

cable bundle

To configure a cable interface to belong to an interface bundle, use the **cable bundle** command in interface configuration mode. To delete a cable interface bundle definition, use the **no** form of this command.

cable bundle *number* [**master**]

no cable bundle *number* [**master**]

Syntax Description

<i>number</i>	Specifies the bundle identifier. Valid range is from 1 to 255.
master	(Optional) Defines the specified interface as the master.

Defaults

No cable interface bundle is defined.

Command Modes

Interface configuration

Command History

Release	Modification
12.0(7)XR	This command was introduced.
12.1(1a)T1	This command was integrated into Cisco IOS Release 12.1(1a)T1.
12.0(8)SC	This command was integrated into Cisco IOS Release 12.0(8)SC
12.1(2)EC1	This command was integrated into Cisco IOS Release 12.1(2)EC1.

Usage Guidelines

You can configure up to four interface bundles. In each bundle, specify one interface as the master interface by using the optional **master** keyword.

Configure only an IP address on the master interface. If an IP address is configured and the interface is not specified as the master interface, any attempt to add an interface to a bundle is rejected.

Specify all generic IP networking information (such as IP address, routing protocols, and switching modes) on the bundle master interface. Do not specify generic IP networking information on bundle slave interfaces.

If you attempt to add an interface to a bundle as nonmaster interface and an IP address is assigned to this interface, the command will fail. You must remove the IP address configuration before you can add the interface to a bundle.

If you have configured an IP address on a bundled interface and the interface is not the master interface, a warning message appears.

Specify generic (not downstream or upstream related) cable interface configurations, such as source-verify or Address Resolution Protocol (ARP) handling, on the master interface. Do not specify generic configuration on nonmaster interfaces.

If you configure an interface as a part of a bundle and it is not the master interface, all generic cable configuration for this interface is removed. The master interface configuration will then apply to all interfaces in the bundle.

If you shut down or remove the master interface in a bundle, no data packets are sent to any of the interfaces in this bundle. Packets are still physically received from nonmaster interfaces that have not been shut down, but those packets will be discarded. Modems connected to those interfaces will not be disconnected immediately, but modems going online will not be able to obtain an IP address, download their configuration file, or renew their IP address assignment if the Dynamic Host Configuration Protocol (DHCP) lease expires.

If you shut down a slave interface, only this shut down interface is affected.

Examples

The following example shows how to configure interface 25 to be the master interface:

```
Router(config-if)# cable bundle 25 master
```

```
Router(config-if)#
```

```
07:28:17: %UBR7200-5-UPDOWN: Interface Cable3/0 Port U0, changed state to down
```

```
07:28:18: %UBR7200-5-UPDOWN: Interface Cable3/0 Port U0, changed state to up
```

The following example shows the error message that appears if you try to configure an interface with an IP address that is not the master interface:

```
Router(config-if)# cable bundle 5
```

```
Please remove ip address config first then reenter this command
```

Related Commands

Command	Description
show cable bundle	Displays the forwarding table for the specified interface bundle.

cable helper-address

To specify a destination address for User Datagram Protocol (UDP) broadcast Dynamic Host Configuration Protocol (DHCP) packets, use the **cable helper-address** command in interface configuration mode. To remove the specified destination address for UDP DHCP packets, use the **no** form of this command.

cable helper-address *ip-address* { **cable-modem** | **host** }

no cable helper-address *ip-address* { **cable-modem** | **host** }

Syntax Description

<i>ip-address</i>	The IP address of a DHCP server. Based on whether you add the host or cable-modem keyword at the end of the cable helper-address command, it is the IP address of the multiple service operators (MSOs) Cisco Network Registrar (CNR) server or the Internet service providers (ISPs) DHCP server.
cable-modem	Specifies that only cable modem UDP broadcasts are forwarded.
host	Specifies that only host UDP broadcasts are forwarded.

Defaults

This command is disabled by default.

Command Modes

Interface configuration

Command History

Release	Modification
11.3NA	This command was introduced.
12.3(14)T	This command was integrated into Cisco IOS Release 12.3(14)T.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

If you specify a secondary interface address, the giaddr field in the DHCP requests will be sent to the primary address for DHCP requests received from cable modems, and to the secondary IP address for DHCP requests received from hosts.

Examples

The following example shows how to forward UDP broadcasts from cable modems to the DHCP server at 172.23.66.44:

```
Router(config-if)# cable helper-address 172.23.66.44 cable-modem
```

The following example shows how to forward UDP broadcasts from hosts to the DHCP server at 172.23.66.44:

```
Router(config-if)# cable helper-address 172.23.66.44 host
```


**Note**

Although you can specify a cable length from 0 to 450 feet, the hardware recognizes only two ranges: 0 to 49 and 50 to 450. For example, entering 35 feet uses the 0 to 49 range. If you later change the cable length to 40 feet, there is no change because 40 is still within the 0 to 49 range. However, if you change the cable length to 50, the 50 to 450 range is used. The actual number you enter is stored in the configuration file.

Cisco 1000 Series Router

Table 2 lists the cable length distances and their relationships to line buildout for E3 and T3 controllers on Cisco 1000 Series Routers:

Table 2 Cable Length Distances and Line Buildout for E3/T3 Controllers

Interface	Cable Length (Feet)	Buildout
E3	0 to 244	No line buildout
E3	225 to 450	Line buildout
T3	0 to 299	No line buildout
T3	300 to 450	Line buildout

**Note**

Although you can specify a cable length from 0 to 450 feet, the hardware recognizes only two ranges: 0 to 49 and 50 to 450. For example, entering 35 feet uses the 0 to 49 range. If you later change the cable length to 40 feet, there is no change because 40 is still within the 0 to 49 range. However, if you change the cable length to 50, the 50 to 450 range is used. The actual number you enter is stored in the configuration file.

Examples**Cable Length to 300 Feet Example**

The following example shows how to set the cable length for the router to 300 feet:

```
Router(config)# controller t3 9/0/0
Router(config-controller)# cablelength 300
```

Cisco 10000 Series Router Example

The following example sets the cable length to 120 feet:

```
Router(config)# controller dsx3 4/0/6
Router(config-controller)# cablelength 120
```

Related Commands

Command	Description
cablelength long	Increases the pulse of a signal at the receiver and decreases the pulse from the transmitter using pulse equalization and line buildout for a T1 cable.
cablelength short	Sets a cable length of 655 feet or shorter for a DS1 link on the Cisco MC3810 or Cisco 2600 and Cisco 3600 series routers.

cablelength (E1 controller)

To fine-tune the pulse of a signal at the receiver for an E1 cable on a Cisco AS5300 or Cisco AS5400, use the **cablelength** command in controller configuration mode. To restore the default receiver sensitivity, use the **no** form of this command.

```
cablelength { custom gain-value [sqelch-on] | long [sqelch-on] | medium [sqelch-on] | short [sqelch-on] }
```

```
no cablelength
```

Syntax Description

custom	Fine-tunes the receiver sensitivity for long-haul, medium-haul, and short-haul applications.
<i>gain-value</i>	Custom gain value for the receiver in the range of 0x1 to 0x3F. These settings are mapped to values in the range of 0 to -45 dB.
long	Fine-tunes the receiver sensitivity for long-haul applications.
medium	Fine-tunes the receiver sensitivity for medium-haul applications.
short	Fine-tunes the receiver sensitivity for short-haul applications.
sqelch-on	(Optional) Enables sqelch to improve the signal-to-noise ratio.

Command Default

Default receiver sensitivity for E1 cables is applied.

Command Modes

Controller configuration

Command History

Release	Modification
12.3(17)	This command was introduced.

Usage Guidelines

This command is supported on E1 controllers only.



Note

The cable line pulse gain values are not dependent upon the E1 line being configured in balanced (120-ohm) mode or unbalanced (75-ohm) mode.

Examples

The following example shows how to fine-tune the receiver sensitivity for an E1 cable on a Cisco AS5300 to support a long-haul configuration:

```
Router(config-controller)# cablelength long sqelch-on
```

cablelength long

To increase the pulse of a signal at the receiver and to decrease the pulse from the transmitter using pulse equalization and line build-out for a T1 cable, use the **cablelength long** command in controller configuration or interface configuration mode. To return the pulse equalization and line build-out values to their default settings, use the **no** form of this command.

cablelength long *db-gain-value db-loss-value*

no cablelength long

Syntax Description	
<i>db-gain-value</i>	Number of decibels (dB) by which the receiver signal is increased. Use one of the following values: <ul style="list-style-type: none"> • gain26 • gain36 The default is 26 dB.
<i>db-loss-value</i>	Number of decibels by which the transmit signal is decreased. Use one of the following values: <ul style="list-style-type: none"> • 0db • -7.5db • -15db • -22.5db The default is 0 dB.

Defaults
db-gain-value: **gain26**
db-loss-value: **0db**

Command Modes
 Controller configuration for the Cisco AS5800 and Cisco MC3810.
 Interface configuration for the Cisco 2600 and Cisco 3600 series routers.

Command History	Release	Modification
	11.2	This command was introduced.
	11.3	The following keywords were added: gain26 , gain36 , 0db , -7.5db , -15db , -22.5db .
	12.0(5)XK	This command was modified to include support as an ATM interface configuration command for the Cisco 2600 and Cisco 3600 series routers and as a controller configuration command for the Cisco AS5800 universal access server.

Release	Modification
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

Cisco AS5800 and Cisco MC3810

Use this command for configuring the controller T1 interface on the Cisco AS5200 access server, on the Cisco AS5800 universal access server, or on the Cisco MC3810 multiservice access concentrator. The **cablelength long** command is used to configure DS1 links (meaning, to build CSU/DSU links) when the cable length is no longer than 655 feet.

On the Cisco MC3810, this command is supported on T1 controllers only and applies to Voice over Frame Relay, Voice over ATM, and Voice over HDLC.



Note

On the Cisco MC3810, you cannot use the **cablelength long** command on a DSX-1 interface only. The **cablelength long** command can be used only on CSU interfaces.

A pulse equalizer regenerates a signal that has been attenuated and filtered by a cable loss. Pulse equalization does not produce a simple gain, but it filters the signal to compensate for complex cable loss. A **gain26** receiver gain compensates for a long cable length equivalent to 26 dB of loss, whereas a **gain36** compensates for 36 dB of loss.

The lengthening or *building out* of a line is used to control far-end crosstalk. Line build-out attenuates the stronger signal from the customer installation transmitter so that the transmitting and receiving signals have similar amplitudes. A signal difference of less than 7.5 dB is ideal. Line build-out does not produce simple flat loss (also known as *resistive* flat loss). Instead, it simulates a cable loss of 7.5 dB, 15 dB, or 22.5 dB so that the resulting signal is handled properly by the receiving equalizer at the other end.

Cisco 2600 and Cisco 3600 Series Routers

This command is supported on T1 long-haul links only. If you enter the **cablelength long** command on a DSX-1 (short-haul) interface, the command is rejected.

The transmit attenuation value is best obtained by experimentation. If the signal received by the far-end equipment is too strong, reduce the transmit level by entering additional attenuation.

Examples

Cisco AS5800 and Cisco MC3810

The following example shows how to increase the receiver gain by 36 decibels and decreases the transmitting pulse by 15 decibels for a long cable on a Cisco AS5800:

```
AS5800(config)# controller t1 0
AS5800(config-controller)# cablelength long gain36 -15db
```

The following example shows how to configure the cable length for controller T1 0 on a Cisco MC3810 to a decibel pulse gain of 36 decibels and a decibel pulse rate of -22.5 decibels:

```
MC3810(config)# controller t1 0
MC3810(config-controller)# cablelength long gain36 -22.5db
```

Cisco 2600 and Cisco 3600 Series Routers

On a Cisco 2600 or Cisco 3600 series router, the following example shows how to specify a pulse gain of 36 decibels and a decibel pulse rate of -7.5 decibels:

```
Router(config)# interface atm 0/2  
Router(config-if)# cablelength long gain36 -7.5db
```

Related Commands

Command	Description
cablelength short	Sets a cable length of 655 feet or shorter for a DS1 link.

cablelength short

To set a cable length of 655 feet or shorter for a DS1 link on the Cisco MC3810 or Cisco 2600 and Cisco 3600 series routers, use the **cablelength short** command in controller configuration or interface configuration mode. To delete the **cablelength short** value, use the **no** form of this command.

cablelength short *length*

no cablelength short

Syntax Description

<i>length</i>	Specifies a cable length. Use one of the following values: <ul style="list-style-type: none"> • 133—Specifies a cable length from 0 to 133 feet. • 266—Specifies a cable length from 134 to 266 feet. • 399—Specifies a cable length from 267 to 399 feet. • 533—Specifies a cable length from 400 to 533 feet. • 655—Specifies a cable length from 534 to 655 feet.
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Defaults

The default is 133 feet for the Cisco AS5200 access server, Cisco AS5800 universal access server, and Cisco MC3810 multiservice access concentrator.

There is no default cable length for the Cisco 2600 and Cisco 3600 series routers.

Command Modes

Controller configuration for the Cisco AS5200 access server, Cisco AS5800 universal access server, and Cisco MC3810 multiservice access concentrator.

Interface configuration for the Cisco 2600 and Cisco 3600 series routers.

Command History

Release	Modification
11.3(2)AA	This command was introduced.
12.0(5)XK	This command was modified to include support as an ATM interface command for the Cisco 2600 and 3600 series routers and as a controller configuration command for the Cisco AS5800 universal access server.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

Cisco AS5200 Access Server, Cisco AS5800 Universal Access Server, and Cisco MC3810 Multiservice Access Concentrator

On the Cisco MC3810, the **cablelength short** command is used to configure DSX-1 links when the cable length is 655 feet or less than 655 feet. On the Cisco MC3810, this command is supported on T1 controllers only.

**Note**

On the Cisco MC3810, you cannot enter the **cablelength short** command on a CSU interface. The **cablelength short** command can be used only on DSX-1 interfaces.

Cisco 2600 and Cisco 3600 Series Routers

This command is supported on T1 short-haul links only. If you enter the **cablelength short** command on a long-haul interface, the command is rejected.

To set cable lengths longer than 655 feet, use the **cablelength long** command.

This command is supported on T1 controllers only.

Cisco AS5200 Access Server, Cisco AS5800 Universal Access Server, and Cisco MC3810 Multiservice Access Concentrator

The following example shows how to set the cable length to 266 for the T1 controller in slot 1 on dial shelf 0:

```
Router# configure terminal
Router(config)# controller t1 1/1/0
Router(config-controller)# cablelength short 266
Router(config-controller)# end
```

Cisco 2600 and Cisco 3600 Series Routers

On a Cisco 2600 or Cisco 3600 series router, the following example shows how to specify a cable length from 0 to 133 feet:

```
Router(config)# interface atm 0/2
Router(config-if)# cablelength short 133
```

Related Commands

Command	Description
cablelength long	Increases the pulse of a signal at the receiver and decreases the pulse from the sender using pulse equalization and line build-out.

card

To preprovision a line card slot in the Cisco 10000 series router, use the **card** command in global configuration mode. To remove preprovisioning from a line card slot, use the **no** form of this command.

```
card slot/subslot {lchoc12-1 | lgigethernet-1 | 1gigethernet-hh-1 | loc12atm-1 | loc12pos-1 |
1oc48dpt-pos-1 | 24che1t1-1 | 4chstm-1 | 4cht3-hh-1 | 4oc3atm-1 | 4oc3atm_lr-1 | 6cht3-1 |
6oc3pos-1 | 8e3ds3-1 | 8e3ds3atm-1 | 8fastethernet-1 [ mode {e1 | t1}]}
```

```
no card slot/subslot
```

Syntax Description

<i>slot</i>	Number of the line card slot in the Cisco 10000 series router to be preprovisioned.
<i>subslot</i>	Number of the line card subslot in the Cisco 10000 series router to be preprovisioned.
lchoc12-1	Preprovisions a line card slot for a 1-Port Channelized OC-12/STM-4 line card.
lgigetherne^t-1	Preprovisions a line card slot for a 1-Port Gigabit Ethernet line card.
1gigetherne^t-hh-1	Preprovisions a line card slot for a 1-Port Gigabit Ethernet Half-Height line card.
loc12atm-1	Preprovisions a line card slot for a 1-Port OC-12 ATM line card.
loc12pos-1	Preprovisions a line card slot for a 1-Port OC-12 Packet over SONET line card.
1oc48dpt-pos-1	Preprovisions a line card slot for a 1-Port OC-48/STM-16 Packet over SONET line card.
24che1t1-1	Preprovisions a line card slot for a 24-Port Channelized E1/T1 line card.
4chstm-1	Preprovisions a line card slot for a 4-Port Channelized OC-3/STM-1 line card.
4cht3-hh-1	Preprovisions a line card slot for a 4-port Channelized Half-Height line card.
4oc3atm-1	Preprovisions a line card slot for a 4-Port OC-3/STM-1 ATM line card with intermediate-reach optics.
4oc3atm_lr-1	Preprovisions a line card slot for a 4-Port OC-3/STM-1 ATM line card with long-reach optics.
6cht3-1	Preprovisions a line card slot for a 6-Port Channelized T3 line card.
6oc3pos-1	Preprovisions a line card slot for a 6-Port OC-3/STM-1 Packet over SONET line card.
8e3ds3-1	Preprovisions a line card slot for an 8-Port Unchannelized E3/T3 line card.
8e3ds3atm-1	Preprovisions a line card slot for an 8-Port E3/DS3 ATM line card.
8fastetherne^t-1	Preprovisions a line card slot for an 8-Port Fast Ethernet Half-Height line card.
mode {e1 t1}	Indicates the mode of operation of the 24-Port Channelized E1/T1 line card.

Command Default

The default mode of operation for the 24-Port Channelized E1/T1 line card is E1.

Command Modes Global configuration

Command History	Release	Modification
	12.0(17)ST	This command was introduced on the Cisco 10000 series routers.
	12.0(21)SX	This command was integrated into Cisco IOS Release 12.0(21)SX.
	12.0(22)S	This command was integrated into Cisco IOS Release 12.0(22)S.
	12.2(15)BX	This command was integrated into Cisco IOS Release 12.2(15)BX.
	12.3(7)XI1	This command was integrated into Cisco IOS Release 12.3(7)XI1.
	12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB. This command was modified to support the 4-port Channelized Half-Height line card and the 4-Port OC-3/STM-1 ATM line card with long-reach optics by adding the 4cht3-hh-1 and the 4oc3atm_lr-1 keywords.

Usage Guidelines

You must specify a line card slot and subslot, and the line card for which you want to preprovision the line card slot.

If you insert a line card into a line card slot that has been preprovisioned for a different line card, the line card reports a boot failure in an error message to the console. Output from the **show ip interface brief** command indicates that the line card remains in an initialized state.

You can specify a mode of operation for the 24-Port Channelized E1/T1 line card. If you do not, the line card operates in the E1 mode.

In Cisco IOS releases earlier than 12.0(28)S, 12.2(16)BX, and 12.3(7)XI1, you used only the **card** command to change the provisioning of a line card slot. It was not necessary to remove the old line card before using the **card** command to change the line card provisioning.

In Cisco IOS releases after 12.0(28)S, 12.2(16)BX, and 12.3(7)XI1, you must deactivate the installed line card using the **hw-module** and **no card** commands before using the **card** command to provision the line card slot for a different line card.

Examples

The following example preprovisions line card slot 2 to accept a 24-Port Channelized E1/T1 line card operating in E1 mode:

```
Router(config)# card 2/0 24che1t1-1 mode e1
```

The following example shows how to change the provisioning for line card slot 5 from the 1-Port Gigabit Ethernet Half-Height line card to the 4-Port OC-3/STM-1 ATM line card.

```
Router(config)# hw-module subslot 5/0 shut
Aug 22 21:52:19.619 UTC: %IPCOIR-3-TIMEOUT: Timeout waiting for a response from slot 5/0.
Aug 22 21:52:19.619 UTC: %IPCOIR-2-CARD_UP_DOWN: Card in slot 5/0 is down. Notifying
lgigetheret-hh-1 driver.
Aug 22 21:52:21.627 UTC: %LINK-3-UPDOWN: Interface GigabitEthernet5/0/0, changed state to
down
Aug 22 21:52:22.627 UTC: %LINEPROTO-5-UPDOWN: Line protocol on Interface
GigabitEthernet5/0/0, changed state to down
Router(config)# no card 5/0 lgigetheret-hh-1
Aug 22 21:53:20.008 UTC: %C10K-3-DEACTIVATED: card in slot [5/0] disabled.
Router(config)# card 5/0 4oc3atm-1
[ Remove the 1-Port Gigabit Ethernet Half-Height line card and
insert the 4-Port OC-3/STM-1 ATM line card ]
```

card type (T1-E1)

To configure a T1 or E1 card type, use the **card type** command in global configuration mode. To deselect the card type on non-SPA platforms, use the **no** form of this command. The **no** form of this command is not available on the SPA platforms.

```
card type {t1 | e1} slot [bay]
```

```
no card type {t1 | e1} slot [bay]
```

Channelized T/E1 Shared Port Adapters

```
card type {t1 | e1} slot subslot
```

Syntax Description		
t1		Specifies T1 connectivity of 1.544 Mbps through the telephone switching network, using AMI or B8ZS coding.
e1		Specifies a wide-area digital transmission scheme used predominantly in Europe that carries data at a rate of 2.048 Mbps.
<i>slot</i>		Chassis slot number. Refer to the appropriate hardware manual for slot information. For SIPs, refer to the platform-specific SPA hardware installation guide or the corresponding “Identifying Slots and Subslots for SIPs and SPAs” topic in the platform-specific SPA software configuration guide.
<i>bay</i>		(Optional) Card interface bay number in a slot (route switch processor [RSP] platform only). This option is not available on other platforms.
<i>subslot</i>		(Channelized T/E1 Shared Port Adapters Only) Secondary slot number on a SPA interface processor (SIP) where a SPA is installed. Refer to the platform-specific SPA hardware installation guide and the corresponding “Specifying the Interface Address on a SPA” topic in the platform-specific SPA software configuration guide for subslot information.

Defaults No default behavior or values

Command Modes Global configuration

Command History	Release	Modification
	12.0(5)XE	This command was introduced.
	12.0(7)T	This command was integrated into Cisco IOS Release 12.0(7)T.
	12.3(1)	This command was integrated into Cisco IOS Release 12.3(1) and support was added for Cisco 2610XM, Cisco 2611XM, Cisco 2620XM, Cisco 2621XM, Cisco 2650XM, Cisco 2651XM, Cisco 2691, Cisco 3631, Cisco 3660, Cisco 3725, and Cisco 3745 platforms.
	12.2S	This command was integrated into Cisco IOS Release 12.2S.

Release	Modification
12.2(18)SXE	This command was integrated into Cisco IOS Release 12.2(18)SXE to support SPAs on the Cisco 7600 series routers and Catalyst 6500 series switches.
12.0(31)S	This command was integrated into Cisco IOS Release 12.0(31)S to support SPAs on Cisco 12000 series routers.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

Changes made using this command on non-SPA platforms, do not take effect unless the **reload** command is used or the router is rebooted.

Channelized T1/E1 Shared Port Adapters

There is no card type when the SPA is inserted for first time. The user must configure this command before they can configure individual ports.

The **no** form of this command is not available on the SPA platforms. To change an existing card type on SPA platforms, perform the following steps:

1. Remove the SPA from its subslot.
2. Save the configuration.
3. Reboot the router.
4. Insert the new SPA into the subslot.
5. Configure the new card using this command.

Examples

The following example configures T1 data transmission on slot 1 of the router:

```
Router(config)# card type t1 1
```

The following example configures all ports of an 8-Port Channelized T1/E1 SPA, seated in slot 5, subslot 2, in T1 mode:

```
Router(config)# card type t1 5 2
```

Related Commands

Command	Description
controller	Configures a T1 or E1 controller and enters controller configuration mode.
reload	Reloads the operating system.
show controller	Displays the controller state that is specific to controller hardware
show interface serial	Displays the serial interface type and other information.

card type (T3-E3)

To configure a T3 or E3 card type, use the **card type** command in global configuration mode. To deselect the card type, use the **no** form of this command. The **no** form of this command is not supported on the 2-Port and 4-Port Clear Channel T3/E3 SPA on Cisco 12000 series routers.

T3 or E3 Controllers

card type {t3 | e3} *slot*

no card type {t3 | e3} *slot*

Clear Channel T3/E3 Shared Port Adapters

card type {t3 | e3} *slot subslot*

no card type {t3 | e3} *slot subslot*

Clear Channel T3/E3 Shared Port Adapters on Cisco 12000 Series Routers

card type {t3 | e3} *slot subslot*

Syntax Description		
t3		Specifies T3 connectivity of 44210 kbps through the network, using B8ZS coding.
e3		Specifies a wide-area digital transmission scheme used predominantly in Europe that carries data at a rate of 34010 kbps.
<i>slot</i>		Slot number of the interface.
<i>subslot</i>		(Clear Channel T3/E3 Shared Port Adapters Only) Secondary slot number on a SIP where a SPA is installed. Refer to the platform-specific SPA hardware installation guide and the corresponding “Specifying the Interface Address on a SPA” topic in the platform-specific SPA software configuration guide for subslot information.

Defaults No default behavior or values.

Command Modes Global configuration

Command History	Release	Modification
	12.1(1)T	This command was introduced.
	12.2(11)YT	This command was integrated into Cisco IOS Release 12.2(11)YT and implemented on the following platforms: Cisco 2650XM, Cisco 2651XM, Cisco 2691, Cisco 3660 series, Cisco 3725, and Cisco 3745 routers.
	12.2(15)T	This command was integrated into Cisco IOS Release 12.2(15)T.

Release	Modification
12.3(1)	This command was integrated into Cisco IOS Release 12.3(1) and support was added for Cisco 2610XM, Cisco 2611XM, Cisco 2620XM, Cisco 2621XM, Cisco 2650XM, Cisco 2651XM, Cisco 2691, Cisco 3631, Cisco 3660, Cisco 3725, and Cisco 3745 platforms.
12.2S	This command was integrated into Cisco IOS Release 12.2S.
12.2(25)S3	This command was integrated into Cisco IOS Release 12.2(25)S3 to support SPAs on the Cisco 7304 routers.
12.2(18)SXE	This command was integrated into Cisco IOS Release 12.2(18)SXE to support SPAs on the Cisco 7600 series routers and Catalyst 6500 series switches.
12.0(31)S	This command was integrated into Cisco IOS Release 12.0(31)S to support SPAs on the Cisco 12000 series routers.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

Usage guidelines vary slightly from platform to platform as follows:

T3 or E3 Controllers

Once a card type is issued, you enter the **no card type** command and then another **card type** command to configure a new card type. You must save the configuration to the NVRAM and reboot the router in order for the new configuration to take effect.

When the router comes up, the software comes up with the new card type. Note that the software will reject the configuration associated with the old controller and old interface. You must configure the new controller and serial interface and save it.

Clear Channel T3/E3 Shared Port Adapters

To change all the SPA ports from T3 to E3, or vice versa, you enter the **no card type** command and then another **card type** command to configure a new card type.

When the router comes up, the software comes up with the new card type. Note that the software will reject the configuration associated with the old controller and old interface. You must configure the new controller and serial interface and save it.

Clear Channel T3/E3 Shared Port Adapters on Cisco 12000 Series Routers

The **no** form of this command is not available on the 2-Port and 4-Port Clear Channel T3/E3 SPA on Cisco 12000 series routers. To change an existing card type on Cisco 12000 series routers, perform the following steps:

1. Remove the SPA from its subslot.
2. Save the configuration.
3. Reboot the router.
4. Insert the new SPA into the subslot.
5. Configure the new card using this command.

Examples

The following example shows T3 data transmission configured in slot 1:

```
Router(config)# card type t3 1
```

card type (T3-E3)

The following example configures all ports of 2-Port and 4-Port Clear Channel T3/E3 SPA, seated in slot 5, subslot 2, in T3 mode:

```
Router(config)# card type t3 5 2
```

Related Commands

Command	Description
controller	Configures a T3 or E3 controller and enters controller configuration mode.
reload	Reloads the operating system.
show interface serial	Displays the serial interface type and other information.

carrier-delay

To set the carrier delay on a main physical interface, use the **carrier-delay** command in interface configuration mode. To return to the default carrier delay value, use the **no** form of this command.

Conventional Carrier Delay

carrier-delay { *seconds* | *msec milliseconds* }

no carrier-delay

Asymmetric Carrier Delay for SIP-200- and SIP-400-Based WAN Cards

carrier-delay [*up* | *down*] { *seconds* | *msec milliseconds* }

no carrier-delay

Syntax Description	
<i>seconds</i>	<p>For Conventional Carrier Delay Specifies the carrier transition delay, in seconds. The range is from 0 to 60. The default is 2.</p> <p>For Asymmetric Carrier Delay In SIP-200- and SIP-400-based WAN cards, <i>seconds</i> specifies the link-up interface state. The acceptable limit to configure carrier delay up time is 4 seconds and above.</p>
<i>msec milliseconds</i>	<p>For Conventional Carrier Delay Specifies the carrier transition delay, in milliseconds. The range is from 0 to 1000. The default is 50.</p> <p>For Asymmetric Carrier Delay In SIP-200- and SIP-400-based WAN cards, <i>msec milliseconds</i> specifies the link-down interface state.</p>
up	(Optional) Configures asymmetric carrier delay for transitions to the up state in SIP-200- and SIP-400-based WAN cards.
down	(Optional) Configures asymmetric carrier delay for transitions to the down state in SIP-200- and SIP-400-based WAN cards.

Command Default

Conventional Carrier Delay

The default carrier delay is 2 seconds or 50 milliseconds.

Asymmetric Carrier Delay

In SIP-200- and SIP-400-based WAN cards, an asymmetric carrier delay of 4 seconds is applied to the up state transitions.

Command Modes

Interface configuration (config-if)

Command History

Release	Modification
10.1	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.
12.2(33)SRD	This command was modified to add the up and down keywords.
12.2(33)SXI	This command was modified. Support for the up and down keywords was integrated into Cisco IOS Release 12.2(33)SXI.

Usage Guidelines**Catalyst 6000 Series Switches**

The default carrier transition delay is 10 milliseconds on all Ethernet interfaces. This enables the carrier-delay time to ensure fast link detection.

Conventional Carrier Delay

If a link goes down and comes back up before the carrier delay timer expires, the down state is effectively filtered, and the rest of the software on the router is not aware that a link-down event occurred. Therefore, a large carrier delay timer results in fewer link-up/link-down events being detected. On the other hand, setting the carrier delay time to 0 means that *every* link-up/link-down event is detected.

In most environments a lower carrier delay is better than a higher one. The exact value that you choose depends on the nature of the link outages that you expect to see in your network and how long you expect those outages to last.

If data links in your network are subject to short outages, especially if those outages last less than the time it takes for your IP routing to converge, you should set a relatively long carrier delay value to prevent these short outages from causing unnecessary churn in your routing tables. If outages in your network tend to be longer, you might want to set a shorter carrier delay so that the outages are detected sooner and the IP route convergence begins and ends sooner.

The following restrictions apply to carrier delay configuration:

- The Fast Link and carrier delay features are mutually exclusive. If you configure one feature on an interface, the other is disabled.
- Administrative shutdown of an interface will force an immediate link-down event regardless of carrier delay configuration.

Asymmetric Carrier Delay

Cisco IOS releases that support the **up** and **down** keywords allow asymmetric carrier delay (ACD) configuration. ACD allows you to configure separate delay times for link-up and link-down event notification on physical interfaces that support ACD, such as the SIP-200- and SIP-400-based interfaces. With ACD, link-down events can be notified quickly while link-up events can be notified after a delay of sufficient time to ensure that a rebooted port is ready to forward packets.

The following restrictions apply to ACD configuration:

- ACD cannot be configured on an interface if conventional carrier delay (the **carrier-delay** command without an **up** or **down** keyword) is configured on the interface.
- Link-up carrier delay times are configured in seconds. Link-down carrier delay times are configured in milliseconds, using the **msec** keyword, or in seconds.

Link-up carrier delay time must be 4 seconds or more.

Examples**Conventional Carrier Delay**

The following example shows how to change the carrier delay to 5 seconds:

```
Router(config)# interface serial2/3/0  
Router(config-if)# carrier-delay 5
```

Asymmetric Carrier Delay

The following example shows how to configure a carrier delay of 8 seconds for link-up transitions and 50 milliseconds for link-down transitions:

```
Router(config)# interface GigabitEthernet2/0/0  
Router(config-if)# carrier-delay up 8  
Router(config-if)# carrier-delay down msec 50
```

cem

To enter circuit emulation (CEM) configuration mode, use the **cem** command in global configuration mode.

```
cem slot/port/channel
```

Syntax Description

<i>slot</i>	Slot number in which the Circuit Emulation over IP (CEoIP) network module (NM) is installed on the networking device.
<i>lport</i>	Port number on the CEoIP NM. The slash mark is required between the <i>slot</i> argument and the <i>port</i> argument.
<i>lchannel</i>	Channel number that identifies the channel that you want to configure (T1/E1 only). The channel number on a serial port is always 0. The slash mark is required between the <i>port</i> argument and the <i>channel</i> argument.

Command Default

CEM configuration mode is not available.

Command Modes

Global configuration

Command History

Release	Modification
12.3(7)T	This command was introduced.

Usage Guidelines

Use this command to enter CEM configuration mode to allow the configuration of all CEM options.

Examples

The following example shows how to enter CEM configuration mode:

```
Router(config)# cem 1/2/0
Router(config-cem)#
```

Related Commands

Command	Description
clear cem	Clears CEM statistics.
show cem	Displays CEM statistics.

cem-group

To create a circuit emulation (CEM) channel from one or more time slots of a T1 or E1 line of an NM-CEM-4TE1 network module, use the **cem-group** command in controller configuration mode. To remove a CEM group and release the associated time slots, use the **no** form of this command.

```
cem-group group-number {unframed | timeslots time-slot-range [speed kbps]}
```

```
no cem-group group-number
```

Syntax Description

<i>group-number</i>	Channel number to be used for this group of time slots. <ul style="list-style-type: none"> For T1 ports, the range is from 0 to 23. For E1 ports, the range is from 0 to 30.
unframed	Specifies that a single CEM channel is being created including all time slots and the framing structure of the line.
timeslots	Specifies that a list of time slots is to be used as specified by the <i>time-slot-range</i> argument.
<i>time-slot-range</i>	List of the time slots to be included in the CEM channel. The list may include commas and hyphens with no spaces between the numbers.
speed	(Optional) Specifies the speed of the channels by specifying the number of kbps of each time slot to be used. This keyword applies only to T1 channels.
<i>kbps</i>	(Optional) Speed of the channel, in kbps. Must be one of the following: <ul style="list-style-type: none"> 56—Specifies a speed of 56 kbps where only the seven most significant bits (MSBs) of each eight-bit time slot are used. 64—Specifies a speed of 64 kbps where all eight bits of each eight-bit time slot are used.

Command Default

No CEM groups are defined.

Command Modes

Controller configuration

Command History

Release	Modification
12.3(7)T	This command was introduced.

Usage Guidelines

Use this command to create CEM channels on the T1 or E1 network module, NM-CEM-4TE1. A maximum of 64 channels may be created on an NM-CEM-4TE1.

Examples

The following example shows how to create circuit emulation group number 0 with a single CEM channel including all time slots and the framing structure of the line on an NM-CEM-4TE1.

```
Router(config-controller)# cem-group 0 unframed
```

The following example shows how to create circuit emulation channel number 6 with T1 channel time slots one through four, nine, and ten using all eight bits of each time slot on an NM-CEM-4TE1.

```
Router(config-controller)# cem-group 6 timeslots 1-4,9,10 speed 64
```

Related Commands

Command	Description
cem	Enters circuit emulation configuration mode.

channel-group

To configure serial WAN on a T1 or E1 interface, use the **channel-group** command in controller configuration mode. To clear a channel group, use the **no** form of this command.

Cisco 2600 Series

channel-group *channel-group-number* **timeslots** *range* [**speed**] [**aim** *aim-slot-number*]

no channel-group *channel-group-number*

Cisco 2611 (Cisco Signaling Link Terminal [SLT])

channel-group *channel-number*

no channel-group *channel-number*

Cisco 2600XM Series, Cisco 2691, Cisco 3631, Cisco 3660, Cisco 3725, and Cisco 3745

channel-group *channel-group-number* {**timeslots** *range* [**speed**] | **unframed**}
[**aim** *aim-slot-number*]

no channel-group [*channel-group-number* **timeslots** *range*]

Cisco AS5350 and Cisco AS5400 Series

channel-group *channel-group-number*

no channel-group *channel-group-number*

Cisco MC3810

channel-group *channel-number* **timeslots** *range* [**speed**]

no channel-group [*channel-number* **timeslots** *range*]

Syntax Description

channel-group-number Channel-group number on the Cisco 2600 series, Cisco 2600XM, Cisco 2691, Cisco 3631, Cisco 3660, Cisco 3725, and Cisco 3745 routers. When a T1 data line is configured, channel-group numbers can be values from 0 to 23. When an E1 data line is configured, channel-group numbers can be values from 0 to 30.

Valid values can be 0 or 1 on the Cisco AS5350 and Cisco AS5400.

timeslots <i>range</i>	<p>Specifies one or more time slots separated by commas, and spaces or ranges of time slots belonging to the channel group separated by a dash. The first time slot is numbered 1.</p> <ul style="list-style-type: none"> For a T1 controller, the time slots range from 1 to 24. For an E1 controller, the time slots range from 1 to 31. <p>You can specify a time slot range (for example, 1-29), individual time slots separated by commas (for example 1, 3, 5), or a combination of the two (for example 1-14, 15, 17-31). See the “Examples” section for samples of different timeslot ranges.</p>
speed	<p>(Optional) Specifies the speed of the underlying DS0s in kilobits per second.</p> <p>The default line speed when configuring a T1 controller is 64 kbps on the Cisco 2600 series, Cisco 2600XM series, Cisco 2691, Cisco 3631, Cisco 3660, Cisco 3725, Cisco 3745, and Cisco MC3810.</p> <p>The default line speed when configuring an E1 controller is 64 kbps on the Cisco 2600 series, Cisco 2600XM series, Cisco 2691, Cisco 3631, Cisco 3660, Cisco 3725, Cisco 3745, and Cisco MC3810.</p> <p>The line speed controls real-time (VBR-RT) traffic shaping, and the maximum burst size (MBS) is 255 cells.</p>
aim <i>aim-slot-number</i>	<p>(Optional) Directs HDLC traffic from the T1/E1 interface to the AIM-ATM-VOICE-30 digital signaling processor (DSP) card on the Cisco 2600 series, Cisco 2600XM series, Cisco 2691, Cisco 3631, Cisco 3660, Cisco 3725, and Cisco 3745.</p>
<i>channel-number</i>	<p>Number of the channel. Valid values can be 0 or 1 on the Cisco SLT (Cisco 2611).</p>
unframed	<p>Specifies the use of all 32 time slots for data. None of the 32 time slots is used for framing signals on the Cisco 2600XM series, Cisco 2691, Cisco 3631, Cisco 3660, Cisco 3725, and Cisco 3745. This keyword is applicable to E1 only.</p>

Command Default

The T1/E1 line is connected to the Motorola MPC-860x processor serial communication controller (SCC) or network module with two voice or WAN interface card (VIC or WIC) slots and 0/1/2 FastEthernet ports DSCC4 by default on Cisco 2600 series, Cisco 2600XM, Cisco 2691, Cisco 3631, Cisco 3660, Cisco 3725, and Cisco 3745 routers.

There is no default behavior or values on the Cisco SLT (Cisco 2611).

The serial interface object encapsulation is set to HDLC on a network access server (NAS) (Cisco AS5350 and Cisco AS5400 series routers).

The default line speed is 64 kbps when a T1 controller is configured on the Cisco 2600 series, Cisco 2600XM series, Cisco 2691, Cisco 3631, Cisco 3660, Cisco 3725, Cisco 3745, and the Cisco MC3810.

The default line speed is 64 kbps when an E1 controller is configured on the Cisco 2600 series, Cisco 2600XM series, Cisco 2691, Cisco 3631, Cisco 3660, Cisco 3725, Cisco 3745, and the Cisco MC3810.

Command Modes

Controller configuration

Command History

Release	Modification
11.3MA	This command was introduced on the Cisco MC3810.
12.0	This command was integrated into Cisco IOS Release 12.0 on the Cisco MC3810.
12.0(7)XE	This command was implemented on the Catalyst 6000 family switches.
12.1(1)E	This command was integrated into Cisco IOS Release 12.1(1)E.
12.1(1)T	This command was modified to accommodate two channel groups on a port on 1- and 2-port T1/E1 multiflex voice or WAN interface cards on the Cisco 2600 and Cisco 3600 series routers.
12.1(3a)E3	The number of valid values for the <i>kbps</i> argument was changed on the Cisco MC3810; see the “Usage Guidelines” section for valid values.
12.2(11)T	This command was implemented on the Cisco AS5350 and Cisco AS5400.
12.2(15)T	The aim keyword was added for use on the Cisco 2600 series (including the Cisco 2691), Cisco 2600XM, Cisco 3660, Cisco 3725, and Cisco 3745.
12.3(1)	The unframed keyword was added for use on the Cisco 2600XM series, Cisco 2691, Cisco 3631, Cisco 3660, Cisco 3725, and Cisco 3745.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

Use this command to direct HDLC traffic from the T1/E1 interface to the AIM-ATM-VOICE-30 DSP card. A channel group is created using Advanced Integration Module (AIM) HDLC resources when a **channel-group** command with the **aim** keyword is parsed during system initialization or when the command is entered during configuration. You must specify the **aim** keyword under a T1/E1 controller port to direct HDLC traffic from the T1/E1 interface to the AIM-ATM-VOICE-30 DSP card on the Cisco 2600 series, Cisco 2600XM series, Cisco 2691, Cisco 3631, Cisco 3660, Cisco 3725, and Cisco 3745.

**Note**

Neither the Cisco AS5400 series NAS nor the Cisco MC3810 is supported with the integrated voice and data WAN on T1/E1 interfaces using the AIM-ATM-VOICE-30 module.

If previous **channel-group** commands are configured with the **aim** keyword, subsequent **channel-group** commands without the **aim** keyword are rejected. Similarly, if a regular **channel-group** command is followed by another **channel-group** command with the **aim** keyword implemented, the second command is rejected on the Cisco 2600 and Cisco 2600XM.

A channel group using AIM HDLC resources is deleted only when a **no channel-group** command is entered.

By default, the **channel-group** command on a NAS sets the serial interface object encapsulation to HDLC. You must override the default by entering the **encapsulation ss7** command for that serial interface object. Once you override the default, encapsulation cannot be changed again for that object. The SS7 encapsulation option is new to the Integrated Signaling Link Terminal feature and is available only for interface serial objects created by the **channel-group** command. The Integrated Signaling Link Terminal feature added SLT functionality on Cisco AS5350 and Cisco AS5400 platforms.

A digital SS7 link can be deleted by entering the **no channel-group channel-group-number** command on the associated T1/E1 controller. The link must first be stopped using the **no shutdown** command. It is not necessary to remove the channel ID association first.

Use the **channel-group** command in configurations where the router or access server must communicate with a T1 or E1 fractional data line. The channel group number may be arbitrarily assigned and must be unique for the controller. The time-slot range must match the time slots assigned to the channel group. The service provider defines the time slots that comprise a channel group.

**Note**

Channel groups, channel-associated signaling (CAS) voice groups, DS0 groups, and time-division multiplexing (TDM) groups all use group numbers. All group numbers configured for channel groups, CAS voice groups, and TDM groups must be unique on the local Cisco MC3810 concentrator. For example, you cannot use the same group number for a channel group and for a TDM group. Furthermore, on the Cisco MC3810, only one channel group can be configured on a controller.

The channel group number can be 0 or 1 on the Cisco SLT (Cisco 2611).

The **channel-group** command also applies to Voice over Frame Relay, Voice over ATM, and Voice over HDLC on the Cisco MC3810.

Examples

The following example shows basic configuration directing HDLC traffic from the T1/E1 interface to the AIM-ATM-VOICE-30 DSP card, starting in global configuration mode:

```
Router(config)# controller e1 1/0
Router(config-controller)# clock source internal
Router(config-controller)# channel-group 0 timeslots 1-31 aim 0
```

The following example explicitly sets the encapsulation type to PPP to override the HDLC default:

```
Router# configure terminal
Router(config)# controller t1 6/0
Router(config-controller)# channel-group 2 timeslots 3 aim 0
Router(config-controller)# exit
Router(config)# interface serial 6/0:2
Router(config-if)# encapsulation ppp
Router(config-if)# ip address 10.0.0.1 255.0.0.0
Router(config-if)# no shutdown
Router(config-if)# end
```

The following example shows how to explicitly set the encapsulation type to SS7 to override the HDLC default using the Integrated Signaling Link Terminal feature. This example uses an 8PRI DFC card inserted into slot 7, and DS0-timeslot 3 on trunk 5 of that card is used as an SS7 link:

```
Router# configure terminal
Router(config)# controller t1 7/5
Router(config-controller)# channel-group 2 timeslots 3
Router(config-controller)# exit
Router(config)# interface serial 7/5:2
Router(config-if)# encapsulation ss7
Router(config-if)# channel-id 0
Router(config-if)# no shutdown
Router(config-if)# end
```

The following example defines three channel groups. Channel-group 0 consists of a single time slot, channel-group 8 consists of seven time slots and runs at a speed of 64 kbps per time slot, and channel-group 12 consists of two time slots.

```
Router(config-controller)# channel-group 0 timeslots 1
Router(config-controller)# channel-group 8 timeslots 5,7,12-15,20 speed 64
Router(config-controller)# channel-group 12 timeslots 2
```

The following example configures a channel group on controller T1 0 on a Cisco MC3810:

```
Router(config)# controller T1 0  
Router(config-controller)# channel-group 10 timeslots 10-64
```

The following example configures a channel group on controller E1 1 and specifies that all time slots are used for data:

```
controller e1 1  
channel-group 1 unframed
```

**Note**

SS7 digital F-link support for the 8PRI line card requires use of a third onboard TDM stream to route trunk DS0 messages to the onboard MGCs.

Related Commands

Command	Description
framing	Specifies the frame type for the T1 or E1 data line.
invert data	Enables channel inversion.
linecode	Specifies the line code type for the T1 or E1 line.
voice-card	Configures a card with voice processing resources and enters voice card configuration mode.
encapsulation	Sets the encapsulation type.

channel-group (interface)

To assign and configure an EtherChannel interface to an EtherChannel group, use the **channel-group** command in interface configuration mode. To remove the channel-group configuration from the interface, use the **no** form of this command.

channel-group *channel-group-number* **mode** { **active** | **on** | **passive** }

no channel-group *channel-group-number*

Cisco 2600 Series, Cisco 3600 Series, and Cisco 3700 Series Routers

channel-group *channel-group-number* **mode on**

no channel-group *channel-group-number*

Cisco Catalyst Switches

channel-group *channel-group-number* **mode** { **active** | **on** | **auto** [**non-silent**] | **desirable** [**non-silent**] | **passive** }

no channel-group *channel-group-number*

Syntax Description

<i>channel-group-number</i>	Integer that identifies the channel-group. Valid values are from 1 to 256; the maximum number of integers that can be used is 64. For Fast EtherChannel groups, the number is an integer from 1 to 4. This number is the one previously assigned to the port-channel interface.
mode	Specifies the EtherChannel mode of the interface.
active	Enables Link Aggregation Control Protocol (LACP) unconditionally.
on	Enables EtherChannel only.
auto	Places a port into a passive negotiating state in which the port responds to Port Aggregation Protocol (PAgP) packets that it receives but does not initiate PAgP packet negotiation.
non-silent	(Optional) Used with the auto or desirable mode when traffic is expected from the other device.
desirable	Places a port into an active negotiating state in which the port initiates negotiations with other ports by sending PAgP packets.
passive	Enables LACP only when an LACP device is detected. This is the default state.

Command Default

No channel groups are assigned.

Command Modes

Interface configuration

Command History

Release	Modification
11.1CA	This command was introduced.
12.0(7)XE	Support for this command was implemented on Cisco Catalyst 6000 series switches.
12.1(3a)E3	The number of valid values for the <i>number</i> argument was changed; see the “Usage Guidelines” section for valid values.
12.2(2)XT	This command was implemented on the Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers.
12.2(8)T	Support for this command was implemented on the Cisco 2600 series, the Cisco 3600 series, and the Cisco 3700 series routers and integrated into Cisco IOS Release 12.2(8)T.
12.2(14)SX	Support for this command was implemented on the Supervisor Engine 720.
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was integrated into Cisco IOS Release 12.2(17d)SXB.
12.2(18)SXE	This command was changed to support advanced QinQ translation on QinQ link bundles using GE-WAN interfaces on an OSM-2+4GE-WAN+ OSM on Catalyst 6000 family switches.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2(31)SB2	This command was integrated into Cisco IOS Release 12.2(31)SB2.
12.2(33)SRB	Support for this command on the Cisco 7600 router was integrated into Cisco IOS Release 12.2(33)SRB.

Usage Guidelines

OSMs are not supported on Catalyst 6000 family switches that are configured with a Supervisor Engine 32.

IP Address for the Physical Interface

You do not have to disable the IP address that is assigned to a physical interface that is part of a channel group, but Cisco highly recommends doing so.

Layer 2 and Layer 3 Port Channels

You can create both Layer 2 and Layer 3 port channels by entering the **interface port-channel** command or, when the channel-group gets its first physical interface assignment. The port channels are not created at run time, nor are they created dynamically.

You do not have to create a port-channel interface before assigning a physical interface to a channel group. A port-channel interface is automatically created when the channel group gets its first physical interface, if it is not already created.

Propagation of Configuration and Attribute Changes

Any configuration or attribute changes you make to the port-channel interface are propagated to all interfaces within the same channel group as the port channel. (for example, configuration changes are also propagated to the physical interfaces that are not part of the port-channel, but are part of the channel group.)

The on Keyword

When you use the **on** keyword, a usable EtherChannel exists only when a port group in **on** mode is connected to another port group in the **on** mode.

Cisco 2600 Series, Cisco 3600 Series, and Cisco 3700 Series Routers

You do not have to create a port-channel interface before assigning a physical interface to a channel group. A port-channel interface is created automatically when the channel group gets its first physical interface, if it is not already created.

Cisco Catalyst Switches

The number of valid values for *number* depends on the software release. For software releases prior to Cisco IOS Release 12.1(3a)E3, valid values are from 1 to 256; for Cisco IOS Release 12.1(3a)E3, 12.1(3a)E4, and 12.1(4)E1, valid values are from 1 to 64. Cisco IOS Release 12.1 E and later releases support a maximum of 64 values ranging from 1 to 256.

The channel-group number is global and is shared between all the channeling protocols. If a specific channel number is used for the PAgP-enabled interfaces of a channel group, that same channel number cannot be used for configuring a channel that has LACP-enabled interfaces or vice versa.

Entering the **auto** or **desirable** keyword enables PAgP on the specified interface; the command will be rejected if it is issued on an LACP-enabled interface.

The **active** and **passive** keywords are valid on PAgP-disabled interfaces only.

You can change the mode for an interface only if it is the only interface that is designated to the specified channel group.

The **on** keyword forces the bundling of the interface on the channel without any negotiation.

You can manually configure a switch with PAgP on one side and LACP on the other side in the **on** mode.

With the **on** mode, a usable EtherChannel exists only when a port group in **on** mode is connected to another port group in **on** mode.

If you enter the **channel group** command on an interface that is added to a channel with a different protocol than the protocol you are entering, the command is rejected.

If the interface belongs to a channel, the **no** form of this command is rejected.

All ports in the same channel group must use the same protocol; you cannot run two protocols on one channel group.

PAgP and LACP are not compatible; both ends of a channel must use the same protocol.

You can change the protocol at any time, but this change causes all existing EtherChannels to reset to the default channel mode for the new protocol.

Configure all ports in an EtherChannel to operate at the same speed and duplex mode (full duplex only for LACP mode).

All ports in a channel must be on the same DFC-equipped module. You cannot configure any of the ports to be on other modules.

On systems that are configured with nonfabric-enabled modules and fabric-enabled modules, you can bundle ports across all modules, but those bundles cannot include a DFC-equipped module port.

You do not have to create a port-channel interface before assigning a physical interface to a channel group. A port-channel interface is created automatically when the channel group gets its first physical interface, if it is not already created.

You do not have to disable the IP address that is assigned to a physical interface that is part of a channel group, but it is highly recommended.

You can create both Layer 2 and Layer 3 port channels by entering the **interface port-channel** command or when the channel group gets its first physical interface assignment. The port channels are not created at runtime or dynamically.

Any configuration or attribute changes that you make to the port-channel interface are propagated to all interfaces within the same channel group as the port channel (for example, configuration changes are also propagated to the physical interfaces that are not part of the port channel but are part of the channel group).

When configuring Layer 2 EtherChannels, you cannot put Layer 2 LAN ports into manually created port-channel logical interfaces.

Only the **on** mode is supported when using this command with GE-WAN ports on the OSM-2+4GE-WAN+ OSM to create QinQ link bundles for advanced QinQ translation. Also, you cannot use the **channel-group** command on GE-WAN interfaces if MPLS is configured. You must remove all IP, MPLS, and other Layer 3 configuration commands before using the **channel-group** command with GE-WAN interfaces.

**Note**

The GE-WAN interfaces on an OSM-2+4GE-WAN+ OSM behave slightly differently than other interfaces if you want to move the interface from one group to another. To move most other interfaces, you can enter the **channel-group** command again to delete the interface from the old group and move it to the new group. For GE-WAN ports, however, you must manually remove the interface from the group by entering the **no channel-group** command before assigning it to a new group.

**Caution**

Do not enable Layer 3 addresses on the physical EtherChannel interfaces. Assigning bridge groups on the physical EtherChannel interfaces causes loops in your network.

For a complete list of guidelines, see the “Configuring EtherChannel” section of the *Cisco 7600 Series Router Cisco IOS Software Configuration Guide*.

Fast EtherChannel

Before you assign a Fast Ethernet interface to a Fast EtherChannel group, you must first create a port-channel interface. To create a port-channel interface, use the **interface port-channel** global configuration command.

If the Fast Ethernet interface has an IP address assigned, you must disable it before adding the Fast Ethernet interface to the Fast EtherChannel. To disable an existing IP address on the Fast Ethernet interface, use the **no ip address** command in interface configuration mode.

The Fast EtherChannel feature allows multiple Fast Ethernet point-to-point links to be bundled into one logical link to provide bidirectional bandwidth of up to 800 Mbps. Fast EtherChannel can be configured between Cisco 7500 series routers and Cisco 7000 series routers with the 7000 Series Route Switch Processor (RSP7000) and 7000 Series Chassis Interface (RSP7000CI) or between a Cisco 7500 series router or a Cisco 7000 series router with the RSP7000 and RSP700CI and a Cisco Catalyst 5000 switch.

A maximum of four Fast Ethernet interfaces can be added to a Fast EtherChannel group.

**Caution**

The port-channel interface is the routed interface. Do not enable Layer 3 addresses on the physical Fast Ethernet interfaces. Do not assign bridge groups on the physical Fast Ethernet interfaces because it creates loops. Also, you must disable spanning tree.

To display information about the Fast EtherChannel, use the **show interfaces port-channel EXEC** command.

For more guidelines see the “Configuring EtherChannel” section of the *Cisco 7600 Series Router Cisco IOS Software Configuration Guide* and the “Configuring EtherChannel” section of the *Catalyst 6500 Series Switch Cisco IOS Software Configuration Guide*.

Examples

This example shows how to add EtherChannel interface 1/0 to the EtherChannel group that is specified by port-channel 1:

```
Router(config-if)# channel-group 1 mode on
Router(config-if)#
```

The following example shows how to add interface Fast Ethernet 1/0 to the Fast EtherChannel group specified by port-channel 1:

```
Router(config)# interface port-channel 1
Router(config-if)# exit
Router(config)# interface fastethernet 1/0
Router(config-if)# channel-group 1
```

Related Commands

Command	Description
interface	Creates a port-channel virtual interface and puts the CLI in interface configuration mode when the port-channel keyword is used.
ip address	Sets a primary or secondary IP address on an interface.
show etherchannel	Displays the EtherChannel information for a channel.
show interfaces port-channel	Displays traffic that is seen by a specific port channel.

channel-protocol (interface)

To enable Port Aggregation Control Protocol (PAgP) or Link Aggregation Control Protocol (LACP) on an interface to manage channeling, use the **channel-protocol** command in interface configuration mode. Use the **no** form of this command to deselect the protocol.

channel-protocol {lacp | pagp}

no channel-protocol

Syntax Description

lacp	Specifies LACP to manage channeling.
pagp	Specifies PAgP to manage channeling.

Defaults

pagp

Command Modes

Interface configuration

Command History

Release	Modification
10.2	This command was introduced.
12.1(11b)EX	Support for this command was introduced on the Catalyst 6500 series switches.
12.1(12c)EA1	Support for this command was introduced on the Catalyst 2900 series switches.
12.1(13)E	Support for this command on the Catalyst 6500 series switches was extended to Cisco IOS Release 12.1(13)E. This command was changed to support the use of the no channel-protocol command (without arguments) to deselect the protocol.
12.1(13)EW	Support for this command was introduced on the Catalyst 4500 series switches.
12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to Cisco IOS Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

This command is valid on multiple interfaces (for example, Fast Ethernet) and routers and switches including the Cisco 2900, 4500/4000, 6500/6000, and 7600 series.

Examples

The following example shows how to set the lacp.

```
(config-if)# channel-protocol lacp
```

channelized

To configure the T3 controller for channelized mode, use the **channelized** command in controller configuration mode. To configure the T3 controller for unchannelized mode, use the **no** form of this command.

channelized

no channelized

Syntax Description This command has no arguments or keywords.

Defaults

T3 Controller

The T3 controller is channelized.

Channelized

Maximum transmission unit (MTU) size is set to 1500.

Unchannelized

MTU size is set to 4470.

Command Modes

Controller configuration

Command History

Release	Modification
12.0(14)S	This command was introduced.
12.1(5a)E	This command was integrated into Cisco IOS Release 12.1(5a)E.
12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T.
12.2(31)SB	This command was integrated into Cisco IOS Release 12.2(31)SB.

Usage Guidelines

Use the **no channelized** controller configuration command to configure the T3 controller for unchannelized mode. When you configure the PA-MC-2T3+ port adapter on a Cisco 7500 series router with the **no channelized** command, the MTU size is set to 4470. In channelized mode, the default MTU size is 1500. The change in MTU sizes will cause a memory recarve and CBus complex to occur, disrupting all traffic on the router for several minutes.

The following message will be displayed when commands initiate switching between channelized and unchannelized modes on a Cisco 7500 series router:

```
Change to subrate mode will cause cbus complex reset. Proceed? [yes/no]: Y
```

Type **Y** for “yes” at the end of the warning. At the prompt, type **^Z** to exit. You will exit configuration mode and enter unchannelized mode.

**Caution**

The **no channelized** command removes all channel groups from a channelized T3 interface. If you have already configured channel groups, use this command with caution.

Examples**Cisco 7500 Series Router**

The following example shows how to configure unchannelized mode on a PA-MC-2T3+ port adapter in slot 1 of a Versatile Interface Processor version 2 (VIP2) or VIP4 in a Cisco 7500 series router:

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# controller T3 1/1/0
Router(config-controller)# no channelized
Change to subrate mode will cause cbus complex reset. Proceed? [yes/no]: Y
^Z
```

Cisco 10000 Series Router

The following example eliminates the T1 interfaces to create a full-rate T3 interface:

```
Router# configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)# controller T3 2/0/0
Router(config-controller)# no channelized
Router(config-controller)# exit
Router(config)#
```

clear aim

To clear the data compression Advanced Interface Module (AIM) daughter card registers and reset the hardware, use the **clear aim** command in privileged EXEC mode.

clear aim *element-number*

Syntax Description

<i>element-number</i>	Number of AIM slot. AIM slots begin with 0.
-----------------------	---

Command Modes

Privileged EXEC

Command History

Release	Modification
12.0(1)T	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

The **clear aim** command is used to reset the data compression AIM hardware. This command is used if the compression Advanced Interface Module (CAIM) hardware becomes “stuck” or hangs for some reason. The CAIM registers are cleared, and the hardware is reset upon execution. All compression history is lost when the CAIM is reset.

This command is supported only on Cisco 2600 series routers.

Examples

The following example shows how to use the **clear aim** command. This command will reset the hardware, flushing the buffers and history for all compression tasks currently under operation:

```
Router# clear aim 0
Router#
1w0d: %CAIM-6-SHUTDOWN: CompressionAim0 shutting down
1w0d: %CAIM-6-STARTUP: CompressionAim0 starting up
```

Related Commands

Command	Description
show pas caim	Displays the IDPROM contents for each AIM board in the Cisco 2600 series routers.
test aim eeprom	Tests the data compression AIM after it is installed in a Cisco 2600 series router.

clear cable-diagnostics tdr

To clear a specific interface or clear all interfaces that support Time Domain Reflectometry (TDR), use the **clear cable-diagnostics tdr** command in privileged EXEC mode.

clear cable-diagnostics tdr [**interface** *interface interface-number*]

Syntax Description

interface *interface* (Optional) Specifies the interface type; possible valid values are **ethernet**, **fastethernet**, **gigabitethernet**, and **tengigabitethernet**. See the “Usage Guidelines” section for additional valid values.

interface-number Module and port number; see the “Usage Guidelines” section for valid values.

Defaults

This command has no default settings.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(17a)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

The valid values for *interface* include the **ge-wan**, **atm**, and **pos** keywords that are supported on Catalyst 6000 family switches that are configured with a Supervisor Engine 2.

See the *Release Notes for Cisco IOS Release 12.2 SX on the Catalyst 6500 and Cisco 7600 Supervisor Engine 720, Supervisor Engine 32, and Supervisor Engine 2* for the list of modules that support TDR

Examples

This example shows how to clear a specific interface:

```
Router# clear cable-diagnostics tdr interface gigabitethernet 4/1
Router#
```

Related Commands

Command	Description
show cable-diagnostics tdr	Displays the test results for the TDR cable diagnostics.
test cable-diagnostics	Tests the condition of 10-Gigabit Ethernet links or copper cables on 48-port 10/100/1000 BASE-T modules.

clear catalyst6000 traffic-meter

To clear the traffic meter counters, use the **clear catalyst6000 traffic-meter** command in privileged EXEC mode.

clear catalyst6000 traffic-meter

Syntax Description This command has no arguments or keywords.

Defaults This command has no default settings.

Command Modes Privileged EXEC

Command History

Release	Modification
12.2(17a)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Examples

This example shows how to clear the traffic meter counters:

```
Router# clear catalyst6000 traffic-meter
Router#
```

clear cem

To clear circuit emulation (CEM) statistics, use the **clear cem** command in privileged EXEC mode.

```
clear cem {slot | slot/port/channel | all}
```

Syntax Description	Argument	Description
	<i>slot</i>	Clears the statistics for all CEM channels on the card in the specified slot (if the card is a Circuit Emulation over IP [CEoIP] card).
	<i>slot</i>	Specifies the slot of the CEM channel to clear.
	<i>/port</i>	Specifies the port of the CEM channel to clear. The slash mark is required between the <i>slot</i> argument and the <i>port</i> argument.
	<i>/channel</i>	Specifies the CEM channel to clear. The slash mark is required between the <i>port</i> argument and the <i>channel</i> argument.
	all	Clears the statistics for all CEM channels on the router.

Command Modes Privileged EXEC

Command History	Release	Modification
	12.3(7)T	This command was introduced.

Examples The following example shows how to clear CEM statistics for CEM channel number 10 on the card installed in slot 1, port 1.

```
Router# clear cem 1/1/10
```

Related Commands	Command	Description
	cem	Enters CEM configuration mode.
	show cem	Displays CEM statistics.

clear controller

To reset the T1 or E1 controller, use the **clear controller** command in user EXEC or privileged EXEC mode.

Cisco 7200 Series and Cisco 7500 Series Routers

```
clear controller {t1 | e1} slot/port
```

Cisco AS5200 Series and Cisco AS5300 Series Routers

```
clear controller {t1 | e1} number
```

Syntax Description		
	t1	T1 controller.
	e1	E1 controller.
	<i>slot/port</i>	Backplane slot number and port number on the interface. Refer to your hardware installation manual for the specific slot and port numbers.
	<i>number</i>	Network interface module (NIM) number, in the range from 0 to 2.

Command Modes	
	User EXEC Privileged EXEC

Command History	Release	Modification
	10.1	This command was introduced.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
	12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples The following example resets the T1 controller at slot 4, port 0 on a Cisco 7500 series router:

```
Router# clear controller t1 4/0
```

The following example resets the E1 controller at NIM 0:

```
Router# clear controller e1 0
```

Related Commands	Command	Description
	controller	Configures a T1, E1, or J1 controller and enters controller configuration mode.

clear controller lex

To reboot the LAN Extender chassis and restart its operating software, use the **clear controller lex** command in privileged EXEC mode.

clear controller lex *number* [**prom**]

Cisco 7500 Series

clear controller lex *slotport* [**prom**]

Cisco 7200 Series and 7500 Series with a Packet over SONET Interface Processor

clear controller lex [*type*] *slotport*

Cisco 7500 Series with Ports on VIP Cards

clear controller lex [*type*] *slotport-adapter*/*port*

Syntax Description		
<i>number</i>		Number of the LAN Extender interface corresponding to the LAN Extender to be rebooted.
prom		(Optional) Forces a reload of the PROM image, regardless of any Flash image.
<i>slot</i>		Number of the slot being configured. Refer to the appropriate hardware manual for slot and port information.
<i>port</i>		Number of the port being configured. Refer to the appropriate hardware manual for slot and port information.
<i>type</i>		(Optional) Specifies the interface type. See Table 4 under the clear counters command for keywords.
<i>port-adapter</i>		Number of the port adapter being configured. Refer to the appropriate hardware manual for information about port adapter compatibility.

Command Modes Privileged EXEC

Command History	Release	Modification
	10.3	This command was introduced.
	12.2(15)T	This command is no longer supported in Cisco_IOS Mainline or Technology-based (T) releases. It may continue to appear in Cisco_IOS 12.2S-family releases.

Usage Guidelines The **clear controller lex** command halts operation of the LAN Extender and performs a cold restart. Without the **prom** keyword, if an image exists in Flash memory, and that image has a newer software version than the PROM image, and that image has a valid checksum, then this command runs the Flash image. If any one of these three conditions is not met, this command reloads the PROM image. With the **prom** keyword, this command reloads the PROM image, regardless of any Flash image.

Examples

The following example halts operation of the LAN Extender bound to LAN Extender interface 2 and causes the LAN Extender to perform a cold restart from Flash memory:

```
Router# clear controller lex 2  
reload remote lex controller? [confirm] yes
```

The following example halts operation of the LAN Extender bound to LAN Extender interface 2 and causes the LAN Extender to perform a cold restart from PROM:

```
Router# clear controller lex 2 prom  
reload remote lex controller? [confirm] yes
```

clear counters

To clear the interface counters, use the **clear counters** command in user EXEC or privileged EXEC mode.

```
clear counters [interface-type interface-number]
```

Cisco 7200 Series and 7500 Series with a Packet over SONET Interface Processor

```
clear counters [interface-type] slot/port
```

Cisco 7500 Series with Ports on VIP Cards

```
clear counters [interface-type] slot/port-adapter/port
```

Cisco 7600 Series

```
clear counters [interface interface-number | null interface-number | port-channel number | vlan
vlan-id]
```

Syntax Description

<i>interface-type</i>	(Optional) Specifies the interface type; one of the keywords listed in Table 3 .
<i>interface-number</i>	(Optional) Specifies the interface number displayed with the show interfaces command.
<i>slot</i>	Slot number. Refer to the appropriate hardware manual for slot and port information.
<i>port</i>	Port number. Refer to the appropriate hardware manual for slot and port information.
<i>port-adapter</i>	Port adapter number. Refer to the appropriate hardware manual for information about port adapter compatibility.
<i>interface</i>	(Optional) Interface type; possible valid values are ethernet , fastethernet , gigabitethernet , and tengigabitethernet . See the “Usage Guidelines” section for additional valid values.
<i>interface-number</i>	(Optional) Module and port number; see the “Usage Guidelines” section for valid values.
null <i>interface-number</i>	(Optional) Specifies the null interface; the valid value is 0 .
port-channel <i>number</i>	(Optional) Specifies the channel interface; valid values are a maximum of 64 values ranging from 1 to 256.
vlan <i>vlan-id</i>	(Optional) Specifies the VLAN ID; valid values are from 1 to 4094.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
10.0	This command was introduced.
11.2F	The virtual-access keyword was added.
11.3	The following keywords were added or modified: <ul style="list-style-type: none"> • vg-anylan keyword was added. • posi keyword was changed to pos.
12.2(15)T	The ethernet and serial keywords were removed because the LAN Extension feature is no longer available in Cisco IOS software.
12.2(17a)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

This command clears all the current interface counters from the interface unless the optional arguments *interface-type* and *interface-number* are specified to clear only a specific interface type (serial, Ethernet, Token Ring, and so on). [Table 3](#) lists the command keywords and their descriptions.

**Note**

This command does not clear counters retrieved using Simple Network Management Protocol (SNMP), but only those seen with the **show interface** command. However, variables seen with the **show interface** command that could affect routing, such as load and reliability, or non-cumulative variables, such as input or output rates, are not cleared.

The *interface-number* argument designates the module and port number. Valid values for *interface-number* depend on the specified interface type and the chassis and module that are used. For example, if you specify a Gigabit Ethernet interface and have a 48-port 10/100BASE-T Ethernet module that is installed in a 13-slot chassis, valid values for the module number are from 1 to 13 and valid values for the port number are from 1 to 48.

Table 3 clear counters Interface Type Keywords

Keyword	Interface Type
async	Asynchronous interface
bri	ISDN BRI
dialer	Dialer interface
ethernet	Ethernet interface
fast-ethernet	Fast Ethernet interface
fddi	FDDI
hssi	High-Speed Serial Interface (HSSI)
line	Terminal line
loopback	Loopback interface
null	Null interface
port-channel	Port channel interface

Table 3 *clear counters Interface Type Keywords (continued)*

Keyword	Interface Type
pos	Packet OC-3 interface
serial	Synchronous serial interface
switch	Switch interface
tokenring	Token Ring interface
tunnel	Tunnel interface (IEEE 02.5)
vg-anylan	100VG-AnyLAN port adapter
virtual-access	Virtual-access interface (Refer to the <i>Cisco IOS Dial Technologies Command Reference</i> for details on virtual templates.)
virtual-template	Virtual-template interface (Refer to the <i>Cisco IOS Dial Technologies Command Reference</i> for details on virtual templates.)
virtual-tokenring	Virtual Token Ring interface

Examples

The following example shows how to clear all interface counters:

```
Router# clear counters
```

The following example shows how to clear the Packet OC-3 interface counters on a POSIP card in slot 1 on a Cisco 7500 series router:

```
Router# clear counters pos 1/0
```

The following example shows how to clear the interface counters on a Fast EtherChannel interface:

```
Router# clear counter port-channel 1
```

```
Clear "show interface" counters on all interfaces [confirm] Y
%CLEAR-5-COUNTERS: Clear counter on all interfaces by console 1
```

Related Commands

Command	Description
show interfaces	Displays the statistical information specific to a serial interface.
show interfaces port-channel	Displays the information about the Fast EtherChannel on Cisco 7500 series routers and Cisco 7000 series routers with the RSP7000 and RSP7000CI.
show queuing interface	Displays queuing information.

clear diagnostic event-log

To clear the diagnostic event logs for a specific module or event type, use the **clear diagnostic event-log** command in Privileged EXEC mode.

```
clear diagnostic event-log { event-type { error | info | warning } | module { num | slot subslot | all } }
```

Syntax Description

event-type error	Specifies clearing error events.
event-type info	Specifies clearing informative events.
event-type warning	Specifies clearing warning events.
module num slot subslot	Specifies clearing events for a specific module.
module all	Specifies clearing all linecards.

Command Default

This command has no default settings.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SXH	This command was introduced on the Supervisor Engine 720.

Usage Guidelines

The **clear diagnostic event-log** command clears all the events for all the modules.

The **clear diagnostic event-log module num** command clears events only for a specific module.

The **clear diagnostic event-log event-type** command clears only specific event types such as error, informative, or warning events.

Examples

This example shows how to clear error event logs:

```
Router# clear diagnostic event-log event-type error
```

This example shows how to clear event logs on module 3:

```
Router# clear diagnostic event-log module 3
```

This example shows how to clear error event logs on all the modules:

```
Router# clear diagnostic event-log module all
```

Related Commands

Command	Description
show diagnostic events	Displays the diagnostic event log

clear dsip tracing

To clear Distributed System Interconnect Protocol (DSIP) tracing statistics (trace logging), use the **clear dsip tracing** command in privileged EXEC mode.

```
clear dsip tracing { counters | tracing } [control | data | ipc]
```

Syntax Description

counters	DSIP counters.
tracing	DSIP tracing buffers.
control	(Optional) Control counters or tracing buffers.
data	(Optional) Data counters or tracing buffers.
ipc	(Optional) Inter-process communication counters or tracing buffers.

Defaults

If no option is specified, all control, data, and inter-process communication counters or tracing buffers are cleared.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.3(2)AA	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

Use this command to clear the counters displayed with the **show dsip tracing** EXEC command.

Examples

In the following example, the DSIP counters are cleared (including data, control, and ipc counters):

```
Router# clear dsip tracing
```

Related Commands

Command	Description
show dsip tracing	Displays DSIP tracing buffer information.
show dsip version	Displays DSIP version information.

clear facility-alarm

To clear alarm conditions and reset the alarm contacts, use the **clear facility-alarm** command in privileged EXEC mode.

```
clear facility-alarm [critical | major | minor | source pem {0 | 1}]
```

Syntax Description

critical	(Optional) Clears all critical alarms.
major	(Optional) Clears all major alarms.
minor	(Optional) Clears all minor alarms.
source pem {0 1}	(Optional—Cisco uBR10012 only) Clears all alarms for either the first or second Power Entry Module (PEM).

Command Default

Cisco ASR 1000 Series Routers

If specified without any options, clears all facility alarms with the exception of:

- An alarm that illuminates the CRIT, MIN, or MAJ LED
- A visual alarm (DC lightbulb) that is wired to the DB-25 connector on a power supply

Cisco uBR10012 Universal Broadband Router

If specified without any options, clears all facility alarms.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.0(17)SL	This command was introduced on the Cisco 10000 series router.
12.2(1)XF1	This command was introduced for the Cisco uBR10012 router.
12.2(16)BX	This command was introduced on the PRE2.
12.2(31)SB2	This command was introduced on the PRE3 for the Cisco 10000 series router.
12.3BC	This command was integrated into Cisco IOS Release 12.3BC.
12.2(33)SCA	This command was integrated into Cisco IOS Release 12.2(33)SCA.
Cisco IOS XE Release 2.1	This command was integrated into Cisco IOS XE Release 2.1 on the Cisco ASR 1000 Series Routers.

Usage Guidelines

Cisco ASR 1000 Series Routers

The **clear facility-alarm** command clears audible alarms. A recurrence of the original alarm source after the original alarm condition is removed restarts the audible alarm.

The **clear facility-alarm** command does not clear an alarm that illuminates the CRIT, MIN, or MAJ LED. This command does not turn off a visual alarm (DC light bulb) that is wired to the DB-25 connector on a power supply.

To clear a CRIT, MIN, or MAJ alarm LED or a visual alarm, you must resolve the alarm condition. For example, if a critical alarm LED is illuminated because an active SPA was removed without a graceful deactivation of the SPA, the only way to resolve that alarm is to replace the SPA.

Cisco uBR10012 Universal Broadband Router

The **clear facility-alarm** command clears the contacts to an external alarm panel. Only a recurrence of the original alarm source after the original alarm condition is removed can restart the audible alarm. These alarms are displayed by the **show facility-alarm status** command.

The alarm LEDs remain lit on the Performance Routing Engine (PRE) as long as the alarm condition continues and is not cleared by the **clear facility-alarm** command. An alarm can only be removed from the list by correcting the issue that is triggering the alarm.

Examples

The following example shows how to clear all facility alarms on the router:

```
Router# clear facility-alarm
Clearing all alarms
```

The following example shows how to clear all critical facility alarms on the router:

```
Router# clear facility-alarm critical
Clearing critical alarms
```

The following example shows how to clear minor facility alarms only:

```
Router# clear facility-alarm minor
Clearing minor alarms
```

Cisco uBR10012 Universal Broadband Router

The following example shows how to clear all alarms for both PEM modules on a Cisco uBR10012 universal broadband router:

```
Router# clear facility-alarm source pem 0
Router# clear facility-alarm source pem 1
```

Related Commands

Command	Description
facility-alarm	Sets the temperature thresholds at which the processor generates a critical, major, or minor alarm to warn of potential equipment damage.
facility-alarm critical exceed-action shutdown	Allows automatic router shutdown.
show facility-alarm	Displays the status of a generated alarm.

clear hub

To reset and reinitialize the hub hardware connected to an interface of a Cisco 2505 or Cisco 2507 router, use the **clear hub** command in user EXEC or privileged EXEC mode.

clear hub ethernet *number*

Syntax Description

ethernet	Hub in front of an Ethernet interface.
<i>number</i>	Hub number to clear, starting with 0. Because there is only one hub, this number is 0.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
10.3	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

The following example clears hub 0:

```
Router# clear hub ethernet 0
```

Related Commands

Command	Description
hub	Enables and configures a port on an Ethernet hub of a Cisco 2505 or Cisco 2507 router.

clear hub counters

To set the hub counters on an interface of a Cisco 2505 or Cisco 2507 router to zero, use the **clear hub counters** command in user EXEC or privileged EXEC mode.

```
clear hub counters [ether number [port [end-port]]]
```

Syntax Description	ether	(Optional) Hub in front of an Ethernet interface.
	<i>number</i>	(Optional) Hub number for which to clear counters. Because there is currently only one hub, this number is 0. If you specify the keyword ether , you must specify the <i>number</i> .
	<i>port</i>	(Optional) Port number on the hub. On the Cisco 2505 router, port numbers range from 1 to 8. On the Cisco 2507 router, port numbers range from 1 to 16. If a second port number follows, this port number indicates the end of a port range. If you do not specify a port number, counters for all ports are cleared.
	<i>end-port</i>	(Optional) Ending port number of a range.

Defaults If no port numbers are specified, counters for all ports are cleared.

Command Modes User EXEC
Privileged EXEC

Command History	Release	Modification
	10.3	This command was introduced.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
	12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples The following example shows how to clear the counters displayed by a **show hub** command for all ports on hub 0:

```
Router# clear hub counters ether 0
```

Related Commands	Command	Description
	show hub	Displays information about the hub (repeater) on an Ethernet interface of a Cisco 2505 or Cisco 2507 router.

clear interface

To reset the hardware logic on an interface, use the **clear interface** command in user EXEC or privileged EXEC mode.

```
clear interface type number [name-tag]
```

Cisco 7200 Series and Cisco 7500 Series with a Packet OC-3 Interface Processor

```
clear interface type slot/port
```

Cisco 7500 Series with Ports on VIP Cards

```
clear interface type slot/port-adapter/port
```

Cisco 7500 Series

```
clear interface type slot/port[:channel-group]
```

Cisco 7500 Series with a CT3IP Port Adapter

```
clear interface type slot/port-adapter/port[:t1-channel]
```

Syntax Description	type	Interface type; it is one of the keywords listed in Table 4 .
	number	Port, connector, or interface card number.
	name-tag	(Optional for use with the Redundant Link Manager (RLM) feature) Logic name to identify the server configuration so that multiple server configurations can be entered.
	slot	Number of the slot being configured. Refer to the appropriate hardware manual for slot and port information.
	port	Number of the port being configured. Refer to the appropriate hardware manual for slot and port information.
	port-adapter	Number of the port adapter being configured. Refer to the appropriate hardware manual for information about port adapter compatibility.
	:channel-group	(Optional) On Cisco 7500 series routers that support channelized T1, specifies the channel number from 0 to 23. This number is preceded by a colon.
	:t1-channel	(Optional) For the CT3IP port adapter, the T1 channel is a number between 1 and 28. T1 channels on the CT3IP are numbered 1 to 28 rather than the more traditional zero-based scheme (0 to 27) used with other Cisco products. This numbering scheme ensures consistency with telco numbering schemes for T1 channels within channelized T3 equipment.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
10.0	This command was introduced.
11.3	The following keywords were added or modified: <ul style="list-style-type: none"> • vg-anylan keyword added • posi keyword changed to pos
12.0(3)T	The following optional argument was added for the RLM feature: <ul style="list-style-type: none"> • <i>name-tag</i>
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

Under normal circumstances, you do not need to clear the hardware logic on interfaces.

This command clears all the current interface hardware logic unless the *type* and *number* arguments are specified to clear only a specific interface type (serial, Ethernet, Token Ring, and so on). [Table 4](#) lists the command keywords and their descriptions.

Table 4 *clear interface Type Keywords*

Keyword	Interface Type
async	Async interface
atm	ATM interface
bri	ISDN BRI
ethernet	Ethernet interface
fddi	FDDI
hssi	High-Speed Serial Interface (HSSI)
loopback	Loopback interface
null	Null interface
port-channel	Port channel interface
pos	Packet OC-3 Interface Processor
serial	Synchronous serial interface
switch	Switch interface
tokenring	Token Ring interface
tunnel	Tunnel interface
vg-anylan	100VG-AnyLAN port adapter

Examples

The following example shows how to reset the interface logic on HSSI interface 1:

```
Router# clear interface hssi 1
```

The following example shows how to reset the interface logic on Packet OC-3 interface 0 on the POSIP in slot 1:

```
Router# clear interface pos 1/0
```

The following example shows how to reset the interface logic on T1 0 on the CT3IP port adapter in slot 9:

```
Router# clear interface serial 9/0/0:0
```

The following example shows how to reset the interface logic on Fast EtherChannel interface 1:

```
Router# clear interface port-channel 1
```

The following example shows how to reset demonstrates the use of the **clear interface** command with the RLM feature:

```
Router# clear interface loopback 1
```

```
Router#
02:48:52: rlm 1: [State_Up, rx ACTIVE_LINK_BROKEN] over link [10.1.1.1(Loopback1),
10.1.4.1]
02:48:52: rlm 1: link [10.1.1.2(Loopback2), 10.1.4.2] requests activation
02:48:52: rlm 1: link [10.1.1.1(Loopback1), 10.1.4.1] is deactivated
02:48:52: rlm 1: link [10.1.1.1(Loopback1), 10.1.4.1] = socket[10.1.1.1, 10.1.4.1]
02:48:52: rlm 1: [State_Recover, rx USER_SOCKET_OPENED] over link [10.1.1.1(Loopback1),
10.1.4.1] for user RLM_MGR
02:48:52: rlm 1: link [10.1.1.1(Loopback1), 10.1.4.1] is opened
02:48:52: rlm 1: link [10.1.1.1(Loopback1), 10.1.5.1] = socket[10.1.1.1, 10.1.5.1]
02:48:52: rlm 1: [State_Recover, rx USER_SOCKET_OPENED] over link [10.1.1.1(Loopback1),
10.1.5.1] for user RLM_MGR
02:48:52: rlm 1: link [10.1.1.1(Loopback1), 10.1.5.1] is opened
02:48:52: rlm 1: [State_Recover, rx START_ACK] over link [10.1.1.2(Loopback2), 10.1.4.2]
02:48:52: rlm 1: link [10.1.1.2(Loopback2), 10.1.4.2] is activated
02:48:52: rlm 1: [State_Up, rx LINK_OPENED] over link [10.1.1.1(Loopback1), 10.1.4.1]
```

```
Router# show rlm group 1 status
```

```
RLM Group 1 Status
User/Port: RLM_MGR/3000
Link State: Up          Last Link Status Reported: Up_Recovered
Next tx TID: 4          Last rx TID: 0
Server Link Group[r1-server]:
  link [10.1.1.1(Loopback1), 10.1.4.1] = socket[standby, 10.1.1.1, 10.1.4.1]
  link [10.1.1.2(Loopback2), 10.1.4.2] = socket[active, 10.1.1.2, 10.1.4.2]
Server Link Group[r2-server]:
  link [10.1.1.1(Loopback1), 10.1.5.1] = socket[opening, 10.1.1.1, 10.1.5.1]
  link [10.1.1.2(Loopback2), 10.1.5.2] = socket[opening, 10.1.1.2, 10.1.5.2]
```

```
Router#
02:49:52: rlm 1: [State_Up, rx UP_RECOVERED_MIN_TIMEOUT]
02:49:52: rlm 1: link [10.1.1.1(Loopback1), 10.1.4.1] requests activation
02:49:52: rlm 1: [State_Switch, rx SWITCH_ACK] over link [10.1.1.1(Loopback1), 10.1.4.1]
02:49:52: rlm 1: link [10.1.1.2(Loopback2), 10.1.4.2] is deactivated
02:49:52: rlm 1: link [10.1.1.1(Loopback1), 10.1.4.1] is activated
```

Related Commands

Command	Description
interface	Defines the IP addresses of the server, configures an interface type, and enters interface configuration mode.
show rlm group	Displays the status of the RLM group.
shutdown (RLM)	Shuts down all of the links under the RLM group.

clear interface fastethernet

To reset the controller for a specified Fast Ethernet interface, use the **clear interface fastethernet** command in privileged EXEC mode.

Cisco 4500 and Cisco 4700 Series

```
clear interface fastethernet interface-number
```

Cisco 7200 and Cisco 7500 Series

```
clear interface fastethernet slot/port
```

Cisco 7500 Series with a VIP

```
clear interface fastethernet slot/port-adapter/port
```

Syntax Description		
<i>interface-number</i>		Port, connector, or interface card number. On a Cisco 4500 or Cisco 4700 Series router, specifies the number of the network processor module (NPM). The numbers are assigned at the factory at the time of installation or when added to a system.
<i>slot</i>		Slot number. Refer to the appropriate hardware manual for slot and port information.
<i>/port</i>		Port number. Refer to the appropriate hardware manual for slot and port information.
<i>/port-adapter</i>		Port adapter number. Refer to the appropriate hardware manual for information about port adapter compatibility.

Command Modes	
	Privileged EXEC

Command History	Release	Modification
	11.2	This command was introduced.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
	12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Examples

Cisco 4500 Series

The following example resets the controller for Fast Ethernet interface 0 on a Cisco 4500:

```
Router# clear interface fastethernet 0
```

Cisco 7200 and Cisco 7500 Series

The following example resets the controller for the Fast Ethernet interface located in slot 1, port 0 on a Cisco 7200 series router or Cisco 7500 series router:

```
Router# clear interface fastethernet 1/0
```

Cisco 7500 Series with a VIP

The following example resets the controller for the Fast Ethernet interface located in slot 1, port adapter 0, port 0 on a Cisco 7500 series router with a virtual interface processor (VIP):

```
Router# clear interface fastethernet 1/0/0
```

Related Commands

Command	Description
clear counters	Clears the interface counters.
show interfaces	Displays statistics for all interfaces configured on the router or access server.
show interfaces serial	Displays information about a serial interface.

clear interface gigabitethernet

To clear the hardware logic on a Gigabit Ethernet IEEE 802.3z interface, use the **clear interface gigabitethernet** command in privileged EXEC mode.

clear interface gigabitethernet *number*

Syntax Description	<i>number</i> Gigabit Ethernet interface number; see the “Usage Guidelines” section for valid values.
---------------------------	---

Command Default	This command has no default settings.
------------------------	---------------------------------------

Command Modes	Privileged EXEC
----------------------	-----------------

Command History	Release	Modification
	12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
	12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines	The <i>number</i> argument designates the module and port number. Valid values for <i>number</i> depend on the specified interface type and the chassis and module that are used. For example, if you specify a Gigabit Ethernet interface and have a 48-port 10/100BASE-T Ethernet module that is installed in a 13-slot chassis, valid values for the module number are from 1 to 13 and valid values for the port number are from 1 to 48.
-------------------------	---

Examples	This example shows how to clear the hardware logic on a Gigabit Ethernet IEEE 802.3z interface:
-----------------	---

```
Router# clear interface gigabitethernet 5
Router#
```

Related Commands	Command	Description
	show interfaces status	Displays the interface status or a list of interfaces in an error-disabled state on LAN ports only.

clear interface serial

To reset the statistical information specific to a serial interface, use the **clear interface serial** command in user EXEC or privileged EXEC mode.

clear interface serial *dial-shelf*/*slot*/*t3-port*:*t1-num*:*chan-group*

Syntax Description		
	<i>dial-shelf</i>	Dial shelf chassis in the Cisco AS5800 access server that contains the CT3 interface card.
	<i>slot</i>	Location of the CT3 interface card in the dial shelf chassis.
	<i>t3-port</i>	T3 port number. The only valid value is 0.
	<i>:t1-num</i>	T1 time slot in the T3 line. The value can be from 1 to 28.
	<i>:chan-group</i>	Channel group identifier.

Command Modes	
	User EXEC Privileged EXEC

Command History	Release	Modification
	10.0	This command was introduced.

Usage Guidelines The **clear interface serial** command clears the interface hardware. To reset the counters for an interface, use the **clear counters** command with the **serial** keyword specified. To confirm at the prompt, use the **show interfaces serial** command.

Examples The following example clears the interface hardware, disconnecting any active lines:

```
Router# clear interface serial 1/4/0:2:23
```

Related Commands	Command	Description
	clear counters	Clears the interface counters.
	show interfaces	Displays statistics for all interfaces configured on the router or access server.
	show interfaces fastethernet	Displays information about a fastethernet interface.

clear interface vlan

To clear the hardware logic on a virtual local area network (VLAN), use the **clear interface vlan** command in privileged EXEC mode.

clear interface vlan *vlan-id*

Syntax Description	<i>vlan-id</i> VLAN ID; valid values are from 1 to 4094.
---------------------------	--

Command Default	This command has no default settings.
------------------------	---------------------------------------

Command Modes	Privileged EXEC
----------------------	-----------------

Command History	Release	Modification
	12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
	12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Examples	<p>This example shows how to clear the hardware logic on a specific VLAN:</p> <pre>Router# clear interface vlan 5 Router#</pre>
-----------------	---

Related Commands	Command	Description
	show interfaces status	Displays the interface status or a list of interfaces in an error-disabled state on LAN ports only.

clear ipc statistics

To clear all interprocess communication (IPC) statistics, use the **clear ipc statistics** command in privileged EXEC mode.

clear ipc statistics

Syntax Description This command has no arguments or keywords.

Command Modes Privileged EXEC

Command History	Release	Modification
	12.2(15)T	This command was introduced.

Usage Guidelines The **clear ipc statistics** command clears all the IPC statistics and is useful for troubleshooting issues with IPC services.

Examples The following example shows how to clear all of the statistics used by IPC services. A **show ipc status** command is issued first to display the current IPC counters for a local IPC server. The **clear ipc statistics** command is then entered to clear and reset the counters. A final **show ipc status** command is issued to show that all the counters, except those counters that show the packets sent since the clearing, are reset to zero.

```
Router# show ipc status

IPC System Status

Time last IPC stat cleared : never

This processor is the IPC master server.
Do not drop output of IPC frames for test purposes.

1000 IPC Message Headers Cached.

                                     Rx Side   Tx Side
Total Frames                          189       140
Total from Local Ports                  189        70
Total Protocol Control Frames           70        44
Total Frames Dropped                     0         0

                               Service Usage

Total via Unreliable Connection-Less Service    145        0
Total via Unreliable Sequenced Connection-Less Svc    0         0
Total via Reliable Connection-Oriented Service    44        70
```

```

IPC Protocol Version 0

Total Acknowledgements                70          44
Total Negative Acknowledgements        0           0

Device Drivers

Total via Local Driver                  0           0
Total via Platform Driver               0          70
Total Frames Dropped by Platform Drivers 0           0

Reliable Tx Statistics

Re-Transmission                        0
Re-Tx Timeout                           0

Rx Errors                                Tx Errors

Unsupp IPC Proto Version                0 Tx Session Error                0
Corrupt Frame                            0 Tx Seat Error                    0
Duplicate Frame                          0 Destination Unreachable         0
Out-of-Sequence Frame                   0 Tx Test Drop                     0
Dest Port does Not Exist                 0 Tx Driver Failed                 0
Rx IPC Msg Alloc Failed                  0 Ctrl Frm Alloc Failed           0
Unable to Deliver Msg                    0

Buffer Errors                            Misc Errors

IPC Msg Alloc                            0 IPC Open Port                    0
Emer IPC Msg Alloc                       0 No HWQ                           0
IPC Frame PakType Alloc                   0 Hardware Error                   0
IPC Frame MemD Alloc                      0

Tx Driver Errors

No Transport                             0
MTU Failure                              0
Dest does not Exist                      0

Router# clear ipc statistics

Router# show ipc status

IPC System Status

Time last IPC stat cleared : 00:00:03

This processor is the IPC master server.
Do not drop output of IPC frames for test purposes.

1000 IPC Message Headers Cached.

Rx Side      Tx Side
Total Frames                26          0
Total from Local Ports      26          0
Total Protocol Control Frames 0           0
Total Frames Dropped        0           0

Service Usage

Total via Unreliable Connection-Less Service 26          0
Total via Unreliable Sequenced Connection-Less Svc 0           0
Total via Reliable Connection-Oriented Service 0           0

```

clear ipc statistics

```

IPC Protocol Version 0

Total Acknowledgements                0          0
Total Negative Acknowledgements        0          0

                                Device Drivers

Total via Local Driver                  0          0
Total via Platform Driver                0          0
Total Frames Dropped by Platform Drivers 0          0

                                Reliable Tx Statistics

Re-Transmission                        0
Re-Tx Timeout                          0

                                Rx Errors                                Tx Errors

Unsupp IPC Proto Version                0 Tx Session Error                0
Corrupt Frame                           0 Tx Seat Error                    0
Duplicate Frame                          0 Destination Unreachable        0
Out-of-Sequence Frame                   0 Tx Test Drop                    0
Dest Port does Not Exist                 0 Tx Driver Failed                0
Rx IPC Msg Alloc Failed                  0 Ctrl Frm Alloc Failed          0
Unable to Deliver Msg                    0

                                Buffer Errors                                Misc Errors

IPC Msg Alloc                            0 IPC Open Port                    0
Emer IPC Msg Alloc                       0 No HWQ                           0
IPC Frame PakType Alloc                   0 Hardware Error                  0
IPC Frame MemD Alloc                      0

                                Tx Driver Errors

No Transport                             0
MTU Failure                              0
Dest does not Exist                      0

```

Related Commands

Command	Description
show ipc	Displays IPC statistics.

clear lacp counters

To clear the statistics for all interfaces belonging to a specific channel group, use the **clear lacp counters** command in privileged EXEC mode.

clear lacp [*channel-group*] **counters**

Syntax Description	<i>channel-group</i> (Optional) Channel group number; valid values are from 1 to 256.
---------------------------	---

Command Default	None
------------------------	------

Command Modes	Privileged EXEC
----------------------	-----------------

Command History	Release	Modification
	12.2(14)SX	Support for this command was introduced on the Supervisor Engine 720.
	12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines	<p>If you do not specify a <i>channel-group</i>, all channel groups are cleared.</p> <p>If you enter this command for a channel group that contains members in PAgP mode, the command is ignored.</p>
-------------------------	---

Examples	This example shows how to clear the statistics for a specific group:
-----------------	--

```
Router# clear lacp 1 counters
Router#
```

Related Commands	Command	Description
	show lacp	Displays LACP information.

clear platform netint

To clear the interrupt-throttling counters for the platform, use the **clear platform netint** command in privileged EXEC mode.

clear platform netint

Syntax Description This command has no arguments or keywords.

Defaults This command has no default settings.

Command Modes Privileged EXEC

Command History

Release	Modification
12.2(17b)SXA	Support for this command was introduced on the Supervisor Engine 720.
12.2(17d)SXB	Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Examples

This example shows how to clear the interrupt-throttling counters for the platform:

```
Router# clear platform netint
Router#
```

Related Commands

Command	Description
show platform netint	Displays the platform network-interrupt information.

clear rbscp

To reset and restart a Rate Based Satellite Control Protocol (RBSCP) tunnel, use the **clear rbscp** command in privileged EXEC mode.

clear rbscp [**tunnel** *tunnel-number*]

Syntax Description	tunnel	(Optional) Resets and restarts the RBSCP tunnel interface specified in the <i>tunnel-number</i> argument. If a tunnel interface is not specified, all RBSCP tunnels are reset and restarted. <ul style="list-style-type: none"> <i>tunnel-number</i>—Number of the tunnel interface in the range from 0 to 2147483647.
---------------------------	---------------	---

Command Modes	Privileged EXEC
----------------------	-----------------

Command History	Release	Modification
	12.3(7)T	This command was introduced.

Usage Guidelines The **clear rbscp** command resets the tunnel interface to its initial state and this clears RBSCP statistical information. Use this command for troubleshooting issues with RBSCP tunnels.

Examples The following example shows how to clear the RBSCP statistics. A **show rbscp statistics** command is issued first to display the current RBSCP counters for tunnel interface 0. The **clear rbscp** command is then entered to reset and restart tunnel interface 0. All the counters for tunnel interface 0 are reset to zero. A final **show rbscp statistics** command is issued to show that all the counters, except those counters that show the packets sent since the clearing, are reset to zero.

```
Router# show rbscp statistics tunnel 0

Tunnel0 is up, line protocol is up
RBSCP protocol statistics:
  Init FWD-TSNs sent 15, received 11
  TUNNEL-UPs sent 10, received 5
  CLOSEDs sent 3, received 2
  TSNs sent 40, resent 2, lost by sender 1
  TSNs received 36 (duplicates 2)
  FWD-TSNs sent 144 (heartbeats 2)
  FWD-TSNs received 120 (ignored 1)
  FWD-TSNs caused 3 packet drops, 0 whole window drops
  SACKs sent 10, received 6 (ignored 1)
  Recovered with RTX 1
  Received with delay 2
  Most released at once 5
  Failed sends into the: tunnel 1, network 0
  Dropped due to: excess delay 0, tmit queue full 0
  Max on any queue: num packets: 12, num bytes: 0
  Max outstanding: 0
```

■ **clear rbscp**

```

Router# clear rbscp tunnel 0

Tunnel0: cleared statistics

Router# show rbscp statistics tunnel 0

Tunnel0 is up, line protocol is up
RBSCP protocol statistics:
  Init FWD-TSNs sent 0, received 0
  TUNNEL-UPs sent 0, received 0
  CLOSEDs sent 0, received 0
  TSNs sent 0, resent 0, lost by sender 0
  TSNs received 0 (duplicates 0)
  FWD-TSNs sent 26 (heartbeats 0)
  FWD-TSNs received 0 (ignored 0)
  FWD-TSNs caused 0 packet drops, 0 whole window drops
  SACKs sent 0, received 0 (ignored 0)
  Recovered with RTX 0
  Received with delay 0
  Most released at once 0
  Failed sends into the: tunnel 0, network 0
  Dropped due to: excess delay 0, tmit queue full 0
  Max on any queue: num packets: 0, num bytes: 0
  Max outstanding: 0

```

Related Commands

Command	Description
show rbscp	Displays RBSCP state and statistical information.

clear service-module serial

To reset an integrated CSU/DSU, use the **clear service-module serial** command in privileged EXEC mode.

clear service-module serial *number*

Syntax Description

number Number of the serial interface.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.2	This command was introduced.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.
12.2SX	This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware.

Usage Guidelines

Use this command only in severe circumstances (for example, when the router is not responding to a CSU/DSU configuration command).

This command terminates all DTE and line loopbacks that are locally or remotely configured. It also interrupts data transmission through the router for up to 15 seconds. The software performs an automatic software reset in case of two consecutive configuration failures.

The CSU/DSU module is not reset with the **clear interface** command.



Caution

If you experience technical difficulties with your router and intend to contact customer support, refrain from using this command. This command erases the router's past CSU/DSU performance statistics. To clear only the CSU/DSU performance statistics, issue the **clear counters** command.

Examples

The following example show how to reset the CSU/DSU on a router:

```
Router# clear service-module serial 0
```

Related Commands

Command	Description
clear counters	Clears the interface counters.
test service-module	Performs self-tests on an integrated CSU/DSU serial interface module, such as a 4-wire, 56/64-kbps CSU/DSU.

clear top counters interface report

To clear the TopN reports, use the **clear top counters interface report** command in privileged EXEC mode.

clear top counters interface report *number*

Syntax Description	<i>number</i> (Optional) Number of ports to be displayed; valid values are from 1 to 5000 physical ports.
---------------------------	---

Defaults This command has no default settings.

Command Modes Privileged EXEC

Command History	Release	Modification
	12.2(18)SXE	Support for this command was introduced on the Supervisor Engine 720.
	12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines This command is supported on Ethernet, Fast Ethernet, Gigabit Ethernet, and 10-Gigabit Ethernet ports only. LAN ports on the OSMs are also supported.

The **clear top interface report** command clears all the completed reports. It does not clear the pending TopN reports. When you specify a report number, the TopN task is cleared regardless of its status.

Examples This example shows how to clear all TopN tasks:

```
Router# clear top counters interface report 1000

04:00:06: %TOPN_COUNTERS-5-DELETED: TopN report 1 deleted by the console
04:00:06: %TOPN_COUNTERS-5-DELETED: TopN report 2 deleted by the console
04:00:06: %TOPN_COUNTERS-5-DELETED: TopN report 3 deleted by the console
04:00:06: %TOPN_COUNTERS-5-DELETED: TopN report 4 deleted by the console1/24/
Router#
```

This example shows the output if you attempt to clear a pending TopN task:

```
Router# clear top counters interface report 4

04:52:12: %TOPN_COUNTERS-5-KILLED: TopN report 4 killed by the sattili onvty0 (9.10.69.9)
Router#
```

Related Commands

Command	Description
collect top counters interface	Lists the TopN processes and specific TopN reports.
show top counters interface report	Displays TopN reports and information.

clock

To configure the port clocking mode for the 1000BASE-T transceivers, use the **clock** command in interface configuration mode. To return to the default settings, use the **no** form of this command.

clock {**auto** | **active** [**prefer**] | **passive** [**prefer**]}

no clock

Syntax Description

auto	Enables the automatic-clock configuration.
active	Enables the active operation.
prefer	(Optional) Negotiates the specified mode with the far end of the link.
passive	Enables the passive operation.

Defaults

auto

Command Modes

Interface configuration

Command History

Release	Modification
12.2(17a)SX	Support for this command was introduced on the Supervisor Engine 720.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

This command is supported on the 1000BASE-T transceivers only.

If the clock mode of the near end of a link does not match the clock mode of the far end, the line protocol does not come up.

The active and passive clock status is determined during the auto negotiation process before the transmission link is established.

The **clock** command supports the following configurations:

- **auto**—Auto negotiates with the far end of the link but preference is given to the active-clock switch.
- **active**—Uses a local clock to determine transmitter-operation timing.
- **passive**—Recovers the clock from the received signal and uses the recovered clock to determine transmitter-operation timing.
- **active prefer**—Auto negotiates with the far end of the link but preference is given to the active-clock switch.
- **passive prefer**—Auto negotiates with the far end of the link but preference is given to the passive-clock switch.

Enter the **show running-config interface** command to display the current clock mode.

Enter the **show interfaces** command to display the clock mode that is negotiated by the firmware.

Examples

This example shows how to enable the active-clock operation:

```
Router(config-if)# clock active  
Router(config-if)#
```

Related Commands

Command	Description
show interfaces	Displays traffic that is seen by a specific interface.
show running-config interface	Displays the status and configuration of the module or Layer 2 VLAN.

clock mode

To configure the clock mode of a serial circuit emulation (CEM) channel, use the **clock mode** command in CEM configuration mode. To reset the clock mode to its default, use the **no** form of this command.

clock mode { **normal** | **split** }

no clock mode

Syntax Description

normal	Specifies normal mode, in which the DCE, whether it is a CEM over IP (CEoIP) data port or the external data device, provides both the receive clock and the transmit clock to the DTE.
split	Specifies split mode, in which the DCE, whether it is a CEoIP data port or the external device, provides the receiver clock to the DTE and the DTE provides the transmit clock to the DCE.

Command Default

The serial CEM channel clock defaults to normal mode.

Command Modes

CEM configuration

Command History

Release	Modification
12.3(7)T	This command was introduced.

Usage Guidelines

This command applies only to serial ports.

Examples

The following example shows how to configure the CEM clock for normal mode.

```
Router(config-cem)# clock mode normal
```

Related Commands

Command	Description
cem	Enters circuit emulation configuration mode.
clock rate	Configures the clock rate of a serial port.
clock source	Configures the clock source of a serial port.
show cem	Displays CEM statistics.