

service-module t1 timeslots

To define timeslots that constitute a fractional T1/T1 (FT1/T1) channel, use the **service-module t1 timeslots** interface configuration command. To resume the default setting (all FT1/T1 timeslots 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

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

Defaults

64 kbps is the default for all timeslots.

Command Modes

Interface configuration

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

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

The timeslot range must match the timeslots assigned to the channel group. Your service provider defines the timeslots 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 timeslot 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.

show aps

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

show aps

Syntax Description	This command has no arguments or keywords.
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Command Modes	Privileged EXEC
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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).
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```
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 15.1.6.1 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.
1100 (0xC)	Signal failure (SF)—low priority request.

Table 14 *K1 Bit Descriptions (continued)*

Bits (hexadecimal)	Description
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** EXEC command.

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 (implemented in the CSA hardware) was added.

Examples The following is an example 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 5 min avg ratio xmt/rcv 10 min avg ratio xmt/rcv	Static compression ratio for bytes sent and received, averaged over 1, 5, and 10 minutes.
no bufs xmt	Number of times buffers were not available to compress data being sent.
no bufs rcv	Number of times buffers were not available to uncompress data being received.
resets	Number of resets (for example, line errors could cause resets).

The following is an example 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 rcv:      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 CSA which is performing compression service.
Compressed bytes sent	Total number of compressed bytes sent including the kilobits per second.
Compressed bytes rcv	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** privileged EXEC command 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.
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Command Modes	Privileged EXEC
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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:
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```
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.cbuc_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:
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```
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 example 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 example 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:

```

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 of 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 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 an example 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 read-only memory).
128 Kbytes of main memory	Amount of main memory on the card.
32 Kbytes cache memory	Amount of cache memory on the card.
40 1520 byte buffers	Number of buffers of this size on the card.
14 4484 byte buffers	Number of buffers of this size on the card.
Restarts 0 line down 0 hung output 0 controller error	Count of restarts for the following conditions: - Communication line down - Output unable to transmit - Internal error

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

The following is an example of the **show controllers cbus** display 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 an example of the **show controllers cbus** display 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 series, Cisco 3000, or Cisco 4000 series routers, use the **show controllers ethernet** EXEC command.

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 an example 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 information, 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** EXEC command.

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	<i>number</i>	Port, connector, or interface card number. On a Cisco 4500 or Cisco 4700 router, specifies the NPM number. The numbers are assigned at the factory at the time of installation or when added to a system.
	<i>slot</i>	Number of the slot being configured. Refer to the appropriate hardware manual for slot and port information.
	<i>port</i>	Number of the port being configured. Refer to the appropriate hardware manual for slot and port information.
	<i>port-adapter</i>	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 of this command is generally useful for diagnostic tasks performed by technical support only.
------------------	--

Examples

The following is an example 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_deferred=15
tx_no_carrier=1, tx_late_collision=10, tx_excess_coll=10
tx_process_stopped=1, fata_tx_err=0
```

The following is an example 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=0xFFFD3FF
CSR11=0xFFFE0000, CSR12=0xFFFFF09, 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 an example from the **show controllers fastethernet** command on a Cisco 7500 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=0xFFFFA4882, CSR3=0x4B019640, CSR4=0x4B019EC0, CSR5=0xFC660000
CSR6=0xE20CA202, CSR7=0xFFFFA241, CSR8=0xFFFE0000, CSR9=0xFFFD7FF
CSR11=0xFFFE0000, CSR12=0xFFFFF98, 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  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** user EXEC command.

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 an example 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 lex

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

show controllers lex [*number*]

Cisco 7500 Series

show controllers lex [*slot/port*]

Syntax Description	<i>number</i>	(Optional) Number of the LAN Extender interface about which to display information.
	<i>slot</i>	(Optional) Refer to the appropriate hardware manual for slot and port information.
	<i>port</i>	(Optional) 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 an example 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 an example 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** privileged EXEC command.

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

**Note**

The interface type is only queried at startup. If the hardware changes *subsequent* to initial startup, then 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, then 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** privileged EXEC command.

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 an example 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

<i>slot-number</i>	(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.
Cisco 7500 Series Routers Use <i>slot/port-adapter/port</i> (for example, 2/0/0).	
Cisco 12000 Series Routers Use <i>slot/port</i> (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.
<i>time-interval</i>	(Optional) Number of the SONET MIB 15-minute time interval in the range from 1 to 96. If the <i>time-interval</i> 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). For B1, the BIP error report is calculated by comparing the BIP-8 code with the BIP-8 code extracted from the B1 byte of the following frame. Differences indicate that section-level bit errors have occurred. For B2, the BIP error report is calculated by comparing the BIP-8/24 code with the BIP-8 code extracted from the B2 byte of the following frame. Differences indicate that line-level bit errors have occurred. For B3, the BIP error report is calculated by comparing the BIP-8 code with the BIP-8 code extracted from the B3 byte of the following frame. Differences indicate that path-level bit errors have occurred.

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

Field	Description
AIS	Alarm indication signal. A line alarm indication signal is sent by the section terminating equipment (STE) to alert the downstream line terminating equipment (LTE) that a loss of signal (LOS) or loss of frame (LOF) defect has been detected on the incoming SONET section. A path alarm indication signal is sent by the LTE to alert the downstream path terminating equipment (PTE) that it has detected a defect on its incoming line signal.
RDI	Remote defect indication. A line remote defect indication is reported by the downstream LTE when it detects LOF, LOS, or AIS. A path remote defect indication is reported by the downstream PTE when it detects a defect on the incoming signal.
FEBE	Far end block errors. Line FEBE (accumulated from the M0 or M1 byte) is reported when the downstream LTE detects BIP(B2) errors. Path FEBE (accumulated from the G1 byte) is reported when the downstream PTE detects BIP(B3) errors.
LOP	Path loss of pointer is reported as a result of an invalid pointer (H1, H2) or an excess number of new data flag (NDF) enabled indications.
NEWPTR	Inexact count of the number of times that the SONET framer has validated a new SONET pointer value (H1, H2).
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: - One or more coding violations. - One or more incoming defects (for example, a severely errored frame (SEF) defect, an LOS defect, an AIS defect, or an LOP defect).
Severely Err Secs	A severely errored second (SES) is a second with one of the following errors: - A certain number of coding violations. The number is dependent on the line rate and the BER. - A certain number of incoming defects.
Coding Violations	Number of coding violations for the current interval. Coding violations are defined as BIP errors that are detected in the incoming signal. The coding violations counter is incremented for each BIP error detected.
Sev Err Framing Secs	Severely errored framing seconds (SEFS) are seconds with one or more SEF defects.
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 SESSs.

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** privileged EXEC command.

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	<i>slot</i>	(Optional) Slot number of the interface.
	<i>port</i>	(Optional) Port number on the interface. The port value is always 0.
	<i>port-adapter</i>	(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 an example 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, 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	An example of the show controllers serial command on the Cisco 4000 follows:
----------	---

```
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
```

show controllers serial

```

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 0xFFFFF, status=0x30, max_buffer_size=0, packet_size=0
XID/Test RX desc at 0xFFFFF, 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 an example 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_ouerrun_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 an example 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 Errorred Secs, 0 C-bit Errorred 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 Errorred Secs, 0 C-bit Errorred 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** privileged EXEC command.

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

<i>slot/port</i>	(Optional) Backplane slot number and port number on the interface. See your hardware installation manual for the specific slot and port numbers.
<i>number</i>	NPM number, in the range 0 through 2.
<i>dial-shelf</i>	Dial shelf chassis in the Cisco AS5800 access server containing the CT3 interface card.
<i>slot</i>	Location of the CT3 interface card in the dial shelf chassis.
<i>t3-port</i>	T3 port number. The only valid value is 0.
<i>:t1-num</i>	T1 timeslot 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, Cisco 4000 Series

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 an example 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 **show controllers t1** display fields.

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, 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: • Transmitter is sending remote alarm. • Transmitter is sending AIS. • Receiver has loss of signal. • Receiver is getting AIS. • Receiver has loss of frame. • Receiver has remote alarm. • Receiver has no alarms.
Data in current interval (725 seconds elapsed)	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.

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

Field	Description
Degraded Mins	Degraded Minute is one in which the estimated error rate exceeds 1E-6 but does not exceed 1E-3.
Errored Secs	In ESF and E1-CRC links, an Errored Second is a second in which one of the following are detected: one or more Path Code Violations; one or more Out-of-Frame defects; one or more Controlled Slip events; a detected AIS defect. For 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. For E1-CRC signals, a second with one of the following errors: 832 or more Path Code Violation errors; one or more Out-of-Frame defects. For E1-noCRC signals, a second with 2048 Line Code Violations or more. For D4 signals, a count of 1-second intervals with Framing Errors, or an Out-of-Frame defect, or 1544 Line Code Violations.
Unavail Secs	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 controller 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 **show controller t1** display.

Table 26 *show controller t1 Command 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** privileged EXEC command.

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

Syntax Description	<i>type</i>	Specify either T1 or E1 facility.
	<i>controller-number</i>	(Optional) Select a specific controller/port numbers. The range is 0 to 7. If not selected, the display will show all ports.
	<i>bert</i>	(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 Channelized T3 Interface Processor (CT3IP) on Cisco 7500 series routers or to display hardware and software driver information for a T3 controller for the Cisco AS5800 access servers, use the **show controllers t3** privileged EXEC command.

Cisco 7500 Series Routers

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

Cisco AS5800 Access Servers

show controller t3 *dial-shelf/slot/t3-port*

Syntax Description		
<i>slot</i>	(Optional) Number of the slot being configured. Refer to the appropriate hardware manual for slot and port information.	
<i>port-adapter</i>	(Optional) Number of the port-adapter being configured. Refer to the appropriate hardware manual for information about port adapter compatibility.	
<i>port</i>	(Optional) Number of the port being configured. Refer to the appropriate hardware manual for slot and port information.	
<i>:t1-channel</i>	(Optional) For the CT3IP, the T1 channel is a number between 1 and 28.	
brief	(Optional) Displays a subset of information.	
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 command.	
<i>dial-shelf</i>	Dial shelf chassis in the Cisco AS5800 access server containing the CT3 interface card.	
<i>slot</i>	Location of the CT3 interface card in the dial shelf chassis.	
<i>t3-port</i>	T3 port number. The only valid value is 0.	

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

Command History	Release	Modification
	11.3	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 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.

**Note**

T1 channels on the CT3IP are numbered 1 to 28 rather than the more traditional zero-based scheme (0 to 27) used with other Cisco products. This 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 7500 Series Routers**

The following is a partial example 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 Error Secs, 0 C-bit Error Secs, 0 C-bit Severely Error 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 Error Secs, 0 C-bit Error Secs, 0 C-bit Severely Error 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
```

...

```

T1 15 is up, speed: 1536 kbs, non-inverted data
timeslots: 1-24
No alarms detected.
Framing is ESF, LineCode is B8ZS, Clock Source is Internal.
Data in current interval (69 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
Total Data (last 1 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, 0 Stuffed Secs

```

The following is a partial example 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 a partial example 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 is a partial example from the **show controllers t3 remote performance** command. This information is available if the **t1 fdl ansi** controller 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 27 describes the **show controllers t3** display fields.

Table 27 *show controllers t3 Field Descriptions*

Field	Description
T3 3/0/0 is up	T3 controller in slot 3 is operating. The controller's state can be up, down, 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.
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.

Table 27 *show controllers t3 Field Descriptions (continued)*

Field	Description
No alarms detected	Any alarms detected by the controller are displayed here. Possible alarms are as follows: • Transmitter is sending remote alarm. • Transmitter is sending AIS. • Receiver has loss of signal. • Receiver is getting AIS. • Receiver has loss of frame. • Receiver has remote alarm. • Receiver has no alarms.
MDL transmission is disabled	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: • DS3 Eqpt. Failure (SA) • DS3 LOS/HBER • DS3 Out-of-Frame • DS3 AIS Received • DS3 IDLE Received • DS3 Eqpt. Failure (NSA) • Common Eqpt. Failure (NSA) • Multiple DS1 LOS/HBER • DS1 Eqpt. Failure • Single DS1 LOS/HBER • DS1 Eqpts Failure (NSA) • No code is being received
Framing is M23	Framing type on the CT3IP. Values are: M23, C-Bit, and Auto-detect.
Line Code is B3ZS	Line coding format on the CT3IP.
Clock Source is Internal	Clock source on the CT3IP. Values are: internal or line.

Table 27 *show controllers t3 Field Descriptions (continued)*

Field	Description
BERT test result	BERT test information is available if the t1 bert controller command is enabled for the T1 channel on the CT3IP. The BERT results include the following information: • Test Pattern—Type of test pattern selected. • Status—Status of the test. • Sync Detected—Number of times the pattern synch is detected (that is, the number of times the pattern goes from No Sync to Sync). • Interval—Duration selected. • Time Remain—Time remaining on the BERT test. • Bit Errors(Sync BERT Started)—Number of bit errors during the BERT test. • Bit Errors(Sync last Sync)—Number of bit errors since the last patter sync was detected. • Bits Received—Total bits received. 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 (LCV) is a count of both Bipolar Violations (BPVs) and Excessive Zeros (EXZs) occurring 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 (PVC) 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 occurring in the accumulation interval. For SYNTRAN, it is a count of CRC-9 errors occurring in the accumulation interval.
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.

Table 27 *show controllers t3 Field Descriptions (continued)*

Field	Description
Unavailable Secs	Unavailable seconds (UAS) are calculated by counting the number of seconds that the interface is unavailable. For more information, refer to RFC 1407, "DS3 MIB Variables."
Line Err Secs	Line errored seconds (LES) is a second in which one or more code violations occurred or one or more LOS defects.
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, 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	Timeslots assigned to the T1 channel.
FDL per AT&T 54016 spec.	Performance monitoring is via Facility Data Link per ANSI T1.403.
No alarms detected	Any alarms detected by the T1 controller are displayed here. Possible alarms are as follows: • Transmitter is sending remote alarm. • Transmitter is sending AIS. • Receiver has loss of signal. • Receiver is getting AIS. • Receiver has loss of frame. • Receiver has remote alarm. • Receiver has no alarms.
Framing is ESF	Type of framing used on the T1 channel. Values are: ESF or SF.
LineCode is B8ZS	Type of line coding used on the T1 channel. Values are: B8ZS or AMI.
Clock Source is Internal	Clock source on the T1 channel. Values are: internal or line.
Path Code Violations	Path coding violation (PCV) error event is 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	Controlled slip second (CSS) is a one-second interval containing one or more controlled slips.
Fr Loss Secs	Frame loss seconds (SELS) is the number of seconds an Out-of-Frame error is detected.

Table 27 *show controllers t3 Field Descriptions (continued)*

Field	Description
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 one 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.
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 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 controller t3
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
Router#

```

The following example shows the detail status of the T3 controller connected to the Cisco AS5800 in shelf 1, slot 4, port 0. Notice that the detail information shows the last 86 15-minute time periods.

```
Router# show controller 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 Errorred Secs
  0 C-bit Errorred Secs, 0 C-bit Severely Errorred 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 Errorred Secs
  0 C-bit Errorred Secs, 0 C-bit Severely Errorred 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 Errorred Secs
  0 C-bit Errorred Secs, 0 C-bit Severely Errorred 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 Errorred Secs
  0 C-bit Errorred Secs, 0 C-bit Severely Errorred 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 Errorred Secs
  0 C-bit Errorred Secs, 0 C-bit Severely Errorred 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 Errorred Secs
  0 C-bit Errorred Secs, 0 C-bit Severely Errorred 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 Errorred Secs,
  0 C-bit Errorred Secs, 0 C-bit Severely Errorred Secs
Router#
```

Table 28 describes the fields shown in the **show controller t3** display.

Table 28 *show controller t3 Command Field Descriptions*

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 is ...	Describes the type of controller.
No alarms detected	Any alarms detected by the controller are displayed here. Possible alarms are as follows: • Transmitter is sending remote alarm. • Transmitter is sending alarm indication signal (AIS). • Receiver has loss of signal (LOS). • Receiver is getting AIS. • Receiver has loss of frame (LOF). • Receiver has remote alarm. • 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 towards 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: • DS3 Eqpt. Failure (SA) • DS3 LOS/HBER • DS3 Out-of-Frame • DS3 AIS Received • DS3 IDLE Received • DS3 Eqpt. Failure (NSA) • Common Eqpt. Failure (NSA) • Multiple DS1 LOS/HBER • DS1 Eqpt. Failure • Single DS1 LOS/HBER • DS1 Eqpts Failure (NSA) • No code is being received
Framing is ...	Standard T3 framing type: M23, C-Bit, or Auto-detect.
Line Code is ...	Standard T3 line-coding format. In this example, the line-coding format is bipolar 3-zero substitution (B3ZS).
Clock Source is ...	The source of the synchronization signal (clock): line or internal. In this example, the line is providing the clock signal.

Table 28 *show controller t3 Command Field Descriptions (continued)*

Field	Description
Data in current interval ...	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) occurring over the accumulation period. An EXZ increments the Line Code Violations (LCV) 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 PVC.
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 occurring in 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 one or more code violations or one or more LOS defects.
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 (TRIP) for the Cisco 7500 series routers, use the **show controllers token** privileged EXEC command.

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 An example for the **show controllers token** command on the Cisco 7500 follows:

```
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 addr: SRB: 0000, ARB: 0000, EXB 0000, MFB: 0000
                Rev: 0000, Adapter: 0000, Params 0000
  Microcode counters:
    MAC giants 0/0, MAC ignored 0/0
    Input runs 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 29 describes key **show controllers token** display fields.

Table 29 *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: • Signal Loss • HW Removal • Remote Removal • Counter Overflow • Only station • 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
Router#
```

Following is an example of the **show controllers token** command output for a Token Ring interface in a full-duplex port mode:

```
Router# show controllers token 4/1
```

```
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, rtxxdmathre: 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** user EXEC command.

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	<i>slot</i>	Number of the slot being configured. Refer to the appropriate hardware manual for slot and port information.
	<i>port-adapter</i>	Number of the port-adapter being configured. Refer to the appropriate hardware manual for information about port adapter compatibility.
	<i>port</i>	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 an example 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:
mmsw=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 router, use the **show diag** privileged EXEC command.

show diag [*slot*]

Syntax Description	<i>slot</i> (Optional) Slot number of the interface.
--------------------	--

Command Modes	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 made available for Cisco IOS Release 11.3 XA.
	12.0(5)XQ	This command was enhanced and made available for the Cisco 1750 router.
	12.0(7)T	This command was modified to add the example for the Cisco 1750 router.

Usage Guidelines	This command displays information for the electronically erasable programmable read-only memory (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 VIP2 in your router.
------------------	--

Examples	The following is an example of the show diag command for a PA-12E/2FE port adapter in chassis slot 3 on a Cisco 7200 series router:
----------	--

```
Router# show diag 3
```

```
Slot 3:
Ethernet Switch port adapter, 14 ports
Port adapter is analyzed
Port adapter insertion time 20:51:22 ago
Hardware revision 1.0 Board revision A0
Serial number      4294967295      Part number 800-02611-05
Test history       0xFF             RMA number   000-000-000
EEPROM format version 255
EEPROM contents (hex):
  0x20: FF 3F 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
```

The following is an example of the **show diag** command for a PA-E3 serial port adapter in chassis slot 2 on a Cisco 7200 series router:

```
byron# show diag 2
Slot 2:
  E3 PA port adapter, 1 port
  Port adapter is analyzed
  Port adapter insertion time 1w0d ago
  Hardware revision 0.1          Board revision A0
  Serial number 4509983          Part number 73-2620-02
  Test history 0x0              RMA number 00-00-00
  EEPROM format version 0
  EEPROM contents (hex):
    0x20: 00 71 00 01 00 44 D1 1F 49 0A 3C 02 00 00 00 00
    0x30: 01 00 00 00 97 06 12 00 FF FF FF FF FF FF FF FF
```

The following is an example of the **show diag** command for a one-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
```

The following is an example of the **show diag** command for a WIC in chassis slot 0 on a Cisco 1750 series router:

```
Router# show diag 0
Slot 0:
C1750 1FE VE Mainboard port adapter, 6 ports
Port adapter is analyzed
Port adapter insertion time unknown
EEPROM contents at hardware discovery:
Hardware revision 0.0          Board revision UNKNOWN
Serial number 1314672220      Part number 00-0000-00
Test history 0x0              RMA number 00-00-00
EEPROM format version 1
EEPROM contents (hex):
0x20:01 C9 00 00 4E 5C 4E 5C 00 00 00 00 00 00 00 00
0x30:00 00 00 04 00 00 00 00 00 00 00 00 00 00 00 00

Packet Voice DSP Module:
Hardware Revision :1.0
Board Revision :01
Processor type :02
Part Number :73-3933-01
Number of DSPs :2
Type of DSP :TMS320C549
EEPROM format version 4
EEPROM contents (hex):
0x00: 04 FF 40 01 5B 41 01 00 42 30 31 09 02 82 49 0F
0x10: 5D 01 FF

WIC Slot 0:
BRI U - 2091 WAN daughtercard
Hardware revision 1.3 Board revision A0
Serial number 0004147773 Part number 800-01834-01
Test history 0x00 RMA number 00-00-00
Connector type WAN Module
EEPROM format version 1
EEPROM contents (hex):
0x20: 01 09 01 03 00 3F 4A 3D 50 07 2A 01 00 00 00 00
0x30: 50 00 00 00 96 11 06 01 FF FF FF FF FF FF FF FF

WIC Slot 1:
Dual FXS Voice Interface Card WAN daughtercard
Hardware revision 1.1 Board revision C0
Serial number 0010377882 Part number 800-02493-01
Test history 0x00 RMA number 00-00-00
Connector type WAN Module
EEPROM format version 1
EEPROM contents (hex):
0x20: 01 0E 01 01 00 9E 5A 9A 50 09 BD 01 00 00 00 00
0x30: 60 00 00 00 98 08 26 01 FF FF FF FF FF FF FF FF

WIC Slot 2:
Dual EAM Voice Interface Card WAN daughtercard
Hardware revision 1.1 Board revision C0
Serial number 0009886880 Part number 800-02497-01
Test history 0x00 RMA number 00-00-00
Connector type WAN Module
EEPROM format version 1
EEPROM contents (hex):
0x20: 01 0F 01 01 00 96 DC A0 50 09 C1 01 00 00 00 00
0x30: 60 00 00 00 98 08 26 01 FF FF FF FF FF FF FF FF
```

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** privileged EXEC command.

show diagbus [*slot*]

Syntax Description	<i>slot</i>	(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 an example for 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 an example 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 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** EXEC command.

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. Since 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, then 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 an example 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 runs, 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 an example 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 30 describes significant fields shown in the display.

Table 30 *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: - The link-state test failed. - The MAC address mismatched when source address configured. - 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 30 *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 ms.
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 clear hub counters command. 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.