is looped back or shut down.  On the CMCC adapter, this may occur if the host software is not requesting data
restarts	Number of times the controller was restarted because of errors.

# shutdown

Use the **shutdown** interface configuration command to shut down an interface or the virtual interface on the CMCC adapter when you are in interface configuration mode. The **shutdown** command also shuts down TN3270 entities, such as PU, DLUR, and DLUR SAP, depending on which configuration mode you are in when the command is issued. Use the **no** form of this command to restart the interface or entity. The entity affected depends on the mode in which the command is issued.

**shutdown**

**no shutdown**

---

**Syntax Description** This command has no arguments or keywords.

---

**Defaults** The interface or entity is enabled.

---

**Command Modes** CMCC adapter interface configuration. TN3270 server configuration. PU configuration. DLUR configuration. DLUR SAP configuration

---

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	10.2	This command was introduced.
	11.2	The following commands were added: <ul style="list-style-type: none"><li>• TN3270</li><li>• PU</li><li>• DLUR</li><li>• DLUR SAP</li></ul>

---

---

**Usage Guidelines**

In channel interface configuration mode, the command applies to the entire CMCC adapter.

In TN3270 server configuration mode, the command applies to the whole TN3270 Server.

In PU configuration mode, the command applies to the DLUR or direct PU.

In DLUR configuration mode, the command applies to the whole DLUR subsystem.

In DLUR SAP configuration, mode the command applies to the local SAP.

---

**Examples**

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

```
shutdown
```

# state-tracks-signal

Use the **state-tracks-signal** interface configuration command to allow the channel interface state to track the state of the physical interface signal on a Channel Port Adapter. Use the **no** form of this command to disable tracking of the physical interface signal on a Channel Port Adapter interface.

**state-tracks-signal**

**no state-tracks-signal**

---

## Syntax Description

This command has no arguments or keywords.

---

## Defaults

The physical interface signal is not tracked.

---

## Command Modes

Interface configuration

---

## Command History

Release	Modification
12.0(4.1)	This command was introduced.

---

## Usage Guidelines

The **state-tracks-signal** command is useful in environments where you are using Hot Standby Router Protocol (HSRP) or SNMP alerts to monitor channel interface status.

The **state-tracks-signal** command is valid only on channel interfaces which combine the functions of both a physical and virtual interface. The ECPA and PCPA are examples of this type of channel interface. The command is not valid for the CIP, which has a separate channel interface for the virtual channel functions.

When the **state-tracks-signal** command is used on an interface that is configured for **no shutdown**, then the state of the channel interface is reported according to the status of the physical channel interface signal. If the physical channel interface signal is not present, then the channel interface status is DOWN/DOWN.

When the channel interface is configured for **no state-tracks-signal** (the default) and **no shutdown**, the channel interface status is always reported as UP/UP, even when there is no signal present on the physical connection. This configuration is useful for TN3270 server environments that are operating in a mode without any physical channel interface connections.

---

## Examples

The following example specifies that the channel interface state tracks the physical channel interface signal and reports the channel interface state according to the presence or absence of the physical interface signal when the interface is configured for **no shutdown**:

```
interface channel 5/0
state-tracks-signal
```

# tcp-port

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

**tcp-port** *port-number*

**no tcp-port**

Syntax Description	<i>port-number</i>	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. PU configuration
---------------	---

Command History	Release	Modification
	11.2	This command was introduced.

Usage Guidelines	The <b>tcp-port</b> 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 <b>tcp-port</b> command affects only future TN3270 sessions. The <b>no tcp-port</b> 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: <pre>no tcp-port</pre>
----------	---

Related Commands	Command	Description
	<b>pu (direct)</b>	Creates a PU entity that has its own direct link to a host, or enters PU configuration mode.
	<b>pu (DLUR)</b>	Creates a PU entity that has no direct link to a host, or enters PU configuration mode.

# tg

Use the **tg** interface configuration command to define LLC connection parameters for the CMPC transmission group. Use the **no** form of this command to remove the specified transmission group from the configuration, which also deactivates the transmission group.

```
tg name llc token-adapter adapter-number lsap [rmac rmac] [rsap rsap]
```

```
no tg name
```

## Syntax Description

<i>name</i>	The name of the CMPC transmission group. The maximum length of the name is eight characters. This must match the name specified on the <b>cmpc</b> statements.
<b>llc</b>	Specifies that this TG is connected to the LLC stack on the CMCC adapter card.
<i>token-adapter</i>	Internal adapter type on the CMCC adapter card. The currently supported type is token-adapter.
<i>adapter-number</i>	Internal adapter number on the CMCC adapter card, which is the same value specified in the <b>adapter</b> internal LAN configuration command.
<i>lsap</i>	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 IEEE 802.2 clients of that adapter, in the router or in a host, can use the same SAP.
<b>rmac rmac</b>	(Optional) Remote MAC address of the form <i>xxxx.xxxx.xxxx</i> in hexadecimal. If not specified, a loopback link to another SAP on the same internal LAN adapter is assumed.
<b>rsap rsap</b>	(Optional) Remote SAP address, 04 to FC in hexadecimal. The <i>rsap</i> value must be even and should be a multiple of 4, but this requirement is not enforced. The <i>rsap</i> value default is 04.

## Defaults

The *lsap* and *rsap* values default to 04.

## Command Modes

Interface configuration

## Command History

Release	Modification
11.3	This command was introduced.

## Usage Guidelines

The **tg** command is valid only on the virtual channel interface. This command defines an LLC connection with a complete addressing 4-tuple. The *lsap*, *rmac*, and *rsap* are specified explicitly by parameters. The *lmac* is the local MAC address of the adapter referred to by the *type* and *adapter-number* parameters.

To change any parameter of the **tg** command, the existing TG must be removed first by using **no tg name**.

The **no tg** command removes the CMPC transmission group from the configuration. If the transmission group is used for a non-HPR connection, all sessions using the TG will be terminated immediately. If the transmission group is an HPR connection, all sessions using the transmission group will be terminated if no other HPR connection is available to the host.

---

### Examples

The following example configures a transmission group name and includes the *rmac* and *rsap* parameters:

```
tg LAGUNAA llc token-adapter 1 18 rmac 4000.0000.beef rsap 14
```

---

### Related Commands

Command	Description
<b>adapter</b>	Configures internal adapters.
<b>client (lu limit)</b>	Configures a CMPC read subchannel and a CMPC write subchannel.
<b>lan</b>	Configures an internal LAN on a CMCC adapter interface and enters the internal LAN configuration mode.

# tn3270-server

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

**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

---

<b>Command History</b>	<b>Release</b>	<b>Modification</b>
	11.2	This command was introduced.

---

---

**Usage Guidelines** The **tn3270 sever** 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
```

# timing-mark

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

**timing-mark**

**no timing-mark**

---

**Syntax Description** This command has no arguments or key words.

---

**Defaults** No WILL TIMING-MARKS are transmitted except by keepalive.

---

**Command Modes** TN3270 server configuration

---

Command History	Release	Modification
	11.2	This command was introduced.

---



---

**Usage Guidelines** If **timing-mark** 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 any of the following are 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 **timing-mark** used in this way. Therefore, **timing-mark** should only be configured where both of the following are true:

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

---

**Examples** The following example enables TIMING-MARK transmission:

```
timing-mark
```

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>idle-time</b>	Specifies how many seconds of LU inactivity, from both host and client, before the TN3270 session is disconnected.
<b>keepalive (TN3270)</b>	Specifies how many seconds of inactivity elapse before transmission of a DO TIMING-MARK to the TN3270 client.

# unbind-action

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

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

**no unbind-action**

Syntax Description	keep	No automatic disconnect will be made by the server upon 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. PU configuration

## 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

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

```
vrn vrn-name
```

```
no vrn
```

### Syntax Description

<i>vrn-name</i>	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 eight characters long; for example, RA12.NODM1PP. The portion of the name before the period is the NETID and is shared between entities in the same logical network.

### Examples

The following example sets a VRN name:

```
vrn SYD.BLAN25
```

**Related Commands**

<b>Command</b>	<b>Description</b>
<b>dlur (TN3270)</b>	Enables the SNA session switch function on the CMCC adapter, or enters DLUR configuration mode.
<b>adapter</b>	Configures internal adapters.
<b>lan</b>	Configures an internal LAN on a CMCC adapter interface and enters the internal LAN configuration mode.
<b>lsap</b>	Creates a SAP in the SNA session switch, or enters DLUR SAP configuration mode.



