# service-module t1 timeslots

To define time slots that constitute a fractional T1/T1 (FT1/T1) channel, use the **service-module t1 timeslots** 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. |

## Defaults

64 kbps is the default for all time slots.

## Command Modes

Interface configuration

## Command History

| Release | Modification |
|---|---|
| 11.2 | This command was introduced. |

## 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-module t1 timeslots all** 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 single-slot-reload-enable

To enable single line card reloading for all line cards in the Cisco 7500 series router, use the **service single-slot-reload-enable** command in global configuration mode. To disable single line card reloading for the line cards in the Cisco 7500 series router, use the **no** form of this command.

**service single-slot-reload-enable**

**no service single-slot-reload-enable**

## Syntax Description

This command has no areguments or keywords.

## Defaults

Single line card reloading is disabled by default.

## Command Modes

Global configuration mode

## Command History

| Release | Modification |
|---|---|
| 12.0(13)S | This command was introduced. |
| 12.1(5)T | This command was integrated into Cisco IOS Release 12.1(5)T. |

## Examples

In the following example, single line card reloading is enabled for all lines cards on the Cisco 7500 series router:

```
Router(config)# service single-slot-reload-enable
```

## Related Commands

| Command | Description |
|---|---|
| **show running-config** | Displays configuration information. |
| **show diag** | Displays hardware information on line cards. |

# set ip df

To change the Don't Fragment (DF) bit value in the IP header, use the **set ip df** 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. |

## Defaults

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. |

## 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 **set ip df** 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. |

# show aps

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

**show aps**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 11.1 CC | This command was introduced. |

## Examples

The following is an example of the **show aps** 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 an example of the **show aps** 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 15.1.6.1 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 Table 14. 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 Table 14.

*Table 14 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. |
| 1111 (0xF) | Lockout of protection request. |
| 1110 (0xE) | Forced switch request. |
| 1101 (0xD) | Signal failure (SF)—high priority request. |

*Table 14 K1 Bit Descriptions (continued)*

| Bits (Hexadecimal) | Description |
|---|---|
| 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 compress

To display compression statistics, use the **show compress** command in EXEC mode.

**show compress**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

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. |

## Examples

The following is a sample output display from the **show compress** 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
```

Table 15 describes the fields shown in the display.

*Table 15 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<br>5 min avg ratio xmt/rcv<br>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. |
| resets | Number of resets (for example, line errors could cause resets). |

The following is a sample output display from the **show compress** 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
```

Table 16 describes the fields shown in the display. The information displayed by the **show compress** 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 16 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 **clear counters** command. |

## Related Commands

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

# show controllers cbus

To display all information under the cBus controller card, use the **show controllers cbus** command in privileged EXEC mode on the Cisco 7500 series routers. This command also shows the capabilities of the card and reports controller-related failures.

**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. |
| 11.0 | The ECA hardware version and the resyncs field were added to CIP output. |

## Usage Guidelines

### Verifying the ECA Hardware Version

The following partial sample output shows how the ECA hardware version is displayed:

```
Router# show controllers cbus

slot0:CIP2, hw 5.0, sw 206.172, ccb 5800FF20, cmdq 48000080, vps 8192
    software loaded from flash slot0:biff/cip206-172.cbus_kernel_hw5
    Loaded:seg_eca         Rev. 0    Compiled by biff on Mon 10-Feb-97 09:28

    EPROM version 2.1, VPLD version 5.8
->  ECA0:hw version 03, microcode version C50602D4
    Load metrics:
      Memory    dram 29763656/32M
      CPU       1m  n/a, 5m  n/a, 60m  n/a
      DMA       1m  n/a, 5m  n/a, 60m  n/a
      ECA0      1m  n/a, 5m  n/a, 60m  n/a
```

For details about specific versions and settings for the CIP2, see the *Second-Generation Channel Interface Processor (CIP2) Installation and Configuration* document.

## Examples

The following is partial sample output from the **show controller cbus** command:

```
Router# show controllers cbus

Switch Processor 3, hardware version 11.1, microcode version 215.1
  Microcode loaded from system
  512 Kbytes of main memory, 128 Kbytes cache memory
  16 256 byte buffers, 4 1024 byte buffers, 130 1520 byte buffers, 63 4484 byte buffers
  Restarts: 0 line down, 0 hung output, 0 controller error
  FSIP 0, hardware version 1.1, microcode version 10.13
   Microcode loaded from system
   Controller Sync: 56 timeouts, 56 resyncs 0 failures, 1 max phase count
   Interface 0 - Serial 0/0, electrical interface is V.35 DTE
     31 buffer RX queue threshold, 10 buffer TX queue limit, buffer size 1520
```

```
     TX queue length is 1
     ift 0001, rql 14, tq 0000 04E0, tql 3
     Transmitter delay is 0 microseconds
```

Interface Processors (IPs) must respond to cBus commands within the prescribed time. Sometimes the IPs may not respond within this time due to heavy traffic or some problem in the IP's hardware or firmware. Then the IP's response to cBus commands may be out of sync. When this situation occurs, the Route Processor (RP) must resync the IP. Currently CIP, FSIP, FEIP, RVIP, and SVIP support the resync mechanism.

Table 17 describes significant fields shown in the display.

***Table 17 show controllers cbus Field Descriptions***

| Field | Description |
|---|---|
| timeouts | Number of times the IP did not respond to a cBus command within the allotted time. |
| resyncs | If the IP supports the resync mechanism, then this count is the same as the timeouts value. |
| failures | Number of resynchronization failures. |
| max phase count | High count of phase synchronization; that is, the maximum attempts tried before the sync was successful. Maximum number of resync attempts is 16 before the failures counter is incremented. |

**Note** The timeouts, resyncs, and max phase count values do not imply any problem in the IP. The failures value implies a problem and usually end in a console error message.

The following is a partial output display from the **show controllers cbus** command on a Cisco 7500 series router with one VIP2 interface processor. This example does not show output from additional interface processors that are usually installed in a Cisco 7500 series router.

```
Router# show controller 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
```

The following is a partial ouput display of the **show controllers cbus** 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
```

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

```
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
```

Table 18 describes significant fields in the per-slot part of these displays.

*Table 18 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<br>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. |

The following is a sample output display from the **show controllers cbus** 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
```

Table 19 describes the fields shown in the following lines of output from the display.

```
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 19 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<br>• 0 line down<br>• 0 hung output<br>• 0 controller error | Count of restarts for the following conditions:<br>• Communication line down<br>• Output unable to transmit<br>• Internal error |

Table 20 describes the fields shown in the following lines of output from the display:

```
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 20 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). |

*Table 20 show controllers cbus Field Descriptions—Part 2 (continued)*

| Field | Description |
|---|---|
| ift 0004 | Interface type code:<br>• 0 = EIP<br>• 1 = FSIP<br>• 4 = HIP<br>• 5 = TRIP<br>• 6 = FIP<br>• 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. |

The following is a sample output display from the **show controllers cbus** command for an AIP installed in IP slot 4. The running AIP microcode is Version 170.30, the 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
```

The following is a sample output display from the **show controllers cbus** command for 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
```

# show controllers ethernet

To display information on the Cisco 2500, Cisco 3000, or Cisco 4000 series routers, use the **show controllers ethernet** command in EXEC mode.

**show controllers ethernet** *number*

## Syntax Description

| | |
|---|---|
| *number* | Interface number of the Ethernet interface. |

## Command Modes

EXEC

## Command History

| Release | Modification |
|---|---|
| 10.0 | This command was introduced. |

## Examples

The following is a sample output display from the **show controllers ethernet** 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
```

# show controllers fastethernet

To display information about initialization block, transmit ring, receive ring and errors for the Fast Ethernet controller chip on the Cisco 4500, Cisco 7200 series, or Cisco 7500 series routers, use the **show controllers fastethernet** command in EXEC mode.

**Cisco 4500 Series**

**show controllers fastethernet** *number*

**Cisco 7200 Series**

**show controllers fastethernet** *slot*/*port*

**Cisco 7500 Series**

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

## 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* | Number of the slot being configured. Refer to the appropriate hardware manual for slot and port information. |
| *port* | Number of the port being configured. Refer to the appropriate hardware manual for slot and port information. |
| *port-adapter* | Number of the port adapter being configured. Refer to the appropriate hardware manual for information about port adapter compatibility. |

## Command Modes

EXEC

## Command History

| Release | Modification |
|---|---|
| 11.2 | This command was introduced. |

## Usage Guidelines

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

## Examples

The following is a sample output display from the **show controllers fastethernet** command on a Cisco 4500 router:

```
c4500-1# 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 display from the **show controllers fastethernet** command on a Cisco AS5300 router:

```
as5300# 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 display from the **show controllers fastethernet** 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
```

## 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 **show controllers fddi** command in user EXEC mode.

**show controllers fddi**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

User EXEC

## Command History

| Release | Modification |
|---|---|
| 10.0 | This command was introduced. |

## Usage Guidelines

This command reflects the internal state of the chips and information 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 asample output display from the **show controllers fddi** 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, and errors for the Gigabit Ethernet interface controllers of the Cisco 7200-I/O-GE+E, use the **show controllers gigabitethernet** command in privileged EXEC mode.

**show controllers gigabitethernet** *slot/port*

## Syntax Description

| | |
|---|---|
| *slot* | Slot number on the interface. |
| *port* | Port number on the interface. |

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 11.1 CC | 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. |

## Usage Guidelines

This command is used on the Cisco 7200-I/O-GE+E to display hardware and software information about the Gigabit Ethernet interface. The I/O controller is always found in slot 0.

## Examples

The following is sample output from the **show controllers gigabitethernet** 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
```

## Related Commands

| Command | Description |
|---|---|
| **show controllers ethernet** | Displays software and hardware information about an Ethernet interface. |
| **show controllers fastethernet** | Displays software and hardware information about a Fast Ethernet interface. |

# show controllers lex

To show hardware and software information about the LAN Extender chassis, use the **show controllers lex** 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. |

## Usage Guidelines

Use the **show controllers lex** 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 **show controllers lex** 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 **show controllers lex** 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
```

Table 21 describes the fields shown in the preceding output.

***Table 21 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 SCI, use the **show controllers mci** 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. |

## Usage Guidelines

This command displays information 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 a sample output from the **show controllers mci** 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
```

Table 22 describes significant fields shown in the display.

***Table 22 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. |

*Table 22 show controllers mci Field Descriptions (continued)*

| Field | Description |
|---|---|
| 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<br>• 0 line down<br>• 0 hung output<br>• 0 controller error | Count of restarts for the following conditions:<br>• Communication line down<br>• Output unable to transmit<br>• 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. |

**Note** The interface type is only queried 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 **show interfaces** command incorrectly reports attachment to a DTE device although the software recognizes the DCE interface and behaves accordingly.

## 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 **show controllers pcbus** 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. |

## Usage Guidelines

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

## Examples

The following is a sample output from the **show controllers pcbus** 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 **show controllers pos** command in privileged EXEC mode.

**show controllers pos** [*slot-number*] [**details** | **pm** [*time-interval*]]

## Syntax Description

| | |
|---|---|
| *slot-number* | (Optional) Number of the chassis slot that contains the POS interface. If you do not specify a slot number, information for all the installed POS controllers is displayed.<br><br>**Cisco 7500 Series Routers**<br>Use *slot*/*port-adapter*/*port* (for example, 2/0/0).<br><br>**Cisco 12000 Series Routers**<br>Use *slot*/*port* (for example, 4/0). |
| **details** | (Optional) In addition to the normal information displayed by the **show controllers pos** 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 Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 11.1 CC | This command was introduced. |

## Usage Guidelines

The **show controllers pos** 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 technical support personnel.

## Examples

The following is sample output from the **show controllers pos** 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
```

Table 23 describes the fields shown in the display.

***Table 23 show controllers pos Field Descriptions***

| Field | Description |
|---|---|
| POS2/0/0 | Slot number of the POS interface. |
| 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).<br><br>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.<br><br>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.<br><br>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. |

*Table 23 show controllers pos Field Descriptions (continued)*

| Field | Description |
|---|---|
| AIS | Alarm indication signal.<br>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.<br>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.<br>A line remote defect indication is reported by the downstream LTE when it detects LOF, LOS, or AIS.<br>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.<br>Line FEBE (accumulated from the M0 or M1 byte) is reported when the downstream LTE detects BIP(B2) errors.<br>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). |
| 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 **pos report** 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). |

*Table 23 show controllers pos Field Descriptions (continued)*

| Field | Description |
|---|---|
| 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/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 **pos threshold** interface command. |
| TCA thresholds | List of threshold crossing alarms (TCAs) that you configured with the **pos threshold** interface command. |

The following is sample output from the **show controllers pos pm** 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
```

Table 24 describes the fields shown in the display.

*Table 24 show controllers pos pm Field Descriptions*

| Field | Description |
|---|---|
| POS1/0 | 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). |

*Table 24 show controllers pos pm Field Descriptions (continued)*

| Field | Description |
|---|---|
| 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:<br>• One or more coding violations.<br>• 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:<br>• A certain number of coding violations. The number is dependent on the line rate and the BER.<br>• 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. |
| 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 serial

To display information that is specific to the interface hardware, use the **show controllers serial** command in privileged EXEC mode.

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

**Cisco 7500 Series and Cisco 7000 Series with the RSP7000 and RSP7000CI**

**show controllers serial** [*slot*/*port-adapter*/*port*]

## Syntax Description

| | |
|---|---|
| *slot* | (Optional) Slot number of the interface. |
| *port* | (Optional) Port number on the interface. The port value is always 0. |
| *port-adapter* | (Optional) On Cisco 7500 series routers and Cisco 7000 series routers with the RSP7000 and RSP7000CI, the location of the port adapter on a VIP. The value can be 0 or 1. |

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 10.0 | This command was introduced. |
| 11.1 CA | This command was modified to include support for the PA-E3 and PA-T3 port adapters. |

## Usage Guidelines

The information displayed is generally useful for diagnostic tasks performed by technical support personnel only. For the PA-E3 or PA-T3 port adapters, the **show controllers serial** command also displays configuration information such as the framing, clock source, bandwidth limit, whether scrambling is enabled, the national bit, the international bits, and DSU mode configured on the interface. Also displayed is the performance statistics for the current interval and last 15-minute interval and whether any alarms exist.

## Examples

The following is a sample output display form the **show controllers serial** command on the Cisco 4000:

```
Router# show controllers serial

MK5 unit 0, NIM slot 1, NIM type code 7, NIM version 1
idb = 0x6150, driver structure at 0x34A878, regaddr = 0x8100300
IB at 0x6045500: mode=0x0108, local_addr=0, remote_addr=0
N1=1524, N2=1, scaler=100, T1=1000, T3=2000, TP=1
buffer size 1524
DTE V.35 serial cable attached


RX ring with 32 entries at 0x45560 : RLEN=5, Rxhead 0
00 pak=0x6044D78  ds=0x6044ED4 status=80 max_size=1524 pak_size=0
01 pak=0x60445F0  ds=0x604474C status=80 max_size=1524 pak_size=0
02 pak=0x6043E68  ds=0x6043FC4 status=80 max_size=1524 pak_size=0
03 pak=0x60436E0  ds=0x604383C status=80 max_size=1524 pak_size=0
```

```
04 pak=0x6042F58  ds=0x60430B4 status=80 max_size=1524 pak_size=0
05 pak=0x60427D0  ds=0x604292C status=80 max_size=1524 pak_size=0
06 pak=0x6042048  ds=0x60421A4 status=80 max_size=1524 pak_size=0
07 pak=0x60418C0  ds=0x6041A1C status=80 max_size=1524 pak_size=0
08 pak=0x6041138  ds=0x6041294 status=80 max_size=1524 pak_size=0
09 pak=0x60409B0  ds=0x6040B0C status=80 max_size=1524 pak_size=0
10 pak=0x6040228  ds=0x6040384 status=80 max_size=1524 pak_size=0
11 pak=0x603FAA0  ds=0x603FBFC status=80 max_size=1524 pak_size=0
12 pak=0x603F318  ds=0x603F474 status=80 max_size=1524 pak_size=0
13 pak=0x603EB90  ds=0x603ECEC status=80 max_size=1524 pak_size=0
14 pak=0x603E408  ds=0x603E564 status=80 max_size=1524 pak_size=0
15 pak=0x603DC80  ds=0x603DDDC status=80 max_size=1524 pak_size=0
16 pak=0x603D4F8  ds=0x603D654 status=80 max_size=1524 pak_size=0
17 pak=0x603CD70  ds=0x603CECC status=80 max_size=1524 pak_size=0
18 pak=0x603C5E8  ds=0x603C744 status=80 max_size=1524 pak_size=0
19 pak=0x603BE60  ds=0x603BFBC status=80 max_size=1524 pak_size=0
20 pak=0x603B6D8  ds=0x603B834 status=80 max_size=1524 pak_size=0
21 pak=0x603AF50  ds=0x603B0AC status=80 max_size=1524 pak_size=0
22 pak=0x603A7C8  ds=0x603A924 status=80 max_size=1524 pak_size=0
23 pak=0x603A040  ds=0x603A19C status=80 max_size=1524 pak_size=0
24 pak=0x60398B8  ds=0x6039A14 status=80 max_size=1524 pak_size=0
25 pak=0x6039130  ds=0x603928C status=80 max_size=1524 pak_size=0
26 pak=0x60389A8  ds=0x6038B04 status=80 max_size=1524 pak_size=0
27 pak=0x6038220  ds=0x603837C status=80 max_size=1524 pak_size=0
28 pak=0x6037A98  ds=0x6037BF4 status=80 max_size=1524 pak_size=0
29 pak=0x6037310  ds=0x603746C status=80 max_size=1524 pak_size=0
30 pak=0x6036B88  ds=0x6036CE4 status=80 max_size=1524 pak_size=0
31 pak=0x6036400  ds=0x603655C status=80 max_size=1524 pak_size=0
TX ring with 8 entries at 0x45790 : TLEN=3, TWD=7
tx_count = 0, tx_head = 7, tx_tail = 7
00 pak=0x000000 ds=0x600D70C status=0x38 max_size=1524 pak_size=22
01 pak=0x000000 ds=0x600D70E status=0x38 max_size=1524 pak_size=2
02 pak=0x000000 ds=0x600D70E status=0x38 max_size=1524 pak_size=2
03 pak=0x000000 ds=0x600D70E status=0x38 max_size=1524 pak_size=2
04 pak=0x000000 ds=0x600D70E status=0x38 max_size=1524 pak_size=2
05 pak=0x000000 ds=0x600D70E status=0x38 max_size=1524 pak_size=2
06 pak=0x000000 ds=0x600D70E status=0x38 max_size=1524 pak_size=2
07 pak=0x000000 ds=0x6000000 status=0x38 max_size=1524 pak_size=0
XID/Test TX desc at 0xFFFFFF, status=0x30, max_buffer_size=0, packet_size=0
XID/Test RX desc at 0xFFFFFF, status=0x0, max_buffer_size=0, packet_size=0
Status Buffer at 0x60459C8: rcv=0, tcv=0, local_state=0, remote_state=0
phase=0, tac=0, currd=0x00000, curxd=0x00000
bad_frames=0, frmrs=0, T1_timeouts=0, rej_rxs=0, runts=0
0 missed datagrams, 0 overruns, 0 bad frame addresses
0 bad datagram encapsulations, 0 user primitive errors
0 provider primitives lost, 0 unexpected provider primitives
0 spurious primitive interrupts, 0 memory errors, 0 tr
%LINEPROTO-5-UPDOWN: Linansmitter underruns
mk5025 registers: csr0 = 0x0E00, csr1 = 0x0302, csr2 = 0x0704
                  csr3 = 0x5500, csr4 = 0x0214, csr5 = 0x0008
```

The following is a sample output display from the **show controllers serial** command for a PA-E3 serial port installed in slot 2:

```
Router# show controllers serial 2/0
M1T-E3 pa: show controller:
PAS unit 0, subunit 0, f/w version 2-55, rev ID 0x2800001, version 2
idb = 0x6080D54C, ds = 0x6080F304, ssb=0x6080F4F4
Clock mux=0x30, ucmd_ctrl=0x0, port_status=0x1
Serial config=0x8, line config=0x1B0202
maxdgram=4474, bufpool=128Kb, 256 particles

   rxLOS inactive, rxLOF inactive, rxAIS inactive
```

```
   txAIS inactive, rxRAI inactive, txRAI inactive

line state: up
E3 DTE cable, received clockrate 50071882

base0 registers=0x3D000000, base1 registers=0x3D002000
mxt_ds=0x608BA654, rx ring entries=128, tx ring entries=256
rxring=0x4B01F480, rxr shadow=0x6081081C, rx_head=26
txring=0x4B01F960, txr shadow=0x60810E48, tx_head=192, tx_tail=192, tx_count=0
throttled=0, enabled=0, disabled=0
rx_no_eop_err=0, rx_no_stp_err=0, rx_no_eop_stp_err=0
rx_no_buf=0, rx_soft_overrun_err=0, dump_err= 1
tx_underrun_err=0, tx_soft_underrun_err=0, tx_limited=0
tx_fullring=0, tx_started=11504
   Framing is g751, Clock Source is Line, Bandwidth limit is 34010.
   Scrambling is enabled
   National Bit is 0, International Bits are: 0 0
   DSU mode 1
   Data in current interval (213 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, 0 Unavailable Secs
     0 Line Errored Secs, 0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
   Total Data (last 24 hours)
     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, 0 Unavailable Secs,
     0 Line Errored Secs, 0 C-bit Errored Secs, 0 C-bit Severely Errored Secs

   No alarms detected.

PIO A: 639, PIO B: 303, Gapper register: 50DE
Framer register information:
reg 0: E0       reg 1: 0        reg 2: 0        reg 3: 0
reg 4: 0        reg 5: 8        reg 6: 0        reg 7: 0
```

The following is a sample output display from the **show controllers serial** command that shows serial port 1/0/0 on a 1-port PA-T3 serial port adapter installed on a VIP2 in chassis slot 1:

```
Router# show controllers serial 2/0/1

Serial1/0/0 -
   Mx T3(1) HW Revision 0x3, FW Revision 2.55
   Framing is c-bit, Clock Source is Line
   Bandwidth limit is 35000, DSU mode 1, Cable length is 50

   Data in current interval (325 seconds elapsed):
     0 Line Code Violations, 0 P-bit Coding Violation
     0 C-bit Coding Violation
     0 P-bit Err Secs, 0 P-bit Sev Err Secs
     0 Sev Err Framing Secs, 0 Unavailable Secs
     0 Line Errored Secs, 0 C-bit Errored Secs, 0 C-bit Sev Err Secs
   Total Data (last 24 hours)
     0 Line Code Violations, 0 P-bit Coding Violation,
     0 C-bit Coding Violation,
     0 P-bit Err Secs, 0 P-bit Sev Err Secs,
     0 Sev Err Framing Secs, 0 Unavailable Secs,
     0 Line Errored Secs, 0 C-bit Errored Secs, 0 C-bit Sev Err Secs
No alarms detected.
```

# show controllers t1

To display information about the T1 links or to display the hardware and software driver information for the T1 controller, use the **show controllers t1** command in privileged EXEC mode.

**Cisco 7500 Series**

**show controllers t1** [*slot*/*port*]

**Cisco 4000 Series**

**show controllers t1** *number*

**Cisco AS5800 Access Servers**

**show controller t1** *dial-shelf*/*slot*/*t3-port*:*t1-num*

## Syntax Description

| | |
|---|---|
| *slot*/*port* | (Optional) Backplane slot number and port number on the interface. Refer to your hardware installation manual for the specific slot and port numbers. |
| *number* | Network processor number (NPM)) number, in the range 0 through 2. |
| *dial-shelf* | Dial shelf chassis in the Cisco AS5800 access server containing the CT3 interface card. |
| *slot* | Location of the CT3 interface card in the dial shelf chassis. |
| *t3-port* | T3 port number. The only valid value is 0. |
| :*t1-num* | T1 time slot in the T3 line. The value can be from 1 to 28. |

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 11.0 | This command was introduced. |
| 12.0(3)T | This command was modified to include support for the Cisco AS5800 access server. |

## Usage Guidelines

**Cisco 7500 Series and Cisco 4000 Series Routers**

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 NPM or MIP can query the port adapters to determine their current status. Issue a **show controllers t1** command to display statistics about the T1 link.

If you specify a slot and port number, each 15 minute period will be displayed.

## Examples

**Cisco 7500 Series and Cisco 4000 Series Routers**

The following is a sample output display from the **show controllers t1** command on the Cisco 7500 series routers:

```
Router# show controllers t1

T1 4/1 is up.
  No alarms detected.
  Framing is ESF, Line Code is AMI, Clock Source is line
  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
```

Table 25 describes the fields shown in the display.

***Table 25 show controller t1 Field Descriptions***

| Field | Description |
|---|---|
| T1 0/0 is up. | The T1 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). |
| No alarms detected. | Any alarms detected by the controller are displayed here. Possible alarms are as follows:<br>• Transmitter is sending remote alarm.<br>• Transmitter is sending AIS.<br>• Receiver has loss of signal.<br>• Receiver is getting AIS.<br>• Receiver has loss of frame.<br>• Receiver has remote alarm.<br>• Receiver has no alarms. |
| Data in current interval (725 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. |
| 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-noCRC formats, or a CRC error in the ESF and E1-CRC formats. |
| Slip Secs | Indicates the replication or deletion of the payload bits of a DS1 frame. A slip may 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 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 | Degraded Minute is one in which the estimated error rate exceeds 1E-6 but does not exceed 1E-3. |

*Table 25 show controller t1 Field Descriptions (continued)*

| 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.<br>For D4 and E1-noCRC links, the presence of Bipolar Violations also triggers an Errored Second. |
| Bursty Err Secs | 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.<br>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.<br>For E1-noCRC signals, a second with 2048 Line Code Violations or more.<br>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 | Count of the total number of seconds on the interface. |

### Cisco AS5800 Access Server

The following example shows the status of the T1 controllers connected to the Cisco AS5800 access servers:

```
Router# show controllers t1
T1 1/0/0:1 is up.
 No alarms detected.
 Framing is ESF, Line Code is AMI, Clock Source is Line.
 Data in current interval (770 seconds elapsed):
     5 Line Code Violations, 8 Path Code Violations
     0 Slip Secs, 0 Fr Loss Secs, 7 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 7 Unavail Secs
 Total Data (last 81 15 minute intervals):
     7 Line Code Violations, 4 Path Code Violations,
     6 Slip Secs, 20 Fr Loss Secs, 2 Line Err Secs, 0 Degraded Mins,
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 2 Unavail Secs
T1 1/0/1:5 is down.
 Transmitter is sending remote alarm.
 Receiver has loss of frame.
 Framing is SF, Line Code is AMI, Clock Source is Line.
 Data in current interval (770 seconds elapsed):
     50 Line Code Violations, 5 Path Code Violations
     0 Slip Secs, 7 Fr Loss Secs, 7 Line Err Secs, 0 Degraded Mins
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 7 Unavail Secs
 Total Data (last 81 15 minute intervals):
     27 Line Code Violations, 22 Path Code Violations,
     0 Slip Secs, 13 Fr Loss Secs, 13 Line Err Secs, 0 Degraded Mins,
     0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 13 Unavail Secs
Router#
```

Table 26 describes the fields shown in the display.

*Table 26 show controllers t1 Field Descriptions*

| Field | Description |
|---|---|
| T1 ... is up | Status of T1 line. |
| No alarms detected | Access server received no alarms. |
| Framing is ... | Standard T1 framing type. In this example, the framing is Extended Super Frame (ESF). |
| Line Code is ... | Standard T1 line-coding format. In this example, the line-coding format is Alternate Mark Inversion (AMI). |
| Clock Source is ... | Source of the synchronization signal (clock). In this example, the line is providing the clock signal. |
| Data in current interval ... | Summary statistics for T1 signal quality for the current time interval of 900 seconds. In this example, the statistics are for current partial interval (770 seconds of 900 seconds). |
| Line Code Violations | Number of T1 line code violations for the current interval. |
| Path Code Violations | Number of T1 path code violations for the current interval. |
| Slip Secs | Number of seconds in this interval during which a frame misalignment occurred. |
| Fr Loss Secs | Number of seconds in this interval during which frame loss occurred. |
| Line Err Secs | Number of seconds in this interval during which line errors occurred. |
| Degraded Mins | Number of minutes in this interval during which the signal quality was degraded. |
| Errored Secs | Number of seconds in this interval during which an error was reported. |
| Bursty Err Secs | Number of bursty error seconds in this interval. |
| Severely Err Secs | Number of severely errored seconds in this interval. |
| Unavail Secs | Number of unavailable seconds in this interval. |
| Total Data (last ... 15 minute intervals) | Summary statistics for T1 signal quality for 15-minute intervals. Every 24 hours (96 intervals) the counters in this data block clear. |

# show controllers t1 bert

To get the results of the bit-error rate testing (BERT) run for all ports, use the **show controllers t1 bert** command in privileged EXEC mode.

**show controllers** {*type*} [*controller-number*] [**bert**]

## Syntax Description

| | |
|---|---|
| *type* | Specify either T1 or E1 facility. |
| *controller-number* | (Optional) Select a specific controller/port numbers. The range is 0 to 7. If not selected, the display will show all ports. |
| **bert** | (Optional) Type **bert** to get a specific display for the BERT results. Otherwise, the display will include all other non-BERT information. |

## Defaults

No default behavior or values.

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 12.0(2)XD | This command was introduced. |
| 12.0(3)T | This command was modified. |

## Usage Guidelines

Use the **show controllers** command to display the results of the BERT feature.

## Examples

The following example shows how the **show controllers** command is used to display the BERT status for all ports:

```
Router# show controllers t1 bert
 Controller T1 0 Profile default : The Test was aborted by User
 Controller T1 0 Profile 2 : Test Never Ran
 Controller T1 1 Profile 3 : Test Never Ran
 Controller T1 1 Profile 3 : Test Failed with a BER of 10^-2
 Controller T1 2 Profile 3 : Current running, BER 0
 Controller T1 2 Profile 2 : Passed with a BER of 0
 Controller T1 3 Profile default : Test Never Ran
 Controller T1 3 Profile 2 : Test Never Ran
 Controller T1 4 Profile default : Test Never Ran
 Controller T1 4 Profile 2 : Test Never Ran
 Controller T1 5 Profile default : Test Never Ran
 Controller T1 5 Profile 2 : Test Never Ran
 Controller T1 6 Profile default : Test Never Ran
 Controller T1 6 Profile 2 : Test Never Ran
 Controller T1 7 Profile default : Test Never Ran
 Controller T1 7 Profile 2 : Test Never Ran
```

The following example shows how the output display was limited to that of only one T1 port, port 0.

```
Router# show controllers t1 0 bert
Controller T1 0 Profile default : The Test was aborted by User
Controller T1 0 Profile 2 : Test Never Ran
```

# show controllers t3

To display information about the T3 links and to display the hardware and software driver information for the T3 controller, use the **show controllers t3** command in privileged EXEC mode.

**Cisco 2650XM, Cisco 2651XM, Cisco 2691, Cisco 3660 Series, Cisco 3725, and Cisco 3745 Routers**

**show controllers t3** *slot*/*port* [**brief** | **tabular**]

**Cisco 7200 Series Routers**

**show controllers t3** [*bay*/*port*[/*t1-channel*]] [**brief** | **errors** | **tabular** | **remote performance** [**brief** | **tabular**]]

**Cisco 7500 Series Routers**

**show controllers t3** [*slot*/*bay*/*port*[/*t1-channel*]] [**brief** | **errors** | **tabular** | **remote performance** [**brief** | **tabular**]]

**Cisco AS5800 Access Servers**

**show controllers t3** *dial-shelf*/*slot*/*t3-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. |
| *port-adapter* | (Optional) Port adapter number. Refer to the appropriate hardware manual for information about port adapter compatibility. |
| /*bay* | (Optional) The port-adaptor-bay number. Refer to the appropriate hardware manual for bay information |
| /*t1-channel* | (Optional) Number between 1 and 28 that represents the T1 channel for the Channelized T3 Interface Processor (CT3IP) on Cisco 7200 series and Cisco 5200 series routers. |
| *dial-shelf* | Dial shelf chassis in the Cisco AS5800 access server that contains the CT3 interface card. |
| /*slot* | Location of the CT3 interface card in the dial shelf chassis. |
| /*t3-port* | T3 port number. The only valid value is 0. |
| **brief** | (Optional) Displays a subset of information. |
| **errors** | (Optional) Displays a history of alarm events that causes a T3 controller or a T1 controller of a T3 to transition from an Up state to a Down state. The history size is 18 events. |
| **tabular** | (Optional) Displays information in a tabular format. |
| **remote performance** | (Optional) Displays the far-end ANSI performance monitor information when enabled on the T1 channel with the **t1 fdl ansi** controller configuration command. |

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 11.3 | This command was introduced. |
| 12.0(3)T | This command was implemented on the Cisco AS5800 access server. |
| 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. |
| 12.2(19c) | This command was modified to display error throttling and alarm conditions that cause the T3 controller to enter a failure state. |

## Usage Guidelines

### Cisco 7500 Series Routers

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.

By using the **errors** keyword, this command displays history that identifies which alarm events caused a T3 or T1 controller of a T3 to go down for the Cisco 7500 and Cisco 7200 series routers.

**Note** T1 channels on the CT3IP are numbered 1 to 28 rather than the more traditional zero-based numbering scheme (0 to 27) used with other Cisco products. This is to ensure consistency with telco numbering schemes for T1 channels within channelized T3 equipment.

The **show controllers t3** command also displays Maintenance Data Link (MDL) information (received strings) if MDL is configured and framing is set to C-bit.

## Examples

### Cisco 7200 Series Routers

The following is partial output from the **show controllers t3 errors** command for Cisco IOS Release 12.2(19c) for a specific T1 controller of a T3 on a Cisco 7200 series router with a bay/port of 4/1, displaying the T1 1 alarm event of OOF:

```
Router# show controllers t3 4/1/1 errors

  T3 4/1: Error Log Information
  present alarm: NONE
  Error: AIS
  17:28:08-17:29:18
  T1 1 Error Log Information
  present alarm: OOF
  Since 17:30:55
  Error: OOF
  17:30:09-17:30:46
```

The following is partial output from the **show controllers t3 errors** command from Cisco IOS Release 12.2(19c) for a T3 controller on a Cisco 7200 series router with a bay/port of 4/1, displaying a history of all alarm events on all 28 T1 channels:

```
Router# show controllers t3 4/1 errors

  T3 4/1: Error Log Information
  present alarm: NONE
  Error: AIS
  17:28:08-17:29:18
```

```
  T1 1 Error Log Information
  present alarm: OOF
  Since 17:30:55
  Error: OOF
  17:30:09-17:30:46
  T1 2 Error Log Information
  present alarm: NONE
  T1 3 Error Log Information
  present alarm: NONE
  T1 4 Error Log Information
  present alarm: NONE
  T1 5 Error Log Information
  present alarm: NONE
  T1 6 Error Log Information
  present alarm: NONE
  T1 7 Error Log Information
  present alarm: NONE
  T1 8 Error Log Information
  present alarm: NONE
  T1 9 Error Log Information
  present alarm: NONE
  T1 10 Error Log Information
  present alarm: NONE
  T1 11 Error Log Information
  present alarm: NONE
  T1 12 Error Log Information
  present alarm: NONE
  T1 13 Error Log Information
  present alarm: NONE
 .
.
.
```

### Cisco 7500 Series Routers

The following is partial output from the **show controllers t3 errors** command from Cisco IOS Release 12.2(19c) for a T3 controller with a slot/bay/port of 1/4/1, displaying a history of all alarm events on all 28 T1 channels:

```
Router# show controllers t3 1/4/1 errors

  T3 1/4/1: Error Log Information
  present alarm: NONE
  Error: AIS
  17:28:08-17:29:18
  T1 1 Error Log Information
  present alarm: OOF
  Since 17:30:55
  Error: OOF
  17:30:09-17:30:46
  T1 2 Error Log Information
  present alarm: NONE
  T1 3 Error Log Information
  present alarm: NONE
  T1 4 Error Log Information
  present alarm: NONE
  T1 5 Error Log Information
  present alarm: NONE
.
.
.
```

The following is partial output from the **show controllers t3 errors** command from Cisco IOS Release 12.2(19c) for a specific T1 controller of a T3 on a Cisco 7200 series router with a bay/port of 4/1, displaying the T1 1 alarm event of OOF:

```
Router# show controllers t3 4/1/1 errors
  T3 4/1: Error Log Information
  present alarm: NONE
  Error: AIS
  17:28:08-17:29:18
  T1 1 Error Log Information
  present alarm: OOF
  Since 17:30:55
  Error: OOF
  17:30:09-17:30:46
.
.
.
```

Table 27 describes the error field shown in the display.

***Table 27 show controllers t3 Error Field Description***

| Field | Description |
|---|---|
| AIS | alarm indication signal. In a T1 transmission, an all-ones signal transmitted in lieu of the normal signal to maintain transmission continuity and to indicate to the receiving terminal that there is a transmission fault that is located either at, or upstream from, the transmitting terminal. |
| RAI | remote alarm indication. Indicates a yellow alarm from the remote end of the T1 transmission. |
| OOF | out of frame. An OOF defect is detected when any three or more errors in sixteen or fewer consecutive F-bits occur. |
| LOS | loss of signal. A loss of signal occurs when n consecutive zeros is detected on an incoming signal. |
| NONE | No error is detected. |

The following is partial output from the **show controllers t3** command from Cisco IOS Release 12.2(19c):

```
Router# show controllers t3 2/1/0
T3 2/1/0 is down.  Hardware is 2CT3 single wide port adapter
  CT3 H/W Version:0.2.2, CT3 ROM Version:1.0, CT3 F/W Version:2.5.1
  FREEDM version:1, reset 0 resurrect 0
  Applique type is Channelized T3
  Transmitter is sending remote alarm.
  Receiver has loss of signal.
  FEAC code received:No code is being received
  Framing is M23, Line Code is B3ZS, Clock Source is Internal
  Rx-error throttling on T1's ENABLED
  Rx throttle total 0, equipment customer loopback
  Data in current interval (545 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
     545 Unavailable Secs, 0 Line Errored Secs
     0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
  Data in Interval 1:
```

```
     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
     900 Unavailable Secs, 0 Line Errored Secs
     0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
  Data in Interval 2:
<snip>
```

The following is partial output from the **show controllers t3** command from Cisco IOS Release 12.2(19c) for the T1 channel of the T3 controller:

```
Router# show controllers t3 2/1/0 /1
T3 2/1/0 is down.  Hardware is 2CT3 single wide port adapter
  CT3 H/W Version:0.2.2, CT3 ROM Version:1.0, CT3 F/W Version:2.5.1
  FREEDM version:1, reset 0 resurrect 0

  T1 1 is down
  timeslots:1-24
  FDL per AT&T 54016 spec.
  Receiver has loss of signal.
  Framing is ESF, Clock Source is Internal
  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, 0 Stuffed Secs
```

The following is partial output from the **show controllers t3** command:

```
Router# show controllers t3 3/0/0

T3 3/0/0 is up.
  CT3 H/W Version: 4, CT3 ROM Version: 0.116, CT3 F/W Version: 0.10.0
  Mx H/W version: 2, Mx ucode ver: 1.24
  Applique type is Channelized T3
  No alarms detected.
  FEAC code received: No code is being received
  Framing is M23, Line Code is B3ZS, Clock Source is Internal.
  Ext1: LOS, Ext2: LOS, Ext3: LOS, Test: OK
  Data in current interval (39 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, 0 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 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, 0 Unavailable Secs,
     0 Line Errored Secs, 0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
.
.
.
T1 1 is down, speed: 1536 kbs, non-inverted data
  timeslots: 1-24
  FDL per ANSI T1.403 and AT&T 54016 spec.
  Configured for FDL Remotely Line Looped
  No alarms detected.
  Framing is ESF, LineCode is B8ZS, Clock Source is Internal.
  BERT test result (running)
      Test Pattern: All 0's, Status: Sync, Sync Detected: 1
      Interval: 4 minute(s), Tim Remain: 4 minute(s)
```

```
      Bit Errors (Sync BERT Started): 0 bits
      Bit Errors (Sync last Sync): 0 bits, Bits Received: 7 Mbits
```

The following is partial output from the **show controllers t3 brief** command:

```
Router# show controllers t3 3/0/0 brief

T3 3/0/0 is up.
  CT3 H/W Version: 4, CT3 ROM Version: 0.116, CT3 F/W Version: 0.10.0
  Mxt H/W version: 2, Mxt ucode ver: 1.24
  Applique type is Channelized T3
  No alarms detected.
  FEAC code received: No code is being received
  Framing is M23, Line Code is B3ZS, Clock Source is Internal.
  Ext1: LOS, Ext2: LOS, Ext3: LOS, Test: OK

  T1 1 is up, speed: 1536 kbs, non-inverted data
  timeslots: 1-24
  FDL per ANSI T1.403 and AT&T 54016 spec.
  Configured for FDL Remotely Line Looped
  No alarms detected.
  Framing is ESF, LineCode is B8ZS, Clock Source is Internal.
  BERT test result (done)
      Test Pattern: All 0's, Status: Not Sync, Sync Detected: 1
      Interval: 4 minute(s), Tim Remain: 0 minute(s)
      Bit Errors(Sync BERT Started): 0 bits
      Bit Errors(Sync last Sync): 0 bits, Bits Received: 368 Mbits
.
.
.
```

The following is partial output from the **show controllers t3 tabular** command:

```
Router# show controllers t3 3/0/0 tabular

T3 3/0/0 is up.
  CT3 H/W Version: 4, CT3 ROM Version: 1.2, CT3 F/W Version: 2.1.0
  Mx H/W version: 2, Mx ucode ver: 1.25
  Applique type is Channelized T3
  No alarms detected.
  MDL transmission is disabled

  FEAC code received: No code is being received
  Framing is C-BIT Parity, Line Code is B3ZS, Clock Source is Internal.
  Ext1: AIS, Ext2: LOS, Ext3: LOS, Test: LOS
  INTERVAL      LCV   PCV   CCV   PES  PSES  SEFS   UAS   LES   CES  CSES
  08:56-09:11     0     0     0     0     0     0     0     0     0     0
  08:41-08:56     0     0     0     0     0     0     0     0     0     0
  08:26-08:41     0     0     0     0     0     0     0     0     0     0
  Total           0     0     0     0     0     0     0     0     0     0
.
.
.

T1 2 is up, speed: 1536 kbs, non-inverted data
  timeslots: 1-24
  FDL per AT&T 54016 spec.
  No alarms detected.
  Framing is ESF, Line Code is B8ZS, Clock Source is Internal.
  INTERVAL      LCV   PCV   CSS  SELS   LES    DM    ES   BES   SES   UAS    SS
  08:56-09:11     0     0     0     0     0     0     0     0     0     0     0
  08:41-08:56     0     0     0     0     0     0     0     0     0     0     0
  08:26-08:41     0     0     0     0     0     0     0     0     0     0     0
  Total           0     0     0     0     0     0     0     0     0     0     0
```

The following output shows a controller with a high number of errors on the line, thus showing a throttle count (RX throttles).

```
Router# show controllers t3 6/0/0 tabular

  T1 2 is up
  timeslots: 1-24
  FDL per AT&T 54016 spec.
  No alarms detected.
  Framing is ESF, Clock Source is Line, Rx throttles 47
  INTERVAL      LCV    PCV    CSS  SELS    LES     DM     ES    BES    SES    UAS SS
  07:48-07:53     0      0      0     0      0      0      0      0      0      0
```

The following is partial output from the **show controllers t3 remote performance** command. This information is available if the **t1 fdl ansi** controller configuration command is enabled for a T1 channel on a CT3IP.

```
Router# show controllers t3 3/0/0 remote performance

T3 3/0/0 is up.
  CT3 H/W Version: 4, CT3 ROM Version: 0.116, CT3 F/W Version: 20.2.0
  Mx H/W version: 2, Mx ucode ver: 1.25

  T1 1 - Remote Performance Data
  Data in current interval (356 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
  Data in Interval 1:
     1 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
     2 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs
     0 Unavail Secs
  Data in Interval 2:
     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 2 15 minute intervals):
     1 Path Code Violations
     1 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins,
     2 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs
     0 Unavail Secs
.
.
.
```

Table 28 describes the fields shown in the display.

***Table 28 show controllers t3 Field Descriptions—Cisco 7500 Series***

| Field | Description |
|---|---|
| T3 3/0/0 is up | T3 controller in slot 3 is operating. The controller's state can be up, down, or administratively down. Loopback conditions are shown by (Locally Looped) or (Remotely Looped). |
| CT3 H/W Version | Version number of the hardware. |
| CT3 ROM Version | Version number of the ROM. |
| CT3 F/W Version | Version number of the firmware. |

*Table 28 show controllers t3 Field Descriptions—Cisco 7500 Series (continued)*

| Field | Description |
|---|---|
| Mx H/W version | Hardware version number of the HDLC controller chip. |
| Mx ucode ver | Microcode version of the HDLC controller chip. |
| Applique type | Controller type. |
| No alarms detected | Any alarms detected by the controller are displayed here. Possible alarms are as follows:<br>• Transmitter is sending remote alarm.<br>• Transmitter is sending AIS.<br>• Receiver has loss of signal.<br>• Receiver is getting AIS.<br>• Receiver has loss of frame.<br>• Receiver has remote alarm.<br>• Receiver has no alarms. |
| MDL transmission | Status of the Maintenance Data Link (either enabled or disabled). |
| FEAC code received | Whether or not a far-end alarm code request is being received. Possible values are as follows:<br>• DS3 Eqpt. Failure (SA)<br>• DS3 LOS/HBER<br>• DS3 Out-of-Frame<br>• DS3 AIS Received<br>• DS3 IDLE Received<br>• DS3 Eqpt. Failure (NSA)<br>• Common Eqpt. Failure (NSA)<br>• Multiple DS1 LOS/HBER<br>• DS1 Eqpt. Failure<br>• Single DS1 LOS/HBER<br>• DS1 Eqpt. Failure (NSA)<br>• No code is being received |
| Framing | Framing type on the CT3IP. Values are M23, C-Bit, and Auto-detect. |
| Line Code | Line coding format on the CT3IP. |
| Clock Source | Clock source on the CT3IP. Values are internal or line. |
| RX-error throttling | Indicates that error throttling is enabled. The **error throttling** command disables the T1 level clock in order to stop receiving error data packets on a T1 controller. If any single interface receives a burst of errors over a short duration, such as 400 errors in 100 milliseconds, the T1 clock will be turned off for a period of 100 milliseconds. |

*Table 28 show controllers t3 Field Descriptions—Cisco 7500 Series (continued)*

| Field | Description |
|---|---|
| RX throttles | The presence of the throttle count indicates that there are many input errors on lines. On the CT3 PA, the T1 is throttled when there are a number of input errors on an interface (400 errors in 100 milliseconds). The T1 is throttled even if one of the interfaces on it sees continuous errors. The 1-second periodic process checks for throttled interfaces and unthrottles them back. |
| BERT test result | BERT test information is available if the **t1 bert** controller configuration command is enabled for the T1 channel on the CT3IP. The BERT results include the following information:<br>• Test Pattern—Type of test pattern selected.<br>• Status—Status of the test.<br>• Sync Detected—Number of times the pattern synch is detected (that is, the number of times the pattern goes from No Sync to Sync).<br>• Interval—Duration selected.<br>• Tim Remain—Time remaining on the BERT test.<br>• Bit Errors (Sync BERT Started)—Number of bit errors during the BERT test.<br>• Bit Errors (Sync last Sync)—Number of bit errors since the last pattern sync was detected.<br>• Bits Received—Total bits received.<br>When the T1 channel has a BERT test running, the line state is DOWN. Also, when the BERT test is running and the Status field is Not Sync, the information in the total bit errors field is not valid. When the BERT test is done, the Status field is not relevant. |
| Data in current interval (39 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. |
| Line Code Violations | Line Code Violations (LCVs) is a count of both Bipolar Violations (BPVs) and Excessive Zeros (EXZs) that occur over the accumulation period. An EXZ increments the LCV by one regardless of the length of the zero string. |
| P-bit Coding Violation | For all DS3 applications, a P-bit coding violation (PCV) error event is a 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. |
| C-bit Coding Violation | For C-bit parity and SYNTRAN DS3 applications, the C-bit coding violation (CCV) is the 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. For SYNTRAN, it is a count of CRC-9 errors that occur during the accumulation interval. |

*Table 28 show controllers t3 Field Descriptions—Cisco 7500 Series (continued)*

| Field | Description |
|---|---|
| P-bit Err Secs | 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. |
| P-bit Severely Err Secs | 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. |
| Severely Err Framing Secs | Severely errored framing seconds (SEFS) is a second with one or more out-of-frame defects or a detected incoming AIS. |
| Unavailable Secs | The number of unavailable seconds (UAS) is calculated by counting the number of seconds for which the interface is unavailable. For more information, refer to RFC 1407, *DS3 MIB Variables*. |
| Line Errored Secs | Line errored seconds (LES) is a second in which one or more code violations or one or more LOS defects occurred. |
| C-bit Errored Secs | C-bit errored seconds (CES) is a second 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. |
| C-bit Severely Errored Secs | C-bit severely errored seconds (CSES) is a second 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. |
| Total Data (last 1 15 minute intervals) | Shows the last 15-minute accumulation period. |
| T1 1 is up | T1 channel is operating. The channel's state can be up, down, or administratively down. Loopback conditions are shown by (Locally Looped) or (Remotely Looped). |
| speed | Speed of the T1 channel, in kbps. |
| non-inverted data | Indicates if the T1 channel is configured for inverted data. |
| timeslots | Time slots assigned to the T1 channel. |
| FDL per ANSI T1.403 and AT&T 54016 spec. | Performance monitoring is via Facility Data Link per ANSI T1.403 and AT&T standard specification number 54016. |
| No alarms detected | Any alarms detected by the T1 controller are displayed here. Possible alarms are as follows:<br>• Transmitter is sending remote alarm.<br>• Transmitter is sending AIS.<br>• Receiver has loss of signal.<br>• Receiver is getting AIS.<br>• Receiver has loss of frame.<br>• Receiver has remote alarm.<br>• Receiver has no alarms. |
| Framing | Type of framing used on the T1 channel. Values are ESF or SF. |
| Line Code | Type of line coding used on the T1 channel. Values are B8ZS or AMI. |
| Clock Source | Clock source on the T1 channel. Values are internal or line. |

*Table 28 show controllers t3 Field Descriptions—Cisco 7500 Series (continued)*

| Field | Description |
|---|---|
| Path Code Violations | Path coding violation (PCV) error event is a frame synchronization bit error in the D4 and E1-no-CRC formats or a CRC error in the ESF and E1-CRC formats. |
| Slip Secs | Controlled slip second (CSS) is a 1-second interval that contains one or more controlled slips. |
| Fr Loss Secs | Frame loss seconds (SELS) is the number of seconds for which an out-of-frame 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 | Degraded minute (DM) is a minute in which the estimated error rate exceeds 1E-6 but does not exceed 1E-3. For more information, refer to RFC 1406, *Definitions of Managed Objects for DS1 and E1 Interface Types*. |
| Errored Secs | Errored seconds (ES) is a second with one or more path coding violations, one or more out-of-frame defects, or one or more controlled slip events or a detected AIS defect. |
| Bursty Err Secs | Bursty errored seconds (BES) is a second with fewer than 320 and more than one path coding violation error events, no severely errored frame defects, and no detected incoming AIS defects. Controlled slips are not included in this parameter. |
| Severely Err Secs | Severely errored seconds (SES) is a second with 320 or more path code violation errors events, one or more out-of-frame defects, or a detected AIS defect. |
| Unavailable Secs | Number of seconds during which the interface was not available in this interval. Referred to as UAS. |
| Stuffed Secs | Stuffed seconds (SS) is a second in which one more bit stuffings take place. This happens when the Pulse Density Enforcer detects a potential violation in the output stream and inserts a 1 to prevent it. Such bit stuffings corrupt user data and indicate that the network is configured incorrectly. This counter can be used to help diagnose this situation. |

### Cisco AS5800 Access Servers

The following example shows the summary status of the T3 controller located in shelf 1, slot 4, port 0:

```
Router# show controllers t3 1/4/0 brief

T3 1/4/0 is up.
 Applique type is Channelized T3
 No alarms detected.
 MDL transmission is disabled

 FEAC code received: Multiple DS1 LOS/HBER
 Framing is C-BIT Parity, Line Code is B3ZS, Clock Source is Line.
 Data in current interval (491 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
     0 Unavailable Secs, 0 Line Errored Secs
     0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
```

```
 Total Data (last 80 15 minute intervals):
     3 Line Code Violations, 4 P-bit Coding Violation,
     2 C-bit Coding Violation, 0 P-bit Err Secs,
     0 P-bit Severely Err Secs, 0 Severely Err Framing Secs,
     2 Unavailable Secs, 0 Line Errored Secs,
     0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
```

The following example shows the detailed status of the T3 controller connected to the Cisco AS5800 in shelf 1, slot 4, port 0. Notice that the detailed information shows the last eighty-six 15-minute time periods.

```
Router# show controllers t3 1/4/0

T3 1/4/0 is up.
 Applique type is Channelized T3
 No alarms detected.
 MDL transmission is disabled

 FEAC code received: Multiple DS1 LOS/HBER
 Framing is C-BIT Parity, Line Code is B3ZS, Clock Source is Line.
 Data in current interval (91 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
     0 Unavailable Secs, 0 Line Errored Secs
     0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
 Data in Interval 1:
     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
     0 Unavailable Secs, 0 Line Errored Secs
     0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
 Data in Interval 2:
     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
     0 Unavailable Secs, 0 Line Errored Secs
     0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
 Data in Interval 3:
     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
     0 Unavailable Secs, 0 Line Errored Secs
     0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
 Data in Interval 4:
     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
     0 Unavailable Secs, 0 Line Errored Secs
     0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
.
.
.

Data in Interval 86:
     3 Line Code Violations, 4 P-bit Coding Violation
     2 C-bit Coding Violation, 0 P-bit Err Secs
     0 P-bit Severely Err Secs, 0 Severely Err Framing Secs
     2 Unavailable Secs, 0 Line Errored Secs
     0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
 Total Data (last 86 15 minute intervals):
     3 Line Code Violations, 4 P-bit Coding Violation,
     2 C-bit Coding Violation, 0 P-bit Err Secs,
     0 P-bit Severely Err Secs, 0 Severely Err Framing Secs,
```

```
2 Unavailable Secs, 0 Line Errored Secs,
0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
```

Table 29 describes the fields shown in the display.

***Table 29 show controllers t3 Field Descriptions—Cisco AS5800***

| Field | Description |
|---|---|
| T3 1/4/0 is up | T3 controller connected to this Cisco AS5800 access server in shelf 1, slot 4, port 0 is up. 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:<br>• Transmitter is sending remote alarm.<br>• Transmitter is sending alarm indication signal (AIS).<br>• Receiver has loss of signal (LOS).<br>• Receiver is getting AIS.<br>• Receiver has loss of frame (LOF).<br>• Receiver has remote alarm.<br>• Receiver has no alarms. |
| 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 T3 unit. It is the counterpart of Facility Data Link (FDL) in a T1 link. |
| FEAC code received | Whether or not a far-end alarm code request is being received. Possible values are as follows:<br>• DS3 Eqpt. Failure (SA)<br>• DS3 LOS/HBER<br>• DS3 Out-of-Frame<br>• DS3 AIS Received<br>• DS3 IDLE Received<br>• DS3 Eqpt. Failure (NSA)<br>• Common Eqpt. Failure (NSA)<br>• Multiple DS1 LOS/HBER<br>• DS1 Eqpt. Failure<br>• Single DS1 LOS/HBER<br>• DS1 Eqpt. Failure (NSA)<br>• No code is being received |
| Framing | Standard T3 framing type: M23, C-Bit, or Auto-detect. |
| Line Code | Standard T3 line-coding format. In this example, the line-coding format is bipolar 3-zero substitution (B3ZS). |

*Table 29 show controllers t3 Field Descriptions—Cisco AS5800 (continued)*

| Field | Description |
|---|---|
| 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 T3 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. |
| Total Data (last ... 15 minute intervals) | Summary statistics for T3 signal quality for 15-minute intervals. Every 24 hours (96 intervals) the counters in this data block clear. |

# show controllers token

To display information about memory management and error counters on the Token Ring Interface Processor (exTRIP) for the Cisco 7500 series routers, use the **show controllers token** command in privileged EXEC mode.

**show controllers token**

## Syntax Description

This command has no arguments or keywords.

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 10.0 | This command was introduced. |
| 11.3(3)T | The information was modified to include the PA-4R-FDX full-duplex Token Ring port adapter. |

## Usage Guidelines

Depending on the card being used, the output can vary. This command also displays information that is proprietary to Cisco Systems. Thus, the information that the **show controllers token** command displays is of primary use to Cisco technical personnel. Information that is useful to users can be obtained with the **show interfaces tokenring** command, which is described later in this chapter.

## Examples

The following is sample output from the **show controllers token** command on the Cisco 7500:

```
Router#> show controllers token

Tokenring4/0: state administratively down
  current address: 0000.3040.8b4a, burned in address: 0000.3040.8b4a
  Last Ring Status: none
    Stats: soft: 0/0, hard: 0/0, sig loss: 0/0
           tx beacon: 0/0, wire fault 0/0, recovery: 0/0
           only station: 0/0, remote removal: 0/0
  Monitor state: (active), chip f/w: '000000........', [bridge capable]
    ring mode: 0"
    internal functional: 00000000 (00000000), group: 00000000 (00000000)
    internal addrs: SRB: 0000, ARB: 0000, EXB 0000, MFB: 0000
                    Rev: 0000, Adapter: 0000, Parms 0000
    Microcode counters:
      MAC giants 0/0, MAC ignored 0/0
      Input runts 0/0, giants 0/0, overrun 0/0
      Input ignored 0/0, parity 0/0, RFED 0/0
      Input REDI 0/0, null rcp 0/0, recovered rcp 0/0
      Input implicit abort 0/0, explicit abort 0/0
      Output underrun 0/0, tx parity 0/0, null tcp 0/0
      Output SFED 0/0, SEDI 0/0, abort 0/0
      Output False Token 0/0, PTT Expired 0/0


    Internal controller counts:
```

```
    line errors: 0/0, internal errors: 0/0
    burst errors: 0/0, ari/fci errors: 0/0
    abort errors: 0/0, lost frame: 0/0
    copy errors: 0/0, rcvr congestion: 0/0
    token errors: 0/0, frequency errors: 0/0
  Internal controller smt state:
    Adapter MAC:     0000.0000.0000, Physical drop:     00000000
    NAUN Address:    0000.0000.0000, NAUN drop:         00000000
    Last source:     0000.0000.0000, Last poll:         0000.0000.0000
    Last MVID:       0000,           Last attn code:    0000
    Txmit priority:  0000,           Auth Class:        0000
    Monitor Error:   0000,           Interface Errors:  0000
    Correlator:      0000,           Soft Error Timer:  0000
    Local Ring:      0000,           Ring Status:       0000
    Beacon rcv type: 0000,           Beacon txmit type: 0000
    Beacon type:     0000,           Beacon NAUN:       0000.0000.0000
    Beacon drop:     00000000,       Reserved:          0000
    Reserved2:       0000
```

Table 30 describes the significant fields shown in the display.

***Table 30 show controllers token Field Descriptions for the Cisco 7500 Series***

| Field | Description |
|---|---|
| Tokenring4/0 | Interface processor type, slot, and port. |
| Last Ring Status | Last abnormal ring condition. Can be any of the following:<br>• Signal Loss<br>• HW Removal<br>• Remote Removal<br>• Counter Overflow<br>• Only station<br>• Ring Recovery |

The following is an example on the PA-4R-DTR from the **show controllers token** command:

```
Router #show controllers token 4/0

Interface TokenRing4/0 state: up
  Data from IDB:
    Current MAC address: 0008.2a36.1a04, Burned in MAC address: 0008.2a36.1a04
    Group address: 80000000
    Functional address: 08000000, enables: CDP
    Ring mode: 0000, enables:

  Last Ring Status: none
    Stats: soft: 0/0, hard: 0/0, sig loss: 0/0, throttle: 0/0
           tx beacon: 0/0, wire fault 0/0, recovery: 0/0
           only station: 0/0, remote removal: 0/0
  Interface failures: 0
```

The current operating mode can be one of the following: classic Token Ring station (standard half-duplex Token Ring station), DTR station (full-duplex Token Ring station), and DTR concentrator (concentrator port). In this case, the current operating mode is classic Token Ring station:

```
  Current operating mode:
  Classic token ring station
```

The MAC state indicates the state of the Token Ring MAC layer protocol. The state can be not inserted (not connected to any ring), inserting (currently entering a ring), and inserted (connected to an active Token Ring):

```
     MAC state: inserted
     Duplex: half
     Access protocol: TKP
     Ring speed: 16 Mbps
     Ring monitor role: Standby monitor

  Internal controller data:
    MAC microcode version: 0.240
    Hawkeye ASIC revision: 0
    Node address: 0008.2a36.1a04
    Functional address: 08000000, Group address: 80000000
    Hawkeye ASIC registers:
      last hisr: 0004h, himr: 00002ABFh, inpace: 0000h
      utility: 6316h, txphthre: 1010h, rxtxdmathre: 2828h
      dmactrl: 0000E004h, earlyrxthre: 0000h, llcstop: 0000h
      reset: 0000h
      txhidescstart: 4B0A45C0h, txlodescstart: 00000000h
      rxdescstart: 4B0A4180h, srbctrl: 0038h, descipoll: 0100h
      congestcnt: 0000h
    Hawkeye transmit error counts:
      Underrun: 0/0
    Hawkeye receive error counts:
      Out of descriptors: 0/0, Giants: 0/0
      Corrupted frames: 0/0, CRC errors: 0/0
      FIFO overflow: 0/0
    Device driver ring buffer data:
      Transmit ring:
        Descriptors outstanding (curr/max): 0/256
        Head pointer: 7   Tail pointer: 7
      Receive ring:
        Ring size: 64 descriptors
        Head pointer: 7
    Internal controller soft error counts:
      Line errors: 0/0, Internal errors: 0/0
      Burst errors: 0/0, ARI/FCI errors: 0/0
      Abort errors: 0/0, Lost frame errors: 0/0
      Copy errors: 0/0, Receiver congestion: 0/0
      Token errors: 0/0, Frequency errors: 0/0
    Internal controller SMT state:
      Adapter MAC:     0008.2a36.1a04, Physical drop:       00000000
      NAUN address:    0060.3ebb.0a21, NAUN drop:           00000000
      Last beacon src: 0000.0000.0000, Last poll:           0060.3ebb.0a21
      Last MVID:       0006,           Last attn code:      0000
      Txmit priority:  0007,           Auth funct class:    FFFF
      Monitor error:   0000,           Front end errors:    0000
      Correlator:      0000,           Soft error timer:    00C8
      Local ring:      0000,           Ring status:         0000
      Beacon rcv type: 0000,           Beacon txmit type:   0000
      Last beacon type:0000,           Bcn station NAUN:    0000.0000.0000
      Beacon drop:     00000000,       Phantom support:     0000


      Access prot req: 0000,           Access prot resp:    0000
      Policy flags:    0110,           Protocol event state:000D
      Ctrl ring state: 0001,           Protocol join state: 0000
      Reserved:        0000,           Protocol mon state:  0000
```

The following is sample output from the **show controllers token** command for a Token Ring interface in a full-duplex port mode:

```
Router# show controllers token

Interface TokenRing4/1 state: up
  Data from IDB:
    Current MAC address: 0008.2a36.1a84, Burned in MAC address: 0008.2a36.1a84
    Group address: 80000000
    Functional address: 08000000, enables: CDP
    Ring mode: 0000, enables:

  Last Ring Status: none
    Stats: soft: 0/0, hard: 0/0, sig loss: 0/0, throttle: 0/0
           tx beacon: 0/0, wire fault 0/0, recovery: 0/0
           only station: 0/0, remote removal: 0/0
  Interface failures: 0

  Current operating mode:
    DTR concentrator
      MAC state: port open, station connected
      Mode: port
      Duplex: full
      Access protocol: TXI
      Ring speed: 16 Mbps
      Ring monitor role: Standby monitor

  Internal controller data:
    MAC microcode version: 0.240
    Hawkeye ASIC revision: 0
    Node address: 0008.2a36.1a84
    Functional address: 08000000, Group address: 80000000
    Hawkeye ASIC registers:
      last hisr: 0008h, himr: 00002ABFh, inpace: 0000h
      utility: 6316h, txphthre: 1010h, rxtxdmathre: 2828h
      dmactrl: 0000E004h, earlyrxthre: 0000h, llcstop: 0000h
      reset: 0000h
      txhidescstart: 4B0A5A40h, txlodescstart: 00000000h
      rxdescstart: 4B0A5600h, srbctrl: 0038h, descipoll: 0100h
      congestcnt: 0000h
    Hawkeye transmit error counts:
      Underrun: 0/0
    Hawkeye receive error counts:
      Out of descriptors: 0/0, Giants: 0/0
      Corrupted frames: 0/0, CRC errors: 0/0
      FIFO overflow: 0/0
    Device driver ring buffer data:
      Transmit ring:
        Descriptors outstanding (curr/max): 0/256
        Head pointer: 5   Tail pointer: 5
      Receive ring:
        Ring size: 64 descriptors
        Head pointer: 2


    Internal controller soft error counts:
      Line errors: 0/0, Internal errors: 0/0
      Burst errors: 0/0, ARI/FCI errors: 0/0
      Abort errors: 0/0, Lost frame errors: 0/0
      Copy errors: 0/0, Receiver congestion: 0/0
      Token errors: 0/0, Frequency errors: 0/0
    Internal controller SMT state:
      Adapter MAC:     0008.2a36.1a84, Physical drop:       00000000
      NAUN address:    0008.2a36.1a44, NAUN drop:           00000000
      Last beacon src: 0000.0000.0000, Last poll:           0000.0000.0000
      Last MVID:       0006,           Last attn code:      0000
      Txmit priority:  0007,           Auth funct class:    FFFF
```

```
Monitor error:   0000,          Front end errors:    0000
Correlator:      0000,          Soft error timer:    00C8
Local ring:      0000,          Ring status:         0000
Beacon rcv type: 0000,          Beacon txmit type:   0000
Last beacon type:0000,          Bcn station NAUN:    0000.0000.0000
Beacon drop:     00000000,      Phantom support:     0001
Access prot req: 0002,          Access prot resp:    0000
Policy flags:    0590,          Protocol event state:000D
Ctrl ring state: 0001,          Protocol join state: 0007
Reserved:        0000,          Protocol mon state:  0002
```

## Related Commands

| Command | Description |
|---|---|
| **show interfaces tokenring** | Displays information about the Token Ring interface and the state of source-route bridging. |
| **show source-bridge** | Displays the current source bridge configuration and miscellaneous statistics. |

# show controllers vg-anylan

To display the controller information for the 100VG-AnyLAN port adapter on Cisco 7200 series routers and Cisco 7500 series routers, use the **show controllers vg-anylan** command in user EXEC mode.

**Cisco 7500 Series with VIP Cards**

**show controllers vg-anylan** *slot/port-adapter/port*

**Cisco 7200 Series**

**show controllers vg-anylan** *slot/port*

## Syntax Description

| | |
|---|---|
| *slot* | Number of the slot being configured. Refer to the appropriate hardware manual for slot and port information. |
| *port-adapter* | Number of the port adapter being configured. Refer to the appropriate hardware manual for information about port adapter compatibility. |
| *port* | Number of the port being configured. Refer to the appropriate hardware manual for slot and port information. |

## Command Modes

User EXEC

## Command History

| Release | Modification |
|---|---|
| 11.3 | This command was introduced. |

## Usage Guidelines

The information displayed is generally useful for diagnostic tasks performed by technical support personnel only.

## Examples

The following is sample output from the **show controllers vg-anylan** command:

```
Router> show controllers vg-anylan 3/0

Interface VG-AnyLAN3/0
Hardware is MC68852
 mc68852_ds=0x60A4C930, registers=0x3C300000, ib=0x4B056240
 rx ring entries=31, tx ring entries=31
 rxring=0x4B056340, rxr shadow=0x60A4CA08, rx_head=0, rx_tail=0
 txring=0x4B057180, txr shadow=0x60A4D07C, tx_head=0, tx_tail=2,
tx_count=2,


 MC68852 Registers:
 hw_id: 5048, hw_id & page: 7053, opr1=0x26, opr2=0x2C, opr3=0x00
  Page 0 - Performance:
  isr=0x3400, imr=0x0A0A, flreg=0x0000
  xfrct=0xC07E0080, rxcnt=0, txcnt=1F
  Page 1 - MAC Address/Hash Table:
  addrlow= 6009B9, addrhigh=9B1809B9,hash bytes=06 00 20 00 00 00 00 00
```

```
 Page 2 - Hardware Mapping:
 mmmsw=0x3785, mmlsw=0x0000, bmreg =0x04
 Page 4 - LAN Configuration:
 tccnf1=0x00, tccnf2=0x01
 vccnf=0x99, vtrrg=0x0020, valow1=0x0000, valow2=0x0000
 maccr1=0xBE, maccr2=0x00, maccr3=0x04, maccr4=0x03
 Page 5 - MMU Registers:
 rx mem stop addr=0xFF03, tx mem stop addr=0xFF07
MC68852 PCI registers:
 bus_no=6, device_no=0
 CFID=0x0005101A, CFCS=0x02800005, CFRV=0x02000000, CFLT=0x0000F800
 CBIO=0x00006001, CBMA=0x00000000, CFIT=0x20080100, CFDA=0x0000000C

Actel Hardware CAM Control Registers:
 CAM DEVICE BASE: 0x3C300800  Register Address: 0x3C300C00
 CSR: 0x8000  CAMCR: 0xFFFF
 USAR: 0000  MSAR: 0000  LSAR: 0000
 FIFOCR: 0x8000  WRMASK: 0x0080
 COMPARAND REG: 0000.0000.0000
 PERSISTENT SOURCE: 0x0   PERSISTENT DEST: 0xFD010000
ACTEL CAM PCI registers:
 bus_no=6, device_no=1
 CFID=0x555511AA, CFCS=0x04800003, CFRV=0xF0F0F001, CFLT=0x00000000
 CBIO=0x00006800, CBMA=0x00000000, CFIT=0x00000000, CFDA=0x00000000
 pak_to_host=0x0, filtered_pak=0
 throttled=0, enabled=0, disabled=0
 tx_carrier_loss=0
 fatal_tx_err=0, mult_ovfl=0
```

# show diag

To display hardware information for the networking device, use the **show diag** command in EXEC or privileged EXEC mode.

**show diag** [*slot*]

## Syntax Description

| | |
|---|---|
| *slot* | (Optional) Slot number of the interface. |

## Command Modes

EXEC
Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 11.1 CA | This command was introduced. |
| 11.2 P | This command was modified to update the example for PA-12E/2FE port adapter, PA-E3 port adapter, and PA-T3 port adapter. |
| 11.3 XA | This command was incorporated into Cisco IOS Release 11.3 XA. |
| 12.0(5)XQ | This command was enhanced and introduced on the Cisco 1750 router. |
| 12.0(7)T | This command was integrated into Cisco IOS Release 12.0(7)T and implemented on the Cisco 1750 router. |
| 12.2 | This command was implemented on the Cisco AS5300. |

## Usage Guidelines

This command displays information for the EEPROM, the motherboard, and the WAN interface cards (WICs) and voice interface cards (VICs). Use this command to determine the type of port adapter installed on a second-generation Versatile Interface Processor (VIP2) in your router.

**Note** The enhancement to display the field replaceable unit (FRU) number in **show diag** command output is not available in all Cisco IOS releases and not all Cisco devices and Cisco network modules will display their FRU numbers.

Examples of output showing the FRU number are included in the Examples section.

### Cisco 7304 Router Usage Guidelines

For the Cisco 7304 router, this command applies to NSEs, line cards, MSCs, and SPAs.

- To display hardware information for an NSE, line card, or MSC in the specified slot, use the *slot-number* argument. For MSCs, information about the MSC and each of its installed SPAs is displayed.
- To display hardware information about the backplane, power supplies, and fan modules, use the **chassis** keyword.

### Shared Port Adapter Usage Guidelines

- To display hardware information for an MSC or SIP only in a specified slot, use the *slot-number* argument.
- To display hardware information for a SPA only, use the **show diag subslot** *slot*/*subslot* version of this command.

## Examples

### Example for a 1-Port T3 Serial Port Adapter on the Cisco 7200 Series Router

The following is sample output from the **show diag** command for a 1-port T3 serial port adapter in chassis slot 1 on a Cisco 7200 series router:

```
Router# show diag 1

Slot 1:
        Physical slot 1, ~physical slot 0xE, logical slot 1, CBus 0
        Microcode Status 0x4
        Master Enable, LED, WCS Loaded
        Board is analyzed
        Pending I/O Status: None
        EEPROM format version 1
        VIP2 controller, HW rev 2.4, board revision D0
        Serial number: 04372053  Part number: 73-1684-03
        Test history: 0x00        RMA number: 00-00-00
        Flags: cisco 7000 board; 7500 compatible

        EEPROM contents (hex):
          0x20: 01 15 02 04 00 42 B6 55 49 06 94 03 00 00 00 00
          0x30: 68 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

        Slot database information:
        Flags: 0x4      Insertion time: 0x14A8 (5d02h ago)

        Controller Memory Size: 16 MBytes DRAM, 1024 KBytes SRAM

        PA Bay 0 Information:
                T3 Serial PA, 1 ports
                EEPROM format version 1
                HW rev FF.FF, Board revision UNKNOWN
                Serial number: 4294967295  Part number: 255-65535-255
```

### Example Output from a Cisco 7200 Showing the FRU Number

The following is sample output from the **show diag** command on a Cisco 7200 series router showing the FRU number:

```
Router# show diag
Slot 0:
        Dual FastEthernet (RJ-45) I/O Card Port adapter, 2 ports
        Port adapter is analyzed
        Port adapter insertion time 6d02h ago
        EEPROM contents at hardware discovery:
        Hardware Revision        : 2.1
        Top Assy. Part Number    : 800-07114-06
        Part Number              : 73-5003-06
        Board Revision           : B0
        PCB Serial Number        : 31558694
        RMA History              : 00
        Fab Version              : 03
        Fab Part Number          : 28-3455-03
        Product (FRU) Number     : C7200-I/O-2FE/E
        Deviation Number         : 0-0
```

```
        EEPROM format version 4
        EEPROM contents (hex):
          0x00: 04 FF 40 02 15 41 02 01 C0 46 03 20 00 1B CA 06
          0x10: 82 49 13 8B 06 42 42 30 C1 8B 33 31 35 35 38 36
          0x20: 39 34 00 00 00 04 00 02 03 85 1C 0D 7F 03 CB 8F
          0x30: 43 37 32 30 30 2D 49 2F 4F 2D 32 46 45 2F 45 80
          0x40: 00 00 00 00 FF FF FF FF FF FF FF FF FF FF FF FF
          0x50: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x60: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
Router#
```

### Examples for a Cisco 12000 Series Internet Router

The following is sample output from the **show diag** command on a Cisco 12000 series Internet router:

```
Router# show diag 3

SLOT 3  (RP/LC 3 ): 4 Port Packet Over SONET OC-3c/STM-1 Multi Mode
  MAIN: type 33,  00-0000-00 rev 70 dev 0
        HW config: 0x01    SW key: 00-00-00
  PCA:  73-2147-02 rev 94 ver 2
        HW version 1.0  S/N 04499695
  MBUS: MBUS Agent (1)  73-2146-05 rev 73 dev 0
        HW version 1.1  S/N 04494882
        Test hist: 0x00    RMA#: 00-00-00    RMA hist: 0x00
  DIAG: Test count: 0x05000001    Test results: 0x00000000
  MBUS Agent Software version 01.27 (RAM) using CAN Bus A
  ROM Monitor version 00.0D
  Fabric Downloader version used 00.0D (ROM version is 00.0D)
  Board is analyzed
  Board State is Line Card Enabled (IOS  RUN )
  Insertion time: 00:00:10 (00:04:51 ago)
  DRAM size: 33554432 bytes
  FrFab SDRAM size: 67108864 bytes
  ToFab SDRAM size: 16777216 bytes
```

The following is sample output from the **show diag** command with the **summary** keyword:

```
Router# show diag summary

SLOT 0  (RP/LC 0 ): Route Processor
SLOT 2  (RP/LC 2 ): 4 Port Packet Over SONET OC-3c/STM-1 Single Mode
SLOT 4  (RP/LC 4 ): 4 Port Packet Over SONET OC-3c/STM-1 Single Mode
SLOT 7  (RP/LC 7 ): 4 Port Packet Over SONET OC-3c/STM-1 Single Mode
SLOT 9  (RP/LC 9 ): 4 Port Packet Over SONET OC-3c/STM-1 Single Mode
SLOT 11 (RP/LC 11): 4 Port Packet Over SONET OC-3c/STM-1 Single Mode
SLOT 16 (CSC 0   ): Clock Scheduler Card
SLOT 17 (CSC 1   ): Clock Scheduler Card
SLOT 18 (SFC 0   ): Switch Fabric Card
SLOT 19 (SFC 1   ): Switch Fabric Card
SLOT 20 (SFC 2   ): Switch Fabric Card
SLOT 24 (PS A1   ): AC Power Supply
SLOT 26 (PS B1   ): AC Power Supply
SLOT 28 (TOP FAN ): Blower Module
SLOT 29 (BOT FAN ): Blower Module
```

The following is sample output from the **show diag** command with the **details** keyword:

```
Router# show diag 4 details

SLOT 4  (RP/LC 4): 4 Port Packet Over SONET OC-3c/STM-1 Single Mode
  MAIN: type 33,  800-2389-01 rev 71 dev 16777215
        HW config: 0x00    SW key: FF-FF-FF
  PCA:  73-2275-03 rev 75 ver 3
```

```
        HW version 1.1  S/N 04529465
  MBUS: MBUS Agent (1)  73-2146-06 rev 73 dev 0
        HW version 1.1  S/N 04541395
        Test hist: 0xFF    RMA#: FF-FF-FF    RMA hist: 0xFF
  DIAG: Test count: 0x05000001    Test results: 0x00000000
  EEPROM contents (hex):
  00: 01 00 01 00  49 00 08 62  06 03 00 00  00 FF FF FF
  10: 30 34 35 34  31 33 39 35  FF FF FF FF  FF FF FF FF
  20: 01 01 00 00  00 00 00 FF  FF FF FF FF  FF FF FF FF
  30: A5 FF A5 A5  A5 A5 FF A5  A5 A5 A5 A5  A5 A5 A5 A5
  40: 00 21 01 01  00 49 00 08  E3 03 05 03  00 01 FF FF
  50: 03 20 00 09  55 01 01 FF  FF FF 00 FF  FF FF FF FF
  60: 30 34 35 32  39 34 36 35  FF FF FF FF  FF FF FF FF
  70: FF FF FF FF  FF FF FF FF  05 00 00 01  00 00 00 00
  MBUS Agent Software version 01.24 (RAM)
  Fabric Downloader version 00.0D
  Board is analyzed
  Flags: 0x4
  Board State is Line Card Enabled (IOS  RUN)
  Insertion time: 00:00:10 (00:04:51 ago)
  DRAM size: 33554432 bytes
  FrFab SDRAM size: 67108864 bytes
  ToFab SDRAM size: 16777216 bytes
```

### Example for an ATM SAR AIM in a Cisco 3660

The following is sample output from the **show diag** command for one ATM Segmentation and Reassembly (SAR) AIM in a Cisco 3660 router:

```
Router# show diag 0

3660 Chassis type: ENTERPRISE

c3600 Backplane EEPROM:
    Hardware Revision        : 1.0
    Top Assy. Part Number    : 800-04740-02
.
.
.
ATM AIM: 1
    ATM AIM module with SAR only (no DSPs)
    Hardware Revision        : 1.0
    Top Assy. Part Number    : 800-03700-01
    Board Revision           : A0
    Deviation Number         : 0-0
    Fab Version              : 02
    PCB Serial Number        : JAB9801ABCD
```

### Example Output from a Cisco 3660 Showing the FRU Number

The following is sample output from the **show diag** command on a Cisco 3660 router that shows the FRU numbers for slots 0 and 1:

```
Router# show diag
3660 Chassis type: ENTERPRISE
3660 Backplane EEPROM:
        Hardware Revision        : 1.0
        Top Assy. Part Number    : 800-04740-02
        Board Revision           : C0
        Deviation Number         : 0-0
        Fab Version              : 02
        PCB Serial Number        : HAD04471U36
        RMA Test History         : 00
        RMA Number               : 0-0-0-0
```

```
        RMA History              : 00
        Chassis Serial Number    : JAB055180FF
        Chassis MAC Address      : 0007.ebea.4460
        MAC Address block size   : 112
        Manufacturing Test Data  : 00 00 00 00 00 00 00 00
        Fab Part Number          : 28-2651-02
        Number of Slots          : 6
        EEPROM format version 4
        EEPROM contents (hex):
          0x00: 04 FF 40 00 C8 41 01 00 C0 46 03 20 00 12 84 02
          0x10: 42 43 30 80 00 00 00 00 02 02 C1 8B 48 41 44 30
          0x20: 34 34 37 31 55 33 36 03 00 81 00 00 00 00 04 00
          0x30: C2 8B 4A 41 42 30 35 35 31 38 30 46 46 C3 06 00
          0x40: 07 EB EA 44 60 43 00 70 C4 08 00 00 00 00 00 00
          0x50: 00 00 85 1C 0A 5B 02 01 06 FF FF FF FF FF FF FF
          0x60: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
Slot 0:
        C3600 Mother board 2FE(TX) Port adapter, 2 ports
        Port adapter is analyzed
        Port adapter insertion time unknown
        EEPROM contents at hardware discovery:
        PCB Serial Number        : JAB05460CSV
        Processor type           : 34
        Top Assy. Part Number    : 800-04737-04
        Board Revision           : C0
        Fab Part Number          : 28-3234-02
        Deviation Number         : 65535-65535
        Manufacturing Test Data  : FF FF FF FF FF FF FF FF
        RMA Number               : 255-255-255-255
        RMA Test History         : FF
        RMA History              : FF
        Field Diagnostics Data   : FF FF FF FF FF FF FF FF
        Product (FRU) Number     : Leopard-2FE
        EEPROM format version 4
        EEPROM contents (hex):
          0x00: 04 FF C1 8B 4A 41 42 30 35 34 36 30 43 53 56 09
          0x10: 34 40 00 B3 C0 46 03 20 00 12 81 04 42 43 30 85
          0x20: 1C 0C A2 02 80 FF FF FF FF C4 08 FF FF FF FF FF
          0x30: FF FF FF 81 FF FF FF FF 03 FF 04 FF C5 08 FF FF
          0x40: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x50: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x60: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF 00

Slot 1:
        Mueslix-4T Port adapter, 4 ports
        Port adapter is analyzed
        Port adapter insertion time unknown
        EEPROM contents at hardware discovery:
        Hardware revision 1.1           Board revision D0
        Serial number     17202570      Part number    800-02314-02
        FRU Part Number:  NM-4T=

        Test history      0x0           RMA number     00-00-00
        EEPROM format version 1
        EEPROM contents (hex):
          0x00: 01 54 01 01 01 06 7D 8A 50 09 0A 02 00 00 00 00
          0x10: 68 00 00 00 99 11 21 00 00 05 FF FF FF FF FF FF
Router#
```

### Example for an NM-AIC-64 Installed in a Cisco 2611

The following is sample output from the **show diag** command for a Cisco 2611 router with the NM-AIC-64 installed.

```
Router# show diag

Slot 0:
C2611 2E Mainboard Port adapter, 2 ports
Port adapter is analyzed
Port adapter insertion time unknown
EEPROM contents at hardware discovery:
Hardware Revision : 2.3
PCB Serial Number : JAD044808SG (1090473337)
Part Number : 73-2840-13
RMA History : 00
RMA Number : 0-0-0-0
Board Revision : C0
Deviation Number : 0-0
EEPROM format version 4
EEPROM contents (hex):
0x00: 04 FF 40 00 92 41 02 03 C1 18 4A 41 44 30 34 34
0x10: 38 30 38 53 47 20 28 31 30 39 30 34 37 33 33 33
0x20: 37 29 82 49 0B 18 0D 04 00 81 00 00 00 00 42 43
0x30: 30 80 00 00 00 00 FF FF FF FF FF FF FF FF FF FF
0x40: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x50: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x60: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

Slot 1:
NM_AIC_64 Port adapter, 3 ports
Port adapter is analyzed
Port adapter insertion time unknown
EEPROM contents at hardware discovery:
Hardware Revision : 1.0
Part Number : 74-1923-01
Board Revision : 02
PCB Serial Number : DAN05060012
EEPROM format version 4
EEPROM contents (hex):
0x00: 04 FF 40 02 55 41 01 00 82 4A 07 83 01 42 30 32
0x10: C1 8B 44 41 4E 30 35 30 36 30 30 31 32 FF FF FF
0x20: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x30: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x40: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x50: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x60: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
```

Table 31 describes significant fields shown in the display.

***Table 31 show diag (AIC) Field Descriptions***

| Field | Description |
|---|---|
| C2611 2E Mainboard Port adapter, 2 ports | Line card type; number of ports available. |
| Port adapter is analyzed | The system has identified the port adapter. |
| Port adapter insertion time | Elapsed time since insertion. |
| Hardware Revision | Version number of the port adapter. |

*Table 31 show diag (AIC) Field Descriptions*

| Field | Description |
|---|---|
| PCB Serial Number | Serial number of the printed circuit board. |
| Part Number | Part number of the port adapter. |
| RMA History | Counter that indicates how many times the port adapter has been returned and repaired. |
| RMA Number | Return material authorization number, which is an administrative number assigned if the port adapter needs to be returned for repair. |
| Board Revision | Revision number (signifying a minor revision) of the port adapter. |
| Deviation Number | Revision number (signifying a minor deviation) of the port adapter. |
| EEPROM format version | Version number of the EEPROM format. |
| EEPROM contents (hex) | Dumps of EEPROM programmed data. |

### Example for an AIM-VPN in a Cisco 2611XM

The following example shows how to obtain hardware information about an installed AIM-VPN on the Cisco 2611XM router.

```
Router# show diag 0

Encryption AIM 1:
        Hardware Revision        :1.0
        Top Assy. Part Number    :800-03700-01
        Board Revision           :A0
        Deviation Number         :0-0
        Fab Version              :02
        PCB Serial Number        :JAB9801ABCD
        RMA Test History         :00
        RMA Number               :0-0-0-0
        RMA History              :00
        EEPROM format version 4
        EEPROM contents (hex):
          0x00:04 FF 40 03 0B 41 01 00 C0 46 03 20 00 0E 74 01
          0x10:42 41 30 80 00 00 00 00 02 02 C1 8B 4A 41 42 39
          0x20:38 30 31 41 42 43 44 03 00 81 00 00 00 00 04 00
          0x30:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x40:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x50:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x60:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x70:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
```

Table 32 describes significant fields shown in the display.

*Table 32 show diag (AIM-VPN) Field Descriptions*

| Field | Description |
|---|---|
| Hardware Revision | Version number of the port adapter. |
| Top Assy. Part Number | Part number of the port adapter. |
| Board Revision | Revision number (signifying a minor revision) of the port adapter. |
| Deviation Number | Revision number (signifying a minor deviation) of the port adapter. |
| PCB Serial Number | Serial number of the printed circuit board. |
| RMA Number | Return material authorization number, which is an administrative number assigned if the port adapter needs to be returned for repair. |
| RMA History | Counter that indicates how many times the port adapter has been returned and repaired. |
| EEPROM format version | Version number of the EEPROM format. |
| EEPROM contents (hex) | Dumps of EEPROM programmed data. |

### Example for an MSC-100 on the Cisco 7304 Router

The following is sample output from the **show diag** *slot-number* version of the command for an MSC-100 located in slot number 4 on a Cisco 7304 router. Information about the MSC is followed by information for its associated SPAs:

```
Router# show diag 4
Slot 4:
        7304-MSC-100 SPA Carrier Card Line Card
        Line Card state: Active
        Insertion time: 00:08:49 ago
        Bandwidth points: 4000000
        EEPROM contents at hardware discovery:
        Hardware Revision        : 0.18
        Boot Time out            : 0000
        PCB Serial Number        : CSJ07288905
        Part Number              : 73-8789-01
        Board Revision           : A0
        Fab Version              : 02
        RMA Test History         : 00
        RMA Number               : 0-0-0-0
        RMA History              : 00
        Deviation Number         : 0-0
        Product Number           : 7304-MSC-100
        Top Assy. Part Number    : 68-1163-04
        Manufacturing Test Data  : 00 00 00 00 00 00 00 00
        Field Diagnostics Data   : 00 00 00 00 00 00 00 00
        Calibration Data         : Minimum: 0 dBmV, Maximum: 0 dBmV
              Calibration values :
        EEPROM format version 4
        EEPROM contents (hex):
          0x00: 04 FF 40 04 50 41 00 12 46 00 00 C1 8B 43 53 4A
          0x10: 30 37 32 38 38 39 30 35 82 49 22 55 01 42 41 30
          0x20: 02 02 03 00 81 00 00 00 00 04 00 80 00 00 00 00
          0x30: CB 94 37 33 30 34 2D 4D 53 43 2D 31 30 30 20 20
          0x40: 20 20 20 20 20 20 87 44 04 8B 04 C4 08 00 00 00
          0x50: 00 00 00 00 00 C5 08 00 00 00 00 00 00 00 00 C8
          0x60: 09 00 00 00 00 00 00 00 00 00 C7 7C F6 44 3F 30
          0x70: 00 00 00 00 00 00 00 00 00 00 00 00 02 EE FF C8
```

```
          0x80: C8 37 26 05 DC 64 28 1E 37 26 09 C4 64 32 28 32
          0x90: DD 0C E4 64 32 28 43 24 2E E0 AA 82 64 F4 24 00
          0xA0: 00 00 00 00 00 00 F0 2E FF FF FF FF FF FF FF FF
          0xB0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0xC0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0xD0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0xE0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0xF0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x100: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x110: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x120: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x130: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x140: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x150: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x160: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x170: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x180: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x190: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x1A0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x1B0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x1C0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x1D0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x1E0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x1F0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
        FPGA information:
          Current FPGA version     : 00.23
          IOS bundled FPGA version : 00.23
        CPLD version     : 01.02

Subslot 4/1:
        Shared port adapter: SPA-4FE-7304, 4 ports
        State: ok
        Insertion time: 00:15:13 ago
        Bandwidth: 400000 kbps
        EEPROM contents:
```

### Examples for Shared Port Adapters on the Cisco 7304 Router

The following is sample output from the **show diag subslot** command for a 4-Port 10/100 Fast Ethernet SPA located in the bottom subslot (1) of the MSC that is installed in slot 4 on a Cisco 7304 router:

```
Router# show diag subslot 4/1
Subslot 4/1:
        Shared port adapter: SPA-4FE-7304, 4 ports
        Info: hw-ver=0x100, sw-ver=0x0 fpga-ver=0x0
        State: ok
        Insertion time: 23:20:42 ago
        Bandwidth: 400000 kbps
        EEPROM contents:
        Hardware Revision        : 1.0
        Boot Time out            : 0190
        PCB Serial Number        : JAB073204G5
        Part Number              : 73-8717-03
        73/68 Level Revision     : 01
        Fab Version              : 02
        RMA Test History         : 00
        RMA Number               : 0-0-0-0
        RMA History              : 00
        Deviation Number         : 0
        Product Number           : SPA-4FE-7304
        Product Version Id       : V01
        Top Assy. Part Number    : 68-2181-01
        73/68 Level Revision     : A0
        CLEI Code                : CNS9420AAA
```

```
Base MAC Address          : 0000.0000.0000
MAC Address block size    : 1024
Manufacturing Test Data   : 00 00 00 00 00 00 00 00
Field Diagnostics Data    : 00 00 00 00 00 00 00 00
Field Diagnostics Data    : 00 00 00 00 00 00 00 00
                            00 00 00 00 00 00 00 00
                            00 00 00 00 00 00 00 00
                            00 00 00 00 00 00 00 00
                            00 00 00 00 00 00 00 00
                            00 00 00 00 00 00 00 00
                            00 00 00 00 00 00 00 00
                            00 00 00 00 00 00 00 00
                            00 00 00 00 00 00 00 00
                            00 00 00 00 00 00 00 00
                            00 00 00 00 00 00 00 00
                            00 00 00 00
Calibration Data          : Minimum: 0 dBmV, Maximum: 0 dBmV
      Calibration values :
Power Consumption         : 160000mW max
                  Mode 1  : 0mW
                  Mode 2  : 0mW
                  Mode 3  : 0mW
EEPROM format version 4
EEPROM contents (hex):
  0x00: 04 FF 40 04 35 41 01 00 46 01 90 C1 8B 4A 41 42
  0x10: 30 37 33 32 30 34 47 35 82 49 22 0D 03 8A 30 31
  0x20: 20 20 02 02 03 00 81 00 00 00 00 04 00 88 00 00
  0x30: 00 00 CB 94 53 50 41 2D 34 46 45 2D 37 33 30 34
  0x40: 20 20 20 20 20 20 20 20 89 56 30 31 20 87 44 08
  0x50: 85 01 8A 41 30 20 20 C6 8A 43 4E 53 39 34 32 30
  0x60: 41 41 41 CF 06 00 00 00 00 00 00 43 04 00 C4 08
  0x70: 00 00 00 00 00 00 00 00 C5 08 00 00 00 00 00 00
  0x80: 00 00 F4 00 64 00 00 00 00 00 00 00 00 00 00 00
  0x90: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  0xA0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  0xB0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  0xC0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  0xD0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  0xE0: 00 00 00 00 00 00 00 00 00 C8 09 00 00 00 00 00
  0xF0: 00 00 00 00 D7 08 3E 80 00 00 00 00 00 00 F3 00
  0x100: 41 01 08 F6 48 43 34 F6 49 44 35 02 31 04 B0 B4
  0x110: A0 8C 00 00 05 DC 64 46 32 00 00 07 08 64 46 32
  0x120: 00 00 09 C4 64 46 32 00 00 0C E4 64 46 32 00 00
  0x130: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 FE 02
  0x140: F2 A6 FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  0x150: CC A0 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  0x160: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  0x170: 00 00 D4 A0 00 00 00 00 00 00 00 00 00 00 00 00
  0x180: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  0x190: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  0x1A0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  0x1B0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  0x1C0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  0x1D0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  0x1E0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  0x1F0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
FPGA version:
  Software version : 04.17
  Hardware version : 04.17
```

The following is sample output from the **show diag subslot** command for a 2-Port 10/100/1000 Gigabit Ethernet SPA located in the top subslot (0) of the MSC that is installed in slot 4 on a Cisco 7304 router:

```
Router# show diag subslot 4/0
Subslot 4/0:
        Shared port adapter: SPA-2GE-7304, 2 ports
        Info: hw-ver=0x17, sw-ver=0x0 fpga-ver=0x0
        State: ok
        Insertion time: 00:08:47 ago
        Bandwidth: 2000000 kbps
        EEPROM contents:
        Hardware Revision        : 0.23
        Boot Time out            : 0190
        PCB Serial Number        : JAB073406YH
        Part Number              : 73-8792-02
        73/68 Level Revision     : 01
        Fab Version              : 02
        RMA Test History         : 00
        RMA Number               : 0-0-0-0
        RMA History              : 00
        Deviation Number         : 0
        Product Number           : SPA-2GE-7304
        Product Version Id       : V01
        Top Assy. Part Number    : 68-2181-01
        73/68 Level Revision     : A0
        CLEI Code                : CNS9420AAA
        Base MAC Address         : 0000.0000.0000
        MAC Address block size   : 1024
        Manufacturing Test Data  : 00 00 00 00 00 00 00 00
        Field Diagnostics Data   : 00 00 00 00 00 00 00 00
        Field Diagnostics Data   : 00 00 00 00 00 00 00 00
                                   00 00 00 00 00 00 00 00
                                   00 00 00 00 00 00 00 00
                                   00 00 00 00 00 00 00 00
                                   00 00 00 00 00 00 00 00
                                   00 00 00 00 00 00 00 00
                                   00 00 00 00 00 00 00 00
                                   00 00 00 00 00 00 00 00
                                   00 00 00 00 00 00 00 00
                                   00 00 00 00 00 00 00 00
                                   00 00 00 00 00 00 00 00
                                   00 00 00 00
        Calibration Data         : Minimum: 0 dBmV, Maximum: 0 dBmV
              Calibration values :
        Power Consumption        : 160000mW max
                         Mode 1 : 0mW
                         Mode 2 : 0mW
                         Mode 3 : 0mW
        EEPROM format version 4
        EEPROM contents (hex):
          0x00: 04 FF 40 04 36 41 00 17 46 01 90 C1 8B 4A 41 42
          0x10: 30 37 33 34 30 36 59 48 82 49 22 58 02 8A 30 31
          0x20: 20 20 02 02 03 00 81 00 00 00 00 04 00 88 00 00
          0x30: 00 00 CB 94 53 50 41 2D 32 47 45 2D 37 33 30 34
          0x40: 20 20 20 20 20 20 20 20 89 56 30 31 20 87 44 08
          0x50: 85 01 8A 41 30 20 20 C6 8A 43 4E 53 39 34 32 30
          0x60: 41 41 41 CF 06 00 00 00 00 00 00 43 04 00 C4 08
          0x70: 00 00 00 00 00 00 00 00 C5 08 00 00 00 00 00 00
          0x80: 00 00 F4 00 64 00 00 00 00 00 00 00 00 00 00 00
          0x90: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
          0xA0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
          0xB0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
          0xC0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

```
  0xD0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  0xE0: 00 00 00 00 00 00 00 00 00 C8 09 00 00 00 00 00
  0xF0: 00 00 00 00 D7 08 3E 80 00 00 00 00 00 00 F3 00
  0x100: 41 01 08 F6 48 43 34 F6 49 44 35 02 31 03 E8 B4
  0x110: A0 8C 37 26 05 DC 64 46 32 37 26 07 08 64 46 32
  0x120: 37 26 09 C4 64 46 32 32 DD 0C E4 64 46 32 43 24
  0x130: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 FE 02
  0x140: EF E2 FF FF FF FF FF FF FF FF FF FF FF FF FF FF
  0x150: CC A0 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  0x160: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  0x170: 00 00 D4 A0 00 00 00 00 00 00 00 00 00 00 00 00
  0x180: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  0x190: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  0x1A0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  0x1B0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  0x1C0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  0x1D0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  0x1E0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
  0x1F0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
FPGA version:
  Software version : 04.17
  Hardware version : 04.17
```

### Examples for a Shared Port Adapter on a Cisco 12000 Series Router

The following is sample output from the **show diag subslot** command for the 1-Port OC-192c/STM-64c POS/RPR XFP SPA in subslot 1 of the SIP located in chassis slot 1 on a Cisco 12000 series router:

```
Router# show diag subslot 1/1
SUBSLOT  1/1 (SPA-OC192POS-XFP): 1-port OC192/STM64 POS/RPR XFP Optics Shared Port Adapter
       Product Identifier (PID) : SPA-OC192POS-XFP
       Version Identifier (VID) : V01
       PCB Serial Number        : PRTA1304061
       Top Assy. Part Number    : 68-2190-01
       Top Assy. Revision       : A0
       Hardware Revision        : 2.0
       CLEI Code                : UNASSIGNED
       Insertion Time           : 00:00:10 (13:14:17 ago)
       Operational Status       : ok
```

Table 33 describes the significant fields shown in the display.

***Table 33 show diag subslot Field Descriptions***

| Field | Description |
|---|---|
| Product Identifier (PID) | Product number of the SPA. |
| Version Identifier (VID) | Version number of the SPA. |
| PCB Serial Number | Serial number of the printed circuit board. |
| Top Assy. Part Number | Part number of the SPA. |
| Top Assy. Revision | Revision number (signifying a minor revision) of the SPA. |
| Hardware Revision | Revision number (signifying a minor revision) of the SPA hardware. |
| CLEI Code | Common Language Equipment Identification number. |

*Table 33 show diag subslot Field Descriptions (continued)*

| Field | Description |
|---|---|
| Insertion Time | Time when the SPA was installed, and elapsed time between that insertion time and the current time. |
| Operational Status | Current status of the SPA. For more information about the status field descriptions, refer to the **show hw-module subslot oir** command. |

The following is sample output from the **show diag subslot details** command for the 1-Port OC-192c/STM-64c POS/RPR XFP SPA in subslot 1 of the SIP located in chassis slot 1 on a Cisco 12000 series router:

```
Router# show diag subslot 1/1 details
SUBSLOT  1/1 (SPA-OC192POS-XFP): 1-port OC192/STM64 POS/RPR XFP Optics Shared Port Adapter
       EEPROM version           : 4
       Compatible Type          : 0xFF
       Controller Type          : 1100
       Hardware Revision        : 2.0
       Boot Timeout             : 400 msecs
       PCB Serial Number        : PRTA1304061
       PCB Part Number          : 73-8546-01
       PCB Revision             : A0        Fab Version             : 01
       RMA Test History         : 00
       RMA Number               : 0-0-0-0
       RMA History              : 00
       Deviation Number         : 0
       Product Identifier (PID) : SPA-OC192POS-XFP
       Version Identifier (VID) : V01
       Top Assy. Part Number    : 68-2190-01
       Top Assy. Revision       : A0        IDPROM Format Revision   : 36
       System Clock Frequency   : 00 00 00 00 00 00 00 00
                                  00 00 00 00 00 00 00 00
                                  00 00 00 00 00 00
       CLEI Code                : UNASSIGNED
       Base MAC Address         : 00 00 00 00 00 00
       MAC Address block size   : 0
       Manufacturing Test Data  : 00 00 00 00 00 00 00 00
       Field Diagnostics Data   : 00 00 00 00 00 00 00 00
       Calibration Data         : Minimum: 0 dBmV, Maximum: 0 dBmV
             Calibration values :
       Power Consumption        : 11000 mWatts (Maximum)
       Environment Monitor Data : 03 30 04 B0 46 32 07 08
                                  46 32 09 C4 46 32 0C E4
                                  46 32 13 88 46 32 07 08
                                  46 32 EB B0 50 3C 00 00
                                  00 00 00 00 00 00 00 00
                                  00 00 00 00 00 00 00 00
                                  00 00 FE 02 F6 AC
       Processor Label          : 00 00 00 00 00 00 00
       Platform features        : 00 00 00 00 00 00 00 00
                                  00 00 00 00 00 00 00 00
                                  00 00 00 00 00 00 00 00
                                  00 00 00 00 00 00 00
       Asset ID                 :
       Asset Alias              :
       Insertion Time           : 00:00:10 (13:14:24 ago)
       Operational Status       : ok
```

### Example for a SPA Interface Processor on a Cisco 12000 Series Router

The following is sample output from the **show diag** command for a SIP located in chassis slot 2 on a Cisco 12000 series router:

```
Router# show diag 2

SLOT 2  (RP/LC 2 ): Modular 10G SPA Interface Card
  MAIN: type 149,  800-26270-01 rev 84
        Deviation: 0
        HW config: 0x00    SW key: 00-00-00
  PCA:  73-9607-01 rev 91 ver 1
        Design Release 1.0  S/N SAD08460678
  MBUS: Embedded Agent
        Test hist: 0x00    RMA#: 00-00-00    RMA hist: 0x00
  DIAG: Test count: 0x00000000    Test results: 0x00000000
  FRU:  Linecard/Module: 12000-SIP-650
  FRU:  Linecard/Module: 12000-SIP-650
        Processor Memory: MEM-LC5-1024=(Non-Replaceable)
        Packet Memory: MEM-LC5-PKT-256=(Non-Replaceable)
  L3 Engine: 5 - ISE OC192 (10 Gbps)
  MBUS Agent Software version 1.114 (RAM) (ROM version is 3.4)
  ROM Monitor version 255.255
  Fabric Downloader version used 3.7 (ROM version is 255.255)
  Primary clock is CSC 1
  Board is analyzed
  Board State is Line Card Enabled (IOS  RUN )
  Insertion time: 1d00h (2d08h ago)
  Processor Memory size: 1073741824 bytes
  TX Packet Memory size: 268435456 bytes, Packet Memory pagesize: 32768 bytes
  RX Packet Memory size: 268435456 bytes, Packet Memory pagesize: 32768 bytes
  0 crashes since restart

  SPA Information:
        subslot 2/0: SPA-OC192POS-XFP (0x44C), status is ok
        subslot 2/1: Empty
        subslot 2/2: Empty
        subslot 2/3: Empty
```

### Example for ADSL HWICs

The following is sample output from the **show diag** command for a Cisco 2811 router with HWIC-1ADSL installed in slot 1 and HWIC-1ADSLI installed in slot 2. Each HWIC has a daughtercard as part of its assembly. The command results below give the output from the HWIC followed by the output from its daughtercard.

```
Router# show diag 0

Slot 0:
C2811 Motherboard with 2FE and integrated VPN Port adapter, 2 ports
        Port adapter is analyzed
        Port adapter insertion time unknown
        Onboard VPN             : v2.2.0
        EEPROM contents at hardware discovery:
        PCB Serial Number        : FOC09052HHA
        Hardware Revision        : 2.0
        Top Assy. Part Number    : 800-21849-02
        Board Revision           : B0
        Deviation Number         : 0
        Fab Version              : 06
        RMA Test History         : 00
        RMA Number               : 0-0-0-0
        RMA History              : 00
        Processor type           : 87
```

```
        Hardware date code       : 20050205
        Chassis Serial Number    : FTX0908A0B0
        Chassis MAC Address      : 0013.1ac2.2848
        MAC Address block size   : 24
        CLEI Code                : CNMJ7N0BRA
        Product (FRU) Number     : CISCO2811
        Part Number              : 73-7214-09
        Version Identifier       :   NA
        EEPROM format version 4
        EEPROM contents (hex):
          0x00: 04 FF C1 8B 46 4F 43 30 39 30 35 32 48 48 41 40
          0x10: 03 E7 41 02 00 C0 46 03 20 00 55 59 02 42 42 30
          0x20: 88 00 00 00 00 02 06 03 00 81 00 00 00 00 04 00
          0x30: 09 87 83 01 31 F1 1D C2 8B 46 54 58 30 39 30 38
          0x40: 41 30 42 30 C3 06 00 13 1A C2 28 48 43 00 18 C6
          0x50: 8A 43 4E 4D 4A 37 4E 30 42 52 41 CB 8F 43 49 53
          0x60: 43 4F 32 38 31 31 20 20 20 20 20 20 82 49 1C 2E
          0x70: 09 89 20 20 4E 41 D9 02 40 C1 FF FF FF FF FF FF

WIC Slot 1:
        ADSL over POTS
        Hardware Revision        : 7.0
        Top Assy. Part Number    : 800-26247-01
        Board Revision           : 01
        Deviation Number         : 0
        Fab Version              : 07
        PCB Serial Number        : FHH093600D4
        RMA Test History         : 00
        RMA Number               : 0-0-0-0
        RMA History              : 00
        Product (FRU) Number     : HWIC-1ADSL
        Version Identifier       : V01
        CLEI Code                :
        EEPROM format version 4
        EEPROM contents (hex):
          0x00: 04 FF 40 04 C8 41 07 00 C0 46 03 20 00 66 87 01
          0x10: 42 30 31 88 00 00 00 00 02 07 C1 8B 46 48 48 30
          0x20: 39 33 36 30 30 44 34 03 00 81 00 00 00 00 04 00
          0x30: CB 94 48 57 49 43 2D 31 41 44 53 4C 20 20 20 20
          0x40: 20 20 20 20 20 20 89 56 30 31 20 D9 02 40 C1 C6
          0x50: 8A FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x60: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

        EM Slot 0:
        ADSL over POTS non-removable daughtercard
        Hardware Revision        : 5.0
        Part Number              : 73-9307-05
        Board Revision           : 03
        Deviation Number         : 0
        Fab Version              : 05
        PCB Serial Number        : FHH0936006E
        RMA Test History         : 00
        RMA Number               : 0-0-0-0
        RMA History              : 00
        Fab Part Number          : 28-6607-05
        Manufacturing Test Data  : 00 00 00 00 00 00 00 00
        Field Diagnostics Data   : 00 00 00 00 00 00 00 00
        Connector Type           : 01
        Version Identifier       : V01
        Product (FRU) Number     :
        EEPROM format version 4
        EEPROM contents (hex):
          0x00: 04 FF 40 04 7A 41 05 00 82 49 24 5B 05 42 30 33
```

```
    0x10: 88 00 00 00 00 02 05 C1 8B 46 48 48 30 39 33 36
    0x20: 30 30 36 45 03 00 81 00 00 00 00 04 00 85 1C 19
    0x30: CF 05 C4 08 00 00 00 00 00 00 00 00 C5 08 00 00
    0x40: 00 00 00 00 00 00 05 01 89 56 30 31 20 FF FF FF
    0x50: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
    0x60: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
    0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

WIC Slot 2:
        ADSL over ISDN
        Hardware Revision        : 7.0
        Top Assy. Part Number    : 800-26248-01
        Board Revision           : 01
        Deviation Number         : 0
        Fab Version              : 07
        PCB Serial Number        : FHH093600DA
        RMA Test History         : 00
        RMA Number               : 0-0-0-0
        RMA History              : 00
        Product (FRU) Number     : HWIC-1ADSLI
        Version Identifier       : V01
        CLEI Code                :
        EEPROM format version 4
        EEPROM contents (hex):
          0x00: 04 FF 40 04 C9 41 07 00 C0 46 03 20 00 66 88 01
          0x10: 42 30 31 88 00 00 00 00 02 07 C1 8B 46 48 48 30
          0x20: 39 33 36 30 30 44 41 03 00 81 00 00 00 00 04 00
          0x30: CB 94 48 57 49 43 2D 31 41 44 53 4C 49 20 20 20
          0x40: 20 20 20 20 20 20 89 56 30 31 20 D9 02 40 C1 C6
          0x50: 8A FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x60: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

        EM Slot 0:
        ADSL over ISDN non-removable daughtercard
        Hardware Revision        : 5.0
        Part Number              : 73-9308-05
        Board Revision           : 03
        Deviation Number         : 0
        Fab Version              : 05
        PCB Serial Number        : FHH0936008M
        RMA Test History         : 00
        RMA Number               : 0-0-0-0
        RMA History              : 00
        Fab Part Number          : 28-6607-05
        Manufacturing Test Data  : 00 00 00 00 00 00 00 00
        Field Diagnostics Data   : 00 00 00 00 00 00 00 00
        Connector Type           : 01
        Version Identifier       : V01
        Product (FRU) Number     :
        EEPROM format version 4
        EEPROM contents (hex):
          0x00: 04 FF 40 04 7B 41 05 00 82 49 24 5C 05 42 30 33
          0x10: 88 00 00 00 00 02 05 C1 8B 46 48 48 30 39 33 36
          0x20: 30 30 38 4D 03 00 81 00 00 00 00 04 00 85 1C 19
          0x30: CF 05 C4 08 00 00 00 00 00 00 00 00 C5 08 00 00
          0x40: 00 00 00 00 00 00 05 01 89 56 30 31 20 FF FF FF
          0x50: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x60: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
```

The following sample output from a Cisco 6500 series switch shows the FRU number:

```
Router# show diag

Slot 4: Logical_index 8
        2 port adapter FlexWAN controller
        Board is analyzed ipc ready
        HW rev 1.5, board revision A0
        Serial Number: SAD062404C8 Part number: 73-3869-08

        Slot database information:
        Flags: 0x2004   Insertion time: 0x20960 (1d04h ago)

        Controller Memory Size:
                112 MBytes CPU Memory
                16 MBytes Packet Memory
                128 MBytes Total on Board SDRAM
        IOS (tm) cwlc Software (cwpa-DW-M), Version 12.2(18)SXF2, RELEASE SOFTW)

        PA Bay 0 Information:
                ENHANCED ATM OC3 MM PA, 1 ports, FRU: PA-A3-OC3-MM
                EEPROM format version 1
                HW rev 2.00, Board revision A0
                Serial number: 29360940  Part number: 73-2430-04
Slot 4: Logical_index 9
        2 port adapter FlexWAN controller
        Board is analyzed ipc ready
        HW rev 1.5, board revision A0
        Serial Number: SAD062404C8 Part number: 73-3869-08

        Slot database information:
        Flags: 0x2004   Insertion time: 0x20D10 (1d04h ago)

        Controller Memory Size:
                112 MBytes CPU Memory
                16 MBytes Packet Memory
                128 MBytes Total on Board SDRAM
        IOS (tm) cwlc Software (cwpa-DW-M), Version 12.2(18)SXF2, RELEASE SOFTW)

        PA Bay 1 Information:
                Mx Serial PA, 4 ports
                EEPROM format version 1
                HW rev 1.00, Board revision A0
                Serial number: 04387628  Part number: 73-1577-04
Router#
```

The following sample output from a Cisco 7600 series router shows the FRU number:

```
Router#show diag

Slot 2: Logical_index 4
        2 port adapter Enhanced FlexWAN controller
        Board is analyzed ipc ready
        HW rev 2.1, board revision A0
        Serial Number: JAE0940MH7Z Part number: 73-9539-04

        Slot database information:
        Flags: 0x2004   Insertion time: 0x256BC (1d01h ago)

        Controller Memory Size:
                384 MBytes CPU Memory
                127 MBytes Packet Memory
                511 MBytes Total on Board SDRAM
        IOS (tm) cwlc Software (cwpa2-DW-M), Version 12.2(18)SXF2, RELEASE SOFT)
```

```
        PA Bay 0 Information:
                ENHANCED ATM OC3 MM PA, 1 ports, FRU: PA-A3-OC3-MM
                EEPROM format version 4
                HW rev 2.00, Board revision A0
                Serial number: JAE0937KUPX  Part number: 73-8728-01
Slot 2: Logical_index 5
        2 port adapter Enhanced FlexWAN controller
        Board is analyzed ipc ready
        HW rev 2.1, board revision A0
        Serial Number: JAE0940MH7Z Part number: 73-9539-04

        Slot database information:
        Flags: 0x2004   Insertion time: 0x22C34 (1d01h ago)

        Controller Memory Size:
                384 MBytes CPU Memory
                127 MBytes Packet Memory
                511 MBytes Total on Board SDRAM
        IOS (tm) cwlc Software (cwpa2-DW-M), Version 12.2(18)SXF2, RELEASE SOFT)

        PA Bay 1 Information:
                Mx Serial PA, 4 ports
                EEPROM format version 1
                HW rev 1.14, Board revision D0
                Serial number: 33929508  Part number: 73-1577-07
Router#
```

## Related Commands

| Command | Description |
|---|---|
| **dsl operating-mode (ADSL)** | Modifies the operating mode of the digital subscriber line for an ATM interface. |
| **show dsl interface atm** | Shows all of the ADSL-specific information for a specified ATM interface. |
| **show controllers fastethernet** | Displays Fast Ethernet interface information, transmission statistics and errors, and applicable MAC destination address and VLAN filtering tables. |
| **show controllers gigabitethernet** | Displays Gigabit Ethernet interface information, transmission statistics and errors, and applicable MAC destination address and VLAN filtering tables. |

# show diagbus

To display diagnostic information about the controller, interface processor, and port adapters associated with a specified slot of a Cisco 7200 series or Cisco 7500 series router, use the **show diagbus** command in privileged EXEC mode.

**show diagbus** [*slot*]

## Syntax Description

| | |
|---|---|
| *slot* | (Optional) Number of the slot being configured. Refer to the appropriate hardware manual for slot and port information. |

## Command Modes

Privileged EXEC

## Command History

| Release | Modification |
|---|---|
| 11.2 | This command was introduced. |

## Examples

The following is sample output from the Cisco 7513 router with a VIP2 in slot 8. This card has two 4-port Token Ring port adapters located in port adapter bays 0 and 1.

```
Router# show diagbus 8

Slot 8:
        Physical slot 8, ~physical slot 0x7, logical slot 8, CBus 0
        Microcode Status 0x4
        Master Enable, LED, WCS Loaded
        Board is analyzed
        Pending I/O Status: None
        EEPROM format version 1
        VIP2 controller, HW rev 2.2, board revision UNKNOWN
        Serial number: 03341418  Part number: 73-1684-02
        Test history: 0x00        RMA number: 00-00-00
        Flags: cisco 7000 board; 7500 compatible


        EEPROM contents (hex):
          0x20: 01 15 02 02 00 32 FC 6A 49 06 94 02 00 00 00 00
          0x30: 07 2B 00 2A 1A 00 00 00 00 00 00 00 00 00 00 00


        Slot database information:
        Flags: 0x4      Insertion time: 0x3188 (01:20:53 ago)


        Controller Memory Size: 8 MBytes


        PA Bay 0 Information:
                Token Ring PA, 4 ports
                EEPROM format version 1
                HW rev 1.1, Board revision 0
                Serial number: 02827613  Part number: 73-1390-04
        PA Bay 1 Information:
                Token Ring PA, 4 ports
```

```
        EEPROM format version 1
        HW rev 1.1, Board revision 88
        Serial number: 02023786  Part number: 73-1390-04
```

The following is sample output from the **show diagbus** command for the Ethernet interface in slot 2 on a Cisco 7200 series router:

```
Router# show diagbus 2

Slot 2:
        Ethernet port adapter, 8 ports
        Port adapter is analyzed
        Port adapter insertion time 1d18h ago
        Hardware revision 1.0           Board revision K0
        Serial number     2023387       Part number    73-1391-03
        Test history      0x0           RMA number     00-00-00
        EEPROM format version 1
        EEPROM contents (hex):
          0x20: 01 01 01 00 00 1E DF DB 49 05 6F 03 00 00 00 00
          0x30: A0 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
```

# show hub

To display information about the hub (repeater) on an Ethernet interface of a Cisco 2505 or Cisco 2507 router, use the **show hub** command in EXEC mode.

**show hub** [**ethernet** *number* [*port* [*end-port*]]]

## Syntax Description

| | |
|---|---|
| **ethernet** | (Optional) Indicates that this is an Ethernet hub. |
| *number* | (Optional) Hub number, starting with 0. Because there is currently only one hub, this number is 0. |
| *port* | (Optional) Port number on the hub. On the Cisco 2505 router, port numbers range from 1 through 8. On the Cisco 2507 router, port numbers range from 1 through 16. If a second port number follows, this port number indicates the beginning of a port range. |
| *end-port* | (Optional) Ending port number of a range. |

## Command Modes

EXEC

## Command History

| Release | Modification |
|---|---|
| 10.3 | This command was introduced. |

## Usage Guidelines

If you do not specify a port or port range for the **show hub** command, the command displays all ports (for example, ports 1 through 16 on a Cisco 2507 router) by default. Therefore, the **show hub**, **show hub ethernet 0**, and **show hub ethernet 0 1 16** commands produce the same result.

If no ports are specified, the command displays some additional data about the internal port. The internal port is the hub's connection to Ethernet interface 0 inside the box. Ethernet interface 0 still exists; physical access to the interface is via the hub.

## Examples

The following is sample output from the **show hub** command for hub 0, port 2 only:

```
Router# show hub ethernet 0 2

Port 2 of 16 is administratively down, link state is down
  0 packets input, 0 bytes
  0 errors with 0 collisions
     (0 FCS, 0 alignment, 0 too long,
      0 short, 0 runts, 0 late,
      0 very long, 0 rate mismatches)
  0 auto partitions, last source address (none)
  Last clearing of "show hub" counters never

Repeater information (Connected to Ethernet0)
  2792429 bytes seen with 18 collisions, 1 hub resets
  Version/device ID 0/1 (0/1)
  Last clearing of "show hub" counters never
```

The following is sample output from the **show hub** command for hub 0, all ports:

```
Router# show hub ethernet 0

Port 1 of 16 is administratively down, link state is up
  2458 packets input, 181443 bytes
  3 errors with 18 collisions
     (0 FCS, 0 alignment, 0 too long,
      0 short, 3 runts, 0 late,
      0 very long, 0 rate mismatches)
  0 auto partitions, last source address was 0000.0cff.e257
  Last clearing of "show hub" counters never
...
Port 16 of 16 is down, link state is down
  0 packets input, 0 bytes
  0 errors with 0 collisions
     (0 FCS, 0 alignment, 0 too long,
      0 short, 0 runts, 0 late,
      0 very long, 0 rate mismatches)
  0 auto partitions, last source address (none)
  Last clearing of "show hub" counters never

Repeater information (Connected to Ethernet0)
  2792429 bytes seen with 18 collisions, 1 hub resets
  Version/device ID 0/1 (0/1)
  Last clearing of "show hub" counters never

Internal Port (Connected to Ethernet0)
  36792 packets input, 4349525 bytes
  0 errors with 14 collisions
     (0 FCS, 0 alignment, 0 too long,
      0 short, 0 runts, 0 late,
      0 very long, 0 rate mismatches)
  0 auto partitions, last source address (none)
  Last clearing of "show hub" counters never
```

Table 34 describes significant fields shown in the display.

***Table 34 show hub Field Descriptions***

| Field | Description |
|---|---|
| Port ... of ... is administratively down | Port number out of total ports; indicates whether the interface hardware is currently active or down because of the following:<br>• The link-state test failed.<br>• The MAC address mismatched when source address configured.<br>• It has been taken down by an administrator. |
| link state is up | Indicates whether port has been disabled by the link-test function. If the link-test function is disabled by the user, nothing will be shown here. |
| packets input | Total number of error-free packets received by the system. |
| bytes | Total number of bytes, including data and MAC encapsulation, in the error-free packets received by the system. |
| errors | Sum of FCS, alignment, too long, short, runts, very long, and rate mismatches. |
| collisions | Number of messages retransmitted due to Ethernet collisions. |

*Table 34 show hub Field Descriptions (continued)*

| Field | Description |
|---|---|
| FCS | Counter for the number of frames detected on the port with an invalid frame check sequence. |
| alignment | Counter for the number of frames of valid length (64 to 1518 bytes) that have been detected on the port with an FCS error and a framing error. |
| too long | Counter for the number of frames that exceed the maximum valid packet length of 1518 bytes. |
| short | Counter for the number of instances when activity is detected with duration less than 74 to 82 bit times. |
| runts | Number of packets that are discarded because they are smaller than the medium's minimum packet size. For example, any Ethernet packet that is less than 64 bytes is considered a runt. |
| late | Counter for the number of instances when a collision is detected after 480 to 565 bit times in the frame. |
| very longs | Counter for the number of times the transmitter is active in excess of 4 to 7.5 milliseconds. |
| rate mismatches | Counter for the number of occurrences when the frequency, or data rate of incoming signal is noticeably different from the local transmit frequency. |
| auto partitions | Counter for the number of instances where the repeater has partitioned the port from the network. |
| last source address | Source address of last packet received by this port. Indicates "none" if no packets have been received since power on or a hub reset. |
| Last clearing of "show hub" counters | Elapsed time since the **clear hub counters** command was entered. Indicates "never" if counters have never been cleared. |
| Repeater information (Connected to Ethernet0) | Indicates that the following information is about the hub connected to the Ethernet interface shown. |
| ... bytes seen with ... collisions, ... hub resets | Hub resets is the number of times the hub has been reset by network management software or by the **clear hub** command. |
| Version/device ID 0/1 (0/1) | Hub hardware version. IMR+ version device of daughter board. |
| Internal Port (Connected to Ethernet0) | Set of counters for the internal AUI port connected to the Ethernet interface. |

## Related Commands

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