service-module t1 linecode through show controllers satellite

service-module t1 linecode

To select the line code for the fractional T1/T1 module, use the **service-modulet1linecode**command in interface configuration mode. To select the default, the B8ZS line code, use the**no** form of this command.

service-module t1 linecode {**ami** | **b8zs**}
no service-module t1 linecode {**ami** | **b8zs**}

Syntax Description

ami	Specifies alternate mark inversion (AMI) as the line code.
b8zs	Specifies binary 8 zero substitution (B8ZS) as the line code. This is the default.

Command Default

The default line code is B8ZS.

Command Modes

Interface configuration

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

Configuring B8ZS is a method of ensuring the ones density requirement on a T1 line by substituting intentional bipolar violations in bit positions four and seven for a sequence of eight zero bits. When the CSU/DSU is configured for AMI, you must guarantee the ones density requirement in your router configuration using the **service-modulet1data-codinginverted** command or the **service-modulet1timeslotsspeed56**command.

Your T1 service provider determines which line code, either **ami**or **b8zs**, is required for your T1 circuit.

Examples

The following example specifies AMI as the line code:

```
Router(config)# interface serial 0
Router(config
-if)
# service-module t1 linecode ami
```

Related Commands

Command	Description
service-module t1 data-coding	Guarantees the ones density requirement on an AMI line using the fractional T1/T1 module.
service-module t1 timeslots	Defines time slots that constitute a fractional T1/T1 (FT1/T1) channel.

service-module t1 remote-alarm-enable

To generate remote alarms (yellow alarms) at the local CSU/DSU or detect remote alarms sent from the remote CSU/DSU, use the **service-modulet1remote-alarm-enable**command in interface configuration mode. To disable remote alarms, use the**no** form of this command.

service-module t1 remote-alarm-enable
no service-module t1 remote-alarm-enable

Syntax Description

This command has no arguments or keywords.

Command Default

Remote alarms are disabled.

Command Modes

Interface configuration

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

Remote alarms are transmitted by the CSU/DSU when it detects an alarm condition, such as a red alarm (loss of frame) or blue alarm (unframed ones). The receiving CSU/DSU then knows that there is an error condition on the line.

With D4 Super Frame configured, a remote alarm condition is transmitted by setting the bit 2 of each time slot to zero. For received user data that has the bit 2 of each time slot set to zero, the CSU/DSU interprets the data as a remote alarm and interrupts data transmission, which explains why remote alarms are disabled by default. With Extended Super Frame configured, the remote alarm condition is signalled out of band in the facilities data link.

You can see if the FT1/T1 CSU/DSU is receiving a remote alarm (yellow alarm) by issuing the **showservice-moduleserial** command.

Examples

The following example enables remote alarm generation and detection:

```
Router(config)# interface serial 0
Router(config
-if)
# service-module t1 remote-alarm-enable
```

Related Commands

Command	Description
service-module t1 framing	Selects the frame type for a line using the fractional T1/T1 (FT1/T1) module.
show service-module serial	Displays performance statistics for an integrated CSU/DSU.

service-module t1 remote-loopback

To specify that the fractional T1/T1 DSU/CSU module enters loopback mode when it receives a loopback code on the line, use the **service-modulet1remote-loopback** command in interface configuration mode. To disable remote loopbacks, use the **no** form of this command.

service-module t1 remote-loopback {**full** | **payload v54**}
no service-module t1 remote-loopback {**full** | **payload v54**}

Syntax Description

full	Configures the remote loopback code used to transmit or accept CSU loopback requests.
payload	Configures the loopback code used by the local CSU/DSU to generate or detect payload-loopback commands.
v54	Industry standard loopback code. Use this keyword for CSU/DSUs that may not support the Accunet loopup standards. This keyword is used only with a payload request, not a full request.

Use the **full**keyword to enable the standard loopup codes, which use a 1-in-5 pattern for loopup and a 1-in-3 pattern for loopdown. Use the **payloadv54**keywords to enable the v54 pseudo-random loopup codes for loopup and v54 pseudo-random loopdown codes for loopdown.

Command Default

Full and payload loopbacks with standard loopup codes

Command Modes

Interface configuration

Command History

Release	Modification
11.2	This command was introduced.
12.3(2)T	The provision for an **alternate** loopback code was removed.
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 **no** form of this command disables loopback requests. For example, the **noservice-modulet1remote-loopbackfull** command ignores all full-bandwidth loopback transmissions and requests.

Configuring the **no** form of the command might not prevent telco line providers from looping your router in extended super frame (esf) mode because fractional T1/T1 lines use facilities data link messages to initiate loopbacks.

To have the loopback remote commands on the FT1/T1 CSU/DSU module function successfully, you need to enable the **service-modulet1remote-loopback** command.

Note Use the **full**keyword to enable the standard loopup codes, which use a 1-in-5 pattern for loopup and a 1-in-3 pattern for loopdown. Use the **payloadv54**keywords to enable the v54 pseudorandom codes for loopup and v54 pseudorandom codes for loopdown.

Examples

The following example shows how to configure two routers connected back-to-back through a fractional T1/T1 line to enter loopback mode:

```
Router(config)# interface serial 0/0
Router(config-if)# service-module t1 remote-loopback full

Router(config-if)# loopback remote full
!
%SERVICE_MODULE-5-LOOPUPREMOTE: Unit Serial0/0 - Remote unit placed in loopback
Router(config-if)# no loopback remote
%SERVICE_MODULE-5-LOOPDOWNREMOTE: Unit Serial0/0 - Remote loopback test cancelled
The following example shows how to configure two routers connected back-to-back through a
fractional T1/T1 line to enter loopback mode and generate or detect payload-loopback commands:
Router(config-if)# service-module t1 remote-loopback payload v54

Router(config-if)# loopback remote payload
%%SERVICE_MODULE-5-LOOPUPREMOTE: Unit Serial0/0 - Remote unit placed in loopback
```

Related Commands

Command	Description
loopback remote (interface)	Loops packets through a DSU/CSU to a remote DSU/CSU and back over a channelized T1 link.

service-module t1 timeslots

To define time slots that constitute a fractional T1/T1 (FT1/T1) channel , use the **service-modulet1timeslots**command in interface configuration mode. To resume the default setting (all FT1/T1 time slots transmit at 64 kbps), use the **no** form of this command.

service-module t1 timeslots {*range* | **all**} [**speed** {**56** | **64**}]
no service-module t1 timeslots {*range* | **all**}

Syntax Description

range	The DS0 time slots that constitute the FT1/T1 channel. The range is from 1 to 24, where the first time slot is numbered 1 and the last time slot is numbered 24. Specify this field by using a series of subranges separated by commas.
all	Selects all FT1/T1 time slots.
speed	(Optional) Specifies the time slot speed.
56	(Optional) 56 kbps.
64	(Optional) 64 kbps. This is the default.

Command Default

64 kbps is the default for all time slots.

Command Modes

Interface configuration

Command History

Release	Modification
11.2	This command was introduced.
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

This command specifies which time slots are used in fractional T1 operation and determines the amount of bandwidth available to the router in each FT1/T1 channel.

The time-slot range must match the time slots assigned to the channel group. Your service provider defines the time slots that comprise a channel group.

To use the entire T1 line, enable the **service-modulet1timeslotsall**command.

Examples

The following example displays a series of time-slot ranges and a speed of 64 kbps:

```
Router(config
-if)
# service-module t1 timeslots 1-10,15-20,22 speed 64
```

Related Commands

Command	Description
service-module t1 data-coding	Guarantees the ones density requirement on an AMI line using the fractional T1/T1 module.
service-module t1 linecode	Selects the linecode for the fractional T1/T1 module.

service-module wlan-ap bootimage

To configure the boot image on the service module, use the **service-module wlan-ap bootimage** command in privileged EXEC mode.

service-module wlan-ap *interface number* **bootimage** [**autonomous** | **unified**]

Syntax Description

interface number	The interface number for the wireless device. Always use 0.
autonomous	Autonomous software image.
unified	Upgrade image with Lightweight Access Point Protocol (LWAPP).

Command Default

Autonomous software image

Command Modes

Privileged EXEC

Command History

Release	Modification
12.4(20) T	This command was introduced for wireless-enabled Cisco 880 Series and Cisco 890 Series Integrated Services Routers.

Usage Guidelines

When running the advanced IP services feature set on either Cisco 880 Series routers or Cisco 890 Series routers, use the **service-module wlan-ap 0 bootimage unified command**to enable the Cisco unified software upgrade image on the embedded wireless access point. After enabling the unified image, use the **service-module wlan-ap 0 reload** command to perform a graceful shutdown and reboot of the access point.

Note The **service-module wlan-ap 0 bootimage**command does not support recovery images on the embedded access point. Use the **service-module wlan-ap 0 reload** command to shutdown and reboot the access point.

Cisco 880 Series and Cisco 890 Series routers with embedded access point running the unified software image require DHCP to obtain an IP address for the access point. An IP address is needed to communicate with the Wireless LAN Controller (WLC) and to download its image upon boot up. The host router can provide DHCP server functionality through the DHCP pool to reach the WLC, and setup option 43 for the controller IP address in the DHCP pool configuration.

Use the following guideline to setup a DHCP pool on the host router.

```
ip dhcp pool embedded-ap-pool
    network 60.0.0.0 255.255.255.0
    default router 60.0.0.1
    option 43 hex f104.0a0a.0a0f  /* Single WLC IP address (10.10.10.15) in HEX format */
int vlan 1  /* Default Vlan */
ip address 60.0.0.1 255.255.255.0
int Wlan-GigabitEthernet0 /* internal switch-port to AP */
switchport access vlan 1
```

Examples

The following example upgrades the embedded access point image from autonomous to unified.

```
Router#configure terminal
Router(config)#service-module wlan-ap 0 bootimage unified
 *Jan 18 05:31:58.172: %WLAN_AP_SM-6-UNIFIED_IMAGE: Embedded AP will change boot image to
mini-IOS also called LWAPP recovery Please check router config to ensure connectivity between
 WLC and AP. Use service-module wlan-ap 0 reload to bootup mini-IOS image on AP
Router(config)#end
Router#
*Jan 18 05:32:04.136: %SYS-5-CONFIG_I: Configured from console by console
Router#service-module wlan-ap 0 reload
 Reload will save AP config....
Do you want to proceed with reload?[confirm] Trying to reload Service Module wlan-ap0.
Router#
Service Module saved config, start reset.
Received reload request from router
Saving configuration...
Building configuration...
```

Related Commands

Command	Description
interface wlan-ap	Enters wireless interface configuration mode to configure an interface.
service-module wlan-ap reload	Performs a graceful shutdown and reboot of the service module.
service-module wlan-ap reset	Resets the service module hardware.

service-module wlan-ap reload

To perform a graceful shutdown and reboot of the service module use the **service-module wlan-ap reload** command in privileged EXEC mode.

service-module wlan-ap *interface number* **reload**

Syntax Description

interface number	The interface number for the wireless device. Always use 0.

Command Default

None

Command Modes

Privileged EXEC

Command History

Release	Modification
12.4(20)T	This command was introduced for wireless-enabled Cisco 860, 880, and 890 Integrated Services Routers.

Usage Guidelines

Autonomous Mode

At the confirmation prompt, press **Enter** to confirm the action, or press **n** to cancel.

Note When running in autonomous mode, the reload command saves the configuration before rebooting. If the attempt is unsuccessful, the following message displays: Failed to save service module configuration.

Unified Mode

The service module reload command is usually handled by the Wireless LAN Controller (WLC).

Note When running in Unified mode, the reload command will produce the following message: The embedded wireless device is in Unified mode. Reload/reset is normally handled by WLC controller. Still want to proceed? [yes]

Examples

The following examples show a graceful shut down and reboot of the service module:

Autonomous Mode

```
Router# service-module wlan-ap0 reload
Do you want to proceed with reload?[confirm]
Router# reload
Do you want to reload the internal AP ? [yes/no]:
Do you want to save the configuration of the AP ? [yes/no]:
System configuration has been modified. Save [yes/no]:
Proceed with reload? [confirm]
```

Unified Mode

```
Router# service-module wlan-ap0 reload
The embedded AP is in Unified mode. Reload/reset is normally handled by WLC controller.
Still want to proceed? [yes]
Router# reload
The embedded AP is in Unified mode. Reload/reset is normally handled by WLC controller.
Do you want to reload the internal AP [yes/no]:
System configuration has been modified. Save [yes/no]:
Proceed with reload [Confirm]
```

Related Commands

Command	Description
interface wlan-ap	Enters wireless interface configuration mode to configure an interface.
service-module wlan-ap reset	Resets the service module hardware.

service-module wlan-ap reset

To reset the service module hardware, software, and configuration, use the **service-module wlan-ap reset** command in privileged EXEC mode.

service-module wlan-ap interface number reset [**bootloader** | **default-config**]

Syntax Description

interface number	The interface number for the wireless device. Always use 0.
bootloader	Resets the wireless device to the bootloader for manual image recovery.
default-config	Resets the wireless device to the factory default configuration.

Command Default

None

Command Modes

Privileged EXEC

Command History

Release	Modification
12.4(20)T	This command was introduced for wireless-enabled Cisco 860, 880, and 890 Integrated Services Routers.

Usage Guidelines

At the confirmation prompt, press **Enter** to confirm the action, or press **n** to cancel.

Caution Because you may lose data, use the **service-module wlan-ap reset** command only to recover from a shutdown or failed state.

Examples

The following example resets a wireless device on a router that is operating in either autonomous mode or LWAPP mode:

Autonomous Mode

```
Router# service-module wlan-ap0 reset
Use reset only to recover from shutdown or failed state.
```

LWAPP Mode

```
Router# service-module wlan-ap0 reset
The embedded device is in LWAPP mode. Reload/reset is normally handled by WLC controller.
Still want to proceed? [yes]
```

Resetting the Factory Default Configuration on the Wireless Device

The following example resets the wireless device to the default configuration.

```
Router#service-module wlan-ap 0 reset default-config
Router#
```

Recovering the Image on the Wireless Device

The following example resets the wireless device down to the bootloader level for manual image recovery.

```
Router#service-module wlan-ap0 reset bootloader
Router#
```

Related Commands

Command	Description
interface wlan-ap	Enters wireless interface configuration mode to configure an interface.
service-module wlan-ap reload	Performs a graceful shutdown and reboot of the service module.

service-module wlan-ap session

To begin a configuration session with a service module through a console connection use the **service-module wlan-ap session** command in privileged EXEC mode.

service-module wlan-ap *interface number* **session** [**clear** | **disconnect**]

Syntax Description

interface number	The interface number for the wireless device. Always use 0.
clear	(Optional) Clears the wireless device configuration session.

Command Default

None

Command Modes

Privileged EXEC

Command History

Release	Modification
12.4(20)T	This command was introduced for wireless-enabled Cisco 860, 880, and 890 Integrated Services Routers.

Usage Guidelines

Only one session is allowed at a time into the wireless device from a router console-port connection. After starting a session, perform configuration tasks on the wireless device. You first access the router in a user-level shell. To access the privileged EXEC command shell, where most commands are available, use the **enable** command.

When you finish configuring the device, and would like to exit the console session, type Ctrl-Shift 6x to return to the router's console. Type service-module wlan-ap session **clear** or disconnect to close the session with the device. At the confirmation prompt, press **Enter twice**to confirm the action or **n** to cancel.

Note If you do not clear or disconnect the session on the service module, it will remain open in the background after you return to the router's console prompt. When the session is open in the background, pressing Enter will toggle you back to the wireless device prompt.

Examples

The following example shows a session being opened on a service-module in an ISR:

```
Router# service-module wlan-ap 0 session
Trying 1.2.3.4, 2002 ... Open
AP#
```

The following example clears the session on the service-module in the ISR:

```
Router#service-module wlan-ap 0 session clear
[confirm]
 [OK]
```

Related Commands

Command	Description
enable	Enters privileged EXEC mode.
interface wlan-ap	Enters wireless interface configuration mode to configure an interface.

service-module wlan-ap statistics

To display reset and reload information for a service module and its operating system software, use the **service-module wlan-ap statistics**command in privileged EXEC mode.

service-module wlan-ap interface number statistics

Syntax Description

interface number	The interface number for the wireless device. Always use 0.

Command Default

none

Command Modes

Privileged EXEC

Command History

Release	Modification
12.4(20)T	This command was introduced for wireless-enabled Cisco 860, 880, and 890 Integrated Services Routers.

Examples

The following example displays information for wireless-enabled Cisco ISRs:

```
Router#service-module wlan-ap 0 statistics
Module Reset Statistics:
  CLI reset count = 0
  CLI reload count = 1
  Registration request timeout reset count = 0
  Error recovery timeout reset count = 0
  Module registration count = 10
The last IOS initiated event was a cli reload at *04:27:32.041 UTC Fri Mar 8 2007
```

Related Commands

Command	Description
interface wlan-ap	Enters wireless interface configuration mode and configures a wireless device.
service-module wlan-ap reset	Resets the wireless device.
service-module wlan-ap reload	Performs a graceful shutdown and reboot on the wireless device.

service-module wlan-ap status

To display configuration information related to hardware and software on the service module, use the **service-module wlan-ap status**command in privileged EXEC mode.

service-module wlan-ap *interface number* **status**

Syntax Description

interface number	The interface number for the wireless device. Aways use 0.

Command Default

None

Command Modes

Privileged EXEC

Command History

Release	Modification
12.4(20)T	This command was introduced for wireless-enabled Cisco 860, 880, and 890 Integrated Services Routers.

Usage Guidelines

Use the **service-module wlan-ap status** command to

- Display the wireless device's software release version
- Check the wireless device's status (steady or down)
- Display hardware information for the wireless device, including image, memory, interface, and system uptime

Examples

The following example displays information for the wireless device on a Cisco Integrated Services Router:

```
Router#service-module wlan-ap 0 status

Service Module is Cisco wlan-ap0
Service Module supports session via TTY line 2
Service Module is in Steady state
Service Module reset on error is disabled
Getting status from the Service Module, please wait..
Image path = flash:c8xx_19xx_ap-k9w7-mx.acregr/c8xx_19xx_ap-k9w7-mx.acre
gr
System uptime = 0 days, 4 hours, 28 minutes, 5 seconds
Router#d was introduced for embedded wireless LAN access points on Cisco 860 and 880 Series
 Integrated Services Routers.
```

Related Commands

Command	Description
interface wlan-ap	Enters wireless service module's console interface.

session slot

To open a session with a module (for example, the Multilayer Switch Module (MSM), Network Analysis Module (NAM), or Asynchronous Transfer Mode (ATM)), use the **sessionslot** command in EXEC mode.

session slot *mod* **processor** *processor-id*

Syntax Description

mod	Slot number.
processor *processor-id*	Specifies the processor ID.

Command Default

This command has no default settings.

Command Modes

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

To end the session, enter the **quit** command.

This command allows you to use the module-specific CLI.

Examples

This example shows how to open a session with an MSM (module 4):

```
Router# session slot 4 processor 2
Router#
```

set ip df

To change the Don't Fragment (DF) bit value in the IP header, use the **setipdf** command in route-map configuration mode. To disable changing the DF bit value, use the **no** form of this command.

set ip df {**0** | **1**}
no set ip df {**0** | **1**}

Syntax Description

0	Sets the DF bit to 0 (clears the DF bit) and allows packet fragmentation.
1	Sets the DF bit to 1 which prohibits packet fragmentation.

Command Default

The DF bit value is not changed in the IP header.

Command Modes

Route-map configuration

Command History

Release	Modification
12.1(6)	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

Using Path MTU Discovery (PMTUD) you can determine an MTU value for IP packets that avoids fragmentation. If ICMP messages are blocked by a router, the path MTU is broken and packets with the DF bit set are discarded. Use the **setipdf** command to clear the DF bit and allow the packet to be fragmented and sent. Fragmentation can slow the speed of packet forwarding on the network but access lists can be used to limit the number of packets on which the DF bit will be cleared.

Note Some IP transmitters (notably some versions of Linux) may set the identification field in the IP header (IPid) to zero when the DF bit is set. If the router should clear the DF bit on such a packet and if that packet should subsequently be fragmented, then the IP receiver will probably be unable to correctly reassemble the original IP packet.

Examples

The following example shows how to clear the DF bit to allow fragmentation. In this example a router is blocking ICMP messages and breaking the path MTU. Using policy routing both the inbound and outbound packets on interface serial 0 will have their DF bit set to 0 which allows fragmentation.

```
interface serial 0
ip policy route-map clear-df-bit
route-map clear-df-bit permit 10
match ip address 111
set ip df 0
access-list 111 permit tcp any any
```

Related Commands

Command	Description
ip tcp path-mtu-discovery	Enables Path MTU Discovery.
route-map	Defines a route map to control where packets are output.

set platform hardware qfp active feature ipsec event-monitor

To set the threshold for IP Security (IPsec) crypto failure, use the **set platform hardware qfp active feature ipsec event-monitor type <*failure type*> count** command in the user EXEC mode. To reset the IPsec crypto failure threshold, use the **clear** form of this command.

set platform hardware qfp active feature ipsec event-monitor type {**decrypt failed** | **encrypt failed** | **replay**} **count** *value*

clear set platform hardware qfp active feature ipsec event-monitor type {**decrypt failed** | **encrypt failed** | **replay**} **count value**

Syntax Description

type	Sets the type of event monitor failure. The following options are available: • *decrypt failed* • *encrypt failed* • *replay*
count	Sets the monitored event threshold count.
value	The value of the monitored event threshold count. The range is from 1 to 4294967295. The default value is 0.

Command Default

The event monitor is not enabled.

Command Modes

User EXEC (#)

Command History

Release	Modification
Cisco IOS 12.2 XN	This command was introduced on the Cisco ASR 1000 Series Aggregation Services Routers.

The following example shows how to set the threshold for IPsec crypto failure:

```
Device> set platform hardware qfp active feature ipsec event-monitor type replay count 1
```

shdsl annex

To define the single-pair high-bit-rate digital subscriber line (SHDSL) G.991.2 standard, use the **shdslannex**command in config controller DSL group mode.

shdsl annex {*annexstandard*}

Syntax Description

standard	Defines the standard for the selected type of DSL group. The following annex standards are supported: • A • A-B-F-G • A-F • B (Default annexure) • B-G • F • G **IMA Group** • A • A-B • B **M-PAIR Group** • A • A-B • B • F {coding 16 | 32} • F-G {coding 16 | 32} • G {coding 16 | 32} **1-PAIR and 2-PAIR Group** • A • A-B • B • F {coding 16 | 32} • F-G {coding 16 | 32} • G {coding 16 | 32}

Command Default

SHDSL annex B

Command Modes

Config controller DSL group

Command History

Release	Modification
12.4(15)T	This command was introduced for the Cisco HWIC-4SHDSL and HWIC-2SHDSL running on the Cisco 1841 router and on the Cisco 2800 and 3800 series access routers.
15.1(1)T	This command was modified. The argument *annex* was introduced for the Cisco HWIC-4SHDSL-E

Usage Guidelines

Use the dsl-group command to create a DSL group, and then use the shdsl annex command to define the G.991.2 standard for the DSL group.

Examples

The following example uses the shdsl annex command to define the annex standard for a 2-Pair DSL group on a Cisco HWIC-4SHDSL:

```
Router(config-controller-dsl-group)# shdsl annex ?
  A    Annex A of G.991.2 standard
  A-B  Annex A/B of G.991.2 standard
  B    Annex B of G.991.2 standard
  F    Annex F of G.991.2 standard
  F-G  Annex F/G of G.991.2 standard
  G    Annex G of G.991.2 standard
Router(config-controller-dsl-group)# shdsl annex g ?
  coding  16-TCPAM or 32-TCPAM line coding
Router(config-controller-dsl-group)# shdsl annex g coding ?
  16-TCPAM  16-TCPAM line coding
  32-TCPAM  32-TCPAM line coding
Router(config-controller-dsl-group)# shdsl annex g coding 16 ?
  <cr>
```

Example

```
Router(config-controller-dsl-group)#shdsl annex ?
  A        Annex A of G.991.2 standard
  A-B-F-G  Annex A/B/F/G of G.991.2 standard
  A-F      Annex A/F of G.991.2 standard
  B        Annex B of G.991.2 standard
  B-G      Annex B/G of G.991.2 standard
  F        Annex F of G.991.2 standard
  G        Annex G of G.991.2 standard
Router(config-controller-dsl-group)#shdsl annex f ?
coding  16-TCPAM, 32-TCPAM line coding or auto-TCPAM line coding
```

The above TCPAM configurations are valid only in case the termination is "co". In case the termination is CPE, user will see the following output

```
Router(config-controller-dsl-group)#shdsl annex f ?
<cr>
```

Related Commands

Command	Description
dsl-group	Creates a DSL group and enters config controller DSL group mode.
shdsl rate	Defines the SHDSL rate.

shdsl rate

To define the single-pair high-bit-rate digital subscriber line (SHDSL) rate, use the **shdslrate**command in config-controller-dsl-group mode.

shdsl rate {*number* | **auto**}

Syntax Description

number	SHDSL rate for the digital subscriber line (DSL) group. **DSL Group with 1 Pair** Annex A & B--192-2304 kbps Annex F & G (32 TC-PAM)--768-5696 kbps Annex F & G (16 TC-PAM)--2304-3840 kbps **DSL Group with 2 Pairs** Annex A & B--384-4608 kbps Annex F & G (32 TC-PAM)--1536-11392 kbps Annex F & G (16 TC-PAM)-- 4608-7680 kbps **DSL Group with 3 Pairs** Annex A & B--576-6912 kbps Annex F & G (32 TC-PAM)--2304-12288 kbps Annex F & G (16 TC-PAM)-- 6912-11520 kbps **DSL Group with 4 Pairs** Annex A & B--768-9216 kbps Annex F & G (32 TC-PAM)--3072-16384 kbps Annex F & G (16 TC-PAM)-- 9216-15360 kbps

	Data rates supported for each Annex and TC-PAM 2-wire configuration. For EFM bonding configuration with multiple links, multiply the data rate ranges by the number of links in the EFM bonding group. **2-wire, 16-TCPAM** Annex A--192 - 2304 kbps Annex B--192 - 2304 kbps Annex F--2304 - 3840 kbps Annex G--2304 - 3840 kbps Annex A & F--192 - 3840 kbps Annex B & G--192 - 3840 kbps A & B & F & G--192 - 3840 kbps **2-wire, 32-TCPAM** Annex F--768 - 5696 kbps Annex G--768 - 5696 kbps Annex A & F--768 - 5696 kbps Annex B & G--768 - 5696 kbps Annex A & B & F & G--768 - 5696 kbps **2-wire Auto-TCPAM** Annex A--192 - 2304 kbps Annex B--192 - 2304 kbps Annex F--768 - 5696 kbps Annex G--768 - 5696 kbps Annex A & F--192 - 5696 kbps Annex B & G--192 - 5696 kbps Annex A & B & F & G--192 - 5696 kbps
auto	Sets this SHDSL rate to automatic mode.

Command Default

The command default is the maximum annex rate for the selected DSL group.

Command Modes

Config controller DSL group

Command History

Release	Modification
12.4(15)T	This command was introduced for the Cisco HWIC-4SHDSL and HWIC-2SHDSL running on the Cisco 1841 router and on the Cisco 2800 and 3800 series access routers.
15.1(1)T	This command was modified. Support for the for the Cisco HWIC-4SHDSL-E is added.

Usage Guidelines

Use the dsl-group command to create a DSL group, and then use the shdsl annex command to define the G.991.2 standard for the newly created DSL group. Define the SHDSL line rate with the shdsl rate command.

Examples

The following example defines the SHDSL line rate for DSL group 1, pairs 0-1 (2 pairs) on a Cisco HWIC-4SHDSL:

```
Router(config-controller)# dsl-group 1 pairs 0-1 ima
Router(config-controller-dsl-group)#
Sep 22 14:53:46.481: %HWIC_SHDSL-5-DSLGROUP_UPDOWN: SHDSL 0/2/0 dsl-group(1) state changed
 to down.
Sep 22 14:53:48.481: %LINK-3-UPDOWN: Interface ATM0/2/IMA1, changed state to down
Sep 22 14:53:49.481: %LINEPROTO-5-UPDOWN: Line protocol on Interface ATM0/2/IMA1, changed
state to down
Router(config-controller-dsl-group)# shdsl annex ?
  A    Annex A of G.991.2 standard
  A-B  Annex A/B of G.991.2 standard
  B    Annex B of G.991.2 standard
Router(config-controller-dsl-group)# shdsl annex b ?
  <cr>
Router(config-controller-dsl-group)# shdsl rate auto
  <384-4608>  DSL Rate in kbps(line will train at the rate + 16kbps overhead)
  auto        auto rate mode
```

The following example shows adaptive rate configurations.

```
Router(config-controller-dsl-group)#shdsl rate ?
<768-9216>  DSL Rate (excluding DSL overhead) in kbps
auto        auto rate mode
Router(config-controller-dsl-group)#shdsl rate 1024
Router(config-controller-dsl-group)#shdsl rate auto ?
current  Current SNR Margin
snext    Self Near end cross talk

Router(config-controller-dsl-group)#shdsl rate auto current ?
<0 - 10>  0dB to 10dB
Router(config-controller-dsl-group)#shdsl rate auto snext ?
<-10 - 10>  -10dB to 10dB
```

Related Commands

Command	Description
dsl-group	Creates a DSL group and enters config controller DSL group mode.
shdsl annex	Defines the G.991.2 standard for a DSL group.

shelf-id

To change the shelf number assigned to the router shelf or dial shelf on the Cisco AS5800, use the **shelf-id** command in global configuration mode. To return the shelf numbers to the default value, use the **no** form of this command.

shelf-id *number* {**router-shelf** | **dial-shelf**}
no shelf-id *number*

Syntax Description

number	Number to assign to the shelf. Range is from 0 to 9999.
router-shelf	Specified number to the router shelf.
dial-shelf	Specified number to the dial shelf.

Command Default

The default shelf number for the router shelf is 0.

The default shelf number for the dial shelf is 1, or one number higher than the specified router shelf number.

Command Modes

Global configuration

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

The shelf number is used to distinguish between cards on the router shelf and cards on the dial shelf.

Caution You must reload the Cisco AS5800 for the shelf number to take effect. The shelf numbers are part of the interface names. When you reload the Cisco AS5800, all NVRAM interface configuration information is lost.

You can specify the shelf number through the setup facility during initial configuration of the Cisco AS5800. This is the recommended method to specify shelf numbers.

To display the shelf numbers, use the **showrunning-config** command. If a shelf number has been changed, the pending change is shown in the output of the **showversion** command (for example, the dial-shelf ID is 87; will change to 2 on reload).

Examples

In the following example, the dial shelf is assigned the number 456:

```
Router(config)# shelf-id 456 dial-shelf
Router(config)# exit
```

Related Commands

Command	Description
show version	Displays the configuration of the system hardware, the software version, the names and sources of configuration files, and the boot images.

show (satellite initial configuration)

To display the initial configuration parameters for the Cisco IP VSAT satellite WAN network module (NM-1VSAT-GILAT), use the **show** command in satellite initial configuration mode.

show

Syntax Description

This command has no arguments or keywords.

Command Default

No default behavior or values

Command Modes

Satellite initial configuration

Command History

Release	Modification
12.3(14)T	This command was introduced.

Usage Guidelines

This command is typically used by an installation technician. Do not use this command unless your satellite service provider instructs you to perform the satellite initial configuration and provides all necessary parameter values.

You can view the satellite initial configuration parameters by entering the **service-modulesatellite***slot*/**0status** command in privileged EXEC mode.

Examples

The following example shows the satellite initial configuration parameters for the Cisco IP VSAT satellite WAN network module (NM-1VSAT-GILAT):

```
Router(sat-init-config)# show

!
! Initial Configuration Parameters:
!
id aa-group 298
id software group 598
id vsat 6201
mode download
mode two-way
outbound data-pid 514
outbound data-rate 15000000
outbound frequency 1201000
outbound id 2
outbound modulation-type DVB
outbound sync ip address 172.16.0.3
outbound viterbi-rate 1/2
!
!
Router(sat-init-config)#
```

Related Commands

Command	Description
service-module satellite status	Displays status information related to the hardware and software on the Cisco IP VSAT satellite WAN network module (NM-1VSAT-GILAT), including the initial configuration parameters.

show alarm-interface

To display the alarm interface controller (AIC) configuration setting and the information sent to the Cisco IOS software by the AIC, use the **showalarm-interface** command in privileged EXEC mode.

show alarm-interface [*slot-number*] [**summary**]

Syntax Description

slot-number	(Optional) Slot number in which the AIC was placed.
summary	(Optional) Selects the summary format for the output message.

Command Default

Displays verbose message output and displays all AICs in all slot numbers on the router.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(2)XG	This command was introduced on the Cisco 2600 series and Cisco 3600 series.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T.

Examples

The following is sample output from the **showalarm-interfacesummary** command:

```
Router# show alarm-interface 5 summary
         Alarm Interface Card in Slot 5:
Configured IP address:10.2.130.102
Status: KEEPALIVE TIMER EXPIRED
Alarm Interface Card in Slot 5:
Configured IP address:10.2.130.102
Status:KEEPALIVE TIMER EXPIRED
```

The following is an example of a verbose **showalarm-interface**display:

```
Router# show alarm-interface 4
         Alarm Interface Card in Slot 4:
Configured IP address: 10.10.10.2
Status: RUNNING
Timer expires in < 11 min.
Reported version: 00 00 00 01
Expected version: 00 00 00 01
Last Self Test result: READY
Last Start-Up message:
----------
<AIC>: Hardware Version 1, Revision A Software Version 2, Revision A 1.0.1 Installed and
running, POST passed.
----------
Last Status severity: 0
Last Status message:
----------
Status
----------
```

The table below describes significant fields shown in this output.

Table 1: show alarm-interface Field Descriptions

Field	Description
Alarm Interface Card in Slot	Card type and slot number.
Configured IP address	Configured IP address
Status	AIC card status. Can be one of the following: • HARDWARE DETECTED • RUNNING • HARDWARE NOT PRESENT • KEEPALIVE TIMER EXPIRED
Timer expires in	Current value of the KEEPALIVE TIMER, or states if the timer has been disabled. This line is only active when the status line reads HARDWARE DETECTED or RUNNING. Used in troubleshooting to detect operational failures of the AIC.
Reported version	Active software version number. Comparing the reported version to the expected version may reveal possible incompatibilities between the AIC's software and the IOS image.
Expected version	Expected software version number. Comparing the reported version to the expected version may reveal possible incompatibilities between the AIC's software and the IOS image.
Last Self Test result	Result of the AIC's power on self-test (POST).
Last Start-Up message	Startup messages.
<AIC>	AIC. Includes version and activity information.
Last Status severity	Rates the severity of the status message. Any number other than 0 indicates a need for intervention. The number 1 indicates the most severe condition.
Last Status message	Last status message.

Related Commands

Command	Description
alarm-interface	Enters the alarm interface mode and configures the AIC.

show alarm-profile

To verify the alarm profile configured for chassis, use the **show alarm-profile** command.

Syntax Description

Syntax Description:

There are no keywords.

Command Default

There is no default.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
Cisco IOS XE 16.8.1	Support for this command was introduced on ASR 900 Series.

Examples

```
Router# show alarm profile
Alarm profile CHASSIS:
 SONET/SDH:
  Alarm Name                            Severity   Syslog
  Section Loss of Frame Failure         CRITICAL   Enabled
  Line Alarm Indication Signal          INFO       Enabled
  Line Remote Failure Indication        INFO       Enabled
  Path Alarm Indication Signal          INFO       Enabled
  Path Remote Failure Indication        INFO       Enabled
  Path Loss of Pointer                  INFO       Enabled
 DS1:
  Alarm Name                            Severity   Syslog
  Receiver has loss of signal           CRITICAL   Enabled
  Receiver has loss of frame            INFO       Enabled
  Receiver has remote alarm             INFO       Enabled
 DS3:
  Alarm Name                            Severity   Syslog
  Receiver has loss of signal           MAJOR      Enabled
  DS1 Alarm Indication Signal           MINOR      Enabled
  DS1 Loss Of Frame                     INFO       Enabled
  DS1 Remote Alarm Indication           INFO       Enabled
```

show als

To display Automatic Laser Shutdown (ALS) status, use the show als command in privileged EXEC mode.

show als {**all** | **interface slot**/**port**}

Syntax Description

all	Displays ALS status for all interfaces.
interface	Displays ALS status for the selected interface .
slot/port	Number of the chassis slot that contains the interface, where: • slot--Chassis slot number. • /port--Port number.

Command Default

No default behavior or values

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SRD1	This command was introduced on the Cisco 7600 series routers.

Examples

The following example shows the ALS status for the selected interface:

```
Router# show als interface t2/1
TenGigabitEthernet2/1
 Mode ALS_MODE_MANUAL
 Pulse Width 100 sec
 Pulse Interval 150 sec
 Current state ALS_STATE_NORMAL

The following example shows the ALS status for all interfaces:
Router# show als all
TenGigabitEthernet2/1
 Mode ALS_MODE_MANUAL
 Pulse Width 100 sec
 Pulse Interval 150 sec
 Current state ALS_STATE_NORMAL

TenGigabitEthernet2/2
 Mode ALS_MODE_AUTOMATIC
 Pulse Width 100 sec
 Pulse Interval 300 sec
 Current state ALS_STATE_NORMAL
```

Related Commands

Command	Description
als	Enables the ALS mode.

Command	Description
als restart	Requests an ALS restart mode.
als restart mode	Selects the ALS restart mode.
als restart pulse	Select the ALS pulse mode.
hw-module als restart	Requests a restart pulse.

show aps

To display information about the current automatic protection switching (APS) feature, use the **showaps** command in privileged EXEC mode.

show aps commandshow aps

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.1CC	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 is sample output from the **showaps**command on a router configured with a working interface. In this example, POS interface 0/0/0 is configured as a working interface in group 1, and the interface is selected (that is, active).

```
Router1# show aps
POS0/0/0 working group 1 channel 1 Enabled Selected
```

The following is sample output from the **showaps**command on a router configured with a protect interface. In this example, POS interface 2/0/0 is configured as a protect interface in group 1, and the interface is not selected (the ~ indicates that the interface is not active). The output also shows that the working channel is located on the router with the IP address 10.1.6.1 and that the interface is currently selected (that is, active).

```
Router2# show aps
POS2/0/0 protect group 1 channel 0 bidirectional ~Selected
        Rx_K1= 0, Rx_K2= 0 Tx_K1= 0 Tx_K2= 5
        Working channel 1 at 10.1.6.1 Enabled
```

For the K1 field (8 bits), the first 4 bits indicate the channel number that has made the request, and the last 4 bits map to the requests (local or external) listed in the table below. For the K2 field (8 bits), the first 4 bits indicate the channel number bridged onto the protect line, the next bit is the architecture used, and the last 3 bits indicate the mode of operation or non-APS use listed in the table below.

Table 2: K1 Bit Descriptions

Bits (Hexadecimal)	Description
K1 bits 8765	K1 bits 8 through 5: Channel number that made the request.
K1 bits 4321	K1 bits 4 through 1: Type of request.

Bits (Hexadecimal)	Description
1111 (0xF)	Lockout of protection request.
1110 (0xE)	Forced switch request.
1101 (0xD)	Signal failure (SF)--high priority request.
1100 (0xC)	Signal failure (SF)--low priority request.
1011 (0xB)	Signal degradation (SD)--high priority request.
1010 (0xA)	Signal degradation (SD)--low priority request.
1001 (0x9)	Not used.
1000 (0x8)	Manual switch request.
0111 (0x7)	Not used.
0110 (0x6)	Wait to restore request.
0101 (0x5)	Not used.
0100 (0x4)	Exercised request.
0011 (0x3)	Not used.
0010 (0x2)	Reverse request.
0001 (0x1)	Do not revert request.
0000 (0x0)	No request.

show asic-version

To display the application-specific integrated circuit (ASIC) version for a specific module, use the **showasic-version** command in EXEC mode.

show asic-version slot *number*

Syntax Description

slot	The slot that the ASIC is installed in.
number	Module number.

Command Default

This command has no default settings.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.2(14)SX	Support for this command was introduced on the Cisco 7600 series routers.
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

In the **showasic-version**command output, the ASIC types are as follows:

- Lyra--Layer 2 forwarding engine
- Medusa--Crossbar and bus fabric interface
- Polaris--Layer 3 CEF engine
- Pinnacle--4-port Gigabit Ethernet interface
- Titan--Packet rewrite and replication engine
- Vela--Constellation bus interface

Examples

This example shows how to display the ASIC type and version for a specific module:

```
Router# show asic-version slot 1
Module in slot 1 has 3 type(s) of ASICs
        ASIC Name      Count      Version
        ASIC1          (2.0)
        ASIC2          (2.0)
        ASIC3 1        (0.1)
Router#
```

Related Commands

Command	Description
show module	Displays the module status and information.

show c7300

To display the types and status of cards installed in a Cisco 7304 router, use the **showc7300**command in privileged EXEC mode.

show c7300

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.1(9)EX	This command was introduced.
12.1(10)EX	The output of this command was enhanced to include information about Field-Programmable Gate Array (FPGA) images.
12.1(10)EX2	The output of this command was enhanced to include information about a standby route processor (RP).
12.2(18)S	This command was integrated into Cisco IOS Release 12.2(18)S.
12.2(20)S	Support was added for the Cisco 7304 router.
12.2(20)S2	Support was added for modular services cards (MSCs) and shared port adapters (SPAs) on the Cisco 7304 router.
12.2(28)SB	This command was integrated into Cisco IOS Release 12.2(28)SB.
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

This command displays the types and status of cards installed in a Cisco 7304 router (such as network services engines [NSEs], RPs, line cards, MSCs, and SPAs), and information about incompatible FPGA images. When the bundled and current FPGA images are compatible, they are not displayed.

This command also displays whether your system is in compliance with line card configuration guidelines. For NSEs and line cards, empty slots are not displayed in the output. However, for SPAs, several status values are reported, including an empty subslot, which is reported as “missing.”

If your system contains an unsupported line card or RP with no matching bundled FPGA image in Cisco IOS software, then this command displays “None” instead of the bundled FPGA version number.

Use this command to display information about the status of the active and standby NSEs.

Examples

The following example displays information about a Cisco 7304 router that has current FPGA images:

```
Router# show c7300
Slot      Card Type           Status          Insertion time
```

```
----      ---------           ------          --------------
0,1       NSE-100             Active          00:13:16 ago
4         1OC48-POS           Active          00:01:43 ago
System is compliant with hardware configuration guidelines.
All the FPGAs in the system are up-to-date
Network IO Interrupt Throttling:
 throttle count=3, timer count=3
 active=0, configured=1
 netint usec=3999, netint mask usec=200
```

The following example displays information about a Cisco 7304 router that has incompatible FPGA images that need to be updated. If your system contains an unsupported line card or RP with no matching bundled FPGA image in Cisco IOS software, “None” is displayed instead of a bundled FPGA version number.

```
Router# show c7300
Slot      Card Type           Status          Insertion time
----      ---------           ------          --------------
0,1       NSE-100             Active          00:02:26 ago
4         6T3                 Active          00:02:23 ago
5         6T3                 Active          00:02:23 ago
System is compliant with hardware configuration guidelines.
%WARNING:The following FPGAs in the system may need an update.
Slot      Card Type           Current FPGA    Bundled FPGA
----      ---------           ------------    ------------
0         NSE-100 (MB)        0.12            None
Network IO Interrupt Throttling:
 throttle count=0, timer count=0
 active=0, configured=1
 netint usec=3999, netint mask usec=200
```

The following example displays sample output information about the redundancy status of the NSEs installed in the system. In the following example, the active RP is the NSE-100 installed in slot 0 and slot 1. The standby is the NSE-100 installed in slot 2 and slot 3.

```
Router# show c7300
Slot      Card Type           Status          Insertion time
----      ---------           ------          --------------
0,1       NSE-100             Active          00:02:03 ago
2,3       NSE-100             Standby         00:02:03 ago
4         4OC3-POS            Active          00:01:59 ago
5         6T3                 Active          00:01:59 ago
System is compliant with hardware configuration guidelines.
Network IO Interrupt Throttling:
 throttle count=0, timer count=0
 active=0, configured=1
 netint usec=3999, netint mask usec=200
```

The following example displays information about a Cisco 7304 router with an NSE-100, MSC-100s, and 4-Port 10/100 Fast Ethernet SPAs:

```
Router# show c7300
Slot      Card Type           Status          Insertion time
----      ---------           ------          --------------
0,1       NSE100              Active          00:45:29 ago
2         7304-MSC-100        Active          00:44:36 ago
3         7304-MSC-100        Active          00:44:36 ago
4         7304-MSC-100        Active          00:44:36 ago
5         7304-MSC-100        Active          00:14:39 ago
The FPGA versions for the cards listed above are current
Shared Port Adapter information:
```

```
Slot/Subslot  SPA Type            Status          Insertion time
------------  --------            ------          --------------
2/0           SPA-4FE-7304        ok              00:44:36 ago
2/1           SPA-4FE-7304        ok              00:44:36 ago
3/0           SPA-4FE-7304        ok              00:44:35 ago
3/1           not present         missing         never
4/0           SPA-4FE-7304        ok              00:44:35 ago
4/1           SPA-4FE-7304        ok              00:44:35 ago
5/0           SPA-4FE-7304        ok              00:14:36 ago
5/1           SPA-4FE-7304        ok              00:14:36 ago
Network IO Interrupt Throttling:
 throttle count=1, timer count=1
 active=0, configured=1
 netint usec=3999, netint mask usec=200
```

The table below provides a description for each of the possible status fields for SPAs.

Table 3: SPA Status Field Descriptions

Status Field for SPAs	Description
booting	SPA is initializing.
failed	SPA is powered off due to five automatic recovery failures.
FW mismatch	An FPGA version mismatch with the Cisco IOS software has been detected for the SPA.
missing	SPA is not present in the MSC subslot.
not allowed online	SPA is not supported.
ok	SPA is operational.
stopped	SPA is deactivated by the **hw-modulesubslotstop**command.
unknown	SPA is in unrecognizable state.

Related Commands

Command	Description
show c7300 errorlog	Displays error information about a Cisco 7304 router.
show diag	Displays hardware information for any slot or the chassis.
show redundancy (7300)	Displays redundancy information for the active and standby NSEs.
show version	Displays the configuration of the system hardware, the number of each interface type installed, the Cisco IOS software version, the names and sources of configuration files, and the boot images. Displays the configuration of the ROM monitor.

show c7300 errorlog

To display error information on a Cisco 7304 router running pre-Cisco IOS Release 12.2(25)S software, use the **showc7300errorlog**command in privileged EXEC mode.

show c7300 errorlog [**slot** *slot-number* | **all**]

Syntax Description

slot	(Optional) Displays error information for the hardware in a slot.
slot-number	(Optional) Specifies the slot location of the hardware to display error information.
all	(Optional) Displays error information for all hardware in all slots.

Command Default

No default behavior or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.1(9)EX	This command was introduced.
12.2(18)S	This command was introduced on Cisco 7304 routers running Cisco IOS Release 12.2 S.
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

Each line card in a Cisco 7304 router has a serial channel connecting to the processor. There are two serial channel controllers on each serial channel, one for the line card side and one for the processor side. Each serial channel has four serial links labeled as SL0, SL1, SL2 and SL3. This command displays a set of error counters for each serial link.

Use this command to display board-level errors. If you are investigating controller or interface errors, use the **showcontroller** and**showinterface** commands.

Examples

The following example displays error information about a line card in slot 2 on a Cisco 7304 router:

```
Router# show c7300 errorlog slot 2
        Backplane serial channel controller (Santa Ana):
        LC 2, LC Santa Ana, channel A, error counters:
                               SL0  SL1  SL2  SL3
        Reframe:             [   0    0    0    0 ]
        Overrun:             [   0    0    0    0 ]
        Underrun:            [   0    0    0    0 ]
        OOB:                 [   0    0    0    0 ]
        Disparity:           [   0    0    0    0 ]
        Missing_Ctrl_Code:   [   0    0    0    0 ]
        Chip access errors:  [   0    0    0    0 ]
        LC 2, NSE Santa Ana 0, channel A, error counters:
                               SL0  SL1  SL2  SL3
        Reframe:             [   0    0    0    0 ]
```

```
        Overrun:            [   0    0    0    0 ]
        Underrun:           [   0    0    0    0 ]
        OOB:                [   0    0    0    0 ]
        Disparity:          [   0    0    0    0 ]
        Missing_Ctrl_Code:  [   0    0    0    0 ]
        Chip access errors: [   0    0    0    0 ]
```

The following example displays error information about all hardware in all of the slots on a Cisco 7304 router:

```
Router# show c7300 errorlog slot all
        Backplane serial channel controller (Santa Ana):
        LC 2, LC Santa Ana, channel A, error counters:
                              SL0  SL1  SL2  SL3
        Reframe:            [   0    0    0    0 ]
        Overrun:            [   0    0    0    0 ]
        Underrun:           [   0    0    0    0 ]
        OOB:                [   0    0    0    0 ]
        Disparity:          [   0    0    0    0 ]
        Missing_Ctrl_Code:  [   0    0    0    0 ]
        Chip access errors: [   0    0    0    0 ]
        LC 2, NSE Santa Ana 0, channel A, error counters:
                              SL0  SL1  SL2  SL3
        Reframe:            [   0    0    0    0 ]
        Overrun:            [   0    0    0    0 ]
        Underrun:           [   0    0    0    0 ]
        OOB:                [   0    0    0    0 ]
        Disparity:          [   0    0    0    0 ]
        Missing_Ctrl_Code:  [   0    0    0    0 ]
        Chip access errors: [   0    0    0    0 ]
        Backplane serial channel controller (Santa Ana):
        LC 3, LC Santa Ana, channel A, error counters:
                              SL0  SL1  SL2  SL3
        Reframe:            [   0    0    0    0 ]
        Overrun:            [   0    0    0    0 ]
        Underrun:           [   0    0    0    0 ]
        OOB:                [   0    0    0    0 ]
        Disparity:          [   0    0    0    0 ]
        Missing_Ctrl_Code:  [   0    0    0    0 ]
        Chip access errors: [   0    0    0    0 ]
        LC 3, NSE Santa Ana 0, channel A, error counters:
                              SL0  SL1  SL2  SL3
        Reframe:            [   0    0    0    0 ]
        Overrun:            [   0    0    0    0 ]
        Underrun:           [   0    0    0    0 ]
        OOB:                [   0    0    0    0 ]
        Disparity:          [   0    0    0    0 ]
        Missing_Ctrl_Code:  [   0    0    0    0 ]
        Chip access errors: [   0    0    0    0 ]
```

The table below describes the significant fields shown in the display.

Table 4: show c7300 errorlog Field Descriptions

Field	Description
Reframe	A data frame on a serial link does not align to the designated framing boundary.
Overrun:	Packets are stored in a FIFO buffer when the serial link is overloaded.
Underrun:	A serial link looks for packets in an empty FIFO buffer.

Field	Description
OOB:	Out of band error. An undefined serial link control character is received.
Disparity:	A running disparity error occurs on the link.
Missing_Ctrl_Code:	Missing Control Code. An incorrect number of control codes are received.
Chip access errors:	Access to the serial channel device fails.

Related Commands

Command	Description
show c7300	Displays the types of hardware currently installed in a Cisco 7304 router.
show diag	Displays hardware information for any slot or the chassis.
show platform errorlog	Displays error information.
show version	Displays the configuration of the system hardware, the number of each interface type installed, the Cisco IOS software version, the names and sources of configuration files, and the boot images. Displays the configuration of the ROM monitor.

show c7300 pxf accounting

To display the number and types of packets entering or exiting the PXF processors, use the **showc7300pxfaccounting** command in privileged EXEC mode.

show c7300 pxf accounting

Syntax Description

This command has no arguments or keywords.

Command Default

No default behavior or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.1(9)EX	This command was introduced.
12.2(14)SZ	This command was modified to **showpxfaccounting** for the Cisco 7304 router. All Cisco IOS releases prior to 12.2(14)SZ that support the Cisco 7304 still require that **showc7300pxfaccounting** be entered to gather PXF accounting output.
12.2(18)S	This command was introduced on Cisco 7304 routers running Cisco IOS Release 12.2S.
12.2(20)S	The **c7300** keyword was removed. Entering **showpxfaccounting** could get the information previously gathered by entering the **showc7300pxfaccounting** command.

Usage Guidelines

Use the **showc7300pxfaccounting** command to display the number of packets entering and exiting the PXF processors.

The c7300 keyword was removed from this command in Cisco IOS Release 12.2(20)S. The**showpxfaccounting** command can be used in post-Cisco IOS Release 12.2(20)S releases to gather information previously gathered by entered the **showc7300pxfaccounting** command.

Examples

The following example displays output of the**showc7300pxfaccounting** command:

```
Router# show c7300 pxf accounting
PXF Utilization:14 %
PXF Packet Counters:
 Ingress from GE :              0      Egress to GE :              8
 Ingress from LCs:       24783520      Egress to LCs:       18387770
 Ingress from RP :             10      Egress to RP :              2
 Priority queue  :             12      Default queue:       18387787
Drop Packet Counters:
    ACL input deny Drop:        6395752
```

The table below describes the significant fields shown in the display.

Table 5: show c7300 pxf accounting Field Descriptions

Field	Description
Ingress from GE:	Packets coming into the PXF processors from the Gigabit Ethernet ports.

Field	Description
Egress to GE:	Packets going to the Gigabit Ethernet ports from the PXF processors.
Ingress from LCs	Packets coming in to the PXF processors from line card ports.
Ingress from RP	Packets coming in to the PXF processors from the Route Processor.
Drop Packet Counters:	Packets dropped by the PXF processors.
ACL input deny Drop:	Packets dropped because of the implicit deny all at the end of all ACLs.

Related Commands

Command	Description
ip pxf	Manually enables the PXF processor.
show pxf accounting	Displays the number and types of packets entering or exiting the PXF processors.
show c7300 pxf interfaces	Displays the status of various interfaces know to the PXF processors.

show c7300 pxf interfaces

Note Effective with Cisco IOS Release 12.2(20)S, the **showc7300pxfinterfaces** command is replaced by the **showpxfinterfaces** command. See the **showpxfinterfaces** command for for information.

To display the status of various interfaces known to the Parallel Express Forwarding (PXF) processors, use the **showc7300pxfinterfaces**command in privileged EXEC mode.

show c7300 pxf interfaces {*interface-index* | **all**}

Syntax Description

interface-index	A number that represents an interface known to the PXF processors. Valid values are 0 to 32767.
all	Specifies all PXF interfaces.

Command Default

No default behaviors or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.1(9)EX	This command was introduced.
12.2(14)SZ	This command was modified to **showpxfinterfaces** for the Cisco 7304 router. All Cisco IOS releases prior to 12.2(14)SZ that support the Cisco 7304 still require that **showc7300pxfinterfaces** be entered to gather PXF interface information.
12.2(18)S	This command was introduced on Cisco 7304 routers running Cisco IOS Release 12.2S.
12.2(20)S	This command was replaced by the show pxf interfaces command.

Examples

The following example shows how to display information about PXF interface 1:

```
Router# show c7300 pxf interfaces 1
PXF-If: 00001  Gi0/0    (Up, Punting to RP - no ip route-cache)
  Features: in=iACL  [0x11],  out=None [0x0]
```

The following example shows how to display information about all PXF interfaces:

```
Router# show c7300 pxf interfaces
 all
PXF-If: 00001  Gi0/0    (Up, Punting to RP - no ip route-cache)
  Features: in=iACL  [0x11],  out=None [0x0]
PXF-If: 00002  Gi0/1    (Down, Punting to RP - no ip route-cache)
  Features: in=None [0x1],  out=None [0x0]
PXF-If: 00007  In Use, Reserved
PXF-If: 00024  PO2/0    (Up, Punting to RP - no ip route-cache)
  Features: in=None [0x1],  out=None [0x0]
PXF-If: 00025  PO2/1    (Down, Punting to RP - no ip route-cache)
```

```
  Features: in=None [0x1],  out=None [0x0]
PXF-If: 00026  PO2/2    (Down, Punting to RP - no ip route-cache)
  Features: in=None [0x1],  out=None [0x0]
PXF-If: 00027  PO2/3    (Down, Punting to RP - no ip route-cache)
  Features: in=None [0x1],  out=None [0x0]
```

The table below describes the significant fields shown in the display.

Table 6: show c7300 pxf interfaces Field Descriptions

Field	Description
PXF-IF:	Internal PXF interface number. This is a unique number assigned by PXF.
Gi 0/0 or PO2/3	Type of interface.
Features:	Ingress and egress features on the PXF interface.
in=	Ingress features.
iACL	Input Access Control Lists is configured on this interface.
[0x11]	Hexadecimal value of features flag for input features on this interface.
out=	Egress features.
[0x0]	Hexadecimal value of feature flag for output features on this interface.
(Up, Punting to RP)	Interface status. Interface is up and packets are being sent to the Route Processor.
(Down, Punting to RP)	Interface status. Interface is down and packets are being sent to the Route Processor.
- no ip route-cache	Reason packets are being sent to the Route Processor. In this display, packets are being sent to the Route Processor because the user has entered the **noiproute-cache** command and CEF is not enabled on the interface. Entering the following commands causes packets to be sent to the Route Processor: • **no ip cef** • **no ip routing** • **no ip route-cache** Other reasons may be displayed: • lineproto down--The line is down. • unsupported feature--Packets from a feature that is not supported by PXF.

Related Commands

Command	Description
ip pxf	Manually enables the PXF processors.
show c7300 pxf accounting	Displays the number of packets entering or exiting the PXF processors.
show pxf interfaces	Displays the status of various interfaces known to the PXF processors.

show c7300 slot

To display various output useful for technical support purposes, enter the **showc7300slot**command in privileged EXEC mode.

show c7300 slot {*slot-number* | **all**}

Syntax Description

slot-number	Displays various information for the hardware in a particular slot. This information is useful for technical support purposes only.
all	Displays various information for all of the hardware in all of the router slots. This information is useful for technical support purposes only.

Command Default

No default behavior or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(20)S	This command replaces the show platform slot command.

Usage Guidelines

This command should not be used. The output gathered from this command is useful for technical support purposes only.

Examples

The following example shows how to display information about the hardware in slot 4 of Cisco 7304 router:

```
Router# show c7300 slot 4
Slot 4 Details
  Card Name: OC12-POS
  Card Present: Yes
  Slot Card Type: 0x377
  Saved Slot Card Type (Persistent after the OIR): 0x377
  Slot State (4): Activated
  Slot Previous State (4): Activated
  Slot Return (Transient) State (3): Analyzing
  Current Event to the OIR FSM: Idle (0)
  Current External Event to the OIR FSM: Idle (0)
  Slot Flags (0x100000):
    FPGA Checked
  Slot Ready: Yes
  Slot Retry Count: 0
  Slot Structure Address: 0x446FAED0
  Slot Sync Data Address : 0x446FB318
Slot 4 Line Card Plugin Details
  Line Card Type: OC12-POS (0x377)
  Number of Ports: 1
  Line Card Plugin Address: 0x45E123C0
  Line Card Compatible S/W Version: 0.0 (0x0)
  Line Card H/W Version: 02.03 (0x203)
  Line Card FPGA Version: 00.20 (0x14)
  Minimum Line Card H/W Version required by the S/W: 00.00 (0x0)
  Minimum Line Card FPGA Version required by the S/W: 00.01 (0x1)
```

```
  Slot 4 Line Card Devices:
  Line Card Common Devices
    Device#0: EEPROM
      Plugin Address 0x433BB830, C2W Control Structure Address 0x433C1138
      Card Bus (4): Address 0x50, Frequency 0x13, Slot 4
    Device#1: CPLD
      Plugin Address 0x433BF9E0, C2W Control Structure Address 0x433C1198
      Card Bus (4): Address 0x30, Frequency 0x13, Slot 4
    Device#2: FPGA Flash
      Plugin Address 0x433BFC30, C2W Control Structure Address 0x433C11F8
      Card Bus (4): Address 0x30, Frequency 0x13, Slot 4
(Output removed for readability)
```

Related Commands

Command	Description
show platform slot	Displays various output useful for technical support purposes.

show cable bundle

To display the forwarding table for the specified interface, use the **showcablebundle** command in privileged EXEC mode.

show cable bundle *bundle-number forwarding-table*

Syntax Description

bundle-number	Specifies the bundle identifier. Valid range is from 1 to 255.
forwarding-table	Displays the forwarding table for the specified interface.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.0(7)XR	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

In the following example, a cable bundle of 25 is specified:

```
Router# show cable bundle 25 forwarding-table
MAC address         Interface
0050.7366.17ab      Cable3/0
0050.7366.1803      Cable3/0
0050.7366.1801      Cable3/0
```

The table below describes the significant fields shown in the display.

Table 7: show cable bundle Field Descriptions

Field	Description
MAC address	Media Access Control ID for each interface in the bundle.
Interface	The cable interface slot and port number.

Related Commands

Command	Description
cable bundle	Creates an interface bundle.

show cable-diagnostics tdr

To display the test results for the Time Domain Reflectometry (TDR) cable diagnostics, use the **showcable-diagnosticstdr**command in privileged EXEC mode.

show cable-diagnostics tdr interface *interface interface-number*

Syntax Description

interface *interface*	Specifies the interface type; valid values are**fastethernet** and **gigabitethernet**.
interface-number	Module and port number.

Command Default

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(18)SXD	The output was changed as follows:
	• The Local Pair field was changed to the Pair field. The local pair designations were changed as follows:
	  • Pair A to Pair 1-2
	  • Pair B to Pair 3-4
	  • Pair C to Pair 5-6
	  • Pair D to Pair 7-8
	• The Remote Pair field was removed.
	• The Channel field was added to display the pair designation and are as follows:
	  • Pair A
	  • Pair B
	  • Pair C
	  • Pair D

12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Usage Guidelines

The **showcable-diagnosticstdr** command is supported on specific modules. See the Release Notes for Cisco IOS Release 12.2 SX on the Catalyst 6500 and Cisco 7600 Supervisor Engine 720, Superivsor Engine 32, and Supervisor Engine 2 for the list of the modules that support TDR.

In the event of an open or shorted cable, the accuracy of length of where the cable is open or shorted is plus or minus 2 meters.

The pair length can be displayed in meters (m), centimeters (cm), or kilometers (km).

If the TDR test has not been run on the port, the following message is displayed:

```
TDR test was never run on Gi2/12
```

Examples

This example shows how to display the information about the TDR test:

```
Router# show cable-diagnostics tdr interface gigabitethernet 8/1
TDR test last run on: February 25 11:18:31
Interface Speed Pair Cable length        Distance to fault   Channel Pair status
--------- ----- ---- ------------------- ------------------- ------- ------------
Gi8/1     1000  1-2  1    +/- 6  m       N/A                 Pair B  Terminated
                3-4  1    +/- 6  m       N/A                 Pair A  Terminated
                5-6  1    +/- 6  m       N/A                 Pair C  Terminated
                7-8  1    +/- 6  m       N/A                 Pair D  Terminated
```

The table below describes the fields in the **showcable-diagnosticstdr**command output.

Table 8: show cable-diagnostics tdr Command Output Fields

Field	Description
Interface	Interface tested.
Speed	Current line speed.
Pair	Local pair name.
Cable Length	Cable length and accuracy. The accuracy unit is displayed in meters (m), centimeters (cm), or kilometers (km).
Channel	Pair designation.
Pair status	Pair status displayed is one of the following: • Terminated--The link is up. • Shorted--A short is detected on the cable. • Open--An opening is detected on the cable. • Not Completed--The test on the port failed. • Not Supported--The test on the port is not supported. • Broken--The pair is bad--either open or shorted. • ImpedanceMis--The impedance is mismatched. • InProgress--The diagnostic test is in progress.

Related Commands

Command	Description
clear cable-diagnostics tdr	Clears a specific interface or clear all interfaces that support TDR.
test cable-diagnostics	Tests the condition of 10-Gigabit Ethernet links or copper cables on 48-port 10/100/1000 BASE-T modules.

show card-protection CPGN detail

To verify card protection configuration, use the **show card-protection CPGN detail** command.

Syntax Description

Syntax Description:

There are no keywords.

Command Default

There is no default.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
XE Everest 16.7.1	This command was integarted into the Cisco NCS 4200 Series and Cisco ASR 900 Series.

Examples

Example:

```
#show card-protection 4 detail
Working(0/1:  ):
    Number of LOS Alarms:0
    ok,Active
    1:1, non-revertive

    Protect(0/2: ):
    Number of LOS Alarms:0
    ok,Inactive
    1:1, non-revertive

Revert Timer : (Not Started)
Last switchover reason: Serdes
```

show catalyst6000

To display the information about the chassis, use the **show catalyst6000** command in user EXEC or privileged EXEC mode.

show catalyst6000 {**all** | **chassis-mac-address** | **switching-clock** | **traffic-meter**}

Syntax Description

all	Displays the MAC-address ranges and the current and peak traffic-meter reading.
chassis-mac-address	Displays the MAC-address range.
switching-clock	Displays the failure recovery mode of the switching clock.
traffic-meter	Displays the percentage of the backplane (shared bus) utilization.

Command Default

The default is **all**

Command Modes

User EXEC (>) 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.
12.2(33)SXI	The output of the **show catalyst6000 traffic-meter** command was changed to include traffic monitor status information.

Usage Guidelines

If you enter the **switching-clock** keywords, the output displays whether switching of the redundant clock sources on the backplane is allowed if the active clock source fails.

There are either 64 or 1024 MAC addresses that are available to support the software features. You can enter the **show catalyst6000 chassis-mac-address** command to display the MAC-address range on your chassis.

In Cisco IOS Release 12.2(33)SXI and later releases, the traffic monitor status information is displayed in the output. In earlier releases, only the current and peak traffic-meter readings are displayed.

Examples

This example shows how to display the MAC-address ranges and the current and peak traffic-meter readings:

```
Router>
show catalyst6000 all
chassis MAC addresses: 64 addresses from 0001.6441.60c0 to 0001.6441.60ff
  traffic meter =   0%  Never cleared
           peak =   0%  reached at 08:14:38 UTC Wed Mar 19 2003
  switching-clock: clock switchover and system reset is allowed
Router>
```

This example shows how to display the MAC-address ranges:

```
Router#
show catalyst6000 chassis-mac-address
chassis MAC addresses: 1024 addresses from 00d0.004c.1800 to 00d0.004c.1c00
Router#
```

The following example shows how to display the current and peak traffic-meter readings and the traffic monitor status:

```
Router
>
show catalyst6000 traffic-meter
traffic meter =   0%  Never cleared
           peak =   0%        reached at 10:54:49 UTC Wed Mar 19 2008
     ------ Traffic Utilization Monitor Status ===---
            State  Interval  Threshold  MsgCount  LastMsgTime
-------------------------------------------------------------------------------
Backplane    Off      60s       80%         0     --
Fpoe#0  In   Off      60s       80%         0     --
       out   Off      60s       80%         0     --
Fpoe#1  In   Off      60s       80%         0     --
       out   Off      60s       80%         0     --
Fpoe#2  In   Off      60s       80%         0     --
       out   Off      60s       80%         0     --
Fpoe#3  In   Off      60s       80%         0     --
       out   Off      60s       80%         0     --
Fpoe#4  In   Off      60s       80%         0     --
       out   Off      60s       80%         0     --
.
.
.
Fpoe#19 In   Off      60s       80%         0     --
       out   Off      60s       80%         0     --
Router
>
```

This example shows how to display the failure recovery mode of the switching clock:

```
Router> show catalyst6000 switching-clock
switching-clock: clock switchover and system reset is allowed
Router>
```

Related Commands

Command	Description
monitor traffic-utilbackplane	Enables the backplane traffic utilization monitor or sets the traffic monitor interval.
monitor traffic-util fpoe	Sets the fabric channel traffic utilization monitor to generate SYSLOG messages.
show environment alarm	Displays the information about the environmental alarm.
show fm summary	Displays a summary of FM Information.
show environment status	Displays the information about the operational FRU status.

show cem

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

show cem {*slot* */port* */channel* | **summary**}

Syntax Description

slot	Slot number where the Circuit Emulation over IP (CEoIP) network module (NM) is installed on the networking device.
/ *port*	Port number on the CEoIP NM. The slash mark is required between the *slot* argument and the *port* argument.
/ *channel*	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 *port* argument and the *channel* argument.
summary	Displays summary CEM statistics.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.3(7)T	This command was introduced.
12.4(2)T	This command was modified. Output was modified to support enhanced adaptive clocking.

Examples

The following example shows a summary of some of the configuration parameters of the CEM channels.

```
Router# show cem summary
cem summary
cem 1/0/1 is up
Line state is up
Operational state is active
Near end ip address: 192.168.55.130, udp port: 15904
Far end ip address: 192.168.55.136, udp port: 15903
IP payload size: 144
IP dscp : 0x2E Idle pattern length: 8 , Idle Pattern: 0x55
Payload compression is disabled
Data protection is enabled
Dejitter buffer size is 120 ms
Channel clock rate is 512000 bps
CEIP header CRC is disabled
Signaling is enabled, onh:0x0 offh:0xF delay:2000 ms
Failure activation time is 2000 ms
Failure deactivation time is 2000 ms
Physical interface is T1 channelized
Ingress packets: 5044607, dropped: 0, overruns: 0, max_ipt: 3
Egress packets: 5039268, dropped: 0, lost pkts: 52792
Egress late pkts: 222
Egress overruns: 0, underruns: 0, ur_delay: 0, ur2pkt: 0
Egress pkts dropped by burst control: 0
Egress corrupt pkts rcvd: 0
```

```
cem info
30 second ingress rate 513523 bits/sec, 445 packets/sec
30 second egress rate 513100 bits/sec, 445 packets/sec
Tx interrupts: 5035243
Reorder queue flush: 3, visited: 6, max wait window: 4
Pkt-to-pkt jitter max: 141 ms, average: 2 ms, min: 0 ms
Dejitter buffer level max: 118 ms, min: 4 ms
Event history: 0x01830000 Pkts dropped by PCI burst limit: 0
```

The table below describes the significant fields shown in the display.

Table 9: show cem summary Field Descriptions

Field	Description
CEM	Displays the slot, port, and channel number of a CEM channel.
Current State	Displays the current state of a CEM channel. The state can be one of the following: • up--The channel is receiving valid packets from a source CEM channel. • down--The channel is receiving no packets (for example, the dejitter buffer is empty). • shutdown--The CEM channel has been administratively shut down.
Line State	Displays the current line state of a CEM channel. The line state can be one of the following: • up--The line is ready. • down--The line is down. A T1 or E1 line is down when the line is experiencing a physical-layer failure, such as loss of signal (LOS), loss of multiframe alignment (OOF), or alarm indication signal (AIS). A serial line is down when no cable is attached to the port.

Field	Description

Operational State	Displays the current operational state of a CEM channel. The operational state can be one of the following:
	• config-incomplete--The channel is in a config-incomplete state when any of the following conditions exist:
	  • An xconnect is not defined.
	  • A local IP address is not defined.
	  • A local UDP port is not defined.
	  • A remote UDP port is not defined.
	  • The CEM channel is administratively shut down.
	• enabled--If none of the conditions for the config-incomplete state exists, but the CEM channel is receiving no packets from the remote side, the CEM channel is in an enabled state.
	• config-mismatch--If packets are arriving from the remote side but with a different payload size, data protection setting, or compression setting, the channel is in the config-mismatch state.
	• active--The CEM channel is active if none of the conditions outlined above exist.

Payload Size	Payload size configured for the CEM channel, in bytes.
Payload Compression	Displays whether payload compression is enabled or disabled for the CEM channel.
Data protection	Displays whether data protection is enabled or disabled for the CEM channel.
MAX_IPT	Maximum time between two consecutive ingress packets
Egress late packets	Number of packets that arrive too late to be queued to the dejitter buffer. A packet identified as late packet is discarded and substituted with an idle pattern.
ur_delay	Delay in milliseconds from the last packet received to the occurrence of an underrun.
ur2pkt	Delay in milliseconds from the occurrence of an underrun to the reception of the next packet.
pkt-to-pkt-jitter max	Maximum time between two consecutive egress packets
Dejitter buffer level max	Maximum recorded level of the dejitter buffer in milliseconds.

Related Commands

Commands	Description
cem	Enters circuit emulation configuration mode.
clear cem	Clears CEM statistics.

show cem circuit

To display the circuit emulation (CEM) statistics for the configured CEM circuits, use the**showcemcircuit**command in privileged EXEC mode.

show cem circuit [*cem-group-id* | **interface** {**CEM** | **Virtual-CEM**} *slot*/*subslot*/*port* *cem-group-id* | **detail** | **summary**]

Syntax Description

cem-group-id	The group ID specified while creating the CEM group.
interface	Displays detailed statistics for a CEM group configured on the specified CEM interface.
CEM	Circuit emulation interface for the data traffic.
Virtual-CEM	Virtual CEM interface created when out-of-band clock recovery is performed on a CEoP SPA.
slot	Slot where SIP-400 is installed.
/ *subslot*	Slot where CEoP SPA is installed. The slash character is required between the*slot* argument and the *subslot* argument.
/ *port*	Port on the CEoP SPA.The slash character is required between the *subslot* argument and the *port* argument.
detail	Displays detailed statistics for all CEM groups.
summary	Displays a summary of CEM groups, as well as their operational modes.

Command Modes

Privileged EXEC(#)

Command History

Release	Modification
12.2(33)SRB	This command was introduced.
15.1(2)SNG	This command was implemented on Cisco ASR 901 Series Aggregation Services Routers.
Cisco IOS XE Everest 16.5.1	This command was implemented on the Cisco ASR 900 Series Routers, Cisco ASR 920 Routers and Cisco NCS 4200 Series.
15.1(2)SNG	This command was implemented on Cisco ASR 901 Series Aggregation Services Routers.

Examples

The following is sample output from the **show cem circuit** command:

```
Router# show cem circuit
CEM Int.       ID   Ctrlr     Admin     Circuit         AC
---------------------------------------------------------------
CEM0/0         0    UP        UP        Enabled         UP
CEM0/1         1    UP        UP        Enabled         UP
CEM0/2         2    UP        UP        Enabled         UP
```

```
CEM0/3          3    UP         UP         Enabled         UP
CEM0/4          4    UP         UP         Enabled         UP
CEM0/5          5    UP         UP         Enabled         UP

Router# show cem circuit 5
CEM0/5, ID: 5, Line: UP, Admin: UP, Ckt: Enabled
Controller state: up
Idle Pattern: 0xFF, Idle cas: 0x8
Dejitter: 4, Sample Rate: 1, Payload Size: 192
Framing: Framed, (DS0 channels: 1-24)
CEM Defects Set
None
Signalling: No CAS
RTP: No RTP
Ingress Pkts:    527521938            Dropped:             0
Egress Pkts:     527521938            Dropped:             0
CEM Counter Details
Input Errors:    0                    Output Errors:       0
Pkts Missing:    0                    Pkts Reordered:      0
Misorder Drops:  0                    JitterBuf Underrun:  0
Error Sec:       0                    Severly Errored Sec: 0
Unavailable Sec: 0                    Failure Counts:      0
Pkts Malformed:  0
```

The following example shows output of the **showcemcircuit**command with the **detail** keyword.

```
Router# show cem circuit detail
CEM2/0/0, ID: 0, Line: UP, Admin: UP, Ckt: ACTIVE
Controller state: up, T1/E1 state: up
Idle Pattern: 0xFF, Idle CAS: 0x8
Dejitter: 5 (In use: 0)
Payload Size: 120
Framing: Framed (DS0 channels: 1-15)
CEM Defects Set
Excessive Pkt Loss Rate Packet Loss
Signalling: No CAS
RTP: No RTP
Ingress Pkts:    715207               Dropped:             0
Egress Pkts:     0                    Dropped:             0
CEM Counter Details
Input Errors:    0                    Output Errors:       0
Pkts Missing:    715234               Pkts Reordered:      0
Misorder Drops:  0                    JitterBuf Underrun:  1
Error Sec:       0                    Severly Errored Sec: 0
Unavailable Sec: 716                  Failure Counts:      1
Pkts Malformed:  0                    JitterBuf Overrun:   0
CEM2/0/0, ID: 1, Line: UP, Admin: UP, Ckt: ACTIVE
Controller state: up, T1/E1 state: up
Idle Pattern: 0xFF, Idle CAS: 0x8
Dejitter: 5 (In use: 0)
Payload Size: 128
Framing: Framed (DS0 channels: 16-31)
CEM Defects Set
Excessive Pkt Loss Rate Packet Loss
Signalling: No CAS
RTP: No RTP
Ingress Pkts:    2306                 Dropped:             0
Egress Pkts:     0                    Dropped:             0
CEM Counter Details
Input Errors:    0                    Output Errors:       0
Pkts Missing:    2306                 Pkts Reordered:      0
Misorder Drops:  0                    JitterBuf Underrun:  1
Error Sec:       0                    Severly Errored Sec: 0
```

```
Unavailable Sec: 0                    Failure Counts:      1
Pkts Malformed:  0                    JitterBuf Overrun:   0
```

The table below describes significant fields shown in the **showcemcircuit** command display.

Table 10: show cem circuit Field Descriptions

Field	Description
CEM	Displays the slot, port, and channel number of a CEM channel.
ID	Displays the value assigned to the CEM group while creating the CEM group.
Controller State	Displays the current state of the controller that represents the CEoP SPA.
Idle Pattern	Specifies the idle pattern that is transmitted on the physical link for any CEM packets that are lost or dropped.
Idle CAS	Specifies the default Channel Associated Signalling (CAS) pattern that is transmitted in the CAS bits of the outgoing T1/E1 frames.
Dejitter	Specifies the size of the dejitter buffer used to compensate for variable network delays experienced by CEM packets.
Payload Size	Specifies the number of payload bytes encapsulated into a single CEM packet.
Framing	Specifies whether the CEM group is framed (CESoPSN) or unframed (SAToP).
CEM Defects Set	Lists the defects that are currently active for the specified CEM group.
CEM Counter Details	Lists the various counters for the CEM group.
Pkts Missing	Specifies the total number of missing packets on the CEM group.
Pkts Reordered	Specifies the number of packets that are arrived out of order on the egress node of the CEM pseudowire and successfully reordered by the CEoP SPA.
Pkts Malformed	Specifies the number of CEM packets that are detected as malformed and dropped.
Misorder Drops	Specifies the number of packets that are dropped because they arrived out of order and could not be reordered.
JitterBuf Underrun	Specifies the number of times the CEoP SPA searches the dejitter buffer for a CEM packet and fails.
JitterBuf Overrun	Specifies the number of times a CEM packet arrived from the pseudowire is not accommodated in the dejitter buffer because the buffer is full.
Error Sec	Specifies the number of seconds in which any missing packet, reorder packet, jitter buffer underrun, misorder dropped packet, or malformed packet is detected.
Severly Errored Sec	Specifies the number of seconds in which more than one percent of the received CEM packets are lost.
Unavailable Sec	Specifies the number of seconds for which the CEM circuit is down due to a fault condition.

Field	Description
Failure Counts	Specifies the number of times the CEM circuit entered into the packet loss state.

show chassis

To display processor and memory information, use the **showchassis** command in privileged EXEC mode.

show chassis [**clocks** | **slot** *slot-number* [**detail**] | **split** | **detail**]

Syntax Description

clocks	(Optional) Displays trunk (T1/E1) clock information.
slot *slot-number*	(Optional) Displays slot-specific information.
split	(Optional) Displays split-related data.
detail	(Optional) Displays slot information

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(2)XB1	This command was introduced on the Cisco AS5850 universal gateway.
12.2(11)T	This command was integrated into Cisco IOS Release 12.2(11)T.
15.0(1)M	This command was modified in a release earlier than Cisco IOS Release 15.0(1)M. The **detail** keyword was added. The **clocks** and **split** keywords were removed.

Usage Guidelines

You must enter this command from one of the route-switch-controller (RSC) cards.

Use the **showchassis** command to display additional output relevant to handover-split mode. Command output shows the RSC card to be configured with all slots of the entire chassis, regardless of configured ownership. Slots owned by the peer RSC are shown in the ignore state, properly configured and ready to go.

Examples

The following example shows output for a system in handover-split mode. Each RSC is shown to be configured with all slots in the entire chassis, regardless of whether the RSC actually owns the slot. Slots that are not owned by an RSC are shown to be in the ignore state. The RSC from which the command is entered owns slots 0 to 5, but has configured for it all slots (0 to 5 and 8 to 13--all slots except those in which the RSCs are inserted). Entries for slots 8 and 10 show the designator "ignore."

```
Router# show chassis
System is in handover-split mode, RSC in slot 6.
!
  Slots owned: 0 1 2 3 4 5
  Slots configured: 0 1 2 3 4 5 8 9 10 11 12 13
  Slots owned by other: 8 9 10 11 12 13
Slot    Board        CPU       DRAM              I/O Memory        State     Elapsed
        Type         Util      Total (free)      Total (free)                Time
5       UP324        0%/0%     26814176( 20%)    33554432( 45%)    Up        01:02:54
8       CT3_UP216    0( 0%)    0( 0%)                              Ignore    01:05:19
10      UP324        0( 0%)    0( 0%)                              Ignore    01:05:19
```

The following example shows output for a system in classic-split mode. The RSC from which the command is entered owns slots 0 to 5, and has configured for it only those same slots 0 to 5.

```
Router# show chassis
System is in classic-split mode, RSC in slot 6.
  Slots owned: 0 1 2 3 4 5
  Slots configured: 0 1 2 3 4 5
  Slots owned by other: 8 9 10 11 12 13
```

The following example shows details for the card in slot 0:

```
Router# show chassis slot 0
Slot: 0, Type: 24 E1 Ports (700)
CPU utilization: 0%/0% (5 secs); 0% (1 min); 0% (5 mins)
Memory: Total(b) Used(b) Free(b) Lowest(b) Largest(b)
Processor 59304928 16307688 42997240 42817836 42819352
I/O 67108864 8200288 58908576 58515056 58515004
State: IOS up; elapsed time in state: 13:28:35
Flags:
FB_FLAGS_PRESENT
FB_FLAGS_LINECARD
FB_FLAGS_ANALYZED
FB_FLAGS_CHECKPOINT
Inserted: 13:39:30 ago
Last update: 00:00:08 ago
```

The table below describes significant fields shown in this output.

Table 11: show chassis Fields Descriptions

Field	Description
Slot	Slot number.
Type	Card type.
CPU utilization	CPU usage in percentages.
Memory	Current processor and I/O memory values.
State	Current state of slot and time in hours, minutes, and seconds that the slot has spent in current state.
Flags	Displays a sequence of flag states that the slot has been through.
Inserted	Time in hours, minutes, and seconds since the slot was inserted into the chassis.
Last Update	Time in hours, minutes, and seconds since the last update message was sent.

Related Commands

Command	Description
show dial-shelf	Displays information about dial shelves.

show class cem

T o display the cem parameters configured for CEM class, use the **showclasscem**commandin privilege exec mode. A CEM class helps in configuring parameters in a template and applying parameters at the CEM interface level on a CEOPS SPA.

show class cem [**name** | **all** | **detail**]

Syntax Description

name	Indicates the class name, specific to which the CEM parameter details are displayed.
all	Displays the CEM parameter configuration details for all the classes.
detail	Displays CEM parameters configured and additionally provides the circuits and interfaces inheriting the respective class.

Command Default

No default behavior or values.

Command Modes

Privilege Exec Mode (Exec)

Command History

Release	Modification
Cisco IOS XE Release 3.3.0S	This command was introduced.

Usage Guidelines

The **showclasscem**command has been introduced on Cisco ASR 1000 Series Router in Cisco IOS XE Release 3.3. The **showclasscem***name* command is used to view the CEM parameters configured for a specific classname. To view the CEM parameters configured for all the CEM classes, use the **showclasscemall** command. To view the circuits and interfaces inheriting the class and the CEM parameters configured, use the **showclasscemdetail** command from privilege exec mode.

Examples

The following example shows the command output for class parameters configured for a specific class name:

```
Router# show class cem cemqos
Class: DUMMY, Dummy mode: user-defined, Dummy Pattern: 0x77
Class: 0/2/0
Dejitter: 320, Payload Size: 960
```

The following example shows the command output providing details of parameters configured for all the classes and additionally shows the interfaces and circuits inheriting the class:

```
Router# show class cem detail
Class: DUMMY, Dummy mode: user-defined, Dummy Pattern: 0x77
Circuits inheriting this Class:
 None
Interfaces inheriting this Class:
 None
Class: 0/2/0
Dejitter: 320, Payload Size: 960
Circuits inheriting this Class:
 None
```

```
Interfaces inheriting this Class:
 None
```

The following example shows the command output providing details of parameters configured for all the classes:

```
Router# show class cem all

Class: cemqos         , Dummy mode: last-frame
Dejitter: 20, Payload Size: 256
Router#show inter
Router#show interfaces cem 0/1/0
CEM0/1/0 is up, line protocol is up
  Hardware is Circuit Emulation Interface
  MTU 1500 bytes, BW 155520 Kbit/sec, DLY 0 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation CEM, loopback not set
  Keepalive not supported
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/375/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/0 (size/max)
  5 minute input rate 1022000 bits/sec, 745 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     2851672 packets input, 215070144 bytes, 0 no buffer
     Received 0 broadcasts (0 IP multicasts)
     0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 unknown protocol drops
```

Related Commands

Command	Description
clear interface cem	Clears the cem channel.

show compress

To display compression statistics, use the **showcompress** command in user EXEC or privileged EXEC mode.

show compressshow compress command

Syntax Description

This command has no arguments or keywords.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
10.0	This command was introduced.
11.3	An example for hardware compression was added as implemented in the Canadian Standards Association (CSA) hardware.
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 is a sample output from the **showcompress** command when software compression is used on the router:

```
Router# show compress
Serial0
uncompressed bytes xmt/rcv 10710562/11376835
1  min avg ratio xmt/rcv 2.773/2.474
5  min avg ratio xmt/rcv 4.084/3.793
10 min avg ratio xmt/rcv 4.125/3.873
no bufs xmt 0 no bufs rcv 0
resets 0
```

The table below describes the fields shown in the display.

*Table 12: **show compress** Field Descriptions--Software Compression*

Field	Description
Serial0	Name and number of the interface.
uncompressed bytes xmt/rcv	Total number of uncompressed bytes sent and received.
1 min avg ratio xmt/rcv 5 min avg ratio xmt/rcv 10 min avg ratio xmt/rcv	Static compression ratio for bytes sent and received, averaged over 1, 5, and 10 minutes.
no bufs xmt	Number of times buffers were not available to compress data being sent.
no bufs rcv	Number of times buffers were not available to uncompress data being received.

Field	Description
resets	Number of resets (for example, line errors could cause resets).

The following is a sample output from the **showcompress** command when hardware compression is enabled (that is, compression is implemented in the CSA hardware):

```
Router# show compress
 Serial6/1
     Hardware compression enabled
     CSA in slot3 in use
     Compressed bytes sent:     402 bytes     0 Kbits/sec    ratio: 4.092
     Compressed bytes recv:     390 bytes     0 Kbits/sec    ratio: 3.476
     restarts:1
     last clearing of counters: 1278 seconds
```

The table below describes the fields shown in the display. The information displayed by the **showcompress** command is the same for hardware and distributed compression. For Cisco 7200 series routers with multiple CSAs, an additional line is displayed indicating the CSA in use.

Table 13: show compress Field Descriptions--Hardware or Distributed Compression

Field	Description
Serial6/1	Name and number of the interface.
Hardware compression enabled	Type of compression.
CSA in slot3 in use	Identifies the CSA that is performing compression service.
Compressed bytes sent	Total number of compressed bytes sent including the kilobits per second.
Compressed bytes recv	Total number of compressed bytes received including the kilobits per second.
ratio	Compression ratio for bytes sent and received since the link last came up or since the counters were last cleared.
restarts	Number of times the compression process restarted or reset.
last clearing of counters	Duration since the last time the counters were cleared with the **clearcounters**command.

Related Commands

Command	Description
compress	Configures compression for LAPB, PPP, and HDLC encapsulations.

show controllers c3794

To display information about configuration of C37.94 controller, use the **show controllers c3794** command in global configuration mode.

Cisco 900 Series Routers
controllers c3794 *slot/sub-slot/port*

Syntax Description

c3794	Controller type
slot	Backplane slot number. The slot number for C37.94 controller is always 0.
sub-slot	Physical sub-slot number. The range for sub-slot is 0-5.
port	Port number of the controller. Valid numbers are 0 and 3. A forward slash mark (/) is required between the slot argument and the port argument.

Command Modes

Global configuration

Command History

Release	Modification
3.18.1SP	This command was introduced.

Usage Guidelines

This command displays controller status. The information displayed is generally useful for diagnostic tasks performed by technical support personnel only. The command is used to display:

- Number of channels configured
- Number of channels received from tele-protection equipment
- Loss of Signal, if any
- Number of times LOS was set and cleared
- Path of Yellow, if any
- Number of times yellow alarm was set and cleared

Examples

The following is sample output from the **showcontrollers c3794** command on the Cisco 900 Series Router:

```
Router# show controllers c3794
C3794 0/0/0 - (A900-IMA4C3794) is up
Configured Channels: 12
Peer Channels      : 12
Alarm                              : Nil
Sending Y-Alarm to Peer Device     : No
Receiving Y-Alarm from Peer Device : No
```

show controller dsl

To display the DSL controller status and the statistics of a DSL port, use the **showcontrollerdsl** command in privileged EXEC mode.

show controller dsl *slot/port*

Syntax Description

slot	Slot number of the DSL controller.
/ *port*	Port number of the DSL controller. The slash (/) character is required and must be entered when specifying the slot and port arguments.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.3(4)XD	This command was introduced on Cisco 2600 series and Cisco 3700 series routers.
12.3(4)XG	This command was integrated into Cisco IOS Release 12.3(4)XG on the Cisco 1700 series routers.
12.3(7)T	This command was integrated into Cisco IOS Release 12.3(7)T on Cisco 2600 series, Cisco 3631, and Cisco 3700 series routers.
12.3(11)T	This command was implemented on Cisco 2800 and Cisco 3800 series routers.
12.3(14)T	This command was implemented on Cisco 1800 series routers.

Usage Guidelines

This command is used to display the controller mode of the controller in the specified slot and port and to display the statistics. Use this command in troubleshooting. Use the Cisco IOS help to find the valid slot and port numbers.

Examples

Display for DSL Controller Configured in ATM 4-Wire Mode

The following example displays the status and statistics of the DSL controller in slot 1 and port 0 configured in ATM 4-wire mode:

```
Router# show controller dsl 1/0
 DSL 1/0 controller UP
 Globespan xDSL controller chipset
 DSL mode:SHDSL Annex B
 Frame mode:Utopia
 Configured Line rate:4608Kbps
 Line Re-activated 0 times after system bootup
 LOSW Defect alarm:ACTIVE
 CRC per second alarm:ACTIVE
 Line termination:CO
 FPGA Revision:0xAD
Line 0 statistics
        Current 15 min CRC:0
        Current 15 min LOSW Defect:0
        Current 15 min ES:0
```

```
        Current 15 min SES:0
        Current 15 min UAS:41
        Previous 15 min CRC:0
        Previous 15 min LOSW Defect:0
        Previous 15 min ES:0
        Previous 15 min SES:0
        Previous 15 min UAS:0
Line 1 statistics
        Current 15 min CRC:0
        Current 15 min LOSW Defect:0
        Current 15 min ES:0
        Current 15 min SES:0
        Current 15 min UAS:30
        Previous 15 min CRC:0
        Previous 15 min LOSW Defect:0
        Previous 15 min ES:0
        Previous 15 min SES:0
        Previous 15 min UAS:0
 Line-0 status
 Chipset Version: 1
 Firmware Version: A29733
 Modem Status: Data, Status 1
 Last Fail Mode: No Failure status:0x0
 Line rate: 2312 Kbps
 Framer Sync Status:In Sync
 Rcv Clock Status:In the Range
 Loop Attenuation: 0.600 dB
 Transmit Power: 8.5 dB
 Receiver Gain: 21.420 dB
 SNR Sampling: 39.3690 dB
 Line-1 status
 Chipset Version: 1
 Firmware Version: A29733
 Modem Status: Data, Status 1
 Last Fail Mode: No Failure status:0x0
 Line rate: 2312 Kbps
 Framer Sync Status:In Sync
 Rcv Clock Status:In the Range
 Loop Attenuation: 0.600 dB
 Transmit Power: 8.5 dB
 Receiver Gain: 21.420 dB
 SNR Sampling: 39.1570 dB
 Dying Gasp:Present
```

Display for DSL Controller Configured in T1 Mode

This example shows the display of a DSL controller that has been configured in T1 mode.

```
Router# show controller dsl 0/0
 DSL 0/0 controller UP
 SLOT 0:Globespan xDSL controller chipset
 Line Mode:Two Wire
 DSL mode:SHDSL Annex A
 Frame mode:T1
 Line Re-activated 0 times after system bootup
 LOSW Defect alarm:ACTIVE
 CRC per second alarm:ACTIVE
 Line termination:CPE
 FPGA Revision:0xA9
        Current 15 min CRC:5
        Current 15 min LOSW Defect:0
```

```
        Current 15 min ES:1
        Current 15 min SES:0
        Current 15 min UAS:570
        Previous 15 min CRC:0
        Previous 15 min LOSW Defect:0
        Previous 15 min ES:0
        Previous 15 min SES:0
        Previous 15 min UAS:0
 Line-0 status
 Chipset Version: 1
 Firmware Version: A29733
 Modem Status: Data, Status 1
 Last Fail Mode: No Failure status:0x0
 Line rate: 1552 Kbps
 Framer Sync Status:In Sync
 Rcv Clock Status:In the Range
 Loop Attenuation: 0.7800 dB
 Transmit Power: 7.5 dB
 Receiver Gain: 22.5420 dB
 SNR Sampling: 35.6120 dB
 Dying Gasp:Present
```

Annex Display When Line Is Trained

The following example shows the DSL controller annex display when the line is trained:

```
Router# show controller dsl 1/0
 DSL 1/0 controller UP
 SLOT 0: Globespan xDSL controller chipset
 DSL mode: SHDSL Trained with Annex B-ANFP
```

Annex Display When Line Is Not Trained

The following example shows the DSL controller annex display when the line is not trained:

```
Router# show controller dsl 1/0
 DSL 1/0 controller DOWN
 SLOT 0: Globespan xDSL controller chipset
 DSL mode: Not trained
```

The following table describes the significant fields of the **showcontrollerdsl** command.

Table 14: show controller dsl Field Descriptions

Field	Description
DSL ... controller ...	Describes the status of the controller in the indicated slot number.
DSL mode	Displays the DSL mode of the controller.
Frame mode	Displays the frame mode of the controller.
Configured Line rate	Displays the line rate.
LOSW Defect alarm	Displays the status of the LOSW alarm.

Field	Description
CRC per second alarm	Displays the status of the CRC per second alarm.
Line termination	Displays how the line is terminated.
Chipset Version	Displays the version of the chipset.
Firmware Version	Displays the version of the firmware.
Modem Status	Displays the status of the modem.
Last Fail Mode	Displays the last fail mode.
Line rate	Displays the line rate.
Framer Sync Status	Displays the framer synchronization status.
Rcv Clock Status	Displays the revision clock status.
Loop Attenuation	Displays the loop attenuation.
Transmit Power	Displays the transmit power.
Receiver Gain	Displays the receiver gain.
SNR Sampling	Displays the signal-to-noise ratio sampling.

Related Commands

Command	Description
controller dsl	Configures the controller status and the controller number.

show controller vdsl

To display VDSL controller related information, use the **showcontrollervdsl** command in privileged EXEC mode.

show controller vdsl *slot/subslot/portnumber* [**bit-alloc** | **brief** | **console** | **crash** | **datapath** | **delt-data**| **detailed** | **gain-nsc** | **ipc** | **regs**]

Syntax Description

slot/subslot/port number	Slot, subslot, and port number on the VDSL interface.
bit-alloc	(Optional) Displays bit allocation NSC information.
brief	(Optional) Displays brief information only.
console	(Optional) Displays the console buffer.
crash	(Optional) Displays the CPU crash log.
datapath	(Optional) Displays total datapath information.
delt-data	(Optional) Displays the results of the **delt** command.
detailed	(Optional) Displays all detailed information.
gain-nsc	(Optional) Displays gain NSC information.
ipc	(Optional) Displays ipc statistics.
regs	(Optional) Displays the registers.

Command Default

No default behavior or values

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
15.0(1)M1	This command was introduced.

Examples

The following example shows output for this command:

```
router# show controller vdsl 0/0/0
Controller VDSL 0/0/0 is UP
Daemon Status:           Up
                       XTU-R (DS)              XTU-C (US)
Chip Vendor ID:        'BDCM'                   'BDCM'
Chip Vendor Specific:  0x0000                   0x0000
Chip Vendor Country:   0xB500                   0xB500
Modem Vendor ID:       'CSCO'                   'BDCM'
Modem Vendor Specific: 0x4602                   0x0000
Modem Vendor Country:  0xB500                   0xB500
Serial Number Near:    FHH1327000CCISCO00000000
Serial Number Far:
```

```
Modem Version Near:    12.4(20090721:202255) [rahuld-t
Modem Version Far:     0x0000
Modem Status:            TC Sync (Showtime!)
DSL Config Mode:         AUTO
Trained Mode:            G.993.2 (VDSL2)
TC Mode:                 PTM
DELT configuration:      disabled
DELT state:              not running
Trellis:                 ON                       OFF
Line Attenuation:         0.0 dB                  0.0 dB
Signal Attenuation:       0.0 dB                  0.0 dB
Noise Margin:             8.3 dB                  8.2 dB
Attainable Rate:        78548 kbits/s           37743 kbits/s
Actual Power:            10.3 dBm                 8.8 dBm
Per Band Status:        D1      D2      D3      U0      U1      U2      U3
Line Attenuation(dB):   0.1     0.9     N/A     2.2     3.5     8.5     N/A
Signal Attenuation(dB): 0.1     0.9     N/A     N/A     3.1     7.8     N/A
Noise Margin(dB):       8.3     8.2     N/A     N/A     8.2     N/A     N/A
Total FECS:             0                        0
Total ES:               0                        4
Total SES:              0                        4
Total LOSS:             0                        0
Firmware        Source          File Name (version)
--------        ------          -------------------
VDSL            embedded        VDSL_LINUX_DEV_01212008 (1)
Modem FW  Version:      090706_1252-4.02L.01.AvC011b.d21j1
Modem PHY Version:      AvC011b.d21j1
                  DS Channel1     DS Channel0   US Channel1       US Channel0
Speed (kbps):              0           72607             0             37425
Reed-Solomon EC:           0               0             0                 0
CRC Errors:                0               0             0                 0
```

The table below describes the significant fields of the **showcontrollervdsl** command.

Table 15: show controller vdsl Field Descriptions

Field	Description
Daemon Status	Current state of the VDSL daemon, the application that controls the VDSL2 line and the modem state. The VDSL2 daemon can transition through the following states: Reload, Start, Boot Init, Boot Code Download, Firmware Download, DSL Mgmt Task Init, Admin State Check, Configuration, Establishing Link, DSL Line Ready, and Up. The VDSL2 daemon is in the “Up” state when the line reaches showtime.
Chip Vendor ID	Identification code for the chipset vendor, made up of four ASCII characters. For example, BDCM stands for Broadcom.
Chip Vendor Specific	Chipset vendor-specific code made up of four hexadecimal digits as specified in ITU standard. This field is used for ITU standard modes exclusively.
Chip Vendor Country	Country code where the vendor is located. This field is used for ITU standard modes exclusively.
Modem Vendor ID	Identification code for the modem equipment vendor, made up of four ASCII characters. For example, CSCO stands for Cisco.
Modem Vendor Specific	Modem equipment vendor specific code made up of four hexadecimal digits.

Field	Description
Modem Vendor Country	Country code where the modem system vendor is located. This field is used for ITU standard modes exclusively.
Serial Number Near	Serial identification number, which is made up of 11 characters for serial number, 8 characters for platform id, and 11 characters for the version. For example, FOC135145AS 3925-CHA 15.1(2.10)T The 11 characters for the serial number include the modem equipment serial number, modem equipment model, and modem equipment firmware version.
Serial Number Far	Serial identification number of the DSLAM is displayed if it is available from the DSLAM.
Modem Version Near	Modem equipment software version information. It is the IOS version string.
Modem Version Far	Software version of the DSLAM is displayed if it is available from the DSLAM.
Modem Status	Current state of the VDSL2 modem. It can be one of the following states: Line NOT initialized, Line Exception, Idle Request, Silent Request, Line Silent, Handshake, Line FullInit, Discovery, Training, Analysis, Exchange, No Sync, TC Sync (Showtime!), Fast Retrain, Low Power L2, Loop Diagnostics Active, Loop Diagnostics Data Exchange, Loop Diagnostics Data Request, Loop Diagnostics Complete, Resync, Test, Test Loop, Test Reverb, Test Medley, Low Power L3, or Unknown.
DSL Config Mode	VDSL2 line configuration mode. For the HWIC-1VDSL, only Auto mode is supported.
Trained Mode	ITU-T mode in which the VDSL2 line trained up. For the HWIC-1VDSL only G.993.2 (VDSL2) mode is supported.
TC Mode	Layer 2 mode for the VDSL line. For HWIC-1VDSL, only PTM mode is supported.
DELT configuration	Dual Ended Loop Test configuration status, if the feature is enabled.
DELT state	Actual State of Dual Ended Loop Test. The values can be one of the following: Successful, Failed, Not Running, In Progress, or Unknown.
Trellis	Actual State of Dual Ended Loop Test. The values can be one of the following: Successful, Failed, Not Running, In Progress, or Unknown.
Line Attenuation	Aggregate value of Line Attenuation across the subcarriers of all VDSL2 bands.
Signal Attenuation	Aggregate value of Signal Attenuation across the subcarriers of all VDSL2 bands.
Noise Margin	Aggregate value of Signal-to-Noise Ratios (SNR) values across the subcarriers of all VDSL2 bands.
Attainable Rate	Maximum net data rate, in bits, currently attainable by the CPE receiver and DSLAM transmitter.

Field	Description
Actual Power	Measured total output power when the line is trained up. When the line is down, the last measured power is given.
Line Attenuation (dB)	For a band in the downstream direction, it is the measured difference in the total power transmitted by the DSLAM (xTU-C) and the total power received by the CPE (xTU-R) over all sub-carriers of that band during initialization. For a band in the upstream direction, it is the measured difference in the total power transmitted by the xTU-R and the total power received by the xTU-C over all sub-carriers of that band during initialization.
Signal Attenuation (dB)	For a band in the downstream direction, it is the measured difference in the total power transmitted by the DSLAM(xTU-C) and the total power received by the CPE(xTU-R) over all sub-carriers of that band during Showtime. For a band in the upstream direction, it is the measured difference in the total power transmitted by the xTU-R and the total power received by the xTU-C over all sub-carriers of that band during Showtime
Noise Margin (dB)	SNR Margin is the maximum increase of the noise power (in dB) received at the xTU (xTU-R for a band in the downstream direction and xTU-C for a band in the upstream direction), such that the Bit Error Rate (BER) requirements are met for all bearer channels received at the xTU.
Total FECS	Cumulative count during which there is at least one Forward Error Correction (FEC) event on the VDSL2 line.
Total ES	Cumulative count during which there is at least one Errored Second (ES) event on the VDSL2 line.
Total SES	Cumulative count during which there is at least one Severely Errored Second (SES) event on the VDSL2 line.
Total LOSS	Cumulative count, in seconds, during which there is at least one Loss of Signal (LOS) event on the VDSL2 line.
Modem FW Version	Comprehensive firmware version information for the modem, which includes the Operating System version, the VDSL2 PHY version, and the VDSL2 driver version.
Modem PHY Version	Modem firmware Version information, which includes the VDSL2 PHY and the VDSL2 driver.
Speed (kbps)	Actual trained line rate as measured in kbps.
Reed-Solomon EC	Number of VDSL2 superframes that have at least one Reed-Solomon correction action in one of its data frames. Reed-Solomon ECs do not affect service performance.
CRC Errors	Number of superframes that have an incorrect CRC. CRC errors do affect service performance.

Related Commands

Command	Description
clear controller vdsl	Resets the VDSL line related counters.

show controllers analysis-module

To display controller information for the analysis module interface, use the **showcontrollersanalysis-module** command in user EXEC or privileged EXEC mode.

show controllers analysis-module *slot/unit*

Syntax Description

slot	Number of the router chassis slot for the network module.
/ *unit*	Number of the daughter card on the network analysis module (NAM). For NAM, always use 0. The slash (/) between the *slot* and *unit* arguments is required.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.3(4)XD	This command was introduced on the following platforms: Cisco 2600XM series, Cisco 2691, Cisco 3660, Cisco 3725, and Cisco 3745.
12.3(7)T	This command was integrated into Cisco IOS Release 12.3(7)T.
12.3(8)T4	This command was implemented on the following platforms: Cisco 2811, Cisco 2821, and Cisco 2851.
12.3(11)T	This command was implemented on the Cisco 3800 series.

Usage Guidelines

The output from this command is generally useful for diagnostic tasks performed by technical support only. Nevertheless, you can use the displayed HARDWARE STATISTICS information to obtain the receive and transmit packet statistics that are collected by the hardware controller during packet processing.

Examples

The following example shows how to display controller information for the analysis module interface when the NAM is installed in router slot 2:

```
Router# show controllers analysis-module 2/0

Interface Analysis-Module2/0
Hardware is Intel 82559 FastEthernet
IDB: 64AD5AB0, FASTSEND: 609A0494, MCI_INDEX: 0
INSTANCE=0x64AD7278
  Rx Ring entries = 64
  Rx Shadow = 0x64AD741C
  Rx Ring = 0x F7C9FE0
  Rx Ring Head = 32
  Rx Ring Last = 31
  Rx Buffer Descr = 0x F7CA420
  Rx Buffer Descr Head = 32
  Rx Buffer Descr Last = 31
  Rx Shadow (malloc) = 0x64AD741C
  Rx Ring (malloc) = 0x4F7C9FE0
  Rx Buffer Descr (malloc) = 0x4F7CA420
  Tx Ring entries = 128
  Tx Shadow = 0x64AD754C
```

```
  Tx Shadow Head = 117
  Tx Shadow Tail = 117
  Tx Shadow Free = 128
  Tx Ring = 0x F7CA860
  Tx Head = 19
  Tx Last = 18
  Tx Tail = 19
  Tx Count = 0
  Tx Buffer Descr = 0x F7CB8A0
  Tx Buffer Descr Head = 0
  Tx Buffer Descr Tail = 0
  Tx Shadow (malloc) = 0x64AD754C
  Tx Ring (malloc) = 0x4F7CA860
  Tx Buffer Descr (malloc) = 0x4F7CB8A0
CONTROL AND STATUS REGISTERS (CSR)=0x3E000000
  SCB Intr Mask    = 00
  SCB CU/RU Cmd    = 00
  SCB Intr Status  = 00
  SCB CU Status    = 01
  SCB RU Status    = 04
  SCB General Ptr  = 00000000
  PORT             = 00000000
  EEPROM           = 0008
  FLASH            = 0002
  MDI              = 1821782D
  Rx Byte Count    = 00000608
  PMDR             = 80
  FC Cmd           = 00
  FC Threshold     = 03
  Early Rx         = 00
  General Status   = 07
  General Control  = 00
PHY REGISTERS
  Register 0x00:   1000  782D  02A8  0154  0501  45E1  0003  0000
  Register 0x08:   0000  0000  0000  0000  0000  0000  0000  0000
  Register 0x10:   0203  0000  0001  0000  0000  0000  0000  0000
  Register 0x18:   0001  0000  8B10  0000  0000  0000  0000  0000
HARDWARE STATISTICS
  Rx good frames:         800
  Rx CRC:                 0
  Rx alignment:           0
  Rx resource:            0
  Rx overrun:             0
  Rx collision detects:   0
  Rx short:               0
  Tx good frames:         614125
  Tx maximum collisions:  0
  Tx late collisions:     0
  Tx underruns:           0
  Tx lost carrier sense:  164
  Tx deferred:            0
  Tx single collisions:   0
  Tx multiple collisions: 0
  Tx total collisions:    0
  FC Tx pause:            0
  FC Rx pause:            0
  FC Rx unsupported:      0
INTERRUPT STATISTICS
  CX  = 613298
  FR  = 805
  CNA = 0
RNR = 0
  MDI = 0
  SWI = 0
```

```
  FCP = 0
Receive All Multicasts = enabled
Receive Promiscuous = disabled
Loopback Mode = disabled
```

The table below describes the significant fields shown in the display.

Table 16: show controllers analysis-module Field Descriptions

Field	Description
Hardware is	Description of the chip being used.
IDB, FASTSEND	Address in router memory of the Interface Descriptor Block (IDB) and the fastsend routine.
INSTANCE	Device-specific data stored in router memory that lists the memory locations and current indexes of receive (Rx) and transmit (Tx) rings in router I/O memory.
CONTROL AND STATUS REGISTERS (CSR)	Control and status registers that are physically located on the chip itself and that are accessed by the CPU over the Peripheral Component Interconnect (PCI) bus.
PHY REGISTERS	Contents of the PHY registers. PHY is a device that interfaces the physical Ethernet line and that is located between the chip and the physical line.
HARDWARE STATISTICS	Receive (Rx) and transmit (Tx) traffic statistics collected by the chip.
INTERRUPT STATISTICS	Transmit (Tx), Receive (Rx), control, software, and flow control interrupt statistics collected by the chip.

Related Commands

Command	Description
service-module analysis-module status	Displays hardware and software status information about the NM-NAM.
show interfaces analysis-module	Displays status, traffic data, and configuration information about the analysis module interface.

show controllers cbus

To display all information under the cBus controller card including the capabilities of the card and reports controller-related failures, use the **showcontrollerscbus** command in privileged EXEC mode on the Cisco 7500 series routers.

show controllers cbus

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

Release	Modification
10.0	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.
12.4(16)	The **showcontrollerscbus** command output display was modified to allow users to monitor IPC buffer limits when **debugcbusipc** is enabled. The **showcontrollerscbus** command output display on the 7500 will now have a new line added under each VIP slot that begins with **ipcacc**. The status line indicates the current ipc accumulator value and its initial limit assigned.

Examples

Cisco 7500 Series Router with VIP2 Card Example

The following is a partial output from the **showcontrollerscbus** command on a Cisco 7500 series router with one Versatile Interface Processor version 2 (VIP2) card. This example does not show output from additional interface processors that are usually installed in a Cisco 7500 series router.

```
Router# show controllers cbus
MEMD at 40000000, 2097152 bytes (unused 2752, recarves 1, lost 0)
  RawQ 48000100, ReturnQ 48000108, EventQ 48000110
  BufhdrQ 48000138 (2849 items), LovltrQ 48000150 (42 items, 1632 bytes)
  IpcbufQ 48000158 (32 items, 4096 bytes)
  3570 buffer headers (48002000 - 4800FF10)
  pool0: 15 buffers, 256 bytes, queue 48000140
  pool1: 368 buffers, 1536 bytes, queue 48000148
  pool2: 260 buffers, 4544 bytes, queue 48000160
  pool3: 4 buffers, 4576 bytes, queue 48000168
slot1: VIP2, hw 2.2, sw 200.50, ccb 5800FF30, cmdq 48000088, vps 8192
    software loaded from system
    FLASH ROM version 255.255
    Fast Ethernet1/0/0, addr 0000.0c41.6c20 (bia 0000.0c41.6c20)
      gfreeq 48000148, lfreeq 480001D0 (1536 bytes), throttled 0
      rxlo 4, rxhi 30, rxcurr 0, maxrxcurr 0
      txq 48001A00, txacc 48001A02 (value 0), txlimit 20
    Ethernet1/1/0, addr 0000.0c41.6c28 (bia 0000.0c41.6c28)
      gfreeq 48000148, lfreeq 480001D8 (1536 bytes), throttled 0
      rxlo 4, rxhi 30, rxcurr 0, maxrxcurr 0
```

```
  txq 48001A08, txacc 48001A0A (value 0), txlimit 20
Ethernet1/1/1, addr 0000.0c41.6c29 (bia 0000.0c41.6c29)
  gfreeq 48000148, lfreeq 480001E0 (1536 bytes), throttled 0
  rxlo 4, rxhi 30, rxcurr 0, maxrxcurr 0
  txq 48001A10, txacc 48001A12 (value 0), txlimit 20
Ethernet1/1/2, addr 0000.0c41.6c2a (bia 0000.0c41.6c2a)
  gfreeq 48000148, lfreeq 480001E8 (1536 bytes), throttled 0
  rxlo 4, rxhi 30, rxcurr 0, maxrxcurr 0
  txq 48001A18, txacc 48001A1A (value 0), txlimit 20
Ethernet1/1/3, addr 0000.0c41.6c2b (bia 0000.0c41.6c2b)
  gfreeq 48000148, lfreeq 480001F0 (1536 bytes), throttled 0
  rxlo 4, rxhi 30, rxcurr 0, maxrxcurr 0
  txq 48001A20, txacc 48001A22 (value 0), txlimit 20
Ethernet1/1/4, addr 0000.0c41.6c2c (bia 0000.0c41.6c2c)
  gfreeq 48000148, lfreeq 480001F8 (1536 bytes), throttled 0
  rxlo 4, rxhi 30, rxcurr 0, maxrxcurr 0
  txq 48001A28, txacc 48001A2A (value 0), txlimit 20
Ethernet1/1/5, addr 0000.0c41.6c2d (bia 0000.0c41.6c2d)
  gfreeq 48000148, lfreeq 48000200 (1536 bytes), throttled 0
  rxlo 4, rxhi 30, rxcurr 0, maxrxcurr 0
  txq 48001A30, txacc 48001A32 (value 0), txlimit 20
Ethernet1/1/6, addr 0000.0c41.6c2e (bia 0000.0c41.6c2e)
  gfreeq 48000148, lfreeq 48000208 (1536 bytes), throttled 0
  rxlo 4, rxhi 30, rxcurr 0, maxrxcurr 0
  txq 48001A38, txacc 48001A3A (value 0), txlimit 20
Ethernet1/1/7, addr 0000.0c41.6c2f (bia 0000.0c41.6c2f)
  gfreeq 48000148, lfreeq 48000210 (1536 bytes), throttled 0
  rxlo 4, rxhi 30, rxcurr 0, maxrxcurr 0
  txq 48001A40, txacc 48001A42 (value 0), txlimit 20
```

Packet-Over_SONET Interface Processor Example

The following is a partial output from the **showcontrollerscbus** command for a Packet-Over-SONET Interface Processor (POSIP) in slot 0; its single Packet OC-3 interface is Posi0/0.

```
Router# show controllers cbus
slot0: POSIP, hw 2.1, sw 200.01, ccb 5800FF30, cmdq 48000080, vps 8192
    software loaded from flash slot0:rsp_posip.new
    FLASH ROM version 160.4, VPLD version 2.2
    Posi0/0, applique is SONET
      gfreeq 48000148, lfreeq 48000158 (4480 bytes), throttled 0
      rxlo 4, rxhi 226, rxcurr 0, maxrxcurr 186
      txq 48000160, txacc 48000082 (value 150), txlimit 150
```

Multichannel Interface Processor Example

The following is partial output from the **showcontrollerscbus** command for a Multichannel Interface Processor (MIP). Not all of the 23 channels defined on serial interface 1/0 are shown.

```
Router# show controllers cbus
slot1: MIP, hw 1.1, sw 205.03, ccb 5800FF40, cmdq 48000088, vps 8192
    software loaded from system
    T1 1/0, applique is Channelized T1
      gfreeq 48000130, lfreeq 480001B0 (1536 bytes), throttled 0
      rxlo 4, rxhi 360, rxcurr 0, maxrxcurr 3
      Serial1/0:0, txq 480001B8, txacc 48000082 (value 3), txlimit 3
      Serial1/0:1, txq 480001B8, txacc 4800008A (value 3), txlimit 3
      Serial1/0:2, txq 480001B8, txacc 48000092 (value 3), txlimit 3
```

```
Serial1/0:3, txq 480001B8, txacc 4800009A (value 3), txlimit 3
Serial1/0:4, txq 480001B8, txacc 480000A2 (value 3), txlimit 3
Serial1/0:5, txq 480001B8, txacc 480000AA (value 3), txlimit 3
Serial1/0:6, txq 480001B8, txacc 480000B2 (value 3), txlimit 3
Serial1/0:7, txq 480001B8, txacc 480000BA (value 3), txlimit 3
```

The table below describes significant fields in the per-slot part of these displays.

*Table 17: **show controllers cbus** Command--Per-Slot Field Descriptions*

Field	Description
slot1	Slot location of the specific interface processor (in this case Packet-over-SONET Interface Processor).
hw	Version number of the card.
sw	Version number of the card's internal software (in ROM).
software loaded from	Source device and file name from which the router software was loaded.
FLASH ROM version VPLD version	Version of Flash ROM.
Pos1/0, applique is SONET	Location of the specific interface and the hardware applique type (in this case a Packet OC-3 interface).
gfreeq	Location of the global free queue that is shared among similar interfaces.
lfreeq	Location of the local free queue, which is a private queue of MEMD buffers.
throttled	Number of times input packet processing has been throttled on this interface.
rxlo	Minimum number of MEMD buffers held on local free queue. When idle, the interface returns buffers from its local queue to the global free queue until only this number of buffers remain in the local queue.
rxhi	Maximum number of MEMD buffers that the interface can remove from the global free queue in order to populate its local queue.
rxcurr	Number of MEMD buffers currently on the local free queue.
maxrxcurr	Maximum number of MEMD buffers that were enqueued on the local free queue.
txq	Address of the transmit queue.
txacc	Address of the transmit queue accumulator.
txlimit	Maximum number of buffers allowed in the transmit queue.

Cisco 7500 Series Router Example

The following is sample output from the **showcontrollerscbus** command on a Cisco 7500 series router:

```
Router# show controllers cbus
cBus 1, controller type 3.0, microcode version 2.0
  128 Kbytes of main memory, 32 Kbytes cache memory
  40 1520 byte buffers, 14 4484 byte buffers
  Restarts: 0 line down, 0 hung output, 0 controller error
HSCI 1, controller type 10.0, microcode version 129.3
  Interface 6 - Hssi0, electrical interface is Hssi DTE
    5 buffer RX queue threshold, 7 buffer TX queue limit, buffer size 1520
    ift 0004, rql 2, tq 0000 0000, tql 7
    Transmitter delay is 0 microseconds
 MEC 3, controller type 5.1, microcode version 130.6
  Interface 18 - Ethernet2, station address 0000.0c02.a03c (bia 0000.0c02.a03c)
    10 buffer RX queue threshold, 7 buffer TX queue limit, buffer size 1520
    ift 0000, rql 10, tq 0000 0000, tql 7
    Transmitter delay is 0 microseconds
  Interface 19 - Ethernet3, station address 0000.0c02.a03d (bia 0000.0c02.a03d)
    10 buffer RX queue threshold, 7 buffer TX queue limit, buffer size 1520
    ift 0000, rql 10, tq 0000 0000, tql 7
    Transmitter delay is 0 microseconds
```

The table below describes the fields shown in the following lines of output.

```
cBus 1, controller type 3.0, microcode version 2.0
  128 Kbytes of main memory, 32 Kbytes cache memory
  40 1520 byte buffers, 14 4484 byte buffers
  Restarts: 0 line down, 0 hung output, 0 controller error
```

Table 18: show controllers cbus Field Descriptions--Part 1

Field	Description
cBus 1	Card type and number (varies depending on card).
controller type 3.0	Version number of the card.
microcode version 2.0	Version number of the card's internal software (in ROM).
128 Kbytes of main memory	Amount of main memory on the card.
32 Kbytes cache memory	Amount of cache memory on the card.
40 1520 byte buffers	Number of buffers of this size on the card.
14 4484 byte buffers	Number of buffers of this size on the card.
Restarts • 0 line down • 0 hung output • 0 controller error	Count of restarts for the following conditions: • Communication line down • Output unable to transmit • Internal error

The table below describes the fields shown in the following lines of output:

```
HSCI 1, controller type 10.0, microcode version 129.3
  Interface 6 - Hssi0, electrical interface is Hssi DTE
    5 buffer RX queue threshold, 7 buffer TX queue limit, buffer size 1520
```

```
ift 0004, rql 2, tq 0000 0000, tql 7
Transmitter delay is 0 microseconds
```

*Table 19: **show controllers cbus** Field Descriptions--Part 2*

Field	Description
HSCI 1	Card type and number (varies depending on card).
controller type 10.0	Version number of the card.
microcode version 129.3	Version number of the card's internal software (in ROM).
Interface 6	Physical interface number.
Hssi 0	Logical name for this interface.
electrical interface is Hssi DTE	Self-explanatory.
5 buffer RX queue threshold	Maximum number of buffers allowed in the receive queue.
7 buffer TX queue limit	Maximum number of buffers allowed in the transmit queue.
buffer size 1520	Size of the buffers on this card (in bytes).
ift 0004	Interface type code: • 0 = EIP • 1 = FSIP • 4 = HIP • 5 = TRIP • 6 = FIP • 7 = AIP
rql 2	Receive queue limit. Current number of buffers allowed for the receive queue. It is used to limit the number of buffers used by a particular inbound interface. When equal to 0, all of that interface's receive buffers are in use.
tq 0000 0000	Transmit queue head and tail pointers.
tql 7	Transmit queue limit. Current number of buffers allowed for transmit queue. It limits the maximum cBus buffers allowed to sit on a particular interface's transmit queue.
Transmitter delay is 0 microseconds	Transmitter delay between the packets.

ATM Interface Processor Example

The following is a sample output from the **showcontrollerscbus** command for an ATM Interface Processor (AIP) installed in IP slot 4. The running AIP microcode is Version 170.30, the physical layer interface module (PLIM) type is 4B/5B, and the available bandwidth is 100 Mbps:

```
Router# show controllers cbus
Switch Processor 5, hardware version 11.1, microcode version 170.46
  Microcode loaded from system
  512 Kbytes of main memory, 128 Kbytes cache memory
  60 1520 byte buffers, 91 4496 byte buffers
  Restarts: 0 line down, 0 hung output, 0 controller error
 AIP 4, hardware version 1.0, microcode version 170.30
  Microcode loaded from system
  Interface 32 - ATM4/0, PLIM is 4B5B(100Mbps)
    15 buffer RX queue threshold, 36 buffer TX queue limit, buffer size 4496
    ift 0007, rql 12, tq 0000 0620, tql 36
    Transmitter delay is 0 microseconds
```

Service Provider MultiChannel Interface Processor Example

The following is sample output from the **showcontrollerscbus** command for the Service Provider MultiChannel Interface Processor (SMIP):

```
Router# show controllers cbus
SMIP 2, hardware version 1.0, microcode version 10.0
 Microcode loaded from system
 Interface 16 - T1 2/0, electrical interface is Channelized T1
   10 buffer RX queue threshold, 14 buffer TX queue limit, buffer size 1580 ift 0001, rql
   7, tq 0000 05B0, tql 14
   Transmitter delay is 0 microseconds
```

Per-Slot Limits on IPC Example

The following example shows the current value of the IPC accumulator used for RSP-to-VIP communication along with the initial value of the IPC accumulator assigned to that particular VIP. The IPC accumulator shows the buffers for IPC packets and is analogous to the tx accumulator used for data packets.

```
Router# show controllers cbus
MEMD at E0000000, 2097152 bytes (unused 2880, recarves 1, lost/qaerror recoveries 0/0)
  RawQ E8000100, ReturnQ E8000108, EventQ E8000110, IpcackQ E8000118, VIP_CrashinfoQ E8000128

  IpcSlaveackQ E8000120
  BufhdrQ E8000150 (2893 items), LovltrQ E8000168 (64 items, 2016 bytes)
  IpcbufQ E8000178 (32 items, 4096 bytes)
  IpcbufQ_classic E8000170 (8 items, 4096 bytes)
  3569 buffer headers (E8002000 - E800FF00)
  pool0: 9 buffers, 256 bytes, queue E8000158
  pool1: 298 buffers, 1536 bytes, queue E8000160
  pool2: 261 buffers, 4544 bytes, queue E8000180
  pool3: 4 buffers, 4576 bytes, queue E8000188
  slot1: VIP2 R5K, hw 2.00, sw 22.20, ccb F800FF20, cmdq E8000088, vps 8192
    software loaded from system
    Copyright (c) 1986-2005 by Cisco Systems, Inc.
```

```
    ROM Monitor version 115.0
    ipcacc E8000082 (value 17), ipclimit 36
    FastEthernet1/0/0, addr 0050.0b35.5820 (bia 0050.0b35.5820)
      gfreeq E8000160, lfreeq E8000190 (1536 bytes)
      rxlo 4, rxhi 123, rxcurr 0, maxrxcurr 0
      txq E8001A00, txacc E8001A02 (value 0), txlimit 33
    ATM1/1/0, applique is OC3 (155000Kbps)
      gfreeq E8000180, lfreeq E8000198 (4544 bytes)
      rxlo 4, rxhi 261, rxcurr 0, maxrxcurr 0
      txq E8001A08, txacc E8001A0A (value 0), txlimit 174
  slot2: VIP4-50 RM5271, hw 2.01, sw 22.20, ccb F800FF30, cmdq E8000090, vps 8192
    software loaded from system
    Copyright (c) 1986-2005 by Cisco Systems, Inc.
    ROM Monitor version 103.0
    ipcacc E800008A (value 36), ipclimit 36
    ATM2/0/0, applique is SONET (155000Kbps)
```

show controllers cbus Display With a Filter Applied to Customize the Display

The following example shows the IPC statistics. The **showcontrollerscbus** command output display on the 7500 includes a line under the entry for each VIP slot that begins with **ipcacc**. The status line indicates the current IPC accumulator value and its initial limit assigned.

```
Router# show controllers cbus | include ipc|slot
  slot1: VIP2 R5K, hw 2.00, sw 22.20, ccb F800FF20, cmdq E8000088, vps 8192
    ipcacc E8000082 (value 6), ipclimit 36
  slot2: VIP4-50 RM5271, hw 2.01, sw 22.20, ccb F800FF30, cmdq E8000090, vps 8192
    ipcacc E800008A (value 36), ipclimit 36
  slot3: VIP2 R5K, hw 2.00, sw 22.20, ccb F800FF40, cmdq E8000098, vps 8192
    ipcacc E8000092 (value 6), ipclimit 36
```

When the IPC acc reaches 10% of the IpcbufQ limit, a rate-limited warning message will be displayed if the **debugcbusipc** comamnd is enabled:

```
%RSP-6-IPC_STUCK: Ipcacc for slot 1 has reached 7% of its Ipclimit
```

show controllers content-engine

To display controller information for content engine (CE) network modules, use the **showcontrollerscontent-engine** command in privileged EXEC mode.

show controllers content-engine *slot/unit*

Syntax Description

slot	Number of the router chassis slot for the network module.
/ *unit*	Number of the daughter card on the network module. For CE network modules, always use 0. The slash (/) character is required when specifying the *slot* and *unit* arguments.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(11)YT	This command was introduced.
12.2(13)T	This command was integrated into Cisco IOS Release 12.2(13)T.

Examples

The following example displays controller information for the CE network module in router slot 1:

```
Router# show controllers content-engine 1/0
Interface Content-Engine1/0
Hardware is Intel 82559 FastEthernet
IDB: 82A92DC4, FASTSEND: 8021B488, MCI_INDEX: 0
INSTANCE=0x82A94534
  Rx Ring entries = 64
  Rx Shadow = 0x82A947A0
  Rx Ring = 0x 3CB5160
  Rx Ring Head = 14
  Rx Ring Last = 13
  Rx Buffer Descr = 0x 3CB55A0
  Rx Buffer Descr Head = 14
  Rx Buffer Descr Last = 13
  Rx Shadow (malloc) = 0x82A947A0
  Rx Ring (malloc) = 0x 3CB5160
  Rx Buffer Descr (malloc) = 0x 3CB55A0
  Tx Ring entries = 128
  Tx Shadow = 0x82A948D0
  Tx Shadow Head = 79
  Tx Shadow Tail = 79
  Tx Shadow Free = 128
  Tx Ring = 0x 3CB59E0
  Tx Head = 81
  Tx Last = 80
  Tx Tail = 81
  Tx Count = 0
  Tx Buffer Descr = 0x 3CB6A20
  Tx Buffer Descr Head = 0
  Tx Buffer Descr Tail = 0
  Tx Shadow (malloc) = 0x82A948D0
  Tx Ring (malloc) = 0x 3CB59E0
  Tx Buffer Descr (malloc) = 0x 3CB6A20
```

```
CONTROL AND STATUS REGISTERS (CSR)=0x40800000
  SCB Intr  Mask   = 00
  SCB CU/RU Cmd    = 00
  SCB Intr  Status = 00
  SCB CU/RU Status = 50
  SCB General Ptr  = 00000000
  PORT             = 00000000
  EEPROM           = 0008
  FLASH            = 0002
  MDI              = 1821782D
  Rx Byte Count    = 00000608
  PMDR             = 80
  FC Cmd           = 00
  FC Threshold     = 03
  Early Rx         = 00
  General Status   = 05
  General Control  = 00
PHY REGISTERS
  Register 0x00:   1000  782D  02A8  0154  0441  45E1  0001  0000
  Register 0x08:   0000  0000  0000  0000  0000  0000  0000  0000
  Register 0x10:   0401  0000  0001  0000  0000  0000  0000  0000
  Register 0x18:   0000  0000  8000  0000  0000  0000  0000  0000
HARDWARE STATISTICS
  Rx good frames:         14
  Rx CRC:                 0
  Rx alignment:           0
  Rx resource:            0
  Rx overrun:             0
  Rx collision detects:   0
  Rx short:               0
  Tx good frames:         79
  Tx maximum collisions:  0
  Tx late collisions:     0
  Tx underruns:           0
  Tx lost carrier sense:  0
  Tx deferred:            0
  Tx single collisions:   0
  Tx multiple collisions: 0
  Tx total collisions:    0
  FC Tx pause:            0
  FC Rx pause:            0
  FC Rx unsupported:      0
INTERRUPT STATISTICS
  CX  = 613298
  FR  = 805
  CNA = 0
RNR = 0
  MDI = 0
  SWI = 0
  FCP = 0
  Receive All Multicasts = enabled
  Receive Promiscuous = disabled
  Loopback Mode = disabled
```

The table below describes the significant fields shown in the display.

Table 20: show controllers content-engine Field Descriptions

Field	Description
Hardware	Description of the chip being used.

Field	Description
IDB, FASTSEND	Address in router memory of the Interface Descriptor Block (IDB) and the fastsend routine.
INSTANCE	Device-specific data stored in router memory that lists the memory locations and current indices of receive (Rx) and transmit (Tx) rings in router I/O memory.
CONTROL AND STATUS REGISTERS (CSR)	Control and status registers that are physically located on the chip itself and that are accessed by the CPU over the protocol control information (PCI) bus.
PHY REGISTERS	Contents of the physical layer (PHY) registers. A PHY module is a device that interfaces the physical Ethernet line and that is located between the chip and the physical line.
HARDWARE STATISTICS	Receive (Rx) and transmit (Tx) traffic statistics collected by the chip.
INTERRUPT STATISTICS	Transmit (Tx), Receive (Rx), control, software, and flow control interrupt statistics collected by the chip.

Related Commands

Command	Description
interface content-engine	Configures an interface for a CE network module and enters interface configuration mode.
show interfaces content-engine	Displays basic interface configuration information for a CE network module.

show controllers dsx3

To display digital signal level 3 cross connect (dsx3) information and to display hardware and software driver information for the dsx3 controller, use the **showcontrollersdsx3**command in privileged EXEC mode.

show controllers dsx3 *shelf /slot/port*

Syntax Description

shelf	Shelf chassis in the Cisco 10000 series router that contains the dsx3 interface card.
/*slot*	Location of the dsx3 interface card in the shelf chassis.
/*port*	Port number.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(31)SB	This command was introduced in a release earlier to Cisco IOS Release 12.2(31)SB.
12.2(33)SB	This command's behavior was modified on the Cisco 10000 series router for the PRE3 and PRE4.

Examples

The following is a sample output show the show controller dsx3 command for 8E3DS3 card:

```
Router# show controllers dsX3 3/0/0
DSX3 3/0/0 is down.  Hardware is C10K ET line card
  ET H/W Version : 0.0.0, ET ROM Version : 0.0, ET F/W Version : 0.0.0
  Applique type is Subrate T3/E3
  Receiver has loss of signal.
  MDL transmission is disabled

  FEAC code received: No code is being received
  Framing is C-BIT Parity (Configured)
  Line Code is B3ZS, Clock Source is Internal
  DSU mode is cisco, DSU bandwidth is 44210
  equipment customer loopback
  Data in current interval (75 seconds elapsed):
     0 Line Code Violations, 0 P-bit Coding Violation
     0 C-bit Coding Violation, 0 P-bit Err Secs
     0 P-bit Severely Err Secs, 0 Severely Err Framing Secs
     75 Unavailable Secs, 0 Line Errored Secs
     0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
     0 AIS Defect Secs, 75 LOS Defect Secs
     0 Near-end path failures
     0 Far-end path failures, 0 FERF Defect Secs
     0 CP-bit Far-End Unavailable Secs, 0 Far-End Coding Violations
     0 Far-End Errored Secs, 0 Far-End Severely Errored Secs
```

The table below describes the significant fields shown in the display.

Table 21: show controllers dsx3 Field Descriptions--Cisco 10000 series router

Field	Description
AIS	The alarm indication signal (AIS).
dsx3 3/0/0 is down	dsx3 controller connected to this Cisco 10000 series router in shelf 3, slot 0, port 0 is down. The controller's state can be up, down, or administratively down. Loopback conditions are shown by Locally Looped or Remotely Looped.
Applique type	Describes the type of controller.
No alarms detected	Any alarms detected by the controller are displayed here. Possible alarms are as follows: • Receiver has loss of frame (LOF). • Receiver has loss of signal (LOS). • Receiver has no alarms. • Receiver has remote alarm. • Receiver is getting AIS. • Transmitter is sending alarm indication signal (AIS). • Transmitter is sending remote alarm.
MDL transmission	Maintenance Data Link status (either enabled or disabled). Used for carrying performance information and control signals across the network toward the far-end dsx3 unit.
FEAC code received	Whether a far-end alarm code request is being received. Possible values are as follows: • Common Eqpt. Failure (NSA) • DS1 Eqpt. Failure (NSA) • DS1 Eqpt. Failure • DS3 AIS Received • DS3 Eqpt. Failure (NSA) • DS3 Eqpt. Failure (SA) • DS3 IDLE Received • DS3 LOS/HBER • DS3 Out-of-Frame • Multiple DS1 LOS/HBER • No code is being received • Single DS1 LOS/HBER

Field	Description
Framing	Standard dsx3 framing type: M23, C-bit, or Auto-detect.
Line Code	Standard dsx3 line-coding format. In the example, the line-coding format is bipolar 3-zero substitution (B3ZS).
Clock Source	The source of the synchronization signal (clock): Line or Internal. In this example, the line is providing the clock signal.
Data in current interval (seconds elapsed)	Summary statistics for dsx3 signal quality for the current time interval of 900 seconds (15 minutes). In this example, the statistics are for current partial interval. Statistics roll into the 24-hour accumulation buffer every 15 minutes. The oldest 15-minute period falls off the back of the 24-hour accumulation buffer.
Line Code Violations	Count of both Bipolar Violations (BPVs) and Excessive Zeros (EXZs) that occur over the accumulation period. An EXZ increments the line code violations (LCVs) by one, regardless of the length of the zero string.
P-bit Coding Violation	P-bit parity error event. A P-bit parity error event is the occurrence of a received P-bit code on the DS3 M-frame that is not identical to the corresponding locally calculated code. Referred to as PCV.
C-bit Coding Violation	Count of coding violations reported via the C-bits. For C-bit parity, it is the count of CP-bit parity errors that occur during the accumulation interval. Referred to as CCV.
P-bit Err Secs	Number of seconds with one or more PCVs, one or more out-of-frame defects, or a detected incoming AIS. This gauge is not incremented when unavailable seconds are counted.
P-bit Severely Err Secs	Number of seconds with 44 or more PCVs, one or more out-of-frame defects, or a detected incoming AIS. This gauge is not incremented when unavailable seconds are counted.
Severely Err Framing Secs	Number of a seconds with one or more out-of-frame defects or a detected incoming AIS.
Unavailable Secs	Number of seconds during which the interface was not available in this interval. Referred to as UAS.
Line Errored Secs	Number of seconds in this interval during which one or more code violations or one or more LOS defects occurred. Referred to as LES.
C-bit Errored Secs	Number of seconds with one or more C-bit code violations (CCV), one or more out-of-frame defects, or a detected incoming AIS. This gauge is not incremented when UASs are counted. Referred to as CES.
C-bit Severely Errored Secs	Number of seconds with 44 or more CCVs, one or more out-of-frame defects, or a detected incoming AIS. This gauge is not incremented when UASs are counted.

show controller dwdm

To display ITU-T G.709 alarms, alerts, and counters for a dense wavelength division multiplexing (DWDM) controller, use the **showcontrollerdwdm**command in privileged EXEC mode.

show controller dwdm *slot/port* [**g709**]

Syntax Description

slot	Chassis slot number of the DWDM controller.
/ *port*	Port number of the DWDM controller.
g709	(Optional) Displays G.709 information.

Command Modes

Privileged EXEC (#)

Command History

Release	Modification
12.2(33)SRD1	This command was introduced on the Cisco 7600 series routers.

Examples

The following is sample output from the **showcontrollerdwdm**command. The output fields are self-explanatory.

```
Router# show controller dwdm 2/3

 Controller dwdm 2/3, is up (operational state)
G709 status : Enabled

OTU
        LOS = 5           LOF = 5           LOM = 0
        AIS = 0           BDI = 1           BIP = 0
        TIM = 0           IAE = 4           BEI = 0

ODU
        AIS = 0           BDI = 0           TIM = 0
        OCI = 0           LCK = 0           PTIM = 5
        BIP = 0           BEI = 0

FEC Mode: FEC
        EC(current second) = 13539920
        EC = 1750575661   UC = 1356085

        pre-FEC BER = 121981.2578E-8

         Q = 2.9677             Q Margin =  0.5052 dBQ

Detected Alarms: NONE
Asserted Alarms: NONE
Detected Alerts: NONE
Asserted Alerts: NONE
Alarm reporting enabled for: LOS LOF LOM OTU-AIS OTU-IAE OTU-BDI OTU-TIM ODU-AIS ODU-OCI
ODU-LCK ODU-BDI ODU-PTIM ODU-TIM
Alert reporting enabled for: OTU-SM-TCA ODU-SD-BER ODU-SF-BER ODU-PM-TCA
```

```
BER thresholds: ODU-SF = 10e-3  ODU-SD = 10e-6
TCA thresholds: SM = 10e-3  PM = 10e-3
```

Related Commands

Command	Description
show platform dwdm alarm history	Displays platform DWDM alarm history.

show controllers e1

To display information about E1 links, use the **showcontrollerse1**command in privileged EXEC mode.

Cisco 4000 Series Routers
show controllers e1 *controller-number*

Cisco 7500 Series Routers and Cisco ASR 901 Series Routers
show controllers e1 [*slot*/*port*]

Cisco AS5000 Series Access Servers
show controllers e1 {*controller-number* | **clock** | **firmware-status** | **monitor** | **timeslots** *timeslot-range*}

Cisco Series
show controllers e1 [*slot*/*bay*/*port*]

Syntax Description

controller-number	Controller number.
slot / *port*	(Optional) Backplane slot number and port number on the interface. Refer to the hardware manuals for your controller type to determine specific slot and port numbers.
slot / *bay* / *port*	Slot number, interface module number in which the slot is inserted, and port number (Cisco series routers).
clock	Displays primary clock change history.
firmware-status	Displays system crash history.
monitor	Displays primary monitor change history.
timeslots *timeslot-range*	Displays DS0 information. Time slot range is 1 through 31 for the E1 controller.

Command Modes

Privileged EXEC

Command History

Release	Modification
10.0	This command was introduced.
11.2	This command was implemented on additional router platforms.
12.1(3)T	This command was implemented on additional access server platforms.
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.
15.4(3)S	This command was implemented on the Cisco ASR 901 Series Aggregation Services Router.

Release	Modification
XE Everest 16.5.1	This command was implemented on the Cisco ASR 900 Series Routers and Cisco NCS 4200 Series.
XE Fuji 16.8.x	This command output was modified on the Cisco Series Routers to display far-end counters for performance monitoring.

Usage Guidelines

This command displays controller status that is specific to the controller hardware. The information displayed is generally useful for diagnostic tasks performed by technical support personnel only.

The Network Processor Module (NPM) on the Cisco 4000 series router or MultiChannel Interface Processor (MIP) on a Cisco 7500 series router can query the port adapters to determine their current status. Issue a **showcontrollerse1** command to display statistics about the E1 link.

On a Cisco 7500 series router, if you specify a slot and port number each 15-minute period will be displayed.

On the Cisco 5000 series access servers use the **showcontrollerse1timeslots** command to display the CAS and ISDN PRI channel state in detail. This command shows whether the DS0 channels of a controller are in idle, in-service, maintenance, or busyout states. Enter the commands to display statistics about the E1 links.

Examples

The following is sample output from the **showcontrollerse1** command on the Cisco 7500 series router:

```
Router# show controllers e1
e1 0/0 is up.
  Applique type is Channelized E1 - unbalanced
  Framing is CRC4, Line Code is HDB3
  No alarms detected.
  Data in current interval (725 seconds elapsed):
     0 Line Code Violations, 0 Path Code Violations
     0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
  Total Data (last 24 hours)
     0 Line Code Violations, 0 Path Code Violations,
     0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins,
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
```

The following is sample output from the **showcontrollerse1**command including the board identifier type:

```
Router#
show controllers e1
E1 4/1 is up.
  No alarms detected.
  Framing is CRC4, Line Code is hdb3
  Data in current interval (0 seconds elapsed):
     0 Line Code Violations, 0 Path Code Violations 0 Slip Secs, 0 Fr Loss Secs,
     0 Line Err Secs, 0 Degraded Mins 0 Errored Secs, 0 Bursty Err Secs,
     0 Severely Err Secs, 0 Unavail Secs
  Total Data (last 79 15 minute intervals):
     0 Line Code Violations, 0 Path Code Violations, 0 Slip Secs, 0 Fr Loss Secs,
     0 Line Err Secs, 0 Degraded Mins, 0 Errored Secs, 0 Bursty Err Secs,
     0 Severely Err Secs, 0 Unavail Secs
```

The table below describes the significant fields shown in the display.

Table 22: show controllers e1 Field Descriptions

Field	Description
e1 0/0 is up	The E1 controller 0 in slot 0 is operating. The controller's state can be up, down, or administratively down. Loopback conditions are shown by (Locally Looped) or (Remotely Looped).
Applique type	The applique type is shown and will indicate balanced or unbalanced.
Framing is	Displays the current framing type.
Linecode is	Displays the current linecode type.
No alarms detected	Any alarms detected by the controller are displayed here. Possible alarms are as follows: • Transmitter is sending remote alarm. • Transmitter is sending AIS. • Receiver has loss of signal. • Receiver is getting AIS. • Receiver has loss of frame. • Receiver has remote alarm. • Receiver has no alarms.
Data in current interval (725 seconds elapsed)	Displays the current accumulation period, which rolls into the 24-hour accumulation every 15 minutes. Accumulation period is from 1 to 900 seconds. The oldest 15-minute period falls off the back of the 24-hour accumulation buffer.
Line Code Violations	Indicates the occurrence of either a Bipolar Violation (BPV) or Excessive Zeros (EXZ) error event.
Path Code Violations	Indicates a frame synchronization bit error in the D4 and E1-no-CRC formats, or a cyclic redundancy check (CRC) error in the Extended Superframe (ESF) and E1-CRC formats.
Slip Secs	Indicates the replication or deletion of the payload bits of a DS1 frame. A slip might be performed when there is a difference between the timing of a synchronous receiving terminal and the received signal.
Fr Loss Secs	Indicates the number of seconds an Out Of Frame (OOF) error is detected.
Line Err Secs	Line Errored Seconds (LES) is a second in which one or more Line Code Violation errors are detected.
Degraded Mins	A Degraded Minute is one in which the estimated error rate exceeds 1E-6 but does not exceed 1E-3.

Field	Description
Errored Secs	In ESF and E1 CRC links, an Errored Second is a second in which one of the following are detected: one or more Path Code Violations; one or more Out of Frame defects; one or more Controlled Slip events; a detected AIS defect. For SF and E1 no-CRC links, the presence of Bipolar Violations also triggers an Errored Second.
Bursty Err Secs	A second with fewer than 320 and more than 1 Path Coding Violation error, no Severely Errored Frame defects and no detected incoming AIS defects. Controlled slips are not included in this parameter.
Severely Err Secs	For ESF signals, a second with one of the following errors: 320 or more Path Code Violation errors; one or more Out of Frame defects; a detected AIS defect. For E1-CRC signals, a second with one of the following errors: 832 or more Path Code Violation errors; one or more Out of Frame defects. For E1-nonCRC signals, a second with 2048 Line Code Violations or more. For D4 signals, a count of 1-second intervals with Framing Errors, or an Out of Frame defect, or 1544 Line Code Violations.
Unavail Secs	A count of the total number of seconds on the interface.

The following is sample output from the **showcontrollerse1timeslots** command on a Cisco access server. The information displayed is self-explanatory.

```
Router# show controllers e1 timeslots 1
SERVICE STATES                CAS CHANNEL STATES
insvc    = In Service         down       = Down
outofsvc = Out of Service     idle       = Idle
maint    = Maintenance        connected  = Call Connected
                              signaling  = Signaling
                              static-bo  = Static Busyout
                              dynamic-bo = Dynamic Busyout
                              ISDN CHANNEL STATES
                              idle       = Available
                              proposed   = Negotiating
                              busy       = Unavailable
                              reserved   = Reserved
                              restart    = Restart Pending
                              maint_pend = Maintenance Pending
                              reassigned = Reassigned
                              prop'd_1tr6= Net may change channel #
```

Series Router

The following is sample output from the **show controllers e1** command on the Cisco series routers:

```
Router# show controllers e1 0/2/1
E1 0/2/1 is up.
Hardware is -48T3E3-CE
No alarms detected.
MDL transmission is disabled
FEAC code received: No code is being received
```

```
Framing is C-BIT Parity, Line Code is B3ZS, Cablelength Short less than 225ft
BER thresholds: SF = 10e-10 SD = 10e-10
Clock Source is internal
Equipment customer loopback
Data in current interval (240 seconds elapsed):
Near End
     0 Line Code Violations, 0 Path Code Violations
     0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavailable Secs
     0 Path Failures, 0 SEF/AIS Secs
   Far End
     0 Line Code Violations, 0 Path Code Violations
     0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavailable Secs
     0 Path Failures
  Data in Interval 1:
   Near End
     0 Line Code Violations, 0 Path Code Violations
     0 Slip Secs, 0 Fr Loss Secs, 14 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 15 Unavailable Secs
     1 Path Failures, 0 SEF/AIS Secs
   Far End Data
     0 Line Code Violations, 0 Path Code Violations
     0 Slip Secs, 4 Fr Loss Secs, 2 Line Err Secs, 0 Degraded Mins
     4 Errored Secs, 0 Bursty Err Secs, 4 Severely Err Secs, 0 Unavailable Secs
     0 Path Failures
  Total Data (last 1 15 minute intervals):
   Near End
     0 Line Code Violations, 0 Path Code Violations,
     0 Slip Secs, 0 Fr Loss Secs, 14 Line Err Secs, 0 Degraded Mins,
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 15 Unavailable Secs
     1 Path Failures, 0 SEF/AIS Secs
   Far End
     0 Line Code Violations, 0 Path Code Violations,
     0 Slip Secs, 4 Fr Loss Secs, 2 Line Err Secs, 0 Degraded Mins,
     4 Errored Secs, 0 Bursty Err Secs, 4 Severely Err Secs, 0 Unavailable Secs
     0 Path Failures
```

Examples

show controllers e3

To display information about an E3 controller, use the**showcontrollerse3**command in user EXEC or privileged EXEC mode.

show controllers e3 *slot*/*port* [**brief** | **tabular**]

Series
show controllers e3 [*slot*/*bay*/*port*]

Syntax Description

slot	Slot number. Refer to the appropriate hardware manual for slot information.
/ *port*	Port number. Refer to the appropriate hardware manual for port information.
brief	(Optional) Displays a list of configurations only.
tabular	(Optional) Displays a list of configurations and MIB information in a tabular format.
slot / *bay* / *port*	Slot number, interface module number in which the slot is inserted, and port number (Cisco series routers).

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
11.1 CC	This command was introduced on the E3 controller.
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.
XE Fuji 16.8.x	This command output was modified on the Cisco ASR 900 Series and Cisco NCS 4200 Series Routers to display far-end counters for performance monitoring.

Examples

The following are samples of output from the **showcontrollerse3**command:

```
Router# show controllers e3 2/0
E3 2/0 is down.
 Applique type is Subrate E3
 Transmitter is sending remote alarm.
 Receiver has loss of signal.
 Framing is G751, Clock Source is Internal.
 Data in current interval (450 seconds elapsed):
  0 C-bit Coding Violation
  0 P-bit Err Secs, 0 P-bit Severely Err Secs
  0 Severely Err Framing Secs, 450 Unavailable Secs
  0 Line Errored Secs, 0-C-bit Errored Secs, 0 C-bit Severely Errored Secs
 Data in Interval 1:
  0 C-bit Coding Violation
  0 P-bit Err Secs, 0 P-bit Severely Err Secs
```

```
  0 Severely Err Framing Secs, 900 Unavailable Secs
  0 Line Errored Secs, 0-C-bit Errored Secs, 0 C-bit Severely Errored Secs
 Total Data (last 1 15 minute intervals):
  0 C-bit Coding Violation
  0 P-bit Err Secs, 0 P-bit Severely Err Secs
  0 Severely Err Framing Secs, 900 Unavailable Secs
0 Line Errored Secs, 0-C-bit Errored Secs, 0 C-bit Severely Errored Secs
Router# show controllers e3 2/0 brief
E3 2/0 is down.
  Applique type is Subrate E3
  Transmitter is sending remote alarm.
  Receiver has loss of signal.
  Framing is G571, Clock Source is Internal.
Router# show controllers e3 2/0 tabular
E3 2/0 is down.
  Applique type is Subrate E3
  Transmitter is sending remote alarm.
  Receiver has loss of signal.
  Framing is G571, Clock Source is Internal.
  INTERNAL   LCV PCV CCV PES PSES SEFS UAS LES CES CSES
  18:10-18:21 0   0   0   0   0    0   680  0   0    0
  17:55-18:10 0   0   0   0   0    0   900  0   0    0
  Total       0   0   0   0   0    0   900  0   0    0
```

The table below describes the significant fields shown in the display.

Table 23: show controllers e3 Field Descriptions

Field	Description
E3 2/0 is down	The E3 controller in slot 0 shows the state in which it is operating. The controller's state can be up, down, or administratively down. Loopback conditions are shown by (Locally Looped) or (Remotely Looped).
Applique type	Controller type.
Description	User-specified information about the E3 controller.
No alarms detected (not shown in display)	Any alarms detected by the controller are displayed here. Possible alarms are as follows: • Transmitter is sending remote alarm. • Transmitter is sending alarm indication signal (AIS). • Receiver has loss of signal. • Receiver is getting AIS. • Receiver has loss of frame. • Receiver has remote alarm. • Receiver has no alarms.
Linecode is (not shown in display)	Line coding format on the E3.
Framing	Framing type.

Field	Description
Clock Source	User-specified clock source (Line or Internal).
Data in current interval (450 seconds elapsed)	Shows the current accumulation period, which rolls into the 24-hour accumulation every 15 minutes. Accumulation period is from 1 to 900 seconds. The oldest 15-minute period falls off the back of the 24-hour accumulation buffer.
PCV	Path coding violation (PCV) error event is a frame synchronization bit error in the E1-no-CRC formats or a cyclic redundancy check (CRC) error in the E1-CRC formats.
CCV	C-bit coding violation (CCV) error event for C-bit parity. This is the count of coding violations reported via the C-bits occurring in the accumulation interval.
PES	P-bit errored seconds (PES) is a second with one or more PCVs, one or more out-of-frame defects, or a detected incoming AIS. This gauge is not incremented when unavailable seconds are counted.
PSES	P-bit severely errored seconds (PSES) is a second with 44 or more PCVs, one or more out-of-frame defects, or a detected incoming AIS. This gauge is not incremented when unavailable seconds are counted.
SEFS	Severely errored framing seconds (SEFS) is a second with one or more out-of-frame defects or a detected incoming AIS.
UAS	Unavailable seconds (UAS) are calculated by counting the number of seconds for which the interface is unavailable. For more information, refer to RFC 1407.
LES	Line errored seconds (LES) is a second in which one or more code violations or one or more LOS defects occurred.
CES	C-bit errored seconds (CES) is a second with one or more out-of-frame defects or a detected incoming AIS. This gauge is not incremented when UASs are counted.
CSES	C-bit severely errored seconds (CSES) is a second with one or more out-of-frame defects or a detected incoming AIS. This gauge is not incremented when UASs are counted.
Total	Displays the last 15-minute accumulation period.

Series Router

The following is sample output from the **show controllers e3** command on the Cisco series routers:

```
Router# show controllers e3 0/4/40
E3 0/4/40 is up.
Hardware is -48T3E3-CE
Applique type is Clear Channel e3
No alarms detected.
MDL transmission is disabled
FEAC code received: No code is being received
```

```
Framing is C-BIT Parity, Line Code is B3ZS, Cablelength Short less than 225ft
BER thresholds: SF = 10e-10 SD = 10e-10
Clock Source is internal
Equipment customer loopback
Data in current interval (240 seconds elapsed):
 Near End
     0 Line Code Violations, 0 P-bit Coding Violations
     0 C-bit Coding Violations, 0 P-bit Err Secs
     0 P-bit Severely Err Secs, 0 Severely Err Framing Secs
     0 Unavailable Secs, 0 Line Errored Secs
     0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
     0 Severely Errored Line Secs, 0 Path Failures
     0 AIS Defect Secs, 0 LOS Defect Secs
   Far End
     0 Errored Secs, 0 Severely Errored Secs
     0 C-bit Unavailable Secs, 0 Path Failures
     0 Code Violations, 0 Service Affecting Secs
  Data in Interval 1:
   Near End
     0 Line Code Violations, 0 P-bit Coding Violations
     0 C-bit Coding Violations, 0 P-bit Err Secs
     0 P-bit Severely Err Secs, 0 Severely Err Framing Secs
     20 Unavailable Secs, 20 Line Errored Secs
     0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
     20 Severely Errored Line Secs, 1 Path Failures
     0 AIS Defect Secs, 20 LOS Defect Secs
   Far End
     0 Errored Secs, 0 Severely Errored Secs
     0 C-bit Unavailable Secs, 0 Path Failures
     0 Code Violations, 0 Service Affecting Secs
  Total Data (last 1 15 minute intervals):
   Near End
     0 Line Code Violations, 0 P-bit Coding Violations,
     0 C-bit Coding Violations, 0 P-bit Err Secs,
     0 P-bit Severely Err Secs, 0 Severely Err Framing Secs,
     20 Unavailable Secs, 20 Line Errored Secs,
     0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
     20 Severely Errored Line Secs, 1 path failures
     0 AIS Defect Secs, 20 LOS Defect Secs
   Far End
     0 Errored Secs, 0 Severely Errored Secs
     0 C-bit Unavailable Secs, 0 Path Failures
     0 Code Violations, 0 Service Affecting Secs

E1 1 is up
  timeslots:
  FDL per AT&T 54016 spec.
  No alarms detected.
  Framing is ESF, Clock Source is Internal
  Data in current interval (250 seconds elapsed):
   Near End
     0 Line Code Violations, 0 Path Code Violations
     0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs
     0 Unavailable Secs, 0 Stuffed Secs
     0 Path Failures, 0 SEF/AIS Secs
   Far End
     0 Line Code Violations, 0 Path Code Violations
     0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs
     0 Unavailable Secs 0 Path Failures
  Data in Interval 1:
   Near End
     0 Line Code Violations, 0 Path Code Violations
```

```
   0 Slip Secs, 2 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
   2 Errored Secs, 0 Bursty Err Secs, 2 Severely Err Secs
   0 Unavailable Secs, 0 Stuffed Secs
   1 Path Failures, 2 SEF/AIS Secs
 Far End
   0 Line Code Violations, 0 Path Code Violations
   0 Slip Secs, 2 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
   3 Errored Secs, 0 Bursty Err Secs, 3 Severely Err Secs
   0 Unavailable Secs 0 Path Failures
Total Data (last 1 15 minute intervals):
 Near End
   0 Line Code Violations,0 Path Code Violations,
   0 Slip Secs, 2 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins,
   2 Errored Secs, 0 Bursty Err Secs, 2 Severely Err Secs
   0 Unavailable Secs, 0 Stuffed Secs
   1 Path Failures, 2 SEF/AIS Secs
 Far End
   0 Line Code Violations,0 Path Code Violations
   0 Slip Secs, 2 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins,
   3 Errored Secs, 0 Bursty Err Secs, 3 Severely Err Secs
   0 Unavailable Secs, 0 Path Failures
```

Examples

show controllers ethernet

To display the hardware information specific to the Ethernet interface on Cisco 2500 and Cisco 4000 series routers, use the **showcontrollersethernet** command in user EXEC or privileged EXEC mode.

show controllers ethernet *interface-number*

Syntax Description

interface-number	Interface number of the Ethernet interface.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
10.0	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 is sample output from the **showcontrollersethernet** command on Cisco 4000 series routers:

```
Router# show controllers ethernet 0
LANCE unit 0, NIM slot 1, NIM type code 4, NIM version 1
Media Type is 10BaseT, Link State is Up, Squelch is Normal
idb 0x4060, ds 0x5C80, regaddr = 0x8100000
IB at 0x600D7AC: mode=0x0000, mcfilter 0000/0001/0000/0040
station address 0000.0c03.a14f default station address 0000.0c03.a14f
buffer size 1524
RX ring with 32 entries at 0xD7E8
Rxhead = 0x600D8A0 (12582935), Rxp = 0x5CF0(23)
00 pak=0x60336D0 ds=0x6033822 status=0x80 max_size=1524 pak_size=98
01 pak=0x60327C0 ds=0x6032912 status=0x80 max_size=1524 pak_size=98
02 pak=0x6036B88 ds=0x6036CDA status=0x80 max_size=1524 pak_size=98
03 pak=0x6041138 ds=0x604128A status=0x80 max_size=1524 pak_size=98
04 pak=0x603FAA0 ds=0x603FBF2 status=0x80 max_size=1524 pak_size=98
05 pak=0x600DC50 ds=0x600DDA2 status=0x80 max_size=1524 pak_size=98
06 pak=0x6023E48 ds=0x6023F9A status=0x80 max_size=1524 pak_size=1506
07 pak=0x600E3D8 ds=0x600E52A status=0x80 max_size=1524 pak_size=1506
08 pak=0x6020990 ds=0x6020AE2 status=0x80 max_size=1524 pak_size=386
09 pak=0x602D4E8 ds=0x602D63A status=0x80 max_size=1524 pak_size=98
10 pak=0x603A7C8 ds=0x603A91A status=0x80 max_size=1524 pak_size=98
11 pak=0x601D4D8 ds=0x601D62A status=0x80 max_size=1524 pak_size=98
12 pak=0x603BE60 ds=0x603BFB2 status=0x80 max_size=1524 pak_size=98
13 pak=0x60318B0 ds=0x6031A02 status=0x80 max_size=1524 pak_size=98
14 pak=0x601CD50 ds=0x601CEA2 status=0x80 max_size=1524 pak_size=98
15 pak=0x602C5D8 ds=0x602C72A status=0x80 max_size=1524 pak_size=98
16 pak=0x60245D0 ds=0x6024722 status=0x80 max_size=1524 pak_size=98
17 pak=0x6008328 ds=0x600847A status=0x80 max_size=1524 pak_size=98
18 pak=0x601EB70 ds=0x601ECC2 status=0x80 max_size=1524 pak_size=98
19 pak=0x602DC70 ds=0x602DDC2 status=0x80 max_size=1524 pak_size=98
20 pak=0x60163E0 ds=0x6016532 status=0x80 max_size=1524 pak_size=98
21 pak=0x602CD60 ds=0x602CEB2 status=0x80 max_size=1524 pak_size=98
```

```
22 pak=0x6037A98 ds=0x6037BEA status=0x80 max_size=1524 pak_size=98
23 pak=0x602BE50 ds=0x602BFA2 status=0x80 max_size=1524 pak_size=98
24 pak=0x6018988 ds=0x6018ADA status=0x80 max_size=1524 pak_size=98
25 pak=0x6033E58 ds=0x6033FAA status=0x80 max_size=1524 pak_size=98
26 pak=0x601BE40 ds=0x601BF92 status=0x80 max_size=1524 pak_size=98
27 pak=0x6026B78 ds=0x6026CCA status=0x80 max_size=1524 pak_size=98
28 pak=0x6024D58 ds=0x6024EAA status=0x80 max_size=1524 pak_size=74
29 pak=0x602AF40 ds=0x602B092 status=0x80 max_size=1524 pak_size=98
30 pak=0x601FA80 ds=0x601FBD2 status=0x80 max_size=1524 pak_size=98
31 pak=0x6038220 ds=0x6038372 status=0x80 max_size=1524 pak_size=98
TX ring with 8 entries at 0xDA20, tx_count = 0
tx_head = 0x600DA58 (12582919), head_txp = 0x5DC4 (7)
tx_tail = 0x600DA58 (12582919), tail_txp = 0x5DC4 (7)
00 pak=0x000000 ds=0x600CF12 status=0x03 status2=0x0000 pak_size=118
01 pak=0x000000 ds=0x602126A status=0x03 status2=0x0000 pak_size=60
02 pak=0x000000 ds=0x600CF12 status=0x03 status2=0x0000 pak_size=118
03 pak=0x000000 ds=0x600CF12 status=0x03 status2=0x0000 pak_size=118
04 pak=0x000000 ds=0x600CF12 status=0x03 status2=0x0000 pak_size=118
05 pak=0x000000 ds=0x600CF12 status=0x03 status2=0x0000 pak_size=118
06 pak=0x000000 ds=0x600CF12 status=0x03 status2=0x0000 pak_size=118
07 pak=0x000000 ds=0x6003ED2 status=0x03 status2=0x0000 pak_size=126
0 missed datagrams, 0 overruns, 2 late collisions, 2 lost carrier events
0 transmitter underruns, 0 excessive collisions, 0 tdr, 0 babbles
0 memory errors, 0 spurious initialization done interrupts
0 no enp status, 0 buffer errors, 0 overflow errors
10 one_col, 10 more_col, 22 deferred, 0 tx_buff
0 throttled, 0 enabled
Lance csr0 = 0x73
Statistics:
  Rx Bytes                      58419   Tx Bytes                      17975
  Rx Good Packets                 676   Tx Good Packets                 154
  Rx Multicast                    603
  Rx Broadcast                     64
  Rx Bad Pkt Errors                 0   Tx Bad Pkt Errors                 0
  Rx FCS Errors                     0   Tx FCS Errors                     0
  Rx Runt Errors                    0   Tx Runt Errors                    0
  Rx Oversize Errors                0   Tx Oversize Errors                0
  Rx Length Errors                  0   Tx Collisions                     0
  Rx Code Errors                    0   Tx Late Collisions                0
  Rx Dribble Errors                 0   Tx Excessive Collisions           0
                                        Tx Abort Errors                   0
```

The table below describes the significant fields shown in the display.

Table 24: show controllers ethernet Field Description

Field	Description
Rx Bytes	Number of packets received without any error on the interface.
Tx Bytes	Number of packets transmitted without any error on the interface.
Rx Good Packets	Number of packets received without any error on the interface.
Tx Good Packets	Number of packets transmitted without any error on the interface.
Rx Multicast	Number of multicast packets received on the interface.
Rx Broadcast	Number of broadcast packets received on the interface.
Rx Bad Pkt Errors	Number of bad frames received on the interface.

Field	Description
Rx FCS Errors	Number of valid size frames with Frame Check Sequence (FCS) errors, but not with framing errors.
Rx Runt Errors	Frames received on the interface that are smaller than the minimum IEEE 802.3 frame size (64 bytes for Ethernet).
Rx Oversize Errors	Number of oversize packets received on the interface.
Rx Length Errors	Number of packets received on the interface with errors in the length of the packet.
Tx Collisions	Number of collision events on the interface. This is applicable only in the half-duplex mode.
Rx Code Errors	Number of packets received on the interface with the code error signal.
Tx Late Collisions	Number of late collisions.
Rx Dribble Errors	Number of packets received with the dribble error. When a packet does not contain an integral number of bytes, it is a dribble error .
Excessive Collisions	Number of frames dropped in the transmit direction due to excessive collision. This is applicable only in the half-duplex mode.
Tx Abort Errors	Number of packets that were aborted during transmission.

Related Commands

Command	Description
show controllers	Displays information specific to the hardware on a line card.

show controllers fastethernet

To display information about initialization block, transmit ring, receive ring, Fast Ethernet interface information, applicable MAC destination address and VLAN filtering tables, and errors for the Fast Ethernet controller chip, use the **showcontrollersfastethernet** command in user EXEC or privileged EXEC mode.

Standard Syntax

show controllers fastethernet *number*

Cisco 7200 Series

show controllers fastethernet *slot/port*

Cisco 7500 Series

show controllers fastethernet *slot/port-adaptor/port*

Shared Port Adapter

show controllers fastethernet *slot/sub-slot/port* {[**detail**]}

Syntax Description

number	Port, connector, or interface card number. On a Cisco 4500 or Cisco 4700 router, specifies the network processor module (NPM) number. The numbers are assigned at the factory at the time of installation or when added to a system.
slot	Slot number. Refer to the appropriate hardware manual for slot information.
/ *port*	Port number. Refer to the appropriate hardware manual for port information.
/ *port-adapter*	Port adapter number. Refer to the appropriate hardware manual for information about port adapter compatibility.
subslot	(Optional) Secondary slot number on a jacket card where a SPA is installed.
detail	Specifies display of additional low-level diagnostic information.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
11.2	This command was introduced.
12.2S	This command was integrated into Cisco IOS Release 12.2S.
12.2(20)S2	This command was implemented on the 4-Port 10/100 Fast Ethernet SPA on the Cisco 7304 router and introduced a new address format and output.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Release	Modification
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 output from this command is generally useful for diagnostic tasks performed by technical support.

Shared Port Adapter Usage Guidelines

The output from the **showcontrollersfastethernet**command for the 4-Port 10/100 Fast Ethernet SPA provides several different sections of information and statistics that are organized according to the internal hardware devices and the various paths in the flow of data on the SPA. The following sections are provided:

Several areas of the output are generally useful for diagnostic tasks performed by Cisco Systems technical support personnel only.

Examples

The following is a sample output from the **showcontrollersfastethernet** command on a Cisco 4500 series router:

```
Router# show controllers fastethernet 0
DEC21140 Slot 0, Subunit 0
dec21140_ds=0x60001234, registers=0x3c001000, ib=0x42301563, ring entries=256
rxring=0x40235878, rxr shadow=0x64528745, rx_head=0, rx_tail=10
txring=0x43562188, txr shadow=0x65438721, tx_head=17, tx_tail=34, tx_count=17
DEC21140 Registers
CSR0=0x23457667, CSR3=0x12349878, CSR4=0x34528745, CSR5=0x76674565
CSR6=0x76453676, CSR7=0x76456574, CSR8=0x25367648, CSR9=0x87253674
CSR11=0x23456454, CSR12=0x76564787, CSR15=0x98273465
DEC21140 PCI registers
bus_no=0, device_no=0
CFID=0x12341234, CFCS=0x76547654, CFRV=0x87658765, CFLT=0x98769876
CBIO=0x12344321, CBMA=0x23454321, CFIT=0x34567654, CFDA=0x76544567
MII registers
Register 0x00: 0x1234 0x1234 0x2345 0x3456 0x4567 0x5678 0x6789 0x7890
Register 0x08: 0x9876 0x8765 0x7654 0x6543 0x5432 0x4321 0x3210 0x2109
Register 0x10: 0x1234 0x2345 0x3456            0x4567 0x5678 0x6789 0x7890
Register 0x18: 0x9876 0x8765 0x7654 0x6543 0x5432 0x4321
DEC21140 statistics
filtered_in_sw=1000, throttled=10, enabled=10
rx_fifo_overflow=10, rx_no_enp=12, rx_late_collision=18
rx_watchdog=15, rx_process_stopped=15, rx_buffer_unavailable=1500
tx_jabber_timeout=10, tx_carrier_loss=2, tx_deffered=15
tx_no_carrier=1, tx_late_collision=10, tx_excess_coll=10
tx_process_stopped=1, fata_tx_err=0
```

The following is a sample output from the **showcontrollersfastethernet** command on a Cisco AS5300 router:

```
Router# show controller fastethernet 0
DEC21140
Setup Frame
 (0 ) 00e0.1e3e.c179
 (1 ) 0100.0ccc.cccc
 (2 ) 0900.2b00.000f
 (3 ) 0900.2b02.0104
 (4 ) 0300.0000.0001
 dec21140_ds=0x60BD33B8, registers=0x3C210000, ib=0x4002F75C, ring entries=32
 rxring=0x4002F844, rxr shadow=0x60F14B58, rx_head=6, rx_tail=6
 txring=0x4002FA6C, txr shadow=0x60F14BF8, tx_head=10, tx_tail=10, tx_count=0
```

```
 tx_size=32, rx_size=32
 PHY link up
 DEC21140 Registers:
 CSR0=0xFE024480, CSR3=0x4002F844, CSR4=0x4002FA6C, CSR5=0xFC660000
 CSR6=0x322C2002, CSR7=0xFFFFA241, CSR8=0xE0000000, CSR9=0xFFFDC3FF
 CSR11=0xFFFE0000, CSR12=0xFFFFFF09, CSR15=0xFFFFFEC8
 DEC21140 PCI registers:
  bus_no=2, device_no=0
  CFID=0x00091011, CFCS=0x82800005, CFRV=0x02000021, CFLT=0x0000FF00
  CBIO=0x3C210001, CBMA=0x00000000, CFIT=0x28140100, CFDA=0x00000000
 MII registers:
  Register 0x00:   0000  784D  2000  5C01  0001  0000  0000  0000
  Register 0x08:   0000  0000  0000  0000  0000  0000  0000  0000
  Register 0x10:   0000  0000  0000  0000        0000  0001  8060
  Register 0x18:   8020  0840  0000  3000  A3B9
 throttled=7, enabled=7
 rx_fifo_overflow=0, rx_no_enp=0, late_collision=0
 rx_watchdog=0, rx_process_stopped=0, rx_buffer_unavailable=0
 tx_jabber_timeout=0, tx_carrier_loss=1, tx_deferred=0
 tx_no_carrier=1, tx_late_collision=0, tx_excess_coll=0
 tx_process_stopped=0, fatal_tx_err=0
 overflow_resets=0
0 missed datagrams, 0 overruns
0 transmitter underruns, 0 excessive collisions
0 single collisions, 0 multiple collisions
0 dma memory errors, 0 CRC errors
0 alignment errors, 0 runts, 0 giants
```

The following is a sample output from the **showcontrollersfastethernet** command on a Cisco 7200 series router:

```
Router# show controllers fastethernet 0/0
Interface Fast Ethernet0/0
Hardware is DEC21140
 dec21140_ds=0x60895888, registers=0x3C018000, ib=0x4B019500
 rx ring entries=128, tx ring entries=128
 rxring=0x4B019640, rxr shadow=0x60895970, rx_head=0, rx_tail=0
 txring=0x4B019EC0, txr shadow=0x60895B98, tx_head=77, tx_tail=77, tx_count=0
 CSR0=0xFFFA4882, CSR3=0x4B019640, CSR4=0x4B019EC0, CSR5=0xFC660000
 CSR6=0xE20CA202, CSR7=0xFFFFA241, CSR8=0xFFFE0000, CSR9=0xFFFDD7FF
 CSR11=0xFFFE0000, CSR12=0xFFFFFF98, CSR15=0xFFFFFEC8
 DEC21140 PCI registers:
  bus_no=0, device_no=6
  CFID=0x00091011, CFCS=0x02800006, CFRV=0x02000012, CFLT=0x0000FF00
  CBIO=0x7C5AFF81, CBMA=0x48018000, CFIT=0x0000018F, CFDA=0x0000AF00
 MII registers:
  Register 0x00:   2000  780B  2000  5C00  01E1  0000  0000  0000
  Register 0x08:   0000  0000  0000  0000  0000  0000  0000  0000
  Register 0x10:   0000  0000  0000  0000        0000  0000  8040
  Register 0x18:   8000  0000  0000  3800  A3B9
 throttled=0, enabled=0, disabled=0
 rx_fifo_overflow=0, rx_no_enp=0, rx_discard=0
 tx_underrun_err=0, tx_jabber_timeout=0, tx_carrier_loss=1
 tx_no_carrier=1, tx_late_collision=0, tx_excess_coll=0
 tx_collision_cnt=0, tx_deferred=0, fatal_tx_err=0, mult_ovfl=0
HW addr filter: 0x60895FC0, ISL Enabled
  Entry= 0: Addr=0100.0CCC.CCCC
  Entry= 1: Addr=0300.0000.0001
  Entry= 2: Addr=0100.0C00.0000
  Entry= 3: Addr=FFFF.FFFF.FFFF
  Entry= 4: Addr=FFFF.FFFF.FFFF
  Entry= 5: Addr=FFFF.FFFF.FFFF
  Entry= 6: Addr=FFFF.FFFF.FFFF
```

```
  Entry= 7: Addr=FFFF.FFFF.FFFF
  Entry= 8: Addr=FFFF.FFFF.FFFF
  Entry= 9: Addr=FFFF.FFFF.FFFF
  Entry=10: Addr=FFFF.FFFF.FFFF
  Entry=11: Addr=FFFF.FFFF.FFFF
  Entry=12: Addr=FFFF.FFFF.FFFF
  Entry=13: Addr=FFFF.FFFF.FFFF
  Entry=14: Addr=FFFF.FFFF.FFFF
  Entry=15: Addr=0060.3E28.6E00
```

Shared Port Adapter Examples

The following is sample output from the **showcontrollersfastethernet** command for the first interface (port 0) on a 4-Port 10/100 Fast Ethernet SPA that is located in the top subslot (0), of the MSC that is installed in slot 4 on a Cisco 7304 router:

```
Router# show controllers fastethernet 4/0/0
Interface FastEthernet4/0/0
  Hardware is SPA-4FE-7304
  Connection mode is auto-negotiation
  Interface state is up, link is up
  Configuration is Auto Speed, Auto Duplex
  Selected media-type is RJ45
  Promiscuous mode is off, VLAN filtering is enabled
  MDI crossover status: MDI
  Auto-negotiation configuration and status:
    Auto-negotiation is enabled and is completed
    Speed/duplex is resolved to 100 Mbps, full duplex
    Advertised capabilities: 10M/HD 10M/FD 100M/HD 100M/FD Pause capable (Asymmetric)
    Partner capabilities: 10M/HD 10M/FD 100M/HD 100M/FD Pause capable
MAC counters:
  Input: packets = 15, bytes = 1776
         FIFO full/reset removed = 0, error drop = 0
  Output: packets = 18, bytes = 2622
          FIFO full/reset removed = 0, error drop = 0
  Total pause frames: transmitted = 0, received = 0
FPGA counters:
  Input: Total (good & bad) packets: 15, TCAM drops: 4
         Satisfy (host-backpressure) drops: 0, CRC drops: 0
         PL3 RERRs: 0
  Output: EOP (SPI4) errors: 0
SPA carrier card counters:
  Input: packets = 11, bytes = 1476, drops = 0
  Output: packets = 18, bytes = 2550, drops = 0
  Egress flow control status: XON
  Per bay counters:
  General errors: input = 0, output = 0
  SPI4 errors: ingress dip4 = 0, egress dip2 = 0
SPA Error counters:
  SPI4 TX out of frame error = 2 (00:02:31 ago)
  SPI4 TX Train valid error = 1 (00:02:11 ago)
  SPI4 TX DIP4 error = 1 (00:01:30 ago)
  SPI4 RX out of frame error = 1 (00:00:36 ago)
  SPI4 RX DIP2 error = 1 (00:00:13 ago)
MAC destination address filtering table:
  Table entries: Total = 512, Used = 4, Available = 508
  Index MAC destination address       Mask
  ----- ----------------------  --------------
  1     0007.0ed3.ba80          ffff.ffff.ffff
  2     ffff.ffff.ffff          ffff.ffff.ffff
  3     0100.0000.0000          0100.0000.0000
```

```
  4     0100.0ccc.cccc           ffff.ffff.ffff
VLAN filtering table:
  Number of VLANs configured on this interface = 0
  Table entries: Total = 1024, Used = 2, Available = 1022
  Index  VLAN identifier  Enabled  Tunnel
  -----  ---------------  -------  ------
  1           0             No      No
  2           0             Yes     No
Platform details:
  PXF tif number: 0x10
```

The table below describes the fields shown in the interface configuration section of the display. This section is useful for verifying the status of autonegotiation and configured parameters on the link, and the amount of traffic being handled by the interface.

Table 25: show controllers Command Field Descriptions--Interface Section

Field	Description
Interface	Name of the interface.
Hardware	Type of hardware.
Connection mode	Indicator of autonegotiation used to establish the connection.
Link	State of the link.
Configuration	Configuration of the speed and duplex operation on the interface.
Selected media-type	Interface port media type. RJ-45 is the only type supported on the 4-Port 10/100 Fast Ethernet SPA.
Promiscuous mode	State of promiscuous mode (on or off). When promiscuous mode is on, the SPA disables MAC destination address and VLAN filtering. When promiscuous mode is off, the SPA enables MAC destination address and VLAN filtering.
VLAN filtering	Status of ternary content addressable memory (TCAM) filtering of VLANs (enabled or disabled). By default, the SPA always enables VLAN filtering. The SPA disables VLAN filtering if the TCAM table is full, or if the SPA is operating in promiscuous mode. **Note** VLAN filtering is not enabled or disabled using any command-line interface (CLI) command.
MDI crossover status	State of the media dependent interface (MDI) for the PHY device on the specified interface. The possible values are MDI for straight-through cables or media dependent interface crossover (MDI-X) for crossover cables.
Auto-negotiation	State of autonegotiation (enabled or disabled) on the interface and its current status.
Speed/duplex is resolved to	Results of autonegotiated parameter values (speed and duplex) currently being used on the link.

Field	Description
Advertised capabilities	List of the possible combinations of speed and duplex modes (in *speed*/*duplex* format) and flow control that the local interface has advertised it supports to the remote device: • For speed--10M is 10 Mbps, and 100M is 100 Mbps. • For duplex--HD is half duplex, and FD is full duplex. • For flow control--"Pause capable (Asymmetric)" means that the SPA advertises support of the PAUSE flow control bit and the ASM_DIR (asymmetric) flow control bit.
Partner capabilities	List of the possible combinations of speed and duplex modes (in *speed*/*duplex* format) and flow control that the remote device has advertised it supports to the local interface: • For speed--10M is 10 Mbps, and 100M is 100 Mbps. • For duplex--HD is half duplex, and FD is full duplex. • For flow control--"Pause capable" means that the remote device supports implementation of the PAUSE flow control bit; "Pause capable (Asymmetric)" means that the remote device supports implementation of the PAUSE flow control bit and the ASM_DIR (asymmetric) flow control bit.

The table below describes the fields shown in the MAC counters section of the display. This section is useful for verifying the status of packets processed by the MAC device for the interface. This information is useful for Cisco Systems technical support personnel.

Table 26: show controllers Command Field Descriptions--MAC Counters Section

Field	Description
Input: packets, bytes	Total number of packets and bytes received by the MAC device for the interface since it was activated or cleared. You can clear these counters using the **clearcounters** privileged EXEC command.
Input: FIFO full/reset removed	Total number of packets removed by the MAC device due to a first-in, first-out (FIFO) overflow condition in the input buffer for the interface.
Input: error drop	Total number of input packets with errors that are dropped by the MAC device for the interface.
Output: packets, bytes	Total number of packets and bytes transmitted by the MAC device for the interface since it was activated or cleared. You can clear these counters using the **clearcounters** privileged EXEC command.

Field	Description
Output: FIFO full/reset removed	Total number of packets removed by the MAC device due to a first-in, first-out (FIFO) overflow condition in the output buffer for the interface.
Output: error drop	Total number of output packets with errors that are dropped by the MAC device for the interface.
Total pause frames	Total number of Ethernet 802.3x pause frames transmitted and received by the MAC device for flow control on the interface.

The table below describes the fields shown in the FPGA counters section of the display. This section is useful for verifying the status of packets processed by the FPGA device for the interface. This information is useful for Cisco Systems technical support personnel.

Table 27: show controllers Command Field Descriptions--FPGA Counters Section

Field	Description
Input: Total (good & bad) packets	Total number of packets received by the FPGA device in the ingress direction for the interface.
Input: TCAM drops	Total number of packets dropped by the FPGA device in the ingress direction for the interface due to a ternary content addressable memory (TCAM) lookup failure. This counter increments when the interface receives a frame with a destination MAC address or VLAN identifier that is not present in the TCAM table.
Input: Satisfy (host-backpressure) drops	Total number of packets dropped by the FPGA device in the ingress direction for the interface due to back-pressure from the MSC.
Input: CRC drops	Total number of packets dropped by the FPGA device in the ingress direction for the interface due to cyclic redundancy check (CRC) errors.
Input: PL3 RERRs	Total number of packets with errors received for the interface by the FPGA device in the ingress direction over the System Packet Interface Level 3 (SPI3) (also called PL3) path from the MAC device to the FPGA device.
Output: EOP (SPI4) errors	Total number of packets with end-of-packet (EOP) errors received by the FPGA device in the egress direction for the interface over the System Packet Interface Level 4 (SPI4) path from the MSC to the FPGA device.

The table below describes the fields shown in the SPA carrier card counters section of the display. This section is useful for verifying the status of packets processed by the MSC for the interface. This information is useful for Cisco Systems technical support personnel.

Table 28: show controllers Command Field Descriptions--SPA Carrier Card Counters Section

Field	Description
Input: packets, bytes, drops	Total number of packets, bytes, and packet drops that have occurred on the SPI4 path from the FPGA device to the MSC.

Field	Description
Output: packets, bytes, drops	Total number of packets, bytes, and packet drops that have occurred on the SPI4 path from the MSC to the FPGA device.
Egress flow control status	Status of flow control between the MSC and the Route Processor (RP). The possible values are: • XON--A control frame has been sent by the MSC to the RP to indicate that the MSC is ready to accept data. • XOFF--A control frame has been sent by the MSC to the RP to indicate congestion on the MSC. The MSC cannot accept any more data from the RP during this condition.
General errors	Total number of errors (such as parity) on the MSC in the ingress and egress direction.
SPI4 errors: ingress dip4	Total number of 4-bit Diagonal Interleaved Parity (DIP4) errors in the ingress direction on the SPI4 path from the FPGA device to the MSC. DIP4 is a parity algorithm where a 4-bit odd parity is computed diagonally over control and data words.
SPI4 errors: egress dip2	Total number of 2-bit Diagonal Interleaved Parity (DIP2) errors in the egress direction on the SPI4 path from the FPGA device to the MSC. DIP2 is a parity algorithm where a 2-bit odd parity is computed diagonally over status words.

The table below describes the fields shown in the SPA error counters section of the display. This section appears only when one of the SPI4 transmit or receive errors occurs on the interface. This information is useful for Cisco Systems technical support personnel.

Note None of the SPA SPI4 error counters appear in **showcontrollersfastethernet** command output until at least one of those types of SPI4 errors occurs.

All of the errors in the SPA error counters section are subject to the SPA automatic recovery process when certain thresholds are reached. For more information about this process on the Cisco 7304 router, refer to the “Understanding SPA Automatic Recovery” section of the *Cisco 7304 Router Modular Services Card and Shared Port Adapter Software Configuration Guide*

Table 29: show controllers Command Field Descriptions--SPA Error Counters Section

Field	Description
SPI4 TX out of frame error = 2 (00:02:31 ago)	Number of SPI4 out-of-frame errors (events) detected in the transmit direction (toward the network), from the MSC to the SPA FPGA device. The time stamp indicates how long ago (in hours:minutes:seconds) from the current system time, that the last error was detected. This error indicates a loss of synchronization between the synchronization block and the data received on the SPI4 path. When synchronization is reacquired, the error no longer occurs.
SPI4 TX Train valid error = 1 (00:02:11 ago)	Number of times that a low-level synchronization problem was detected in the transmit direction (toward the network), from the MSC to the SPA FPGA device. The time stamp indicates how long ago (in hours:minutes:seconds) from the current system time, that the last error was detected.
SPI4 TX DIP4 error = 1 (00:01:30 ago)	Number of 4-bit Diagonal Interleaved Parity (DIP4) errors in the transmit direction (toward the network), from the MSC to the SPA FPGA device. The time stamp indicates how long ago (in hours:minutes:seconds) from the current system time, that the last error was detected. DIP4 is a parity algorithm where a 4-bit odd parity is computed diagonally over control and data words.
SPI4 RX out of frame error = 1 (00:00:36 ago)	Number of SPI4 out-of-frame errors (events) detected in the receive direction (from the network), from the SPA FPGA device to the MSC. The time stamp indicates how long ago (in hours:minutes:seconds) from the current system time, that the last error was detected. This error indicates a loss of synchronization between the synchronization block and the data received on the SPI4 path. When synchronization is reacquired, the error no longer occurs.
SPI4 RX DIP2 error = 1 (00:00:13 ago)	Number of 2-bit Diagonal Interleaved Parity (DIP2) errors in the receive direction (from the network), from the SPA FPGA device to the MSC. The time stamp indicates how long ago (in hours:minutes:seconds) from the current system time, that the last error was detected. DIP2 is a parity algorithm where a 2-bit odd parity is computed diagonally over status words.

The table below describes the fields shown in the MAC destination address filtering table section of the display. This section is useful for verifying the multicast destination addresses that are in the TCAM table and permitted by the interface. This information is useful for Cisco Systems technical support personnel.

Table 30: show controllers Command Field Descriptions--MAC Destination Address Filtering Table Section

Field	Description
Table entries: Total, Used, Available	Total number of MAC destination address entries possible in the TCAM table for the interface, the number of table entries currently used by the interface, and the number of table entries that remain available. The 4-Port 10/100 Fast Ethernet SPA supports a 512-entry MAC filtering table for each supported interface (2048 entries total on the card).
Index	Table entry identifier.
MAC destination address	MAC destination address (multicast) permitted by the interface and used in the TCAM lookup table for packet filtering. The multicast MAC entries typically come from routing protocols [such as Open Shortest Path First (OSPF) and Enhanced IGRP (EIGRP)], and other protocols including the Hot Standby Router Protocol (HSRP). When the router reloads, three addresses appear by default in the MAC filtering table: the unicast address of the local interface, the Ethernet broadcast address, and the Ethernet multicast address.
Mask	Mask for the corresponding destination address. The SPA uses the bits that are set in the mask to look up the address in the TCAM table.

The table below describes the fields shown in the VLAN filtering table section of the display. This section is useful for verifying the VLANs that are in the TCAM table and are permitted by the interface. This information is useful for Cisco Systems technical support personnel.

Table 31: show controllers Command Field Descriptions--VLAN Filtering Table Section

Field	Description
Number of VLANs configured on this interface	Number of VLANs that are configured on the interface. If the number of VLANs configured on the interface is 1022 or less, then the VLAN filtering table also shows an index entry for every VLAN ID. The number of VLANs configured on the interface can be 0, while the number of used table entries reports 2, because the SPA always uses two entries to provide valid matching criteria for promiscuous mode and non-VLAN packets.
Table entries: Total, Used, Available	Total number of VLAN entries possible in the TCAM filtering table for the interface, the number of table entries currently used by the interface (two are always in use by default), and the number of table entries that remain available. The 4-Port 10/100 Fast Ethernet SPA supports a 1024-entry VLAN filtering table for each supported interface (4096 entries total on the card).
Index	Table entry identifier.
VLAN identifier	Number of the VLAN. Two VLAN ID 0 entries always appear in the table and represent the local interface port for handling of promiscuous mode and non-VLAN packets. Other VLAN entries appear in this table when VLANs are configured on the interface.

Field	Description
Enabled	Status of the VLAN ID for TCAM filtering, with the following possible values: • No--The entry is disabled for filtering. • Yes--The entry is enabled for filtering. The TCAM filter uses the "first-match" rule to filter packets that the SPA receives against entries in the table. The matching assessment begins at the top of the table with the VLAN ID 0 entries. **Note** The SPA always supports two VLAN ID 0 entries. The first VLAN ID 0 entry of the TCAM table is used for promiscuous mode. It has a value of "No," meaning it is disabled, whenever promiscuous mode is disabled for the interface. The second VLAN ID 0 entry is used for filtering of non-VLAN packets.
Tunnel	Status of tunneling for the interface, with the following possible values: • No--Tunneling is disabled and the SPA performs MAC destination address filtering. • Yes--Tunneling is enabled and the SPA does not perform MAC destination address filtering. **Note** If promiscuous mode is enabled, then the first VLAN ID 0 entry shows tunnel = Yes. All other VLAN ID entries show tunnel = No.

The table below describes the fields shown in the Platform details section of the display.

Table 32: show controllers Command Field Descriptions--Platform Details Section

Field	Description
PXF tif number	Number of the interface (in hexadecimal format) used for PXF on the network services engine (NSE) or by the Hyper Transport (HT) FPGA device on the network processing engine (NPE).

Related Commands

Command	Description
show interfaces fastethernet	Displays information about the Fast Ethernet interfaces.

show controllers fddi

To display all information under the FDDI Interface Processor (FIP) on the Cisco 7200 series and Cisco 7500 series routers, use the **showcontrollersfddi** command in user EXEC or privileged EXEC mode.

show controllers fddi

Syntax Description

This command has no arguments or keywords.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
10.0	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

This command reflects the internal state of the chips and information that the system uses for bridging and routing that is specific to the interface hardware. The information displayed is generally useful for diagnostic tasks performed by technical support personnel only.

Examples

The following is sample output from the **showcontrollersfddi** command:

```
Router# show controllers fddi
Fddi2/0 - hardware version 2.2, microcode version 1.2
  Phy-A registers:
    cr0 4, cr1 0, cr2 0, status 3, cr3 0
  Phy-B registers:
    cr0 4, cr1 4, cr2 0, status 3, cr3 0
  FORMAC registers:
    irdtlb  71C2, irdtneg F85E, irdthtt F5D5, irdmir  FFFF0BDC
    irdtrth F85F, irdtmax FBC5, irdtvxt 5959, irdstmc 0810
    irdmode 6A20, irdimsk 0000, irdstat 8060, irdtpri 0000
  FIP registers
    ccb:   002C  cmd:   0006  fr:   000F  mdptr: 0000  mema: 0000
    icb:   00C0  arg:   0003  app:  0004  mdpg:  0000  af:   0603
    clm:   E002  bcn:   E016  clbn: 0198  rxoff: 002A  en:   0001
    clmbc: 8011  bcnbc: 8011  robn: 0004  park:  0000  fop:  8004
    txchn: 0000  pend:  0000  act:  0000  tail:  0000  cnt:  0000
    state: 0003  check: 0000  eof:  0000  tail:  0000  cnt:  0000
    rxchn: 0000  buf0:  0534  nxt0: 0570  eof:   0000  tail: 0000
    eofch: 0000  buf1:  051C  nxt1: 0528  pool:  0050  err:  005C
    head:  0984  cur:   0000  t0:   0030  t1:    0027  t2:   000F
    tail:  0984  cnt:   0001  t3:   0000  rxlft: 000B  used: 0000
    txq_s: 0018  txq_f: 0018  Aarm: 0000  Barm:  1388  fint: 8004
 Total LEM: phy-a 6, phy-b 13
```

The last line of output indicates how many times the specific PHY encountered an “UNKNOWN LINE STATE” event on the fiber.

show controllers gigabitethernet

To display initialization block information, transmit ring, receive ring, transmission statistics and errors, and applicable MAC destination address and VLAN filtering tables for Gigabit Ethernet interface controllers, use the **showcontrollersgigabitethernet**command in privileged EXEC mode.

Standard Syntax
show controllers gigabitethernet *slot/port*

Shared Port Adapters
show controllers gigabitethernet *slot/subslot/port* [**detail**]

Syntax Description

slot	(Optional) Chassis slot number. Refer to the appropriate hardware manual for slot information. For MSCs, refer to the platform-specific SPA hardware installation guide or the corresponding “Identifying Slots and Subslots for MSCs and SPAs” topic in the platform-specific SPA software configuration guide.
/ *subslot*	(Optional) Secondary slot number on a MSC 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.
/ *port*	(Optional) Port or interface number. Refer to the appropriate hardware manual for port information. For SPAs, refer to the corresponding “Specifying the Interface Address on a SPA" topics in the platform-specific SPA software configuration guide.
detail	Specifies display of additional low-level diagnostic information.

Command Default

No default behavior or values.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.1CC	This command was introduced.
12.1(3a)E	Support for the Cisco 7200-I/O-GE+E controller was introduced.
12.1(5)T	This command was integrated into Cisco IOS Release 12.1(5)T.
12.2S	This command was integrated into Cisco IOS Release 12.2S.
12.2(20)S2	This command was implemented on the 2-Port 10/100/1000 Gigabit Ethernet SPA on the Cisco 7304 router with a new address format and output.
12.2(33)SRA	This command was integrated into Cisco IOS Release 12.2(33)SRA.

Release	Modification
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.
15.2(02)SA	This command was implemented on the Cisco ME 2600X Series Ethernet Access Switches.

Usage Guidelines

This command is used to display hardware and software information about the Gigabit Ethernet interface. The I/O controller is always found in slot 0.

Shared Port Adapter Usage Guidelines

The output from the **showcontrollersgigabitethernet**command for the 2-Port 10/100/1000 Gigabit Ethernet SPA provides several different sections of information and statistics that are organized according to the internal hardware devices and the various paths in the flow of data on the SPA. Several areas of the output are generally useful for diagnostic tasks performed by technical support only.

Examples

The following is sample output from the **showcontrollersgigabitethernet**command:

```
Router# show controllers gigabitethernet 0/0
Interface GigabitEthernet0/0 (idb 0x627D8344)
Hardware is i82543 (Livengood) A1
network connection mode is AUTO
network link is up
loopback type is none
SERDES is enabled (TBI mode), GBIC is enabled
GBIC type is 1000BaseSX
idb->lc_ip_turbo_fs=0x604A82B0, ip_routecache=0x1(dfs=0/mdfs=0), max_mtu=1524
i82543_ds=0x627DA094, registers=0x3C100000, curr_intr=0
rx cache size=2000, rx cache end=1744, rx_nobuffer=0
i82543 MAC registers:
CTRL  =0x0ACC0004, STATUS=0x00000FAB, CTRL_X=0x000048E0, IMS   =0x00000096
RCTL  =0x0042803A, RDBAL =0x2000E000, RDBAH =0x00000000, RDLEN =0x00001000
RDH   =0x000000CB, RDT   =0x000000CA, RDTR  =0x00000000
TCTL  =0x000400FA, TDBAL =0x20010000, TDBAH =0x00000000, TDLEN =0x00001000
TDH   =0x00000057, TDT   =0x00000057, TIPG  =0x00600806
ETT   =0x00000000, TXDMAC=0x00000001
TXCW  =0xC00001A0, RXCW  =0xDC004120, FCRTH =0x0000AFF0, FCRTL =0x80001200
FCAH  =0x00000100, FCAL  =0x00C28001, FCT   =0x00008808, FCTTV =0x00000080
RDFH  =0x00000BFA, RDFT  =0x00000BFA, RDFPC =0x00000000
TDFH  =0x00001EBA, TDFT  =0x00001EBA, TDFPC =0x00000000
RX is normal, enabled  TX is normal, enabled
Device status = full-duplex, link up
AN status = done(RF:0 , PAUSE:2 ), bit sync OK, rx idle stream, rx invalid
symbols, rx idle char
GBIC registers:
Register 0x00:  01  00  01  00  00  00  01  00
Register 0x08:  00  00  00  00  0D  00  00  00
Register 0x10:  32  1E  00  00  4D  65  74  68
Register 0x18:  6F  64  65  20  45  6C  65  63
Register 0x20:  2E  20  20  20  00  00  00  00
Register 0x28:  4D  47  42  43  2D  32  30  2D
Register 0x30:  34  2D  31  2D  53  20  20  20
Register 0x38:  31  30  30  30  00  00  00  55
Register 0x40:  00  0A  00  00  41  4A  42  48
Register 0x48:  47  30  36  30  20  20  20  20
Register 0x50:  20  20  20  20  30  30  30  33
Register 0x58:  32  30  20  20  00  00  00  61
PartNumber:MGBC-20-4-1-S
```

```
PartRev:G
SerialNo:AJBHG060
Options: 0
Length(9um/50um/62.5um):000/500/300
Date Code:000320
Gigabit Ethernet Codes: 1
PCI configuration registers:
bus_no=0, device_no=8
DeviceID=0x1001, VendorID=0x8086, Command=0x0156, Status=0x0230
Class=0x02/0x00/0x00, Revision=0x01, LatencyTimer=0xFC, CacheLineSize=0x20
BaseAddr0=0x48100000, BaseAddr1=0x00000000, MaxLat=0x00, MinGnt=0xFF
SubsysDeviceID=0x1001, SubsysVendorID=0x8086
Cap_Ptr=0x000000DC  Retry/TRDY Timeout=0x00000000
PMC=0x00220001  PMCSR=0x00000000
I82543 Internal Driver Variables:
rxring(256)=0x2000E000, shadow=0x627DA3F0, head=203, rx_buf_size=512
txring(256)=0x20010000, shadow=0x627DA81C, head=87, tail=87
chip_state=2, pci_rev=1
tx_count=0, tx_limited=0
rx_overrun=0, rx_seq=0, rx_no_enp=0, rx_discard=0
throttled=0, enabled=0, disabled=0
reset=17(init=1, check=0, restart=3, pci=0), auto_restart=18
link_reset=0, tx_carrier_loss=1, fatal_tx_err=0
isl_err=0, wait_for_last_tdt=0
HW addr filter:0x627DB048, ISL disabled, Promiscuous mode on
Entry= 0: Addr=0000.C000.4000
(All other entries are empty)
i82543 Statistics
CRC error        0            Symbol error     7
Missed Packets   0            Single Collision 0
Excessive Coll   0            Multiple Coll    0
Late Coll        0            Collision        0
Defer            0            Receive Length   0
Sequence Error   0            XON RX           0
XON TX           0            XOFF RX          0
OFF TX          0            FC RX Unsupport  0
Packet RX (64)   11510        Packet RX (127)  17488
Packet RX (255)  1176         Packet RX (511)  7941
Packet RX (1023) 738          Packet RX (1522) 18
Good Packet RX   38871        Broadcast RX     0
Multicast RX     0            Good Packet TX   5208
Good Octets RX.H 0            Good Octets RX.L 5579526
Good Octets TX.H 0            Good Octets TX.L 513145
RX No Buff       0            RX Undersize     0
RX Fragment      0            RX Oversize      0
RX Octets High   0            RX Octets Low    5579526
TX Octets High   0            TX Octets Low    513145
TX Packet        5208         RX Packet        38871
TX Broadcast     1796         TX Multicast     330
Packet TX (64)   1795         Packet TX (127)  3110
Packet TX (255)  0            Packet TX (511)  300
Packet TX (1023) 3            Packet TX (1522) 0
TX Underruns     0            TX No CSR        0
RX Error Count   0            RX DMA Underruns 0
RX Carrier Ext   0
TCP Segmentation 0            TCP Seg Failed   0
```

Shared Port Adapter Examples

The following is sample output from the **showcontrollersgigabitethernet** command for the first RJ-45 interface (port 0) in a 2-Port 10/100/1000 Gigabit Ethernet SPA located in the top subslot (0)

of the MSC that is installed in slot 5 on a Cisco 7304 router. This output also shows the SPA Error counters section that appears only if one of the types of SPI4 errors occurs on the interface:

```
Router#  show controllers gigabitethernet 0/0
Interface GigabitEthernet5/0/0
  Hardware is SPA-2GE-7304
  Connection mode is auto-negotiation
  Interface state is up, link is up
  Configuration is Auto Speed, Auto Duplex
  Selected media-type is RJ45
  Promiscuous mode is off, VLAN filtering is enabled
  MDI crossover status: MDIX
  Auto-negotiation configuration and status:
    Auto-negotiation is enabled and is completed
    Speed/duplex is resolved to 1000 Mbps, full duplex
    Advertised capabilities: 10M/HD 10M/FD 100M/HD 100M/FD 1000M/HD 1000M/FD
                             Pause capable (Asymmetric)
    Partner capabilities: 10M/HD 10M/FD 100M/HD 100M/FD 1000M/FD Pause capable
MAC counters:
  Input: packets = 0, bytes = 0
         FIFO full/reset removed = 0, error drop = 0
  Output: packets = 1, bytes = 64
          FIFO full/reset removed = 0, error drop = 0
  Total pause frames: transmitted = 0, received = 0
FPGA counters:
  Input: Total (good & bad) packets: 0, TCAM drops: 0
         Satisfy (host-backpressure) drops: 0, CRC drops: 0
         PL3 RERRs: 0
  Output: EOP (SPI4) errors: 0
SPA carrier card counters:
  Input: packets = 0, bytes = 0, drops = 0
  Output: packets = 1, bytes = 60, drops = 0
  Egress flow control status: XON
  Per bay counters:
  General errors: input = 0, output = 0
  SPI4 errors: ingress dip4 = 0, egress dip2 = 0
SPA Error counters:
  SPI4 TX out of frame error = 2 (00:02:31 ago)
  SPI4 TX Train valid error = 1 (00:02:11 ago)
  SPI4 TX DIP4 error = 1 (00:01:30 ago)
  SPI4 RX out of frame error = 1 (00:00:36 ago)
  SPI4 RX DIP2 error = 1 (00:00:13 ago)
MAC destination address filtering table:
  Table entries: Total = 1024, Used = 3, Available = 1021
  Index MAC destination address       Mask
  ----- ----------------------  --------------
  1     00b0.64ff.5aa0          ffff.ffff.ffff
  2     ffff.ffff.ffff          ffff.ffff.ffff
  3     0100.0000.0000          0100.0000.0000
VLAN filtering table:
  Number of VLANs configured on this interface = 0
  Table entries: Total = 2048, Used = 2, Available = 2046
  Index  VLAN identifier  Enabled  Tunnel
  -----  ---------------  -------  ------
  1           0             No      No
  2           0             Yes     No
Platform details:
  PXF tif number: 0x10
```

The following is sample output from the **showcontrollersgigabitethernet** command for the first fiber interface (port 0) in a 2-Port 10/100/1000 Gigabit Ethernet SPA located in the bottom subslot (1) of the MSC that is installed in slot 4 on a Cisco 7304 router:

```
Router# show controllers gigabitethernet 4/1/0
Interface GigabitEthernet4/1/0
  Hardware is SPA-2GE-7304
  Connection mode is auto-negotiation
  Interface state is up, link is up
  Configuration is Auto Speed, Auto Duplex
  Selected media-type is GBIC, GBIC type is 1000BaseSX
  SFP is present, LOS: no, Tx fault: no, Security check status: Pass
  Promiscuous mode is off, VLAN filtering is enabled
  MDI configuration is automatic crossover, status is MDI
  Auto-negotiation configuration and status:
    Auto-negotiation is enabled and is completed
    Speed/duplex is resolved to 1000 Mbps, full duplex
    Advertised capabilities: 1000BaseX/FD Pause capable (Asymmetric)
    Partner capabilities: 1000BaseX/FD Pause capable(Asymmetric)
MAC counters:
  Input: packets = 213, bytes = 21972
         FIFO full/reset removed = 0, error drop = 0
  Output: packets = 216, bytes = 22932
          FIFO full/reset removed = 0, error drop = 0
  Total pause frames: transmitted = 0, received = 0
FPGA counters:
  Input: Total (good & bad) packets: 213, TCAM drops: 183
         Satisfy (host-backpressure) drops: 0, CRC drops: 0
         PL3 RERRs: 0
  Output: EOP (SPI4) errors: 0
SPA carrier card counters:
  Input: packets = 30, bytes = 10140, drops = 0
  Output: packets = 216, bytes = 22068, drops = 0
  Egress flow control status: XON
  Per bay counters:
  General errors: input = 0, output = 0
  SPI4 errors: ingress dip4 = 0, egress dip2 = 0
MAC destination address filtering table:
  Table entries: Total = 1024, Used = 4, Available = 1020
  Index MAC destination address       Mask
  ----- ----------------------  --------------
  1     0007.0ed3.ba88          ffff.ffff.ffff
  2     ffff.ffff.ffff          ffff.ffff.ffff
  3     0100.0000.0000          0100.0000.0000
  4     0100.0ccc.cccc          ffff.ffff.ffff
VLAN filtering table:
  Number of VLANs configured on this interface = 0
  Table entries: Total = 2048, Used = 2, Available = 2046
  Index  VLAN identifier  Enabled  Tunnel
  -----  ---------------  -------  ------
  1           0             No      No
  2           0             Yes     No
Platform details:
  PXF tif number: 0x14
```

This table describes the fields shown in the interface configuration section of the display. This section is useful for verifying the status of autonegotiation and configured parameters on the link, and the amount of traffic being handled by the interface.

Table 33: show controllers Command Field Descriptions--Interface Section

Field	Description
Interface	Name of the interface.
Hardware	Type of hardware.

Field	Description
Connection mode	Indicator of autonegotiation used to establish the connection.
Link	State of the link.
Configuration	Configuration of the speed and duplex operation on the interface.
Selected media-type	Interface port media type: RJ45 or Gigabit Interface Converter (GBIC).
GBIC type is	GBIC interface type: 1000BaseSX, 1000BaseLX, or 1000BaseZX
SFP is	Indicates presence of an SFP optical transceiver.
LOS	Indicates whether or not the SFP detects a loss of signal (LOS).
Tx fault	Indicates whether or not the SFP detects a transmission fault.
Security check status	Indicates whether or not the SFP passes the security check. The SPA enables a security check by default to verify whether a Cisco-approved SFP is inserted. If the SFP is not a Cisco-approved device, the link is brought down.
Promiscuous mode	State of promiscuous mode (on or off). When promiscuous mode is on, the SPA disables MAC destination address and VLAN filtering. When promiscuous mode is off, the SPA enables MAC destination address and VLAN filtering.
VLAN filtering	Status of ternary content addressable memory (TCAM) filtering of VLANs (enabled or disabled). By default, the SPA always enables VLAN filtering. The SPA disables VLAN filtering if the TCAM table is full, or if the SPA is operating in promiscuous mode. **Note** VLAN filtering is not enabled or disabled using any command-line interface (CLI) command.
MDI crossover status	State of the media dependent interface (MDI) for the PHY device on the specified interface. The possible values are MDI for straight-through cables or media dependent interface crossover (MDI-X) for crossover cables.
Auto-negotiation	State of autonegotiation (enabled or disabled) on the interface and its current status.
Speed/duplex is resolved to	Results of autonegotiated parameter values (speed and duplex) currently being used on the link.
Advertised capabilities	List of the possible combinations of speed and duplex modes (in *speed*/*duplex* format) and flow control that the local interface has advertised it supports to the remote device: • For speed--10M is 10 Mbps, 100M is 100 Mbps, and 1000M is 1000 Mbps. • For duplex--HD is half duplex, and FD is full duplex. • For flow control--“Pause capable (Asymmetric)” means that the SPA advertises support of the PAUSE flow control bit and the ASM_DIR (asymmetric) flow control bit.

Field	Description
Partner capabilities	List of the possible combinations of speed and duplex modes (in *speed*/*duplex* format) and flow control that the remote device has advertised it supports to the local interface: • For speed--10M is 10 Mbps, 100M is 100 Mbps, and 1000M is 1000 Mbps. • For duplex--HD is half duplex, and FD is full duplex. • For flow control--"Pause capable" means that the remote device supports implementation of the PAUSE flow control bit; "Pause capable (Asymmetric)" means that the remote device supports implementation of the PAUSE flow control bit and the ASM_DIR (asymmetric) flow control bit.

This table describes the fields shown in the MAC counters section of the display. This section is useful for verifying the status of packets processed by the MAC device for the interface. This information is useful for Cisco Systems technical support personnel.

Table 34: show controllers Command Field Descriptions--MAC Counters Section

Field	Description
Input: packets, bytes	Total number of packets and bytes received by the MAC device for the interface since it was activated or cleared. You can clear these counters using the **clearcounters** privileged EXEC command.
Input: FIFO full/reset removed	Total number of packets removed by the MAC device due to a first-in, first-out (FIFO) overflow condition in the input buffer for the interface.
Input: error drop	Total number of input packets with errors that are dropped by the MAC device for the interface.
Output: packets, bytes	Total number of packets and bytes transmitted by the MAC device for the interface since it was activated or cleared. You can clear these counters using the **clearcounters** privileged EXEC command.
Output: FIFO full/reset removed	Total number of packets removed by the MAC device due to a first-in, first-out (FIFO) overflow condition in the output buffer for the interface.
Output: error drop	Total number of output packets with errors that are dropped by the MAC device for the interface.
SPI3: disabled port drop	Total number of packets dropped by the MAC device at the System Packet Interface Level 3 (SPI3) path between the MAC device and FPGA device due to a disabled port condition.
SPI3: sync error drop	Total number of packets dropped by the MAC device at the SPI3 path between the MAC device and FPGA device due to a sync error (synchronization bits altered) condition.

Field	Description
SPI3: short packet drop	Total number of packets dropped by the MAC device at the SPI3 path between the MAC device and FPGA device due to a short packet (packet length is less than 64 bytes) condition.
SPI3: parity error drop	Total number of packets dropped by the MAC device at the path between the MAC device and FPGA device due to a parity error (parity bit is altered during data transmission) condition.
Total pause frames	Total number of Ethernet 802.3x pause frames transmitted and received by the MAC device for flow control on the interface.

This table describes the fields shown in the FPGA counters section of the display. This section is useful for verifying the status of packets processed by the FPGA device for the interface. This information is useful for Cisco Systems technical support personnel.

Table 35: show controllers Command Field Descriptions--FPGA Counters Section

Field	Description
Input: Total (good & bad) packets	Total number of packets received by the FPGA device in the ingress direction for the interface.
Input: TCAM drops	Total number of packets dropped by the FPGA device in the ingress direction for the interface due to a ternary content addressable memory (TCAM) lookup failure. This counter increments when the interface receives a frame with a destination MAC address or VLAN identifier that is not present in the TCAM table.
Input: Satisfy (host-backpressure) drops	Total number of packets dropped by the FPGA device in the ingress direction for the interface due to back-pressure from the MSC.
Input: CRC drops	Total number of packets dropped by the FPGA device in the ingress direction for the interface due to cyclic redundancy check (CRC) errors.
Input: PL3 RERRs	Total number of packets with errors received for the interface by the FPGA device in the ingress direction over the SPI3 (PL3) path from the MAC device to the FPGA device.
Output: EOP (SPI4) errors	Total number of packets with end-of-packet (EOP) errors received by the FPGA device in the egress direction for the interface over the System Packet Interface Level 4 (SPI4) path from the MSC to the FPGA device.

The following table describes the fields shown in the SPA carrier card counters section of the display. This section is useful for verifying the status of packets processed by the MSC for the interface. This information is useful for Cisco Systems technical support personnel.

Table 36: show controllers Command Field Descriptions--SPA Carrier Card Counters Section

Field	Description
Input: packets, bytes, drops	Total number of packets, bytes, and packet drops that have occurred on the SPI4 path from the FPGA device to the MSC.
Output: packets, bytes, drops	Total number of packets, bytes, and packet drops that have occurred on the SPI4 path from the MSC to the FPGA device.
Egress flow control status	Status of flow control between the MSC and the Route Processor (RP). The possible values are: • XON--A control frame has been sent by the MSC to the RP to indicate that the MSC is ready to accept data. • XOFF--A control frame has been sent by the MSC to the RP to indicate congestion on the MSC. The MSC cannot accept any more data from the RP during this condition.
General errors	Total number of errors (such as parity) on the MSC in the ingress and egress direction.
SPI4 errors: ingress dip4	Total number of 4-bit Diagonal Interleaved Parity (DIP4) errors in the ingress direction on the SPI4 path from the FPGA device to the MSC. DIP4 is a parity algorithm where a 4-bit odd parity is computed diagonally over control and data words.
SPI4 errors: egress dip2	Total number of 2-bit Diagonal Interleaved Parity (DIP2) errors in the egress direction on the SPI4 path from the FPGA device to the MSC. DIP2 is a parity algorithm where a 2-bit odd parity is computed diagonally over status words.

The following table describes the fields shown in the SPA error counters section of the display. This section appears only when one of the SPI4 transmit or receive errors occurs on the interface. This information is useful for Cisco Systems technical support personnel.

Note None of the SPA SPI4 error counters appear in **showcontrollersgigabitethernet** command output until at least one of those types of SPI4 errors occurs.

All of the errors in the SPA error counters section are subject to the SPA automatic recovery process when certain thresholds are reached. For more information about this process on the Cisco 7304 router, refer to the “Understanding SPA Automatic Recovery” section of the *Cisco 7304 Router Modular Services Card and Shared Port Adapter Software Configuration Guide* .

Table 37: show controllers Command Field Descriptions--SPA Error Counters Section

Field	Description
SPI4 TX out of frame error = (*hh:mm:ss* ago)	Number of SPI4 out of frame errors (events) detected in the transmit direction (toward the network), from the MSC to the SPA FPGA device. The time stamp indicates how long ago (in hours:minutes:seconds) from the current system time, that the last error was detected. This error indicates a loss of synchronization between the synchronization block and the data received on the SPI4 path. When synchronization is reacquired, the error no longer occurs.
SPI4 TX Train valid error = (*hh:mm:ss* ago)	Number of times that a low-level synchronization problem was detected in the transmit direction (toward the network), from the MSC to the SPA FPGA device. The time stamp indicates how long ago (in hours:minutes:seconds) from the current system time, that the last error was detected.
SPI4 TX DIP4 error = (*hh:mm:ss* ago)	Number of 4-bit Diagonal Interleaved Parity (DIP4) errors in the transmit direction (toward the network), from the MSC to the SPA FPGAdevice. The time stamp indicates how long ago (in hours:minutes:seconds) from the current system time, that the last error was detected. DIP4 is a parity algorithm where a 4-bit odd parity is computed diagonally over control and data words.
SPI4 RX out of frame error = (*hh:mm:ss* ago)	Number of SPI4 out of frame errors (events) detected in the receive direction (from the network), from the SPA FPGA device to theMSC. The time stamp indicates how long ago (in hours:minutes:seconds) from the current system time, that the last error was detected. This error indicates a loss of synchronization between the synchronization block and the data received on the SPI4 path. When synchronization is reacquired, the error no longer occurs.
SPI4 RX DIP2 error = (*hh:mm:ss* ago)	Number of 2-bit Diagonal Interleaved Parity (DIP2) errors in the receive direction (from the network), from theSPA FPGA device to the MSC. The time stamp indicates how long ago (in hours:minutes:seconds) from the current system time, that the last error was detected. DIP2 is a parity algorithm where a 2-bit odd parity is computed diagonally over status words.

The following table describes the fields shown in the MAC destination address filtering table section of the display. This section is useful for verifying the multicast destination addresses that are in the TCAM table and permitted by the interface. This information is useful for Cisco Systems technical support personnel.

Table 38: show controllers Command Field Descriptions--MAC Destination Address Filtering Table Section

Field	Description
Table entries: Total, Used	Total number of MAC destination address entries possible in the TCAM table for the interface, and the number of table entries currently used by the interface. The 2-Port 10/100/1000 Gigabit Ethernet SPA supports a 512-entry MAC filtering table for each supported interface (1024 entries total on the card).
Index	Table entry identifier.
MAC destination address	MAC destination address (multicast) permitted by the interface and used in the TCAM lookup table for packet filtering. The multicast MAC entries typically come from routing protocols [such as Open Shortest Path First (OSPF) and Enhanced IGRP (EIGRP)], and other protocols including the Hot Standby Router Protocol (HSRP). When the router reloads, three addresses appear by default in the MAC filtering table: the unicast address of the local interface, the Ethernet broadcast address, and the Ethernet multicast address.
Mask	Mask for the corresponding destination address. The SPA uses the bits that are set in the mask to look up the address in the TCAM table.

The following table describes the fields shown in the VLAN filtering table section of the display. This section is useful for verifying the VLANs that are in the TCAM table and are permitted by the interface. This information is useful for Cisco Systems technical support personnel.

Table 39: show controllers Command Field Descriptions--VLAN Filtering Table Section

Field	Description
Number of VLANs configured on this interface	Number of VLANs that are configured on the interface. If the number of VLANs configured on the interface is 1022 or less, then the VLAN filtering table also shows an index entry for every VLAN ID. The number of VLANs configured on the interface can be 0, while the number of used table entries reports 2, because the SPA always uses two entries to provide valid matching criteria for promiscuous mode and non-VLAN packets.
Table entries: Total, Used, Available	Total number of VLAN entries possible in the TCAM filtering table for the interface, the number of table entries currently used by the interface (two are always in use by default), and the number of table entries that remain available. The 2-Port 10/100/1000 Gigabit Ethernet SPA supports a 1024-entry VLAN filtering table for each supported interface (2048 entries total on the card).
Index	Table entry identifier.
VLAN identifier	Number of the VLAN. Two VLAN ID 0 entries always appear in the table and represent the local interface port for handling of promiscuous mode and non-VLAN packets. Other VLAN entries appear in this table when VLANs are configured on the interface.

Field	Description
Enabled	Status of the VLAN ID for TCAM filtering, with the following possible values: • No--The entry is disabled for filtering. • Yes--The entry is enabled for filtering. The TCAM filter uses the "first-match" rule to filter packets that the SPA receives against entries in the table. The matching assessment begins at the top of the table with the VLAN ID 0 entries. **Note** The SPA always supports two VLAN ID 0 entries. The first VLAN ID 0 entry of the TCAM table is used for promiscuous mode. It has a value of "No," meaning it is disabled, whenever promiscuous mode is disabled for the interface. The second VLAN ID 0 entry is used for filtering of non-VLAN packets.
Tunnel	Status of tunneling for the interface, with the following possible values: • No--Tunneling is disabled and theSPA performs MAC destination address filtering. • Yes--Tunneling is enabled and the SPA does not perform MAC destination address filtering. **Note** If promiscuous mode is enabled, then the first VLAN ID 0 entry shows tunnel = Yes. All other VLAN ID entries show tunnel = No.

The following table describes the fields shown in the platform details section of the display.

Table 40: show controllers Command Field Descriptions--Platform Details Section

Field	Description
PXF tif number	Number of the interface (in hexadecimal format) used for PXF on the network services engine (NSE) or by the Hyper Transport (HT) FPGA device on the network processing engine (NPE).

Related Commands

Command	Description
show interfaces gigabitethernet	Displays software and hardware information about a Gigabit Ethernet interface.

show controllers integrated-service-engine

To show the Cisco wireless LAN controller network module (WLCM) on the router, use the **showcontrollersintegrated-service-engine** command in privileged EXEC mode.

show controllers integrated-service-engine slot/unit

Syntax Description

slot/unit	Specifies the router slot and unit numbers for the WLCM.

Command Default

None

Command Modes

Privileged EXEC

Command History

Release	Modification
12.4(15)T	This command was introduced.

Examples

The following example shows how to display interface information for the WLCM:

```
Router# show controllers integrated-service-engines
 1/0
Interface integrated-service-engine 1/0
Hardware is Intel 82559 FastEthernet
IDB: 67796B08, FASTSEND: 60E073CC, MCI_INDEX: 0

INSTANCE=0x67797BE8
  Rx Ring entries = 64
  Rx Shadow = 0x67797ED0
  Rx Ring = 0x2DCC1840
  Rx Ring Head = 5
  Rx Ring Last = 4
  Rx Buffer Descr = 0x2DCC3040
  Rx Buffer Descr Head = 5
  Rx Buffer Descr Last = 4

(cont...)
Receive All Multicasts = enabled
Receive Promiscuous = disabled
Loopback Mode = disabled


Module Reset Statistics:
  CLI reset count = 0
  CLI reload count = 0
  Registration request timeout reset count = 0
  Error recovery timeout reset count = 0
  Module registration count = 1
```

show controllers ism

To display controller information for the internal service module interface, use the **showcontrollersism** command in user EXEC or privileged EXEC mode.

show controllers ism *slot*/*port*

Syntax Description

slot	Router slot in which the service module is installed. For internal service modules, always use 0.
/ *port*	Port number of the module interface. Always use 0. The slash mark (/) is required.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

Release	Modification
15.0(1)M	This command was introduced.

Usage Guidelines

The output from this command is generally useful for diagnostic tasks performed by technical support only. You can, however, use the displayed hardware statistics to obtain the receive and transmit packet statistics that are collected by the hardware controller during packet processing.

Examples

The following example shows how to display information for the ISM installed in the router:

```
Router# show controllers ism 0/0
Interface ISM0/0
Hardware is PSE2
HWIDB: 0x01395BF0 INSTANCE: 0x11E75280, FASTSEND: 0x040D6C44
Init flags: 0x23

FPGA registers
----------------
  Base address:   0xE2000000    Revision:       0x09030416
  FPGA type:      0x72676D69    FPGA_error_val: 0x00000000
  Cfg MSI mask:   0x00000008    Rx_buffer_size: 0x00000600

Frame statistics: (polling enabled)
-----------------------------------
  tx_frame_cnt: 677                     rx_frame_cnt: 333
  tx_byte_cnt: 104953                   rx_byte_cnt: 35076
  tx_pause_frame_cnt: 0                 rx_pause_frame_cnt: 0
  rx_unicast_filtered_cnt: 0            rx_multicast_filtered_cnt: 8
  rx_undersize_pkts: 0                  rx_oversize_pkts: 0
  tx_64_byte_pkts: 435                  rx_64_byte_pkts: 217
  tx_65_to_127_byte_pkts: 17            rx_65_to_127_byte_pkts: 8
  tx_128_to_255_byte_pkts: 4            rx_128_to_255_byte_pkts: 108
  tx_256_to_511_byte_pkts: 221          rx_256_to_511_byte_pkts: 0
  tx_512_to_1023_byte_pkts: 0           rx_512_to_1023_byte_pkts: 0
  tx_1024_to_1518_byte_pkts: 0          rx_1024_to_1518_byte_pkts: 0
  rx_congestion_drop_cnt: 0             rx_mtusize_drop_cnt: 0
  rx_bad_cnt: 0

Interrupt statistics
--------------------
  ge_tx_interrupt: 569                  ge_rx_interrupt: 326
```

```
  txbd_seq_err: 0                       txbd_done_err: 0
  rxbd_done_err: 0                      isl_inner_crc_err: 0
  pcie_busmstr_dsbld_err: 0             pcie_tgt_abort_err: 0
  pcie_mst_abort_err: 0                 spi_done_event: 0
  rx_empty_pak: 0                       rx_sw_usage_err: 0
  ing_buf_adrs_err: 0                   pcie_null_ptr_err: 0
  uart_tx_intr: 58                      uart_rx_intr: 9036
  uart_break_detected: 0                uart_framing_err: 0
  uart_bad_egr_adrs: 0                  uart_egr_overflow: 0
  i2c_errs: misc/nack/tmo: 0/0/0

TX ring
-------
  Tx Ring txr_head/txr_tail:  167/167
  Tx Shadow txs_head/txs_tail/txs_free: 167/167/256
  Tx Ring(txr): 0x3CF84800 Tx Shadow (malloc): 0x11E75500
  Tx Limited: 0 Tx Count: 0 hold_pak 0x00000000

RX rings
--------
  size: 256      max_spin_size 32       head: 70
  Rx Ring(rxr):   0x3CF84000  rxr_malloc: 0x3CF84000
  Rx Shadow(rxs): 0x13969F4   rxs_malloc: 0x13969F4

Software MAC Address Filter (hash:length/addr/mask/hits)
------------------------------------------------------------
   000:  0  ffff.ffff.ffff  0000.0000.0000         2
   039:  0  001e.4a97.646d  0000.0000.0000         0
   192:  0  0180.c200.0002  0000.0000.0000         0
   192:  1  0100.0ccc.cccc  0000.0000.0000       106
   197:  0  0180.c200.0007  0000.0000.0000         0

   Software filtered frames: 0
   Unicast overflow mode:   0
   Multicast overflow mode: 1
   Promiscuous mode:        0

  HW MAC Address Filter
  ---------------------
   Unicast Addr0: 001E.4A97.646D
   Unicast Addr1: 0000.0000.0100
   Unicast Addr2: 0000.0000.0100
   Unicast Addr3: 0000.0000.0100
   Unicast Addr4: 0000.0000.0100
   Unicast HW Filter Count   : 1

   Multicast Hash b63_32: 0x2000001
   Multicast Hash b32_00: 0x00
   HW unicast filter enabled: Yes
   HW multicast filter enabled: Yes

FPGA upgrade info
-----------------
  Golden area fpga version:  00000000
  Upgrade area fpga version: 09030416
  IOS bundled fpga version:  09030416
```

The table below describes the significant fields shown in the display.

Table 41: show controllers analysis-module Field Descriptions

Field	Description
Hardware	Description of the chip being used.
IDB, FASTSEND	Address in router memory of the Interface Descriptor Block (IDB) and the fastsend routine.
INSTANCE	Device-specific data stored in router memory that lists the memory locations and current indexes of receive (Rx) and transmit (Tx) rings in router I/O memory.
CONTROL AND STATUS REGISTERS (CSR)	Control and status registers that are physically located on the chip itself and that are accessed by the CPU over the Peripheral Component Interconnect (PCI) bus.
PHY REGISTERS	Contents of the PHY registers. PHY is a device that interfaces the physical Ethernet line and that is located between the chip and the physical line.
HARDWARE STATISTICS	Receive (Rx) and transmit (Tx) traffic statistics collected by the chip.
INTERRUPT STATISTICS	Transmit (Tx), Receive (Rx), control, software, and flow control interrupt statistics collected by the chip.

Related Commands

Command	Description
service-module ism status	Displays hardware and software status information about the ISM.
show interfaces ism	Displays status, traffic data, and configuration information about the ISM interface.

show controllers j1

To display statistics about the J1 link, use the **showcontrollersj1**command in privileged EXEC mode.

show controllers j1 *slot*/*port*

Syntax Description

slot / *port*	Backplane slot and port number on the controller.

Command Modes

Privileged EXEC

Command History

Release	Modification
12.2(8)T	The command was introduced on the J1 controller for the Cisco 2600 and Cisco 3600 series.

Examples

The following is sample output from the **showcontrollersj1**command on the Cisco 3660:

```
Router# show controllers j1 3/0
J1 3/0 is up.
  Applique type is Channelized J1 - TTC2M
  No alarms detected.
Version info Firmware: 20010530, FPGA: 1
  Framing is J1-TTC2M MF, Line Code is CMI, Clock Source is Line.
  Data in current interval (344 seconds elapsed):
     0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
  Total Data (last 24 hours)
     0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins,
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
```

The table below describes the fields shown in the display.

Table 42: show controllers j1 Field Descriptions

Field	Description
j1 3/0 is up.	The J1 controller 3 in slot 0 is operating. The controller's state can be up, down, or administratively down.
Applique type	The applique type is shown and is always Channelized.

Field	Description
No alarms detected	Any alarms detected by the controller are displayed here. Possible alarms are as follows: • Transmitter is sending remote alarm. • Transmitter is sending AIS. • Receiver has loss of signal. • Receiver is getting AIS. • Receiver has loss of frame. • Receiver has remote alarm. • Receiver has no alarms.
Version	Indicates date of compilation.
Framing is	Shows the current framing type which is always J1-TTC2M MF.
Linecode is	Shows the current line encoding type which is always coded mark inversion (CMI).
Clock Source	Shows the current clock source type.
Data in current interval (344 seconds elapsed)	Shows the current accumulation period, which rolls into the 24-hour accumulation every 15 minutes. Accumulation period is from 1 to 900 seconds. The oldest 15-minute period falls off the back of the 24-hour accumulation buffer.
Slip Secs	Indicates the replication or deletion of the payload bits of a DS1 frame. A slip might be performed when there is a difference between the timing of a synchronous receiving terminal and the received signal.
Fr Loss Secs	Indicates the number of seconds an Out of Frame (OOF) error is detected.
Line Err Secs	Line errored seconds (LES) is a second in which one or more line code violation errors are detected.
Degraded Mins	A degraded minute is one in which the estimated error rate exceeds 1E-6 but does not exceed 1E-3.
Errored Secs	An errored second is a second in which one of the following are detected: • One or more path code violations. • One or more out of rame defects. • One or more controlled slip events. • A detected alarm indication signal (AIS) defect.

Field	Description
Bursty Err Secs	A second with fewer than 320 and more than 1 path coding violation error, no severely errored frame defects, and no detected incoming AIS defects. Controlled slips are not included in this parameter.
Severely Err Secs	A severely err sec is a second with one of the following errors: 320 or more path code violation errors; one or more out of frame defects; a detected AIS defect.
Unavail Secs	A count of the total number of seconds where the controller did not get a clock.

show controllers lex

To show hardware and software information about the LAN Extender chassis, use the **showcontrollerslex** command in EXEC mode.

show controllers lex [*number*]

Cisco 7500 Series
show controllers lex [*slot*/*port*]

Syntax Description

number	(Optional) Number of the LAN Extender interface about which to display information.
slot	(Optional) Number of the slot being configured. Refer to the appropriate hardware manual for slot and port information.
port	(Optional) Number of the port being configured. Refer to the appropriate hardware manual for slot and port information.

Command Modes

EXEC

Command History

Release	Modification
11.0	This command was introduced.
12.2(15)T	This command is no longer supported in Cisco IOS Mainline or Technology-based releases. It may conintue to appear in Cisco IOS 12.2S-family releases.
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 the **showcontrollerslex** command to display information about the hardware revision level, software version number, Flash memory size, serial number, and other information related to the configuration of the LAN Extender.

Examples

The following is a sample output from the **showcontrollerslex** command:

```
Router# show controllers lex 0
Lex0:
FLEX Hardware revision 1
FLEX Software version 255.0
128K bytes of flash memory
Serial number is 123456789
Station address is 0000.4060.1100
```

The following is a sample output from the **showcontrollerslex** command when the LAN Extender interface is not bound to a serial interface:

```
Router#
```

```
show controllers lex 1
Lex1 is not bound to a serial interface
```

The table below describes the fields shown in the preceding output.

Table 43: show controllers lex Field Descriptions

Field	Description
Lex0:	Number of the LAN Extender interface.
FLEX Hardware revision	Revision number of the Cisco 1000 series LAN Extender chassis.
FLEX Software version	Revision number of the software running on the LAN Extender chassis.
128K bytes of Flash memory	Amount of Flash memory in the LAN Extender.
Serial number	Serial number of the LAN Extender chassis.
Station address	MAC address of the LAN Extender chassis.

show controllers mci

To display all information under the Multiport Communications Interface (MCI) card or the Serial Communications Interface (SCI) card, use the **showcontrollersmci** command in privileged EXEC mode.

show controllers mci

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

Release	Modification
10.0	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

This command displays information that the system uses for bridging and routing that is specific to the interface hardware. The information displayed is generally useful for diagnostic tasks performed by technical support personnel.

The interface type is queried only at startup. If the hardware changes *subsequent* to initial startup, the wrong type is reported. This has *no* adverse effect on the operation of the software. For instance, if a DCE cable is connected to a dual-mode V.35 applique after the unit has been booted, the display presented for the **showinterfaces** command incorrectly reports attachment to a DTE device although the software recognizes the DCE interface and behaves accordingly.

Examples

The following is sample output from the **showcontrollersmci** command:

```
Router# show controllers mci
MCI 0, controller type 1.1, microcode version 1.8
    128 Kbytes of main memory, 4 Kbytes cache memory
22 system TX buffers, largest buffer size 1520
    Restarts: 0 line down, 0 hung output, 0 controller error
Interface 0 is Ethernet0, station address 0000.0c00.d4a6
    15 total RX buffers, 11 buffer TX queue limit, buffer size 1520
    Transmitter delay is 0 microseconds
Interface 1 is Serial0, electrical interface is V.35 DTE
    15 total RX buffers, 11 buffer TX queue limit, buffer size 1520
    Transmitter delay is 0 microseconds
    High speed synchronous serial interface
Interface 2 is Ethernet1, station address aa00.0400.3be4
    15 total RX buffers, 11 buffer TX queue limit, buffer size 1520
    Transmitter delay is 0 microseconds
Interface 3 is Serial1, electrical interface is V.35 DCE
    15 total RX buffers, 11 buffer TX queue limit, buffer size 1520
    Transmitter delay is 0 microseconds
    High speed synchronous serial interface
```

The table below describes significant fields shown in the display.

Table 44: show controllers mci Field Descriptions

Field	Description
MCI 0	Card type and unit number (varies depending on card).
controller type 1.1	Version number of the card.
microcode version 1.8	Version number of the card's internal software (in ROM).
128 Kbytes of main memory	Amount of main memory on the card.
4 Kbytes cache memory	Amount of cache memory on the card.
22 system TX buffers	Number of buffers that hold packets to be transmitted.
largest buffer size 1520	Largest size of these buffers (in bytes).
Restarts • 0 line down • 0 hung output • 0 controller error	Count of restarts for the following conditions: • Communication line down • Output unable to transmit • Internal error
Interface 0 is Ethernet0	Names of interfaces, by number.
electrical interface is V.35 DTE	Line interface type for serial connections.
15 total RX buffers	Number of buffers for received packets.
11 buffer TX queue limit	Maximum number of buffers in transmit queue.
Transmitter delay is 0 microseconds	Delay between outgoing frames.
Station address 0000.0c00.d4a6	Hardware address of the interface.

Related Commands

Command	Description
tx-queue-limit	Controls the number of transmit buffers available to a specified interface on the MCI and SCI cards.

show controllers pcbus

To display all information about the bus interface, use the **showcontrollerspcbus** command in privileged EXEC mode.

show controllers pcbus

Syntax Description

This command has no arguments or keywords.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.0	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

This command is valid on LanOptics Branchcard or Stacknet 2000 products only.

Examples

The following is sample output from the **showcontrollerspcbus** command:

```
Router# show controllers pcbus
PCbus unit 0, Name = PCbus0  Hardware is ISA PCbus shared RAM
IDB at 0x3719B0, Interface driver data structure at 0x3735F8
Control/status register at 0x2110008, Shared memory at 0xC000000
Shared memory is initialized

Shared memory interface control block :
Magic no = 0x41435A56 (valid) Version = 1.0
Shared memory size = 64K bytes, Interface is NOT shutdown
Interface state is up, line protocol is up

Tx buffer : (control block at 0xC000010)
Start offset = 0x30, Size = 0x7FE8, Overflows = 1
GET_ptr = 0x4F6C, PUT_ptr = 0x4F6C, WRAP_ptr = 0x3BB0

Rx buffer : (control block at 0xC000020)
Start offset = 0x8018, Size 0x7FE8, Overflows = 22250698
GET_ptr = 0x60, PUT_ptr = 0x60, WRAP_ptr = 0x7FD0

Interrupts received = 567
```

show controllers pos

To display information about the Packet over SONET (POS) controllers, use the **showcontrollerspos** command in privileged EXEC mode.

Cisco 7500 Series Routers
show controllers pos [*slot*/*port-adapter*/*port*] [**details** | **pm** [*time-interval*]]

Cisco 12000 Series Routers
show controllers pos [*slot*/*port*] [**details** | **pm** [*time-interval*]]

POS Shared Port Adapters
show controllers pos [*slot*/*subslot*/*port* [/*sub_int*]] [**alarm** | **details** | **pm** [*time-interval*]]

Syntax Description

slot / *port-adapter* / *port*	**(Optional) Cisco 7500 Series Routers** Number of the chassis slot that contains the POS interface (for example, 2/0/0), where: • *slot* --Chassis slot number. • / *port-adapter*-- Port adapter number. • / *port*-- Port or interface number. Refer to the appropriate hardware manual for slot and port information, and port adapter compatibility.
slot / *port*	**(Optional) Cisco 12000 Series Routers** Number of the chassis slot that contains the POS interface (for example, 4/0), where: • *slot* --Chassis slot number. • / *port*-- Port or interface number. Refer to the appropriate hardware manual for slot and port information.

slot / *subslot* / *port* / *sub_int*	**(Optional) POS Shared Port Adapters** Number of the chassis slot that contains the POS interface (for example 4/3/0), where: • *slot* --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. • / *subslot*-- 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. • / *port* --Port or interface number. For SPAs, refer to the corresponding "Specifying the Interface Address on a SPA" topics in the platform-specific SPA software configuration guide. • / *sub_int* -- (Optional) Subinterface number.
alarm	(Optional) Displays SONET/SDH alarm event counters.
details	(Optional) In addition to the normal information displayed by the **showcontrollerspos** command, the **details** keyword provides a hexadecimal and ASCII "dump" of the path trace buffer.
pm	(Optional) Displays SONET performance monitoring statistics accumulated for a 24-hour period in 15-minute intervals.
time-interval	(Optional) Number of the SONET MIB 15-minute time interval in the range from 1 to 96. If the *time-interval*argument is not specified, the performance monitoring statistics for the current time interval are displayed.

Command Default

If you do not specify any slot addressing, information for all installed POS interfaces is displayed.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.1CC	This command was introduced.
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 router. The command was modified to support a new addressing format for SPAs on the Cisco 7304 router.
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.

Release	Modification
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

The **showcontrollerspos** command with the **pm** keyword displays SONET performance monitoring statistics accumulated at 15-minute intervals, and these statistics can be queried using Simple Network Management Protocol (SNMP) tools. The performance monitoring statistics are collected according to the RFC 1595 specification.

The information that this command displays is generally useful only for diagnostic tasks performed by Cisco Systems technical support personnel.

Examples

Example of the show controllers pos Command on the Cisco 7500 Series Router

The following is sample output from the **showcontrollerspos** command on a Cisco 7500 series router:

```
Router# show controllers pos
POS2/0/0
SECTION
  LOF = 0          LOS = 2335                          BIP(B1) = 77937133
LINE
  AIS = 2335       RDI = 20         FEBE = 3387950089 BIP(B2) = 1622825387
PATH
  AIS = 2340       RDI = 66090      FEBE = 248886263  BIP(B3) = 103862953
  LOP = 246806     NEWPTR = 11428072   PSE = 5067357     NSE = 4645
Active Defects: B2-TCA B3-TCA
Active Alarms:  None
Alarm reporting enabled for: B1-TCA
APS
  COAPS = 12612784   PSBF = 8339
  State: PSBF_state = False
  Rx(K1/K2): 00/CC  Tx(K1/K2): 00/00
  S1S0 = 03, C2 = 96
CLOCK RECOVERY
  RDOOL = 64322060
  State: RDOOL_state = True
PATH TRACE BUFFER: UNSTABLE
  Remote hostname :
  Remote interface:
  Remote IP addr  :
  Remote Rx(K1/K2): ../..  Tx(K1/K2): ../..
BER thresholds:  SF = 10e-3  SD = 10e-8
TCA thresholds:  B1 = 10e-7  B2 = 10e-3  B3 = 10e-6
```

The table below describes the fields shown in this display.

Table 45: show controllers pos Field Descriptions

Field	Description
POS*x/y/z*	Slot number of the POS interface.

Field	Description
LOF	Section loss of frame is detected when a severely error framing (SEF) defect on the incoming SONET signal persist for 3 milliseconds.
LOS	Section loss of signal is detected when an all-zeros pattern on the incoming SONET signal lasts 19 plus or minus 3 microseconds or longer. This defect might also be reported if the received signal level drops below the specified threshold.
BIP(B1)/BIP(B2)/BIP(B3)	Bit interleaved parity (BIP). For B1, the BIP error report is calculated by comparing the BIP-8 code with the BIP-8 code extracted from the B1 byte of the following frame. Differences indicate that section-level bit errors have occurred. For B2, the BIP error report is calculated by comparing the BIP-8/24 code with the BIP-8 code extracted from the B2 byte of the following frame. Differences indicate that line-level bit errors have occurred. For B3, the BIP error report is calculated by comparing the BIP-8 code with the BIP-8 code extracted from the B3 byte of the following frame. Differences indicate that path-level bit errors have occurred.
AIS	Alarm indication signal. A line alarm indication signal is sent by the section terminating equipment (STE) to alert the downstream line terminating equipment (LTE) that a loss of signal (LOS) or loss of frame (LOF) defect has been detected on the incoming SONET section. A path alarm indication signal is sent by the LTE to alert the downstream path terminating equipment (PTE) that it has detected a defect on its incoming line signal.
RDI	Remote defect indication. A line remote defect indication is reported by the downstream LTE when it detects LOF, LOS, or AIS. A path remote defect indication is reported by the downstream PTE when it detects a defect on the incoming signal.
FEBE	Far end block errors. Line FEBE (accumulated from the M0 or M1 byte) is reported when the downstream LTE detects BIP(B2) errors. Path FEBE (accumulated from the G1 byte) is reported when the downstream PTE detects BIP(B3) errors.
LOP	Path loss of pointer is reported as a result of an invalid pointer (H1, H2) or an excess number of new data flag (NDF)-enabled indications.
NEWPTR	Inexact count of the number of times that the SONET framer has validated a new SONET pointer value (H1, H2).

Field	Description
PSE	Inexact count of the number of times that the SONET framer has detected a positive stuff event in the received pointer (H1, H2).
NSE	Inexact count of the number of times that the SONET framer has detected a negative stuff event in the received pointer (H1, H2).
Active Defects	List of all currently active SONET defects.
Active Alarms	List of current alarms as enforced by Sonet Alarm Hierarchy.
Alarm reporting enabled for	List of alarms for which you enabled reporting with the **posreport** interface command.
APS	Automatic protection switching.
COAPS	An inexact count of the number of times that a new APS value has been detected in the K1, K2 bytes.
PSBF	An inexact count of the number of times that a protection switching byte failure has been detected (no three consecutive SONET frames contain identical K1 bytes).
PSBF_state	Protection switching byte failure state.
Rx(K1/K2)/Tx(K1/K2)	Contents of the received and transmitted K1 and K2 bytes.
S1S0	The two S bits received in the last H1 byte.
C2	The value extracted from the SONET path signal label byte (C2).
CLOCK RECOVERY	The SONET clock is recovered using information in the SONET overhead. RDOOL is an inexact count of the number of times that Receive Data Out Of Lock has been detected, which indicates that the clock recovery phased lock loop is unable to lock to the receive stream.
PATH TRACE BUFFER	SONET path trace buffer is used to communicate information regarding the remote host name, interface name and number, and IP address. This is a Cisco-proprietary use of the J1 (path trace) byte.
BER thresholds	List of the bit error rate (BER) thresholds that you configured with the **posthreshold** interface command.
TCA thresholds	List of the threshold crossing alarms (TCAs) that you configured with the**posthreshold** interface command.

Example of the show controllers pos Command on a POS Shared Port Adapter

The following is sample output from the **showcontrollerspos** command on a Cisco 7600 series router for POS interface 4/3/0 (which is the interface for port 0 of the SPA in subslot 3 of the SIP in chassis slot 4):

```
Router# show controllers pos 4/3/0

POS4/3/0
SECTION
  LOF = 0          LOS    = 0                            BIP(B1) = 65535
LINE
  AIS = 0          RDI    = 0          FEBE = 65535      BIP(B2) = 16777215
PATH
  AIS = 0          RDI    = 0          FEBE = 65535      BIP(B3) = 65535
  PLM = 0          UNEQ   = 0          TIM  = 0          TIU     = 0
  LOP = 0          NEWPTR = 3          PSE  = 0          NSE     = 0
Active Defects: None
Active Alarms:  None
Alarm reporting enabled for: SF SLOS SLOF B1-TCA B2-TCA PLOP B3-TCA
Framing: SONET
APS
  COAPS = 1          PSBF = 0
  State: PSBF_state = False
  Rx(K1/K2): 00/00  Tx(K1/K2): 00/00
  Rx Synchronization Status S1 = 00
  S1S0 = 00, C2 = CF
  Remote aps status (none); Reflected local aps status (none)
CLOCK RECOVERY
  RDOOL = 0
  State: RDOOL_state = False
PATH TRACE BUFFER: STABLE
  Remote hostname : woodson
  Remote interface: POS3/0/0
  Remote IP addr  : 0.0.0.0
  Remote Rx(K1/K2): 00/00  Tx(K1/K2): 00/00
BER thresholds:  SF = 10e-3  SD = 10e-6
TCA thresholds:  B1 = 10e-6  B2 = 10e-6  B3 = 10e-6
  Clock source:  internal
```

The table below describes the fields shown in this display.

Example of the show controllers pos alarm Command on the Cisco 7600 Series Router

The following is sample output from the **showcontrollersposalarm** command that displays SONET/SDH alarm event counters on a Cisco 7600 series router:

```
Router# show controllers pos3/2/0 alarm
POS3/2/0
Alarm Event Statistics:
SECTION
  LOF = 0          LOS    = 0          B1-TCA = 0
LINE
  AIS = 0          RDI    = 0          RDOOL  = 0
  SF  = 0          SD     = 0          B2-TCA = 0
PATH
  AIS = 0          RDI    = 0          LOP    = 0          B3-TCA = 0
  PLM = 0          UNEQ   = 0
```

Example of the show controllers pos pm Command on the Cisco 12000 Series Router

The following is sample output from the **showcontrollerspospm** command that displays performance monitoring statistics on a Cisco 12000 series router:

```
Router# show controllers pos 1/0 pm
POS1/0
Medium is SONET
Line coding is RZ, Line type is LONG SM
Data in current interval (516 seconds elapsed)
SECTION ( NO DEFECT )
    515 Errored Secs, 515 Severely Err Secs
    0 Coding Violations, 515 Sev Err Framing Secs
LINE ( NO DEFECT )
    0 Errored Secs, 0 Severely Err Secs
    0 Coding Violations, 0 Unavailable Secs
FAR END LINE
    0 Errored Secs, 0 Severely Err Secs
    0 Coding Violations, 0 Unavailable Secs
PATH ( NO DEFECT )
    0 Errored Secs, 0 Severely Err Secs
    0 Coding Violations, 0 Unavailable Secs
FAR END PATH
    0 Errored Secs, 0 Severely Err Secs
    0 Coding Violations, 0 Unavailable Secs
```

The table below describes the fields shown in the display.

Table 46: show controllers pos pm Field Descriptions

Field	Description
POS*x/y*	Slot number of the POS interface.
Line coding	Shows the current line encoding type, either return to zero (RZ) or nonreturn to zero (NRZ).
Line type	Line type for this interface. Optical line types can be either long range (LONG) or short range (SHORT), and either single mode (SM) or multimode (MM).
Data in current interval	Shows the current accumulation period, which rolls into the 24-hour accumulation every 15 minutes. Accumulation period is from 1 to 900 seconds. The oldest 15-minute period falls off the back of the 24-hour accumulation buffer.
Errored Secs	An errored second is a second in which one of the following is detected: • One or more coding violations. • One or more incoming defects (for example, a severely errored frame [SEF] defect, an LOS defect, an AIS defect, or an LOP defect).
Severely Err Secs	A severely errored second (SES) is a second with one of the following errors: • A certain number of coding violations. The number is dependent on the line rate and the BER. • A certain number of incoming defects.
Coding Violations	Number of coding violations for the current interval. Coding violations are defined as BIP errors that are detected in the incoming signal. The coding violations counter is incremented for each BIP error detected.
Sev Err Framing Secs	Severely errored framing seconds (SEFS) are seconds with one or more SEF defects.

Field	Description
Unavailable Secs	Total number of seconds for which the interface is unavailable. The interface is considered to be unavailable after a series of ten consecutive SESs.

Related Commands

Command	Description
pos report	Permits selected SONET alarms to be logged to the console for a POS interface.
pos threshold	Sets the BER threshold values of specified alarms for a POS interface.

show controllers satellite

To display controller information about the internal router interface that connects to an installed Cisco IP VSAT satellite WAN network module (NM-1VSAT-GILAT), use the **showcontrollerssatellite** command in user EXEC or privileged EXEC mode.

show controllers satellite *slot*/*unit*

Syntax Description

slot	Router chassis slot in which the network module is installed.
unit	Interface number. For NM-1VSAT-GILAT network modules, always use 0.

Command Default

No default behavior or values.

Command Modes

User EXEC Privileged EXEC

Command History

Release	Modification
12.3(14)T	This command was introduced.

Usage Guidelines

The output from this command is generally useful for diagnostic tasks performed by technical support.

The **showcontrollerssatellite** command displays information about initialization block, transmit ring, receive ring, and errors for the Fast Ethernet controller chip in the internal router interface that connects to an installed Cisco IP VSAT satellite WAN network module (NM-1VSAT-GILAT).

Examples

The following example shows how to display controller information about the internal router interface that connects to an installed NM-1VSAT-GILAT network module:

```
Router# show controllers satellite
 2/0

Interface Satellite2/0
Hardware is Intel 82559 FastEthernet
IDB:640B6584, FASTSEND:60A585E0, MCI_INDEX:0
INSTANCE=0x640B7D84
  Rx Ring entries = 64
  Rx Shadow = 0x640B8054
  Rx Ring = 0x 70FEE80
  Rx Ring Head = 51
  Rx Ring Last = 50
  Rx Buffer Descr = 0x 70FF2C0
  Rx Buffer Descr Head = 51
  Rx Buffer Descr Last = 50
  Rx Shadow (malloc) = 0x640B8054
  Rx Ring (malloc) = 0x 70FEE80
  Rx Buffer Descr (malloc) = 0x 70FF2C0
  Tx Ring entries = 128
  Tx Shadow = 0x640B8184
  Tx Shadow Head = 78
  Tx Shadow Tail = 78
  Tx Shadow Free = 128
  Tx Ring = 0x 70FF700
```

```
  Tx Head = 80
  Tx Last = 79
  Tx Tail = 80
  Tx Count = 0
  Tx Buffer Descr = 0x 7100740
  Tx Buffer Descr Head = 0
  Tx Buffer Descr Tail = 0
  Tx Shadow (malloc) = 0x640B8184
  Tx Ring (malloc) = 0x 70FF700
  Tx Buffer Descr (malloc) = 0x 7100740
CONTROL AND STATUS REGISTERS (CSR)=0x3E000000
  SCB Intr Mask    = 00
  SCB CU/RU Cmd    = 00
  SCB Intr Status  = 00
  SCB CU Status    = 01
  SCB RU Status    = 04
  SCB General Ptr  = 00000000
  PORT             = 00000000
  EEPROM           = 0008
  FLASH            = 0002
  MDI              = 1821780D
  Rx Byte Count    = 00000608
  PMDR             = 80
  FC Cmd           = 00
  FC Threshold     = 03
  Early Rx         = 00
  General Status   = 03
  General Control  = 00
PHY REGISTERS
  Register 0x00:  2000  780D  02A8  0154  0081  0000  0000  0000
  Register 0x08:  0000  0000  0000  0000  0000  0000  0000  0000
  Register 0x10:  0202  0000  0001  0005  0000  0000  0000  0000
  Register 0x18:  0000  0000  8B10  0000  0010  0000  0000  0000
HARDWARE STATISTICS
  Rx good frames:        420979
  Rx CRC:                0
  Rx alignment:          0
  Rx resource:           0
  Rx overrun:            0
  Rx collision detects:  0
  Rx short:              0
  Tx good frames:        653125
  Tx maximum collisions: 0
  Tx late collisions:    0
  Tx underruns:          0
  Tx lost carrier sense: 9
  Tx deferred:           86
  Tx single collisions:  1
  Tx multiple collisions:1
  Tx total collisions:   3
  FC Tx pause:           0
  FC Rx pause:           0
  FC Rx unsupported:     0
INTERRUPT STATISTICS
  CX  = 653136
  FR  = 420979
  CNA = 0
  RNR = 0
  MDI = 0
  SWI = 0
  FCP = 0
Receive All Multicasts = enabled
Receive Promiscuous = disabled
Loopback Mode = disabled
```

The table below describes the significant fields shown in the display.

Table 47: show controllers satellite Field Descriptions

Field	Description
Hardware	Description of the chip being used.
IDB	Address in router memory of the Interface Descriptor Block (IDB).
FASTSEND	Fastsend routine.
INSTANCE	Device-specific data stored in router memory that lists the memory locations and current indices of receive (Rx) and transmit (Tx) rings in router I/O memory.
CONTROL AND STATUS REGISTERS (CSR)	Control and status registers that are physically located on the chip itself and that are accessed by the CPU over the protocol control information (PCI) bus.
PHY REGISTERS	Contents of the physical layer (PHY) registers of the PHY module, which is an internal device that interfaces between the internal physical Ethernet line and the external physical line.
HARDWARE STATISTICS	Receive (Rx) and transmit (Tx) traffic statistics collected by the chip.
INTERRUPT STATISTICS	Receive (Rx), transmit (Tx), control, software, and flow control interrupt statistics collected by the chip.

Related Commands

Command	Description
service-module satellite status	Displays status information related to the hardware and software on the Cisco IP VSAT satellite WAN network module (NM-1VSAT-GILAT), including the initial configuration parameters.
show interfaces satellite	Displays general interface settings and traffic rates for the internal router interface that connects to an installed Cisco IP VSAT satellite WAN network module (NM-1VSAT-GILAT).