



CMPC, CMPC+ and CSNA Commands

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



Note

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

For interface configuration information and examples, refer to the “Configuring Cisco Mainframe Channel Connection Adapters,” “Configuring CSNA and CMPC,” and “Configuring CMPC+” chapters of the *Cisco IOS Bridging and IBM Networking Configuration Guide*.

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

cmpc

To configure a CMPC (or CMPC+) read subchannel and a CMPC (or CMPC+) write subchannel, use the **cmpc** interface configuration command. To remove a subchannel definition and to deactivate the transmission group, use the **no** form of this command.

cmpc *path device tg-name* { **read** | **write** }

no cmpc *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>	Name of the CMPC or CMPC+ TG. The maximum length of the name is 8 characters.
read	Same read value as specified in the TRL major node.
write	Same write value 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.
12.0(3)T	Support for the CMPC+ feature was added.

Usage Guidelines

Each **cmpc** configuration command in a given CMPC or CMPC+ TG specifies the same TG name. The corresponding **tg** command specifies the same TG name. Together, the **cmpc** and **tg** commands make up the TG specification.

The **cmpc** command defines the read/write subchannel addresses that CMPC or 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 or CMPC+ is configured on a CMCC adapter with two physical interfaces, the read and write CMPC or CMPC+ subchannels may be configured on separate physical interfaces.

The **no cmpc** command deactivates the CMPC or CMPC+ subchannel. If the TG is used for a non-HPR connection, all sessions using the TG will be terminated immediately. If the TG is an HPR connection, all sessions using the TG 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 or CMPC+ TG named CONFIGE:

```
cmprc C020 F8 CONFIGE READ
cmprc C020 F9 CONFIGE WRITE
```

Related Commands

Command	Description
tg (CMPC)	Defines LLC connection parameters for the CMPC transmission group.
tg (CMPC+)	Defines IP connection parameters for the CMPC+ transmission group.
show extended channel cmprc	Displays information about each CMPC or CMPC+ subchannel configured on the specified channel interface.
show extended channel tg	Displays configuration, operational information, and statistics information for CMPC or CMPC+ transmission groups configured on the virtual interface of the specified CMCC adapter.
show extended channel subchannel	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.
show extended channel statistics	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

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

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

no csna path device
```

Syntax Description	path	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.
	device	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.
	maxpiu value	(Optional) Maximum channel I/O block size in bytes that is sent across the physical channel from the CMCC adapter to the attached mainframe. The range is 4096 to 65535 bytes. The default is 20470 bytes.
	time-delay value	(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.
	length-delay value	(Optional) Amount of SNA frame data in bytes the CSNA subchannel accumulates before sending the accumulated channel I/O block to the attached mainframe. The range is 0 to 65535 bytes. The default is 20470 bytes.

Defaults	maxpiu value: 20470 bytes
	time-delay value: 10 ms
	length-delay value: 20470 bytes

Command Modes	Interface configuration
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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.
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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:

- time-delay expires
- 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 CISCOVM 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
lan	Configures an internal LAN on a CMCC adapter interface and enters the internal LAN configuration mode.
adapter	Configures internal adapters.
show extended channel csna	Displays information about the CSNA subchannels configured on the specified CMCC interface.
show extended channel connection-map llc2	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 subchannel	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.
show extended channel statistics	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.

show extended channel cmgr

To display information about the MPC+ transmission group (TG) connection manager, use the **show extended channel cmgr** privileged EXEC command.

```
show extended channel slot/port cmgr [tg-name]
```

Syntax Description	slot	Slot number.
	port	Physical channel interface port number.
	tg-name	(Optional) Name of the TG.

Command Modes	Privileged EXEC
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Command History	Release	Modification
	12.0(3)T	This command was introduced.

Usage Guidelines	This command is valid on the CIP’s virtual channel interface or the CPA’s physical channel interface.
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Examples The following is sample output from the **show extended channel cmgr** command:

```
Router# show extended channel 3/2 cmgr
CMGR:MPCPTG2  Type=PTP
  Local Group Token:0500128933          Remote Group Token :0500993355
  Local VC Token   :0500109002          Local Conn. Token   :0500109003
  Remote VC Token  :0500201002          Remote Conn. Token  :0500201002
  VC Status        :Active               Connection Status   :Active

CMGR:MPCPTG3   Type=PTP
  Local Group Token:050014573           Remote Group Token :05008984300
  Local VC Token   :0500109044          Local Conn. Token   :0500109066
  Remote VC Token  :0500201095          Remote Conn. Token  :0500201088
  VC Status        :Active               Connection Status   :Active
```

Table 27 describes the fields shown in the display.

Table 27 show extended channel cmgr Field Descriptions

Field	Description
Local Group Token	CMCC’s MPC+ group token for this TG.
Remote Group Token	Host’s MPC+ group token for this TG.
Type	Connection manager type supported is point-to-point (PTP).
Local VC Token	CMCC adapter’s token for the connection manager’s virtual circuit.
Remote VC Token	host’s token for the connection manager’s virtual circuit.

Table 27 *show extended channel cmgr Field Descriptions (continued)*

Field	Description
VC Status	Valid states for a VC are: <ul style="list-style-type: none"> Reset—Awaiting a connection manager virtual circuit activate indication from the host. Active—Connection manager virtual circuit active indication was received from the host and CMCC adapter has sent a virtual circuit active indication to the host. The virtual circuit is now ready to send and/or receive connection requests.
Local Conn Token	CMCC's token for the connection manager's connection.
Remote Conn Token	Host's token for the connection manager's connection.
Connection Status	Valid states for a connection manager's connection are: <ul style="list-style-type: none"> Reset—Awaiting a connection manager connection request from the host. Active—Connection is active. The host has sent a connection request and the CMCC adapter has responded with a confirmation of the connection.

Related Commands

Command	Description
cmpe	Configures a CMPC (or CMPC+) read subchannel and a CMPC (or CMPC+) write subchannel.

show extended channel cmpc

To display information about each CMPC or CMPC+ subchannel configured on the specified channel interface, use the **show extended channel cmpc** privileged EXEC command.

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

Syntax Description	slot	Slot number.
	port	Physical channel interface port number.
	path	(Optional) Logical channel path.
	device	(Optional) 2-digit hexadecimal value that specifies a device address of the CPMC or CMPC+ subchannel. If specified, only status for that CMPC or CMPC+ device is displayed. If not specified, status for all CMPC or CMPC+ devices for the specified path is displayed.

Command Modes	Privileged EXEC
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Command History	Release	Modification
	11.3	This command was introduced.
	12.0(3)T	Support for the CMPC+ feature was added.

Usage Guidelines	This command is valid only on the CMCC adapter physical interfaces.
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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 28 describes the fields shown in the display.

Table 28 *show extended channel cmpc Field Descriptions*

Field	Description
Path	CMPC or CMPC+ channel path configured.
Dv	CMPC or CMPC+ subchannel device configured.
TGName	TG name configured for the CMPC or CMPC+ subchannel.
Dir	Identifies this CMPC or 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 or CMPC+ subchannel. Valid values are: <ul style="list-style-type: none"> Shutdown—CMCC adapter interface for this CMPC or CMPC+ subchannel is shutdown. In this state, the Bfrs value is not available and will be displayed as zeros. Inactive—CMPC or CMPC+ subchannel is not active. XID2 Pending—XID2 handshaking in progress. Active—XID2 exchange completed; CMPC or CMPC+ subchannel is active. Active+—XID2 exchange is complete; subchannel is active in HPDT mode.

Related Commands

Command	Description
cmpc	Configures a CMPC (or CMPC+) read subchannel and a CMPC (or CMPC+) write subchannel.
tg (CMPC)	Defines LLC connection parameters for the CMPC transmission group.
tg (CMPC+)	Defines IP connection parameters for the CMPC+ transmission group.
show extended channel cmgr	Displays information about the MPC+ transmission group connection manager.

show extended channel csna

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

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

Syntax Description	slot	Slot number.
	port	Port number.
	path	(Optional) A hexadecimal value in the range of 0000 to FFFF. 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.
	device	(Optional) A hexadecimal value in the range of 00 to FE. 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.
	admin	(Optional) Displays configured values for CSNA channel devices. If neither admin , oper , or stats is specified, admin is the default.
	oper	(Optional) Displays operational values for CSNA channel devices.
	stats	(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
```

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

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 29 describes the fields shown in the displays.

Table 29 *show extended channel csna Field Descriptions*

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

Table 29 *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"> off—Subchannel is normal (both CSNA and VTAM are able to send data). sent—CSNA has put VTAM into a slow down state for this CSNA subchannel. received—VTAM has put the CSNA subchannel into a slow down state. both—Both VTAM and the CSNA subchannel are in a slow down state. unknown—Current state of flow control on this CSNA subchannel cannot be determined.
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 admin keyword will be the new, configured value while the maxpiu displayed by the oper 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 from sending. 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 sending 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>
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>

Table 29 *show extended channel csna Field Descriptions (continued)*

Field	Description
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 sends. 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 sent 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 sent 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 sent to VTAM by this CSNA subchannel because blocking length-delay configured for this subchannel was reached.

Related Commands

Command	Description
csna	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 hsma

To display hot standby MAC address (HSMA) information, use the **show access-lists hardware** command in privileged EXEC mode.

show extended channel *slot:port* hsma

Syntax Description	<i>slot:</i>	Chassis slot number of the ISE line card and port number on that line card. Refer to the appropriate hardware manual or online help for port numbers on your networking device.
	<i>port</i>	Number of the port on the interface. Refer to the appropriate hardware manual or online help for port numbers on your networking device.

Defaults There are no defaults.

Command Modes Privileged EXEC

Command History	Release	Modification
	12.3(3)	This command was introduced.

Examples The following example shows sample output of the **show extended channel hsma** command:

```
LC-Slot2# show extended channel 1/0 hsma

HSMA information for Channel1/0:
Control adapter:
  LAN Token-26
  Adapter 26
  MAC Address 4043.1111.001a

HSMA peers for this control adapter:
      Hot Standby   HSMA-Partner   Link
LAN      Adapter  Mac Address   Mac Address   State
=====
Token 20  09      4043.1313.9009  4043.3333.001a  UP
Control Sap: EC(configured) (E8 on next restart)
Peer State : Active
Local State: Standby (Preferred)
Open Stations: 1
Open SAPs: 1
XCA Query Interval: 30 seconds.
Hello Interval    : 2 seconds.
Dead Interval     : 8 seconds.
```

Table 30 describes the significant fields shown in the display.

Table 30 *show extended channel hsma Field Descriptions*

Field	Description
Control Adapter	Information about the control adapter.
LAN Token-26	CMCC virtual lan on which the control adapter is configured.
LAN	The number of the CMCC virtual LAN on which the control adapter is configured.
Adapter-26	The adapter number of the control adapter with MAC address 4043.1111.001a
Hot Standby Mac Address	The HSMA MAC address.
HSMA-Partner Mac Address	The MAC address of the control adapter.
Link state	<p>The status of the LLC connection between the control adapters. Valid values are:</p> <ul style="list-style-type: none"> • UP—The connection is active. • DOWN—The connection is disabled. • Unknown—The router is unable to retrieve the information from the CMCC Control Sap. • OK Peer State— Status of the peer (remote) HSMA adapter
Control Sap	The address of the control service access point (SAP) for this peer. In this example, EC is the current address of the control SAP, but this has been changed, by using the hsma control-sap command, to E8. Once the interface is restarted, E8 will become the new control SAP address.
Peer State	<p>The current state of the peer (remote) HSMA adapter. Valid values are:</p> <ul style="list-style-type: none"> • UNDEFINED—Mismatched configuration options- an error occurred in retrieving the information from the CMCC. • Active—This adapter is active. • Adapter Starting—The adapter is being started. • Checkpointing—Both adapters are active and beginning negotiations to decide which will remain active. • Negotiating—The peers are negotiating their roles. • Pending Enable—The HSMA adapter is being enabled. • Shutdown—The HSMA adapter has been shutdown. • Standby—The HSMA adapter is not active because the peer is active. • Stopped—HSMA is initializing. • XCA Inactive—The XCA associated with this adapter is not active. • (Preferred)—The hsma preferred command is configured on this adapter.

Table 30 *show extended channel hsma Field Descriptions (continued)*

Field	Description
Local State	Status of the HSMA adapter on this interface (same as for peer).
Open Stations	The number of LLC2 connection stations open on this internal adapter.
Open SAPs	The number of SAPs open on this internal MAC adapter.
XCA Query Interval	The time interval between checks of the status of the XCA that has opened the HSMA adapter.
Hello Interval	The time interval between hello messages between the peered HSMA CIP or CPAs. This is configured by the hsma hello-interval command.
Dead Interval	Time interval during which at least one hello packet must be received from the peer HSMA adapter before the router declares that neighbor down. This is configured by the hsma dead-interval command.

show extended channel tg

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

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

Syntax Description	<i>slot</i>	Slot number.
	<i>port</i>	Port number.
	oper	(Optional) Operational parameters for the CMPC or CMPC+ TG values.
	stats	(Optional) Statistical values for the CMPC or CMPC+ TG.
	detailed	(Optional) Additional information about the CMPC or CMPC+ TG.
	<i>tg-name</i>	(Optional) Name of the TG.

Command Modes	EXEC
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Command History	Release	Modification
	11.3	This command was introduced.
	12.0(3)T	Support for the CMPC+ feature was added.

Usage Guidelines	<p>The show extended channel tg command is valid only on the virtual channel interface. If <i>tg-name</i> argument is not specified, information about all TGs configured on the specified interface is displayed.</p> <p>If neither the oper or stats arguments are specified, operational values are displayed.</p>
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Examples	The following is sample output from the show extended channel tg oper command for a CMPC TG:
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```
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
  RIF      :0830.1FF1.0041.00A0
  HPR RSAP :00
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
  Last Ww Cause = other
  Connection Time: 00:00:00 UTC Jan 1 1970
  Last modified: 00:00:00 UTC Jan 1 1970
```

Table 31 describes the fields shown in the display.

Table 31 *show extended channel tg oper Field Descriptions*

Field	Description
Status	<p>Connection status of the CMPC TG. Valid values are:</p> <ul style="list-style-type: none"> • 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. • Inactive—CMPC TG is reset ready to activate. • LocatingRemoteLinkStation—Exploring network for configured CMPC TG peer. • RemoteLinkStationLocated—CMPC TG network peer found. Waiting for connection negotiation to start. • XID3Negotiation—XID negotiation in progress. • PendingActive—Connect station pending. • Active—CMPC TG connection active.
Adapter	Identifies the CMCC adapter's internal MAC adapter configured for this CMPC TG. The MAC address configured for this adapter is the local MAC address for the CMPC or CMPC+ TG LLC connection.
RMAC	Remote MAC address configured for the CMPC TG LLC connection.
LSAP	Local SAP configured for the CMPC TG LLC connection.
RSAP	Remote SAP configured for the CMPC TG LLC connection.
TGN	TG number for this CMPC TG 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 TG. 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.
HPR	Valid values are YES and NO. If HPR is active on this CMPC TG, 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 TG 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 for a CMPC TG:

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           ConnectCnfs    :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 32 describes the fields shown in the display.

Table 32 *show extended channel tg stats Field Descriptions*

Field	Description
IFramesIn	Number of connection-oriented PIUs received by this CMPC TG from the remote network node.
IFramesOut	Number of connection-oriented PIUs sent by this CMPC TG to the remote network node.
UIFramesIn	Number of connectionless PIUs (HPR frames) received by this CMPC TG from the remote network node.
UIFramesOut	Number of connectionless PIUs (HPR frames) sent by this CMPC TG to the remote network node.
TestRspsIn	Number of TEST responses received for this CMPC TG.
TestCmdsOut	Number of TEST commands sent by this CMPC TG to the configured remote MAC address.
XidCmdsIn	Number of XID commands received for this CMPC TG.
XidCmdsOut	Number of XID commands sent by this CMPC TG.
XidRspsIn	Number of XID responses received for this CMPC TG.
XidRspsOut	Number of XID responses sent by this CMPC TG.
SweepReqsIn	Number of CMPC sweep requests received from VTAM on this CMPC TG.

Table 32 *show extended channel tg stats Field Descriptions (continued)*

Field	Description
SweepReqsOut	Number of CMPC sweep requests sent to VTAM on the CMPC TG.
SweepRspIn	Number of CMPC responses received from VTAM on this CMPC TG.
SweepRspOut	Number of CMPC responses sent to VTAM on this CMPC TG.
IBytesIn	Number of bytes for connection-oriented PIUs received by this CMPC TG from the remote network node.
IBytesOut	Number of bytes for connection-oriented PIUs sent by this CMPC TG to the remote network node.
UIBytesIn	Number of bytes for connectionless PIUs received by this CMPC TG from the remote network node.
UIBytesOut	Number of bytes for connectionless PIUs sent by this CMPC TG to the remote network node.
ConnectReqs	Number of connect requests received from the host by this CMPC TG.
ConnectInds	Number of connect indications sent to the host by this CMPC TG.
ConnectRsp	Number of connect responses received from the host by this CMPC TG.
ConnectCnfs	Number of connect confirms sent to the host by this CMPC TG.
DISCReqs	Number of disconnect requests received from the host by this CMPC TG.
DISCInds	Number of disconnect indications sent to the host by this CMPC TG.
Wraps	The number of times the sequence numbers wrapped for this CMPC TG.
LastSeqNoIn	The sequence number on the last CMPC data block sent to the host from this CMPC TG.
LastSeqNoOut	The sequence number on the last CMPC data block received from the host for this CMPC TG.
LastSeqNoFailureCause	<p>The cause of the last sequence number failure for this CMPC TG. Valid values are as follows:</p> <ul style="list-style-type: none"> • None—No sequence number failures have occurred on this CMPC TG since it was configured or the interface was last “no shut”. • Block—The sequence number failure occurred on a MPC data block received from the host for this CMPC TG. • Sweep—The sequence number failure occurred on a sweep command received from the host for this CMPC TG.
TimeSinceLastSeqNoFailure	Time since the last CMPC sequence number failure for this CMPC TG. 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 for a CMPC TG when the interface is shut down:

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

```
CIP LLC-TG:MVS2ISR1 -Statistics Not Available
```

The following is sample output from the **show extended channel tg** command for a CMPC+ TG:

```
CMPC-TG:MPCPTG2    Status:Active
  Local IP address:201.44.4.1                Remote IP Address :201.44.4.2

  Connection Info: Type=TCP/IP
  Local VC Token   :0500109002              Local Conn. Token :0500109003
  Remote VC Token  :0500201002              Remote Conn. Token:0500201002
  VC Status        :Active                  Connection Status :Active

CMPC-TG:MPCPTG3    Status:Active
  Local IP address:172.18.3.1                Remote IP Address :172.18.3.2

  MPC+ Connection Info: Type=HSAS IP
  Local VC Token   :0500109002              Local Conn. Token :0500109003
  Remote VC Token  :0500201002              Remote Conn. Token:0500201002
  VC Status        :Active                  Connection Status :PendingActive
```

Table 33 describes the fields shown in the display.

Table 33 *show extended channel tg Field Descriptions*

Field	Description
Status	<p>Connection status of the CMPC+ TG. Valid values are:</p> <ul style="list-style-type: none"> Shutdown—CMCC virtual interface is shut down. In this state, all nonconfigurable values will not be displayed and the connection operational values displayed when the detailed argument is specified also are not displayed. Ready—CMCC virtual interface is operational. Unknown—Unknown status. Inactive—CMPC+ TG is reset ready to activate. Active—CMPC+ TG connection active.
Local IP Address	IP address of the CMCC interface for this TG. This address matches the router's IP address configured on the corresponding TG statement.
Remote IP Address	IP address of the host for this TG. This address matches the host IP address configured on the corresponding TG statement.
Type	<p>Valid IP connection types are:</p> <ul style="list-style-type: none"> TCP/IP—Indicates that the connection is via the TCP/IP stack. HSAS IP—Indicates that the connection is via the HSAS stack.
Local VC Token	CMCC adapter's token for the virtual circuit.
Remote VC Token	Host's token for the virtual circuit.

Table 33 *show extended channel tg Field Descriptions (continued)*

Field	Description
VC Status	Valid states for the virtual circuit are: <ul style="list-style-type: none"> Reset—Awaiting a connection request from the host or CMCC adapter. Active—Virtual circuit active indication was received from the host and the CMCC adapter sent a virtual circuit active indication to the host. The virtual circuit is now ready to send and receive connection requests.
Local Conn Token	CMCC adapter's token for the MPC+ connection.
Remote Conn Token	Host's token for the MPC+ connection.
Connection Status	The valid states for a connection are: <ul style="list-style-type: none"> Reset—Awaiting a connection request from the host or CMCC adapter. ConnectionRequestSent—CMCC adapter sent a Connection Request to the host and is waiting a Connection Confirm from the host. PendingActive—CMCC adapter is waiting for the host to enable traffic flow on the connection. Active—Connection is active and both the CMCC adapter and the host have enabled traffic flow on the connection. At this point, the CMCC adapter has added a static route on the router for the host's IP address. Verify with the show ip route static command.

The following sample shows output on a CMCC adapter from the **show extended channel tg stats** command for a CMPC+ TG:

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

CMPC-TG:MPCPTG2

```

PacketsIn      :      81361  PacketsOut      :      71369
BytesIn        :  3874888438  BytesOut        :  377499994
ConnNr         :           0  ConnNs           :           0
SweepReqsIn   :           0  SweepReqsOut   :           0
SweepRspsIn   :           0  SweepRspsOut   :           0
Wraps          :           0
LastSeqNoIn    :   56047093  LastSeqNoOut    :   6751136
LastSeqNoFailureCause : None
TimeSinceLastSeqNoFailure : never

```

CMPC-TG:MPCPTG3

```

PacketsIn      :      44361  PacketsOut      :      63369
BytesIn        :  6834888438  BytesOut        :  954539994
ConnNr         :           0  ConnNs           :           0
SweepReqsIn   :           0  SweepReqsOut   :           0
SweepRspsIn   :           0  SweepRspsOut   :           0
Wraps          :           0
LastSeqNoIn    :   6274700  LastSeqNoOut    :   1829808
LastSeqNoFailureCause : None
TimeSinceLastSeqNoFailure : never

```

Table 34 describes the fields shown in the display.

Table 34 *show extended channel tg stats Field Descriptions*

Field	Description
PacketsIn	Number of packets sent to the host on this TG.
PacketsOut	Number of packets sent by the host on this TG.
BytesIn	Total byte count for all packets sent to the host on this TG.
BytesOut	Total byte count for all packets sent by the host on this TG.
ConnNr	Sequence number of the last MPC+ frame on this connection from the host. Because IP traffic is all connectionless, the value is always 0.
ConnNs	Sequence number of the last MPC+ frame on this connection sent to the host. Because IP traffic is always connectionless, the value is always 0.
SweepsReqsIn	Number of CMPC+ sweep requests received from the host on this CMPC+ TG.
SweepsReqsOut	Number of CMPC+ sweep requests sent to the host on the CMPC+ TG.
SweepsRspsIn	Number of CMPC+ sweep responses received from the host on the CMPC+ TG.
SweepsRspsOut	Number of CMPC+ responses sent to the host on this CMPC+ TG.
Wraps	Number of times the CMPC+ sequence number for this TG has wrapped on the write subchannel.
LastSeqNoIn	Last block sequence number sent on the read subchannel.
LastSeqNoOut	Last block sequence number received on the write subchannel.
Last SeqNoFailureCause	Valid values are: <ul style="list-style-type: none"> None—No sequence number failures detected since the program started. Block—Sequence number received in a data block on the write subchannel was not the expected sequence number. Sweep—Sequence number received in a sweep message on the write subchannel was not the expected sequence number
TimeSinceLastSeqNoFailure	Number of seconds since the last sequence number failure.

Related Commands

Command	Description
cmpc	Configures a CMPC (or CMPC+) read subchannel and a CMPC (or CMPC+) write subchannel.
tg (CMPC)	Defines LLC connection parameters for the CMPC transmission group.
tg (CMPC+)	Defines IP connection parameters for the CMPC+ transmission group.
show extended channel cmgr	Displays information about the MPC+ transmission group connection manager.

tg (CMPC)

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

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

```
no tg tg-name llc
```

Syntax Description	tg-name	Name of the CMPC TG. The maximum length of the name is eight characters. This must match the name specified on the cmpc statements.
	llc	Specifies that this TG is connected to the LLC stack on the CMCC adapter card.
	token-adapter	Internal adapter type on the CMCC adapter card. The currently supported type is token-adapter.
	adapter-number	Internal adapter number on the CMCC adapter card, which is the same value specified in the adapter internal LAN configuration command.
	lsap	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. The default value is 04.
	rmac rmac	(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.
	rsap rsap	(Optional) Remote SAP address, 04 to FC in hexadecimal. The value for the <i>rsap</i> argument must be even and should be a multiple of 4, but this requirement is not enforced. The default value for the <i>rsap</i> argument 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** (CMPC) 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* arguments are specified explicitly by parameters. The *lmac* argument is the local MAC address of the adapter referred to by the *type* and *adapter-number* arguments.

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

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

Examples

The following example configures a TG name and includes values for the *rmac* and *rsap* arguments:

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

Related Commands

Command	Description
adapter	Configures internal adapters.
lan	Configures an internal LAN on a CMCC adapter interface and enters internal LAN configuration mode.

tg (CMPC+)

To define IP connection parameters for the CMPC+ transmission group, use the **tg** (CMPC+) interface configuration command. To remove the specified transmission group from the configuration and deactivate the transmission group, use the **no** form of this command.

tg *tg-name* {**ip** | **hsas-ip**} *host-ip-addr local-ip-addr* [**broadcast**]

no tg *tg-name* {**ip** | **hsas-ip**}

Syntax Description	<i>tg-name</i>	Name of the CMPC+ TG. The maximum length of the name is eight characters. This name must match the name specified on the cmpc statements.
	ip	Specifies that this TG is connected to the TCP/IP stack.
	hsas-ip	Specifies that this TG is connected to the HSAS IP stack.
	<i>host-ip-addr</i>	Specifies the IP address of the channel-attached host using this TG. A host may have more than one IP stack, therefore this is the IP address of the host IP stack as indicated by the HOME statement in the host TCP/IP profile. For HSAS, this address is the host address as indicated by the <i>source-IP-address</i> parameter of the oeifconfig command.
	<i>local-ip-addr</i>	This address must match an IP address configured on the virtual interface. Specifies the IP address of the router to be used for this TG. This is the IP address of the router as indicated by the DEFAULTNET statement in the host TCP/IP profile. For HSAS, this address is the router IP address as indicated by the <i>destination-IP-address</i> parameter of the oeifconfig command.
	broadcast	(Optional) Enables the sending of routing updates to the host.

Command Modes Interface configuration

Command History	Release	Modification
	12.0(3)T	This command was introduced.

Usage Guidelines

The **tg** (CMPC+) command is valid only on the CIP’s virtual channel interface and the CPA’s physical channel interface. This command defines either an IP connection or an HSAS IP connection.

To change any parameter of the **tg** (CMPC+) command, the existing TG must be removed first by using **no tg name** command. At a minimum, *tg-name* must be specified to avoid ambiguity.

The **no tg** command removes the CMPC+ TG from the configuration. All sessions using the TG are terminated immediately.

Examples

The following example configures a TG name for an HSAS stack configured with CMPC+:

```
interface Channel0/2
 ip address 80.12.165.1 255.255.255.0
 no ip redirects
 no ip directed-broadcast
 ip route-cache same-interface
 no ip mroute-cache
 no keepalive
 tg TG00 hsas-ip 80.12.165.2 80.12.165.1
```

The following example configures a TG name for an IP stack configured with CMPC+:

```
interface Channel0/2
 ip address 80.12.165.1 255.255.255.0
 no ip redirects
 no ip directed-broadcast
 ip route-cache same-interface
 no ip mroute-cache
 no keepalive
 tg TG00      ip 80.12.165.2 80.12.165.1
```

Related Commands

Command	Description
cmpe	Configures a CMPC (or CMPC+) read subchannel and a CMPC (or CMPC+) write subchannel.

■ tg (CMPC+)