



show controllers serial through show hw-module slot proc cpu

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show cem circuit

To display information about the circuit state, administrative state, the CEM ID of the circuit, and the interface on which it is configured, use the **show cem circuit** command. If cross connect is configured under the circuit, the command output also includes information about the attachment circuit status.

Syntax Description

Syntax Description

Command Default

There is no default.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

| Release | Modification |
|-------------------|--|
| XE 3.18 SP | Support for this command was introduced on Cisco NCS 4200 Series. |
| XE Everest 16.5.1 | This command was integrated into the Cisco NCS 4200 Series and Cisco ASR 900 Series Routers. |

Usage Guidelines

The **show cem circuit** command allows you to display information about the circuit state, administrative state, the CEM ID of the circuit, and the interface on which it is configured.

Examples

The following example shows the detailed information about a particular circuit.:

```
Router# show cem circuit 0
CEM0/1/2, ID: 0, Line: UP, Admin: UP, Ckt: ACTIVE
Controller state: up, T1/E1 state: up
Idle Pattern: 0xFF, Idle CAS: 0x8
Dejitter: 5 (In use: 0)
Payload Size: 192
Framing: Unframed
CEM Defects Set
None
Signalling: No CAS
RTP: No RTP
Ingress Pkts: 11060 Dropped: 0
Egress Pkts: 11061 Dropped: 0
CEM Counter Details
Input Errors: 0 Output Errors: 0
Pkts Missing: 0 Pkts Reordered: 0
Misorder Drops: 0 JitterBuf Underrun: 0
Error Sec: 0 Severly Errored Sec: 0
Unavailable Sec: 0 Failure Counts: 0
Pkts Malformed: 0 JitterBuf Overrun: 0
```

show controllers serial

To display serial controller statistics, use the **showcontrollersserial** command in privileged EXEC mode.

Standard Syntax

show controllers serial [*slot/port*]

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

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

T3/E3 Shared Port Adapters and 2-Port and 4-Port Channelized T3 SPA in Unchannelized Mode

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

Channelized T3 Shared Port Adapters

show controllers serial [*slot/subslot/port/t1-number*]

Syntax Description

| | |
|---------------------|---|
| <i>slot</i> | (Optional) Chassis slot number. Refer to the appropriate hardware manual for slot information. For SIPs, refer to the platform-specific SPA hardware installation guide or the corresponding “Identifying Slots and Subslots for SIPs and SPAs” topic in the platform-specific SPA software configuration guide. |
| <i>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 Versatile Interface Processor (VIP). The value can be 0 or 1. |
| <i>/ subslot</i> | (Optional) Secondary slot number on a SIP where a SPA is installed. Refer to the platform-specific SPA hardware installation guide and the corresponding “Specifying the Interface Address on a SPA” topic in the platform-specific SPA software configuration guide for subslot information. |
| <i>/ port</i> | (Optional) Port or interface number. Refer to the appropriate hardware manual for port information. For SPAs, refer to the corresponding “Specifying the Interface Address on a SPA” topics in the platform-specific SPA software configuration guide. |
| <i>t1-number</i> | (Optional) Logical T1 number in channelized mode. For SPAs, refer to the corresponding “Specifying the Interface Address on a SPA” topics in the platform-specific SPA software configuration guide. |

Command Default

No default behavior or values

Command Modes

Privileged EXEC

Command History

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

| Release | Modification |
|-------------|--|
| 11.1CA | This command was modified to include support for the PA-E3 and PA-T3 port adapters. |
| 12.2S | This command was integrated into Cisco IOS Release 12.2S. |
| 12.2(25)S3 | This command was integrated into Cisco IOS Release 12.2(25)S3. |
| 12.2(18)SXE | This command was integrated into Cisco IOS Release 12.2(18)SXE and introduced a new output for interfaces on the serial SPAs on the Cisco 7600 series routers and Catalyst 6500 series switches. |
| 12.0(31)S | This command was integrated into Cisco IOS Release 12.0(31)S. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |

Usage Guidelines

The output from the **showcontrollersserial** command provides error and alarm information that is useful in troubleshooting line problems.

The information displayed is generally useful for diagnostic tasks performed by Cisco Systems technical support personnel only. For the PA-E3 or PA-T3 port adapters, the **showcontrollersserial** 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 are the performance statistics for the current interval and last 15-minute interval and whether any alarms exist.

Examples

Example of the show controllers serial Command on the Cisco 4000 Series Router

The following is sample output from the **showcontrollersserial** command on the Cisco 4000:

```
Router# show controllers serial
MK5 unit 0, NIM slot 1, NIM type code 7, NIM version 1
idb = 0x6150, driver structure at 0x34A878, regaddr = 0x8100300
IB at 0x6045500: mode=0x0108, local_addr=0, remote_addr=0
N1=1524, N2=1, scaler=100, T1=1000, T3=2000, TP=1
buffer size 1524
DTE V.35 serial cable attached
RX ring with 32 entries at 0x45560 : RLEN=5, Rxhead 0
00 pak=0x6044D78 ds=0x6044ED4 status=80 max_size=1524 pak_size=0
01 pak=0x60445F0 ds=0x604474C status=80 max_size=1524 pak_size=0
02 pak=0x6043E68 ds=0x6043FC4 status=80 max_size=1524 pak_size=0
03 pak=0x60436E0 ds=0x604383C status=80 max_size=1524 pak_size=0
04 pak=0x6042F58 ds=0x60430B4 status=80 max_size=1524 pak_size=0
05 pak=0x60427D0 ds=0x604292C status=80 max_size=1524 pak_size=0
06 pak=0x6042048 ds=0x60421A4 status=80 max_size=1524 pak_size=0
07 pak=0x60418C0 ds=0x6041A1C status=80 max_size=1524 pak_size=0
08 pak=0x6041138 ds=0x6041294 status=80 max_size=1524 pak_size=0
09 pak=0x60409B0 ds=0x6040B0C status=80 max_size=1524 pak_size=0
10 pak=0x6040228 ds=0x6040384 status=80 max_size=1524 pak_size=0
11 pak=0x603FAA0 ds=0x603FBFC status=80 max_size=1524 pak_size=0
12 pak=0x603F318 ds=0x603F474 status=80 max_size=1524 pak_size=0
13 pak=0x603EB90 ds=0x603ECEC status=80 max_size=1524 pak_size=0
14 pak=0x603E408 ds=0x603E564 status=80 max_size=1524 pak_size=0
15 pak=0x603DC80 ds=0x603DDCC 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

```

Example of the show controllers serial Command for a PA-E3 Serial Port Adapter

The following is sample output from the `showcontrollersserial` command for a PA-E3 serial port adapter installed in slot 2:

```

Router# show controllers serial 2/0
M1T-E3 pa: show controller:
PAS unit 0, subunit 0, f/w version 2-55, rev ID 0x2800001, version 2
idb = 0x6080D54C, ds = 0x6080F304, ssb=0x6080F4F4
Clock mux=0x30, ucmd_ctrl=0x0, port_status=0x1
Serial config=0x8, line config=0x1B0202
maxdgram=4474, bufpool=128Kb, 256 particles
  rxLOS inactive, rxLOF inactive, rxAIS inactive
  txAIS inactive, rxRAI inactive, txRAI inactive
line state: up
E3 DTE cable, received clockrate 50071882
base0 registers=0x3D000000, base1 registers=0x3D002000
mxt_ds=0x608BA654, rx ring entries=128, tx ring entries=256
rxring=0x4B01F480, rxr shadow=0x6081081C, rx_head=26
txring=0x4B01F960, txr shadow=0x60810E48, tx_head=192, tx_tail=192, tx_count=0
throttled=0, enabled=0, disabled=0
rx_no_eop_err=0, rx_no_stp_err=0, rx_no_eop_stp_err=0
rx_no_buf=0, rx_soft_overrun_err=0, dump_err= 1
tx_underrun_err=0, tx_soft_underrun_err=0, tx_limited=0
tx_fullring=0, tx_started=11504

```

```

Framing is g751, Clock Source is Line, Bandwidth limit is 34010.
Scrambling is enabled
National Bit is 0, International Bits are: 0 0
DSU mode 1
Data in current interval (213 seconds elapsed):
  0 Line Code Violations, 0 P-bit Coding Violation
  0 C-bit Coding Violation
  0 P-bit Err Secs, 0 P-bit Severely Err Secs
  0 Severely Err Framing Secs, 0 Unavailable Secs
  0 Line Errored Secs, 0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
Total Data (last 24 hours)
  0 Line Code Violations, 0 P-bit Coding Violation,
  0 C-bit Coding Violation,
  0 P-bit Err Secs, 0 P-bit Severely Err Secs,
  0 Severely Err Framing Secs, 0 Unavailable Secs,
  0 Line Errored Secs, 0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
No alarms detected.

```

Example of the show controllers serial Command for a PA-T3 Serial Port Adapter

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

```

Router# show controllers serial 2/0/1
Serial1/0/0 -
Mx T3(1) HW Revision 0x3, FW Revision 2.55
Framing is c-bit, Clock Source is Line
Bandwidth limit is 35000, DSU mode 1, Cable length is 50
Data in current interval (325 seconds elapsed):
  0 Line Code Violations, 0 P-bit Coding Violation
  0 C-bit Coding Violation
  0 P-bit Err Secs, 0 P-bit Sev Err Secs
  0 Sev Err Framing Secs, 0 Unavailable Secs
  0 Line Errored Secs, 0 C-bit Errored Secs, 0 C-bit Sev Err Secs
Total Data (last 24 hours)
  0 Line Code Violations, 0 P-bit Coding Violation,
  0 C-bit Coding Violation,
  0 P-bit Err Secs, 0 P-bit Sev Err Secs,
  0 Sev Err Framing Secs, 0 Unavailable Secs,
  0 Line Errored Secs, 0 C-bit Errored Secs, 0 C-bit Sev Err Secs
No alarms detected.

```

Example of the show controllers serial Command for a Channelized T3 SPA

The following is sample output from the **showcontrollersserial** command for a 2-port or 4-Port CT3 SPA located in slot 3 of a Cisco 7304 router:

```

Router# show controllers serial
Serial3/1/0 -
Framing is c-bit, Clock Source is Internal
Bandwidth limit is 44210, DSU mode 0, Cable length is 10
rx FEBE since last clear counter 0, since reset 0
Data in current interval (0 seconds elapsed):
  0 Line Code Violations, 0 P-bit Coding Violation
  0 C-bit Coding Violation
  0 P-bit Err Secs, 0 P-bit Sev Err Secs
  0 Sev Err Framing Secs, 0 Unavailable Secs
  0 Line Errored Secs, 0 C-bit Errored Secs, 0 C-bit Sev Err Secs

```

```

0 Severely Errored Line Secs
0 Far-End Errored Secs, 0 Far-End Severely Errored Secs
0 CP-bit Far-end Unavailable Secs
0 Near-end path failures, 0 Far-end path failures
0 Far-end code violations, 0 FERF Defect Secs
0 AIS Defect Secs, 0 LOS Defect Secs
Transmitter is sending AIS.
Receiver has loss of signal.
Serial3/1/3 -
Framing is c-bit, Clock Source is Line
Bandwidth limit is 44210, DSU mode 0, Cable length is 10
rx FEBE since last clear counter 0, since reset 0
Data in current interval (757 seconds elapsed):
0 Line Code Violations, 0 P-bit Coding Violation
0 C-bit Coding Violation
0 P-bit Err Secs, 0 P-bit Sev Err Secs
0 Sev Err Framing Secs, 0 Unavailable Secs
0 Line Errored Secs, 0 C-bit Errored Secs, 0 C-bit Sev Err Secs
0 Severely Errored Line Secs
0 Far-End Errored Secs, 0 Far-End Severely Errored Secs
0 CP-bit Far-end Unavailable Secs
0 Near-end path failures, 0 Far-end path failures
0 Far-end code violations, 0 FERF Defect Secs
0 AIS Defect Secs, 0 LOS Defect Secs
No alarms detected.

```

The table below describes the fields shown in the **showcontrollersserial** output.



Note The fields appearing in the output will vary depending on card type, controller configuration, and the status of the controller line.

Table 1: show controllers serial Field Descriptions

| Field | Description |
|----------------------------------|---|
| Serial | Name of the serial controller. |
| Framing | Framing type. |
| Clock source | Source of the synchronization signal (clock). |
| Bandwidth limit | The allowable bandwidth for the controller. |
| DSU mode | The Data Service Unit (DSU) interoperability mode. |
| Cable length | The distance to the first repeater. |
| rx FEBE since last clear counter | Number of received far-end block errors. Note Line far-end block error (accumulated from the M0 or M1 byte) is reported when the downstream LTE detects BIP(B2) errors. Path far-end block error (accumulated from the G1 byte) is reported when the downstream PTE detects BIP(B3) errors. |
| rx FEBE since last reset | Number of received far-end block errors. |

| Field | Description |
|---------------------------|---|
| Line Code Violations | Number of Bipolar Violation (BPV) errors or Excessive Zeros (EXZ) errors. |
| P-bit Coding Violations | Number of P-bit errors encountered between source and destination. |
| C-bit coding violations | Number of C-bit errors encountered between source and destination. |
| P-bit Err Secs (PES) | Number of seconds with P-bit errors. Note A PES is a second with one or more PCVs or one or more Out of Frame defects or a detected incoming AIS. This gauge is not incremented when UASs are counted. |
| P-bit Sev Err Secs (PSES) | Number of seconds with P-bit severe errors. Note A PSES is a second with 44 or more PCVs or one or more Out of Frame defects or a detected incoming AIS. This gauge is not incremented when UASs are counted. |
| Sev Err Framing Secs | The number of 1-second intervals in which either a Remote Alarm Indication was received or a Loss Of Frame condition occurred. |
| Unavailable Secs | The number of 1-second intervals in which the controller was down. |
| Line Errored Secs | The number of 1-second intervals in which a Line Code Violation occurred. |
| C-bit Errored Secs (CES) | Number of seconds with C-bit errors. Note A CES is a second with one or more CCVs or one or more Out of Frame defects or a detected incoming AIS. This count is only for the SYNTRAN and C-bit Parity DS3 applications. This gauge is not incremented when UASs are counted. |
| C-bit Sev Err Secs (CSES) | Number of seconds with severe C-bit errors. Note A CSES is a second with 44 or more CCVs or one or more Out of Frame defects or a detected incoming AIS. This count is only for the SYNTRAN and C-bit Parity DS3 applications. This gauge is not incremented when UASs are counted. |

| Field | Description |
|---------------------------------|--|
| Severely Errored Line Secs | <p>For ESF signals, this is a second in which one of the following defects is detected:</p> <ul style="list-style-type: none"> • 320 or more Path Code Violation errors. • One or more Out of Frame defects. • An AIS defect. <p>For E1-CRC signals, this is a second with one of the following errors:</p> <ul style="list-style-type: none"> • 832 or more Path Code Violation errors. • One or more Out of Frame defects. <p>For E1-nonCRC signals, this is a second with 2048 or more Line Code Violations.</p> |
| Far-End Errored Secs | Number of seconds of far-end failures. |
| Far-End Severely Errored Secs | The number of 1-second intervals in which either a Remote Alarm Indication was received or a Loss Of Frame condition occurred. |
| P-bit Unavailable Secs | Number of seconds the interface is unavailable because of P-bit errors. |
| CP-bit Unavailable Secs | Number of seconds the interface is unavailable because of CP-bit errors. |
| CP-bit Far-end Unavailable Secs | Number of seconds the interface is unavailable because of CP-bit errors from the far-end device. |
| Near-end path failures | Indicates the number of failures at the near end of the path, or device, during the specified trace period. |
| Far-end path failures | Indicates the number of failures at the remote (or far) end of the path, or device, during the specified trace period. |
| Far-end code violations | Indicates a frame synchronization bit error in the D4 and E1-no CRC formats, or a CRC error in the Extended Superframe (ESF) and E1-CRC formats has occurred on the remote, or far-end device. |
| FERF Defect Secs | Number of far-end receive failures detected per second. |
| AIS Defect Secs | Number of alarm indication signals per second. |
| LOS Defect Secs | Number of loss of signal alarms per second. |
| Path Code Violations | Indicates a frame synchronization bit error in the D4 and E1-no CRC formats, or a CRC error in the Extended Superframe (ESF) and E1-CRC formats. |
| Slip Secs | Indicates the replication or deletion of the payload bits of a domestic trunk interface (DS1) frame. A slip might happen when there is a difference between the timing of a synchronous receiving terminal and the received signal. |

| Field | Description |
|-----------------|---|
| Fr Loss Secs | Indicates the number of seconds an Out of Frame (OOF) error is detected. |
| Line Err Secs | Line Errored Seconds (LES) is a second in which one or more Line Code Violation errors are detected. |
| Degraded Mins | A degraded minute is one in which the estimated error rate exceeds 1E-6 but does not exceed 1E-3. |
| Errored Secs | <p>In ESF and E1-CRC links, an errored second is a second in which one of the following defects is detected:</p> <ul style="list-style-type: none">• One or more Path Code Violations.• One or more Controlled Slip events. <p>Note For SF and E1 no-CRC links, the presence of Bipolar Violations also triggers an errored second.</p> |
| Bursty Err Secs | A second with more than one but fewer than 320 Path Coding Violation errors, no Severely Errored Frame defects, and no detected incoming AIS defects. Controlled slips are not included in this parameter. |

show controllers serial bert

To view the BERT statistics for a completed or in-progress BERT test, enter the **showcontrollersserialbert** in user EXEC or EXEC privileged mode.

show controllers serial *slot/interface-number* bert

| Syntax Description | slot | Specifies the slot where the serial interface is located. |
|--------------------|------------------|---|
| | interface-number | Specifies the number of the serial interface. |

Command Default None

Command Modes User EXEC Privileged EXEC

| Command History | Release | Modification |
|-----------------|--------------|---|
| | 12.1(12c)EX1 | This command was introduced for Cisco 7304 routers. |
| | 12.2(18)S | This command was introduced on Cisco 7304 routers running Cisco IOS Release 12.2S. |
| | 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |
| | 12.2SX | This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware. |

Usage Guidelines This command is used to view the results of a user-initiated BERT test.

Examples In the following example, the **showcontrollersserialbert** command is used to view a BERT test that is still in progress:

```
Router#
show controllers serial 6/0 bert
Interface Serial6/0 (DS3 port 1)
BERT information:
  State           :enabled (sync'd)
  Pattern         :2^23
  Interval        :10 minutes
  Time remaining  :00:01:44
  Total errors    :0
  Time this sync  :00:08:10
  Errors this sync :0
  Sync count      :1
```

In the following example, the **showcontrollersserialbert** command is used to view a BERT test that is complete:

```
Router# show controllers serial 6/0 bert
Interface Serial6/0 (DS3 port 1)
BERT information:
  State           :enabled (sync'd)
  Pattern         :2^23
```

```
Interval          :10 minutes
Time remaining    :00:09:44
Total errors      :0
Time this sync    :00:00:10
Errors this sync  :0
Sync count        :1
```

Related Commands

| Command | Description |
|---------------------|--|
| bert errors | Inserts intention errors into a BERT test. |
| bert pattern | Begins a BERT test. |

show controllers sm

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

show controllers sm *slot/port*

| Syntax Description | slot | Router slot in which the service module is installed. Range: 1 to 4. |
|--------------------|--------|--|
| | / port | Port number of the module interface. Always use 0. The slash mark (/) is required. |

Command Modes User EXEC (>) Privileged EXEC (#)

| Command History | Release | Modification |
|-----------------|----------|------------------------------|
| | 15.0(1)M | This command was introduced. |

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

Examples

The following example shows how to display information for the SM-SRE installed in the router:

```
Router# show controllers sm 1/0
Interface SM1/0
Hardware is PSE2
HWIDB: 0x11E3C8C8 INSTANCE: 0x01323100, FASTSEND: 0x040D6C44
Init flags: 0x23

FPGA registers
-----
Base address: 0xE4000000 Revision: 0x09030416
FPGA type: 0x316B6278 FPGA_error_val: 0x00000000
Cfg MSI mask: 0x00000008 Rx_buffer_size: 0x00000600

Frame statistics: (polling enabled)
-----
tx_frame_cnt: 177 rx_frame_cnt: 28
tx_byte_cnt: 45154 rx_byte_cnt: 2113
tx_pause_frame_cnt: 0 rx_pause_frame_cnt: 0
rx_unicast_filtered_cnt: 0 rx_multicast_filtered_cnt: 8
rx_undersize_pkts: 0 rx_oversize_pkts: 0
tx_64_byte_pkts: 38 rx_64_byte_pkts: 17
tx_65_to_127_byte_pkts: 17 rx_65_to_127_byte_pkts: 8
tx_128_to_255_byte_pkts: 6 rx_128_to_255_byte_pkts: 3
tx_256_to_511_byte_pkts: 116 rx_256_to_511_byte_pkts: 0
tx_512_to_1023_byte_pkts: 0 rx_512_to_1023_byte_pkts: 0
tx_1024_to_1518_byte_pkts: 0 rx_1024_to_1518_byte_pkts: 0
rx_congestion_drop_cnt: 0 rx_mtusize_drop_cnt: 0
rx_bad_cnt: 0

Interrupt statistics
-----
ge_tx_interrupt: 171 ge_rx_interrupt: 20
```

```

txbd_seq_err: 0                txbd_done_err: 0
rxbd_done_err: 0              isl_inner_crc_err: 0
pcie_busmstr_dsblld_err: 0    pcie_tgt_abort_err: 0
pcie_mst_abort_err: 0        spi_done_event: 0
rx_empty_pak: 0              rx_sw_usage_err: 0
ing_buf_adrs_err: 0          pcie_null_ptr_err: 0
uart_tx_intr: 13             uart_rx_intr: 27169
uart_break_detected: 1       uart_framing_err: 0
uart_bad_egr_adrs: 0         uart_egr_overflow: 0
i2c_errs: misc/nack/tmo: 0/0/0

```

TX ring

```

Tx Ring txr_head/txr_tail: 178/178
Tx Shadow txs_head/txs_tail/txs_free: 178/178/256
Tx Ring(txr): 0x3C631800 Tx Shadow (malloc): 0x01323380
Tx Limited: 0 Tx Count: 0 hold_pak 0x00000000

```

RX rings

```

size: 256      max_spin_size 32      head: 20
Rx Ring(rxr):  0x3C631000 rxr_malloc: 0x3C631000
Rx Shadow(rxs): 0x11E3D6CC rxs_malloc: 0x11E3D6CC

```

Software MAC Address Filter (hash:length/addr/mask/hits)

```

000: 0 ffff.ffff.ffff 0000.0000.0000      3
007: 0 001e.4a97.644d 0000.0000.0000      0
192: 0 0180.c200.0002 0000.0000.0000      0
192: 1 0100.0ccc.cccc 0000.0000.0000      0
197: 0 0180.c200.0007 0000.0000.0000      0

```

```

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

```

HW MAC Address Filter

```

Unicast Addr0: 001E.4A97.644D
Unicast Addr1: 0000.0000.0100
Unicast Addr2: 0000.0000.0100
Unicast Addr3: 0000.0000.0100
Unicast Addr4: 0000.0000.0100
Unicast HW Filter Count   : 1

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

```

FPGA upgrade info

```

Golden area fpga version: 00000000
Upgrade area fpga version: 09030416
IOS bundled fpga version: 09030416

```

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

Table 2: show controllers analysis-module Field Descriptions

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

Related Commands

| Command | Description |
|---------------------------------|--|
| service-module sm status | Displays hardware and software status information about the SM-SRE. |
| show interfaces sm | Displays status, traffic data, and configuration information about the SM-SRE interface. |

show controllers sonet

To display information about Synchronous Optical Network (SONET) controllers, use the **show controllers sonet** command in user EXEC or privileged EXEC mode with the appropriate parameters for the operating mode of the channelized line.

```
show controllers sonet[slot/bay/port
slot/bay/port:st1-number | slot/bay/port:vtg1-number | slot/bay/port:st1-number | slot/bay/port:au-3-number | slot/bay/port:au-4-number | slot/bay/port:vc3-number | slot/bay/port:t1-line-number][bert | brief | tabular]
```

Cisco Series

```
show controllers sonet [slot/bay/port]
```

| Syntax | Description |
|---|---|
| <i>slot / bay / port</i> | (Optional) Slot, bay, and port number. The slash mark is required between the <i>slot</i> argument, the <i>bay</i> argument, and the <i>port</i> argument. Note This form of the syntax is used only for the synchronous transport module-1 (STM-1) trunk card on a Cisco AS5850 universal gateway. |
| <i>slot / bay / port . st1 - number / t1 - number</i> | (Optional) Slot and port number of a T1 line under SONET framing in CT3 mode. |
| <i>slot / bay / port . vtg1 - number / st1 - number / t1 - number</i> | (Optional) Slot and port number of a T1 line under SONET framing in VT-15 mode. |
| <i>slot / bay / port . au-3-number / tug-2-number / t1-number</i> | (Optional) Slot and port number of a T1 line under synchronous digital hierarchy (SDH) framing with administrative unit type 3 (AU-3) administrative unit group (AUG) mapping. |
| <i>slot / bay / port . au - 4 - number / tug - 3 - number / tug - 2 - number / e1 - line - number</i> | (Optional) Slot and port number of an E1 line under SDH framing with AU-4 AUG mapping. |
| <i>slot / bay / port . au - 4 - number / vc3 - number</i> | (Optional) Slot and port number of a DS3/E3 interface under SDH framing with AU-4 mapping. |
| <i>slot / bay / port : interface - number</i> | (Optional) Slot and port number of a DS3/E3 interface under SONET framing or SDH framing with AU-3 mapping. |
| <i>t3 slot / bay / port : t1 - line - number</i> | (Optional) Displays information for a T1 line under SF or ESF format framing. |
| bert | (Optional) Displays bit error rate test (BERT) information. |
| brief | (Optional) Displays summary information about SONET controllers. |
| tabular | (Optional) Displays SONET controller information in a tabular format. |

Command Modes User EXEC (>) Privileged EXEC (#)

Command History

| Release | Modification |
|-----------------------------|--|
| 12.0(21)S | This command was introduced on Cisco 12000 series Internet routers. |
| 12.2(15)T | This command was integrated into Cisco IOS Release 12.2(15)T, and support was added for the STM-1 trunk card on the Cisco AS5850 platform. |
| 12.3(11)T | This command was modified to support SONET APS on the Cisco AS5850 platform. |
| Cisco IOS XE Release 3.1 | This command was modified to display the Detected Alarms and Asserted/Active Alarms fields. |
| Cisco IOS XE Everest 16.5.1 | This command was implemented on the Cisco ASR 900 Series Rotuters and Cisco NCS 4200 Series. |
| XE Fuji 16.8.x | This command output was modified on the Cisco Series Routers to display far-end counters for performance monitoring. |

Usage Guidelines

You can enter the **showcontrollerssonet** command at any time during a BERT.

Examples

The following is sample output from the **showcontrollerssonet** command on a T1 line under SONET framing in VT-15 mode. (The table below describes the lines in the BERT portion of the output.)

```
Router# show controllers sonet
4/0.1/1/1 brief
OC3.STS1 4/0.1 is up. Hardware is GSR 2 port STM1/OC3 (channelized)
  Applique type is VT1.5 in STS-1

STS-1 1, VTG 1, T1 1 (VT1.5 1/1/1) is up
  timeslots: 1-24
  FDL per AT&T 54016 spec.
  No alarms detected.
  Framing is ESF, Clock Source is Internal
  BERT test result (running)
    Test Pattern : 2^20-QRSS, Status : Sync, Sync Detected : 1
    Interval : 5 minute(s), Time Remain : 4 minute(s)
    Bit Errors (since BERT started): 0 bits,
    Bits Received (since BERT started): 112 Mbits
    Bit Errors (since last sync): 0 bits
    Bits Received (since last sync): 112 Mbits
```

Table 3: show controllers sonet Line Descriptions

| Field | Description |
|--|--|
| BERT test result (running) | Indicates the current state of the test. In this case, “running” indicates that the test is still active. If the test is complete, “done” is displayed. |
| Test Pattern : 2^20-QRSS, Status : Sync, Sync Detected : 1 | Indicates the test pattern that you selected for the test (2^20-QRSS), the current synchronization state (Sync), and the number of times that synchronization was detected during this test (1). |

| Field | Description |
|---|---|
| Interval : 5 minute(s), Time Remain : 4 minute(s) | Indicates the time allocated for the test to run and the time remaining for the test to run. For a BERT that you terminate before the time expires, this line indicates the time the test would have taken to run and the time remaining for the test to run had you not terminated it. "unable to complete" is displayed to indicate that you interrupted the test. |
| Bit Errors (since BERT started): 0 bits Bits Received (since BERT started): 112 Mbits Bit Errors (since last sync): 0 bits Bits Received (since last sync): 112 Mbits | Shows the bit errors that were detected versus the total number of test bits that were received since the test started and since the last synchronization was detected. |

The following is sample output from the **show controllers sonet** command for an E1 line under SDH framing with AU-4 AUG mapping.

```

Router# show controllers sonet 3/0.1/1/3/5
SONET 3/0 is up. (Configured for Locally Looped) Hardware is GSR 2 port
STM1/OC3 (channelized)
  Applique type is Channelized OCx interface
  Clock Source is Line, AUG mapping is AU4.
Medium info:
  Type: SDH, Line Coding: NRZ, Line Type: Short SM
Regenerator Section:
  LOF = 0          LOS = 0          BIP(B1) = 0
Multiplex Section:
  AIS = 0          RDI = 0          REI = 0          BIP(B2) = 0
Active Defects: None
Active Alarms: None
Alarm reporting enabled for: SF SLOS SLOF B1-TCA B2-TCA B3-TCA
BER thresholds: SF = 10e-3 SD = 10e-6
TCA thresholds: B1 = 10e-6 B2 = 10e-6 B3 = 10e-6
High Order Path:

PATH 1:
  AIS = 0          RDI = 0          REI = 15         BIP(B3) = 11
  LOP = 0          PSE = 4          NSE = 0         NEWPTR = 1
  LOM = 0          PLM = 0          UNEQ = 0
Active Defects: None

S1S0 = 02, C2 = 02

PATH TRACE BUFFER : STABLE
CRC-7: 0xF2 OK
  52 6F 75 74 65 72 33 2F 30 2F 31 00 00 00 00 Router3/0/1....

STM1.AU4 3/0.1 is up. Hardware is GSR 2 port STM1/OC3 (channelized)
  Applique type is C12 in TUG-3 in AU-4

AU-4 1, TUG-3 1, TUG-2 1, E1 1 (C-12 1/1/1/1) is up
timeslots: 1-31
No alarms detected.
Framing is crc4, Clock Source is Internal
BERT test result (running)
  Test Pattern : 2^15, Status : Sync, Sync Detected : 1
    
```

```

Interval : 5 minute(s), Time Remain : 5 minute(s)
Bit Errors (since BERT started): 0 bits,
Bits Received (since BERT started): 95 Mbits
Bit Errors (since last sync): 0 bits
Bits Received (since last sync): 95 Mbits
Data in current interval (708 seconds elapsed):
 0 Line Code Violations, 1 Path Code Violations
 0 Slip Secs, 1 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
 1 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs
 0 Unavail Secs, 0 Stuffed Secs
Data in Interval 1:
 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
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, 0 Stuffed Secs
Data in Interval 3:
 0 Line Code Violations, 0 Path Code Violations
 0 Slip Secs, 1 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
 1 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs
 0 Unavail Secs, 0 Stuffed Secs
Total Data (last 3 15 minute intervals):
 0 Line Code Violations,0 Path Code Violations,
 0 Slip Secs, 1 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins,
 1 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs
 0 Unavail Secs, 0 Stuffed Secs

```

The following is sample output from the **showcontrollerssonet** command when AUG mapping is AU-3 and the **tabular** keyword is specified.

```

Router# show controllers sonet
 2/0.1/1/1 tabular
SONET 2/0/0 is up.
Channelized OC-3/STM-1 SMI PA
  H/W Version : 0.2.3, ROM Version : 1.2
  FREEDM version : 2, F/W Version : 0.14.0
SONET 2/0/0 El 1/1/1 is down
Transmitter is sending LOF Indication (RAI).
Receiver has loss of frame.
Framing is crc4, Clock Source is internal, National bits are 0x1F.
INTERVAL      LCV  PCV  CSS  SEFS  LES  DM  ES  BES  SES  UAS  SS
17:26-17:29   0    0    0    0    0    0  0  0    0    173  0
17:11-17:26   0    0    0    0    0    0  0  0    0    471  0
16:56-17:11   0    0    0    0    0    0  0  0    0    0    0
16:41-16:56   0    0    0    0    0    0  0  0    0    0    0
16:26-16:41   0    0    0    0    0    0  0  0    0    216  0
16:11-16:26   0    0    0    0    0    0  0  0    0    225  0
Total         0    0    0    0    0    0  0  0    0    912  0

```

The following is partial sample output from the **showcontrollerssonet** command using an STM-1 card in the Cisco AS5850.

```

Router# show controllers sonet 3/0
SONET 3/0 is down.
  Applique type is Channelized Sonet/SDH
  Clock Source is Internal, AUG mapping is AU4.
Medium info:
  Type: SDH, Line Coding: NRZ, Line Type: Short SM
Regenerator Section Status:

```

```

LOS
Multiplex Section Status:
Higher Order Path Status:
  Path# 1 has no defects
Lower Order Path Status:
  VC-12 1/1/1/1 has no defects
  VC-12 1/1/1/2 has no defects
  VC-12 1/1/1/3 has no defects
  VC-12 1/1/2/1 has no defects
  VC-12 1/1/2/2 has no defects
  VC-12 1/1/2/3 has no defects
  VC-12 1/1/3/1 has no defects
  VC-12 1/1/3/2 has no defects
  VC-12 1/1/3/3 has no defects
  VC-12 1/1/4/1 has no defects
  VC-12 1/1/4/2 has no defects
  VC-12 1/1/4/3 has no defects
  VC-12 1/1/5/1 has no defects
  VC-12 1/1/5/2 has no defects
  VC-12 1/1/5/3 has no defects
  VC-12 1/1/6/1 has no defects
  VC-12 1/1/6/2 has no defects
  .
  .
  .
  VC-12 1/3/5/3 has no defects
  VC-12 1/3/6/1 has no defects
  VC-12 1/3/6/2 has no defects
  VC-12 1/3/6/3 has no defects
  VC-12 1/3/7/1 has no defects
  VC-12 1/3/7/2 has no defects
  VC-12 1/3/7/3 has no defects
Data in current interval (20 seconds elapsed):
  Regenerator Section:
    0 CVs, 20 ESSs, 20 SESs, 0 SEFSs
  Multiplex Section:
    0 CVs, 0 ESSs, 0 SESs, 0 UASs
  Higher Order Path:
    Path# 1: 0 CVs, 0 ESSs, 0 SESs, 20 UASs
  Lower Order Path:
    VC-12 1/1/1/1: 0 CVs, 0 ESSs, 0 SESs, 20 UASs
    VC-12 1/1/1/2: 0 CVs, 0 ESSs, 0 SESs, 20 UASs
    VC-12 1/1/1/3: 0 CVs, 0 ESSs, 0 SESs, 20 UASs
    VC-12 1/1/2/1: 0 CVs, 0 ESSs, 0 SESs, 20 UASs
    VC-12 1/1/2/2: 0 CVs, 0 ESSs, 0 SESs, 20 UASs
    VC-12 1/1/2/3: 0 CVs, 0 ESSs, 0 SESs, 20 UASs
    .
    .
    .
    VC-12 1/3/5/3: 0 CVs, 0 ESSs, 0 SESs, 20 UASs
    VC-12 1/3/6/1: 0 CVs, 0 ESSs, 0 SESs, 20 UASs
    VC-12 1/3/6/2: 0 CVs, 0 ESSs, 0 SESs, 20 UASs
    VC-12 1/3/6/3: 0 CVs, 0 ESSs, 0 SESs, 20 UASs
    VC-12 1/3/7/1: 0 CVs, 0 ESSs, 0 SESs, 20 UASs
    VC-12 1/3/7/2: 0 CVs, 0 ESSs, 0 SESs, 20 UASs
    VC-12 1/3/7/3: 0 CVs, 0 ESSs, 0 SESs, 20 UASs

```

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

Table 4: show controllers sonet STM-1 Field Descriptions

| Field | Description |
|---------------|---|
| SONET 3/0 | The SONET controller in slot 3 shows the state in which it is operating. The controller's state can be up, down, or administratively down. Loopback conditions are shown by (Locally Looped) or (Remotely Looped). |
| Applique type | Controller type. |
| Clock Source | User-specified clock source (Line or Internal). |
| AUG mapping | Indicates type of administrative unit group (AUG) mapping. |
| Line Coding | Shows the current line encoding type, either return to zero (RZ) or non return 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). |
| VC-12 | Indicates the number of the virtual circuit (VC) and whether the VC has reported any defects. |
| CVs | Number of coding violation (CV) error events. |
| ESs | An errored second (ES) is a second in which one of the following is detected: <ul style="list-style-type: none"> • One or more path code violations. • One or more out of frame defects. • One or more controlled slip events. • A detected alarm indication signal (AIS) defect. |
| SESSs | Severely errored seconds (SESSs) are seconds with one or more out-of-frame defects or a detected incoming AIS. This gauge is not incremented when UASs are counted. |
| SEFSSs | Severely errored framing seconds (SEFSSs) are seconds with one or more out-of-frame defects or a detected incoming AIS. |
| UASs | Unavailable seconds (UASs) are calculated by counting the number of seconds for which the interface is unavailable. |

The following is partial output from the **show controllers sonet** command using an STM-1 card in the Cisco AS5850 with SONET APS configured.

```
Router# show controllers sonet 1/0
SONET 1/0 is up.
  Applique type is Channelized Sonet/SDH
  Clock Source is Line, AUG mapping is AU4.
  MSP 1+1 bi-directional enabled
  Protection fiber (Port 0), No Alarm, traffic in-use
  Working fiber (Port 1), No Alarm, traffic not in-use
  Local request: No Request
  Remote request: No Request
Medium info:
  Type: SDH, Line Coding: NRZ, Line Type: Short SM
Regenerator Section Status:
```

```

No alarms detected.
Multiplex Section Status:
  No alarms detected.
  No BER failure/degrade detected
  B2 BER_SF threshold power : 3
  B2 BER_SD threshold power : 6
Higher Order Path Status:
  Path# 1 has no defects
Lower Order Path Status:
  VC-12 1/1/1/1 has no defects
  VC-12 1/1/1/2 has no defects
  VC-12 1/1/1/3 has no defects
.
.
.

```

The table below describes the significant fields shown in the display that are different from the fields described in the table above.

Table 5: show controllers sonet STM-1 APS Field Descriptions

| Field | Description |
|----------------------------------|---|
| MSP 1+1 | Indicates whether the SDH multiplex section protection (MSP) is bidirectional or unidirectional. |
| Protection fiber | Indicates the port location of the protect fiber, whether an alarm has been detected, and whether traffic is flowing through the port. |
| Working fiber | Indicates the port location of the working fiber, whether an alarm has been detected, and whether traffic is flowing through the port. |
| Local request | Indicates whether a local request to switch fibers has been received. If a request has been received, the type of request (forced, lockout, or manual) is indicated. |
| Remote request | Indicates whether a remote request to switch fibers has been received. If a request has been received, the type of request (forced, lockout, or manual) is indicated. |
| No alarms detected | Alarms detected by the controller are displayed here. The possible alarms are as follows: <ul style="list-style-type: none"> • Transmitter is sending remote alarm. • Transmitter is sending alarm indication signal (AIS). • Receiver has loss of signal. • Receiver is getting AIS. • Receiver has loss of frame. • Receiver has remote alarm. • Receiver has no alarms. |
| No BERT failure/degrade detected | No bit error rate (BER) failures or degrades detected. |

| Field | Description |
|---------------------------|---|
| B2 BER_SF threshold power | BER signal failure (SF) threshold configured with the b2sf-ber controller command. |
| B2 BER_SD threshold power | BER signal degrade (SD) threshold configured with the b2sd-ber controller command. |

The following is a sample output from the **showcontrollerssonet** command using the CHOCX card.

```
Router# show controllers sonet 0/0/0

SONET 0/0/0 is down.
  Hardware is SPA-1XCHOC12/DS0
  Applique type is Channelized Sonet/SDH
  Clock Source is Line
Medium info:
  Type: Sonet, Line Coding: NRZ,
SECTION:
  LOS = 1           LOF = 0           BIP (B1) = 0
SONET/SDH Section Tables
  INTERVAL      CV      ES      SES      SEFS
  18:51-18:54   0      182    182     182     LINE:
  AIS = 0           RDI = 0           REI = 0           BIP (B2) = 0
Active Defects: None
Detected Alarms: PRDI B3-TCA
Asserted/Active Alarms: PRDI B3-TCA
  Alarm reporting enabled for: PLOP LOM B3-TCA
BER thresholds: SF = 10e-3 SD = 10e-6
TCA thresholds: B1 = 10e-6 B2 = 10e-6
```

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

Table 6: show controllers sonet CHOCX Card Field Descriptions

| Field | Description |
|------------------------|---|
| Applique type | The controller type. |
| Clock Source | The user-specified clock source (line or internal). |
| Active Defects | List of active SONET defects. |
| Detected Alarms | List of alarms detected by the controllers. |
| Asserted/Active Alarms | List of resultant active alarms after SONET alarm hierarchy is enforced on detected alarms. |
| BER thresholds | BER threshold values of the specified alarms. |
| TCA thresholds | Threshold crossing alarm (TCA) values of the specified alarms. |

The following is sample output from the **showcontrollerssonet** command using a shared port adapter (SPA), SPA-1XCHOC12/DS0 on a Cisco 7600 series router. SPAs such as the SPA-1XCHSTM1/OC3, SPA-1xCE-OC3/STM1, and SPA-1xCHOC12/OC3 are also used on a Cisco 7600 series router to get output on the SONET controller.


```

Router# show controllers sonet 3/0/0.2/1
SONET 3/0/0 is up.
  Hardware is SPA-1XCHOC12/DS0
  Applique type is Channelized Sonet/SDH
  Clock Source is Line, AUG mapping is AU4.
Medium info:
  Type: SDH, Line Coding: NRZ,
  Regenerator Section:
  LOS = 0          LOF = 0          BIP(B1) = 0

SONET/SDH Section Tables
  INTERVAL      CV      ES      SES      SEFS
  16:07-16:12   0       0       0       0

Multiplex Section:
  AIS = 0          RDI = 0          REI = 358160      BIP(B2) = 0
Active Defects: None
Detected Alarms: None
Asserted/Active Alarms: None
Alarm reporting enabled for: SLOS SLOF SF B1-TCA B2-TCA
BER thresholds: SF = 10e-3 SD = 10e-6
TCA thresholds: B1 = 10e-6 B2 = 10e-6
Rx: S1S0 = 00
    K1 = 00,    K2 = 00
    J0 = 19

Tx: S1S0 = 02
    K1 = 00,    K2 = 00
    J0 = 01

SONET/SDH Line Tables
  INTERVAL      CV      ES      SES      UAS
  16:08-16:14   0       0       0       0
PATH 4:
  AIS = 0          RDI = 0          REI = 0          BIP(B3) = 0
  LOP = 0          PSE = 0          NSE = 0          NEWPTR = 0
  LOM = 0          PLM = 0          UNEQ = 0
Active Defects: None
Detected Alarms: None
Asserted/Active Alarms: None
Alarm reporting enabled for: PLOP LOM B3-TCA
TCA threshold: B3 = 10e-6
Rx: C2 = 02
Tx: C2 = 02

```

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

Table 7: show controllers sonet SPA Field Descriptions

| Field | Description |
|------------------------|---|
| Applique type | The controller type. |
| Clock Source | The user-specified clock source (line or internal). |
| Active Defects | List of active SONET defects. |
| Detected Alarms | List of alarms detected by the controllers. |
| Asserted/Active Alarms | List of resultant active alarms after SONET alarm hierarchy is enforced on detected alarms. |

| Field | Description |
|----------------|---|
| BER thresholds | BER threshold values of the specified alarms. |
| TCA thresholds | TCA values of the specified alarms. |

Related Commands

| Command | Description |
|-----------------|---|
| xconnect | Configures a pseudowire for transporting data over the network. |

Series Router

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

```
Router# show controllers sonet 0/3/3
SONET 0/3/3 is up. =====> this is the controller/port
status.
Hardware is asr900
Port configured rate: OC3 =====> this is the rate the port is configured
on it.
Applique type is Channelized Sonet / SDH
Clock Source is Line ==> the clocking config
Medium info:
Type: Sonet, Line Coding: NRZ,
SECTION:
LOS = 0 LOF = 0 =====> the section level alarm
counter (from last clear counters)
SONET/SDH Section Tables
INTERVAL CV ES SES SEFS
05:50-05:58 0 0 0 0 ==> PMON for the
port
LINE:
AIS = 0 RDI = 0 REI = 0 BIP(B2) = 0 =====> the line level
alarm counter (from last clear counters)
Active Defects: None
Detected Alarms: None
Asserted/Active Alarms: None =====> present active
alarms on the port.
Alarm reporting enabled for: SLOS SLOF SF B2-TCA
BER thresholds: SF = 10e-3 SD = 10e-6 =====> ber thresholds
TCA thresholds: B2 = 10e-6
Rx: S1S0 = 00
K1 = 00, K2 = 00 ==> k1k2 values
J0 = 00
RX S1 = 00
Tx: S1S0 = 00
K1 = 00, K2 = 00
J0 = 00
High Order Path:
PATH 1:
Clock Source is internal =====> path level clock
AIS = 0 RDI = 0 REI = 0 BIP(B3) = 0 =====> path layer alarms counter
LOP = 0 PSE = 0 NSE = 0 NEWPTR = 0
LOM = 0 PLM = 0 UNEQ = 0
Active Defects: None
Detected Alarms: None
Asserted/Active Alarms: None =====> present alarms on the path.
```

```

Alarm reporting enabled for: PLOP LOM B3-TCA
TCA threshold: B3 = 10e-6
Rx: C2 = 00 =====> rx and tx C2 byte..
Tx: C2 = 02
PATH TRACE BUFFER : UNSTABLE
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  =====> path trace of the path
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
SONET Path Tables
INTERVAL CV ES SES UAS
05:58-05:58 0 0 0 0
PATH 2:
Clock Source is internal
AIS = 0 RDI = 0 REI = 0 BIP(B3) = 0
LOP = 0 PSE = 0 NSE = 0 NEWPTR = 0
LOM = 0 PLM = 0 UNEQ = 0
Active Defects: None
Detected Alarms: None
Asserted/Active Alarms: None
Alarm reporting enabled for: PLOP LOM B3-TCA
TCA threshold: B3 = 10e-6
Rx: C2 = 00
Tx: C2 = 00
PATH TRACE BUFFER : UNSTABLE
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00  .....
SONET/SDH Path Tables
INTERVAL CV ES SES UAS
05:58-05:58 0 0 0 0
OC3.STS1 0/3/3.1 is up. =====> present status of the path
Hardware is
Applique type is VT1.5 =====> mode of the path
STS-1 1, VTG 1, T1 1 (VT1.5 1/1/1) is down =====> status of the SPE (t1)
VT Receiver has no alarm.
Receiver is getting AIS. ===> alarm of the SPE (t1)
Framing is unframed, Clock Source is Internal =====> framing of the T1, clock of the t1
Data in current interval (0 seconds elapsed):
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs
0 Unavail Secs, 0 Stuffed Secs
STS-1 1, VTG 1, T1 2 (VT1.5 1/1/2) is down
VT Receiver has no alarm.
Receiver is getting AIS.

```

Series Router

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

```

Router# show controllers sonet 0/2/0
SONET 0/2/0 is up.
Hardware is -1T8S-10CS
Port configured rate: OC3
Applique type is Channelized Sonet
Clock Source is Internal
Medium info:
Type: Sonet, Line Coding: NRZ,

```

```

Alarm Throttling: OFF
SECTION:
LOS = 0 LOF = 0 BIP(B1) = 0
SONET Section Tables
INTERVAL CV ES SES SEFS
12:00-12:07 0 0 0 0
11:45-12:00 15 1 0 0
Total of Data in Current and Previous Intervals
11:45-12:07 15 1 0 0
LINE:
AIS = 0 RDI = 0 REI = 0 BIP(B2) = 0
Active Defects: None
Detected Alarms: None
Asserted/Active Alarms: None
Alarm reporting enabled for: SLOS SLOF LAIS SF SD LRDI B1-TCA B2-TCA
BER thresholds: SF = 10e-3 SD = 10e-6
TCA thresholds: B1 = 10e-6 B2 = 10e-6
Rx: S1S0 = 00
K1 = 00, K2 = 00
J0 = 00
RX S1 = 00
Tx: S1S0 = 00
K1 = 00, K2 = 00
J0 = 04
Tx J0 Length : 64
Tx J0 Trace :
52 6F 75 74 65 72 20 20 20 20 20 20 20 20 20 20 Router
20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
20 20 20 20 20 20 20 20 20 20 20 20 20 20 00 00 ..
Expected J0 Length : 64
Expected J0 Trace :
52 6F 75 74 65 72 20 20 20 20 20 20 20 20 20 20 Router
20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
20 20 20 20 20 20 20 20 20 20 20 20 20 20 20 20
20 20 20 20 20 20 20 20 20 20 20 20 20 20 00 00 ..
Rx J0 Length : 64
Rx J0 Trace :
01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 .....
01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 .....
01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 .....
01 01 01 01 01 01 01 01 01 01 01 01 01 01 01 00 .....
SONET Line Tables
INTERVAL CV ES SES UAS CVFE ESFE SESFE UASFE
12:00-12:07 0 0 0 0 0 0 0 0 0
11:45-12:00 48 1 0 0 53 1 0 0
Total of Data in Current and Previous Intervals
11:45-12:07 48 1 0 0 53 1 0 0
High Order Path:
PATH 2:
Clock Source is internal
AIS = 0 RDI = 0 REI = 0 BIP(B3) = 0
LOP = 1 PSE = 0 NSE = 0 NEWPTR = 0
LOM = 0 PLM = 0 UNEQ = 1
Active Defects: None
Detected Alarms: PLOP
Asserted/Active Alarms: PLOP
Alarm reporting enabled for: PAIS PRDI PUNEQ PLOP PPLM LOM B3-TCA
TCA threshold: B3 = 10e-6
Rx: C2 = 00
Tx: C2 = 04
Tx J1 Length : 64
Tx J1 Trace
52 6F 75 74 65 72 20 30 2F 32 2F 30 2E 32 00 00 Router 0/2/0.2..

```

```

00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
Expected J1 Length : 64
Expected J1 Trace
52 6F 75 74 65 72 20 30 2F 32 2F 30 2E 32 00 00 Router 0/2/0.2..
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 .....
PATH TRACE BUFFER : UNSTABLE
Rx J1 Length : 0
Rx J1 Trace
SONET Path Tables
INTERVAL CV ES SES UAS CVFE ESFE SESFE UASFE
12:00-12:07 0 0 0 409 0 0 0 0
11:45-12:00 0 0 0 900 0 0 0 0
Total of Data in Current and Previous Intervals
11:45-12:07 0 0 0 1309 0 0 0 0

```

Related Commands

show controllers t1

To display information about the T1 links and to display the hardware and software driver information for the T1 controller, use the **showcontrollerst1** command in privileged EXEC mode.

Standard Syntax

```
show controllers t1 number [bert]
```

Cisco 7500 Series

```
show controllers t1 [slot/port] [bert]
```

Cisco AS5800 Access Servers

```
show controllers t1 dial-shelf/slot/t3-port:t1-num [bert]
```

Cisco Series

```
show controllers t1 [slot/bay/port]
```

Syntax Description

| | |
|--------------------------|--|
| <i>number</i> | Network processor number (NPM) number, in the range 0 through 2. |
| <i>slot / port</i> | (Optional) Backplane slot number and port number on the interface. Refer to your hardware installation manual for the specific slot and port numbers. |
| <i>slot / bay / port</i> | Slot number, interface module number in which the slot is inserted, and port number (Cisco series routers). |
| <i>dial-shelf</i> | Dial shelf chassis in the Cisco AS5800 access server that contains the CT3 interface card. |
| <i>/ slot</i> | Location of the CT3 interface card in the dial shelf chassis. |
| <i>/ t3-port</i> | T3 port number. The only valid value is 0. |
| <i>: t1-num</i> | T1 time slot in the T3 line. The value can be from 1 to 28. |
| bert | (Optional) Type bert to get a specific display for the bit-error rate testing (BERT) results. Otherwise, the display will include all other non-BERT information. |

Command Modes

Privileged EXEC

Command History

| Release | Modification |
|-------------|---|
| 11.0 | This command was introduced. |
| 12.0(2)XD | The keyword bert was added. |
| 12.0(3)T | This command was implemented on the Cisco AS5800 access server. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |
| 12.2SX | This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware. |

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

Usage Guidelines

This command displays controller status that is specific to the controller hardware. The information displayed is generally useful for diagnostic tasks performed by technical support personnel. Use the **showcontrollerst1bert** command to display the results of the BERT feature.

The NPM or MultiChannel Interface Processor (MIP) can query the port adapters to determine their current status. Issue a **showcontrollerst1** command to display statistics about the T1 link.

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

Cisco 7500 Series Routers

The following is sample output from the **showcontrollerst1** 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 (10 seconds elapsed):
    0 Line Code Violations, 0 Path Code Violations 0 Slip Secs, 0 Fr Loss Secs,
    0 Line Err Secs, 0 Degraded Mins 0 Errored Secs, 0 Bursty Err Secs,
    0 Severely Err Secs, 0 Unavail Secs
  Total Data (last 79 15 minute intervals):
    0 Line Code Violations, 0 Path Code Violations, 0 Slip Secs, 0 Fr Loss Secs,
    0 Line Err Secs, 0 Degraded Mins, 0 Errored Secs, 0 Bursty Err Secs,
    0 Severely Err Secs, 0 Unavail Secs
```

The table below describes the fields shown in the display.

Table 8: show controllers t1 Field Descriptions--Cisco 7500 Series

| Field | Description |
|--------------|---|
| T1 4/1 is up | The T1 controller 1 in slot 4 is operating. The controller's state can be up, down, or administratively down. Loopback conditions are shown by (Locally Looped) or (Remotely Looped). |

| Field | Description |
|---|---|
| No alarms detected | Any alarms detected by the controller are displayed here. Possible alarms are as follows: <ul style="list-style-type: none"> • 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 (10 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-no-CRC formats, or a CRC error in the ESF and E1-CRC formats. |
| Slip Secs | Indicates the replication or deletion of the payload bits of a DS1 frame. A slip may be performed when there is a difference between the timing of a synchronous receiving terminal and the received signal. |
| Fr Loss Secs | Indicates the number of seconds an out-of-frame error is detected. |
| Line Err Secs | Line Errored Seconds (LES) is a second in which one or more Line Code Violation errors are detected. |
| Degraded Mins | Degraded Minute is one in which the estimated error rate exceeds 1E-6 but does not exceed 1E-3. |
| 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-no-CRC 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. |

| Field | Description |
|-------------------|--|
| 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-no-CRC 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 controllers t1 1/0/0:1
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
```

The table below describes the fields shown in the display.

Table 9: show controllers t1 Field Descriptions--Cisco AS5800 Access Server

| 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). |

| Field | Description |
|---|---|
| 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. |

Using the bert Keyword

The following is sample output from the **showcontrollerst1bert** command displaying 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 is sample output from the **showcontrollerst1bert** command with 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

```

Series Router

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

```

Router# show controllers t1 0/2/1
T1 0/2/1 is down.
Applique type is -48T1E1-CE
Cablelength is short 110
No alarms detected.
alarm-trigger is not set
Soaking time: 3, Clearance time: 10
AIS State:Clear LOS State:Clear LOF State:Clear
Framing is ESF, FDL is ansi, Line Code is B8ZS, Clock Source is Line.
BER thresholds: SF = 10e-3 SD = 10e-6
Data in current interval (230 seconds elapsed):
Near End
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavailable Secs
0 Path Failures, 0 SEF/AIS Secs
Far End
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavailable Secs
0 Path Failures
Data in Interval 1:
Near End
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 0 Fr Loss Secs, 14 Line Err Secs, 0 Degraded Mins
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 15 Unavailable Secs
1 Path Failures, 0 SEF/AIS Secs
Far End Data
0 Line Code Violations, 0 Path Code Violations
0 Slip Secs, 4 Fr Loss Secs, 2 Line Err Secs, 0 Degraded Mins
4 Errored Secs, 0 Bursty Err Secs, 4 Severely Err Secs, 0 Unavailable Secs
0 Path Failures
Total Data (last 1 15 minute intervals):
Near End
0 Line Code Violations, 0 Path Code Violations,
0 Slip Secs, 0 Fr Loss Secs, 14 Line Err Secs, 0 Degraded Mins,
0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 15 Unavailable Secs
1 Path Failures, 0 SEF/AIS Secs
Far End
0 Line Code Violations, 0 Path Code Violations,
0 Slip Secs, 4 Fr Loss Secs, 2 Line Err Secs, 0 Degraded Mins,

```

show controllers t1

4 Errored Secs, 0 Bursty Err Secs, 4 Severely Err Secs, 0 Unavailable Secs
0 Path Failures

show controllers t1 bert

To get the results of the bit-error rate testing (BERT) run for all ports, use the **showcontrollerst1bert** command in privileged EXEC mode.

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. |
| bert | | (Optional) Type bert to get a specific display for the BERT results. Otherwise, the display will include all other non-BERT information. |

Command Default 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. |
| | 12.2(15)T | This command is no longer supported in Cisco IOS Mainline or Technology-based releases. It may continue to appear in Cisco IOS 12.2S-family releases. |
| | 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |
| | 12.2SX | This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware. |

Usage Guidelines Use the **showcontrollers** command to display the results of the BERT feature.

Examples The following example shows how the **showcontrollers** 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 T1-E1 errors

To show the last nineteen alarms on a controller, use the **showcontrollers** command in privileged EXEC mode.

show controllers {t1 | e1} slot subslot port errors

| Syntax Description | |
|--------------------|---|
| <i>slot</i> | Chassis slot number. Refer to the appropriate hardware manual for slot information. For SIPs, refer to the platform-specific SPA hardware installation guide or the corresponding “Identifying Slots and Subslots for SIPs and SPAs” topic in the platform-specific SPA software configuration guide. |
| <i>subslot</i> | Secondary slot number on a SPA interface processor (SIP) where a SPA is installed. Refer to the platform-specific SPA hardware installation guide and the corresponding “Specifying the Interface Address on a SPA” topic in the platform-specific SPA software configuration guide for subslot information. |
| <i>port</i> | Interface number on a SPA. |
| t1 | Clear-channel T1 with integrated data service units (DSUs). |
| e1 | Clear-channel E1 with integrated data service units (DSUs). |

Command Modes Privileged EXEC mode

| Command History | Release | Modification |
|-----------------|-------------|---|
| | 12.2(18)SXE | This command was introduced in Cisco IOS Release 12.2(18)SXE to support SPAs on the Cisco 7600 series router and Catalyst 6500 series switch. |
| | 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |

Usage Guidelines Use the **showcontrollers** command to show the last nineteen alarms on a controller on a 8-Port T1/E1 SPA.

Examples The following example displays the alarms on an E1 interface.

```
Router# #show controllers e1 10/2/4 errors
E1 10/2/4:Alarm Log Information
present alarm:NONE
Alarm:OOF 03:54:17 - 03:54:22
Alarm:OOF 03:53:34 - 03:54:07
```

| Related Commands | Command | Description |
|------------------|------------------------|---|
| | controller | Configures a T1, E1, or T3 controller and enters controller configuration mode. |
| | show controller | Displays controller configuration. |

show controllers t3

To display information about T3 links and to display hardware and software driver information for the T3 controller, use the **showcontrollerst3** command in privileged EXEC mode.

Cisco 2650XM, Cisco 2651XM, Cisco 2691, Cisco 3660 Series, Cisco 3725, and Cisco 3745 Routers
show controllers t3 *slot/port* [**brief** | **tabular**]

Cisco 7200 Series Routers

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

Cisco 7500 Series Routers

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

Cisco AS5800 Access Servers and Cisco 10000 Series Routers

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

Cisco Series

show controllers t3 [*slot/bay/port*]

Cisco Series

show controllers t3 [*slot/bay/port path*]



Note This is applicable to 48-Port T3/E3 CEM Interface Module and 1 port OC-48/STM-16 or 4 port OC-12/OC-3 / STM-1/STM-4 + 12 port T1/E1 + 4 port T3/E3 CEM Interface Module.

Syntax Description

| | |
|--------------------------|--|
| <i>slot</i> | Slot number. Refer to the appropriate hardware manual for slot information. |
| <i>/ port</i> | Port number. Refer to the appropriate hardware manual for port information. |
| <i>slot / bay / port</i> | Slot number, interface module number in which the slot is inserted, and port number (Cisco series routers). |
| <i>/ bay</i> | (Optional) The port adaptor bay number. Refer to the appropriate hardware manual for bay information |
| <i>/ t1-channel</i> | (Optional) Number from 1 to 28 that represents the T1 channel for the Channelized T3 Interface Processor (CT3IP) on Cisco 7200 series and Cisco 5200 series routers. |
| <i>dial-shelf</i> | Dial shelf chassis in the Cisco AS5800 access server that contains the CT3 interface card. |
| <i>/ slot</i> | Location of the CT3 interface card in the dial shelf chassis. |
| <i>/ t3-port</i> | T3 port number. |

| | |
|---------------------------|---|
| brief | (Optional) Displays a subset of information. |
| errors | (Optional) Displays a history of alarm events that causes a T3 controller or a T1 controller of a T3 to transition from an Up state to a Down state. The history size is 18 events. |
| tabular | (Optional) Displays information in a tabular format. |
| remote performance | (Optional) Displays the far-end ANSI performance monitor information when enabled on the T1 channel with the t1fdlansi controller configuration command. |
| <i>path</i> | Defines the path (sts-1/vc3) information to which the DS3 (T3 or E3) is mapped. |

Command Modes

Privileged EXEC (#)

Command History

| Release | Modification |
|-------------------|--|
| 11.3 | This command was introduced. |
| 12.0(3)T | This command was implemented on the Cisco AS5800 access server. |
| 12.2(11)YT | This command was integrated into Cisco IOS Release 12.2(11)YT and implemented on the following platforms: Cisco 2650XM, Cisco 2651XM, Cisco 2691, Cisco 3660 series, Cisco 3725, and Cisco 3745 routers. |
| 12.2(15)T | This command was integrated into Cisco IOS Release 12.2(15)T. |
| 12.2(19c) | This command was modified to display error throttling and alarm conditions that cause the T3 controller to enter a failure state. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |
| 12.2SX | This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware. |
| 12.2(31)SB | This command was integrated in Cisco IOS Release 12.2(31)SB. |
| 12.2(33)SB | This command's behavior was modified on the Cisco 10000 series router for the PRE3 and PRE4. |
| XE Everest 16.5.1 | This command was implemented on the Cisco ASR 900 Series Routers and Cisco NCS 4200 Series. |
| XE Fuji 16.8.x | This command output was modified on the Cisco Series Routers to display far-end counters for performance monitoring. |
| XE Fuji 16.8.x | The path keyword is introduced in Cisco IOS XE Fuji 16.8.x release for Cisco ASR 900 Series Routers and Cisco NCS 4200 Series Routers for 48-Port T3/E3 CEM Interface Module and 1 port OC-48/STM-16 or 4 port OC-12/OC-3 / STM-1/STM-4 + 12 port T1/E1 + 4 port T3/E3 CEM Interface Module. |

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.

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



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

The **showcontrollerst3** command also displays Maintenance Data Link (MDL) information (received strings) if MDL is configured and framing is set to C-bit.

Cisco 10000 Series Router Usage Guidelines

In releases prior to Cisco IOS Release 12.2(33)SB, when you configure the t1 loopback remote command on the local router, the command also displays in the running configuration file of the far-end router. This is due to the Route Processor (RP) updating an incorrect parameter when it receives the loopback event message from the line card for loopback requests from the far end.

In Cisco IOS Release 12.2(33)SB, the RP updates the correct parameter and the show controllers command correctly displays the loopback CLI commands applied on the local end and displays the loopback events and status received from the line card in response to loopback requests from the far end.

This change in behavior affects the following line cards and is documented in the CSCsm84447 caveat:

- 4-port channelized STM1
- 1-port channelized OC-12
- 6-port channelized T3
- 4-port half-height channelized T3

In Cisco IOS Release 12.2(33)SB, the output from the show controller command includes line code information for the 6-port channelized T3 line card and the 8-port E3/DS3 line card. However, because SONET line cards do not have a direct physical link at the T3 or E3 level, the output from the show controller t3 command does not include line code information.

In Cisco IOS Release 12.2(31)SB, the output from the show controller command displays line code information. The output of the show controller t3 command for SONET-based T3 also includes line code information.

Examples

Cisco 7200 Series Routers

The following is partial output from the **showcontrollerst3 errors** command for Cisco IOS Release 12.2(19c) for a specific T1 controller of a T3 on a Cisco 7200 series router with a bay/port of 4/1, displaying the T1 1 alarm event of OOF:

```
Router# show controllers t3 4/1/1 errors
T3 4/1: Error Log Information
present alarm: NONE
Error: AIS
17:28:08-17:29:18
T1 1 Error Log Information
```

```

present alarm: OOF
Since 17:30:55
Error: OOF
17:30:09-17:30:46

```

The following is partial output from the **showcontrollerst3** errors command from Cisco IOS Release 12.2(19c) for a T3 controller on a Cisco 7200 series router with a bay/port of 4/1, displaying a history of all alarm events on all 28 T1 channels:

```

Router# show controllers t3 4/1 errors
T3 4/1: Error Log Information
present alarm: NONE
Error: AIS
17:28:08-17:29:18
T1 1 Error Log Information
present alarm: OOF
Since 17:30:55
Error: OOF
17:30:09-17:30:46
T1 2 Error Log Information
present alarm: NONE
T1 3 Error Log Information
present alarm: NONE
T1 4 Error Log Information
present alarm: NONE
T1 5 Error Log Information
present alarm: NONE
T1 6 Error Log Information
present alarm: NONE
T1 7 Error Log Information
present alarm: NONE
T1 8 Error Log Information
present alarm: NONE
T1 9 Error Log Information
present alarm: NONE
T1 10 Error Log Information
present alarm: NONE
T1 11 Error Log Information
present alarm: NONE
.
.
.

```

.Cisco 7500 Series Routers

The following is partial output from the **showcontrollerst3** errors command from Cisco IOS Release 12.2(19c) for a T3 controller with a slot/bay/port of 1/4/1, displaying a history of all alarm events on all 28 T1 channels:

```

Router# show controllers t3 1/4/1 errors
T3 1/4/1: Error Log Information
present alarm: NONE
Error: AIS
17:28:08-17:29:18
T1 1 Error Log Information
present alarm: OOF
Since 17:30:55
Error: OOF
17:30:09-17:30:46
T1 2 Error Log Information

```

```

present alarm: NONE
T1 3 Error Log Information
present alarm: NONE
T1 4 Error Log Information
present alarm: NONE
T1 5 Error Log Information
present alarm: NONE
T1 6 Error Log Information
present alarm: NONE
T1 7 Error Log Information
present alarm: NONE
.
.
.

```

The following is partial output from the **showcontrollerst3** errors command from Cisco IOS Release 12.2(19c) for a specific T1 controller of a T3 on a Cisco 7200 series router with a bay/port of 4/1, displaying the T1 1 alarm event of OOF:

```

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

```

The table below describes the error field shown in the display.

Table 10: show controllers t3 Error Field Description

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

The following is partial output from the **showcontrollerst3** command from Cisco IOS Release 12.2(19c):

```

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

```

```

Applique type is Channelized T3
Transmitter is sending remote alarm.
Receiver has loss of signal.
FEAC code received:No code is being received
Framing is M23, Line Code is B3ZS, Clock Source is Internal
Rx-error throttling on T1's ENABLED
Rx throttle total 0, equipment customer loopback
Data in current interval (545 seconds elapsed):
  0 Line Code Violations, 0 P-bit Coding Violation
  0 C-bit Coding Violation, 0 P-bit Err Secs
  0 P-bit Severely Err Secs, 0 Severely Err Framing Secs
  545 Unavailable Secs, 0 Line Errored Secs
  0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
Data in Interval 1:
  0 Line Code Violations, 0 P-bit Coding Violation
  0 C-bit Coding Violation, 0 P-bit Err Secs
  0 P-bit Severely Err Secs, 0 Severely Err Framing Secs
  900 Unavailable Secs, 0 Line Errored Secs
  0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
Data in Interval 2:
<snip>

```

The following is partial output from the **showcontrollerst3** command from Cisco IOS Release 12.2(19c) for the T1 channel of the T3 controller:

```

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

T1 1 is down
timeslots:1-24
FDL per AT&T 54016 spec.
Receiver has loss of signal.
Framing is ESF, Clock Source is Internal
Data in current interval (0 seconds elapsed):
  0 Line Code Violations, 0 Path Code Violations
  0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
  0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs
  0 Unavail Secs, 0 Stuffed Secs

```

The following is partial output from the **showcontrollerst3** command:

```

Router# show controllers t3 3/0/0
T3 3/0/0 is up.
CT3 H/W Version: 4, CT3 ROM Version: 0.116, CT3 F/W Version: 0.10.0
Mx H/W version: 2, Mx ucode ver: 1.24
Applique type is Channelized T3
No alarms detected.
FEAC code received: No code is being received
Framing is M23, Line Code is B3ZS, Clock Source is Internal.
Ext1: LOS, Ext2: LOS, Ext3: LOS, Test: OK
Data in current interval (39 seconds elapsed):
  0 Line Code Violations, 0 P-bit Coding Violation
  0 C-bit Coding Violation
  0 P-bit Err Secs, 0 P-bit Severely Err Secs
  0 Severely Err Framing Secs, 0 Unavailable Secs
  0 Line Errored Secs, 0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
Total Data (last 1 15 minute intervals):
  0 Line Code Violations, 0 P-bit Coding Violation,
  0 C-bit Coding Violation,
  0 P-bit Err Secs, 0 P-bit Severely Err Secs,

```

```

    0 Severely Err Framing Secs, 0 Unavailable Secs,
    0 Line Errored Secs, 0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
.
.
.
T1 1 is down, speed: 1536 kbs, non-inverted data
timeslots: 1-24
FDL per ANSI T1.403 and AT&T 54016 spec.
Configured for FDL Remotely Line Looped
No alarms detected.
Framing is ESF, LineCode is B8ZS, Clock Source is Internal.
BERT test result (running)
  Test Pattern: All 0's, Status: Sync, Sync Detected: 1
  Interval: 4 minute(s), Tim Remain: 4 minute(s)
  Bit Errors (Sync BERT Started): 0 bits
  Bit Errors (Sync last Sync): 0 bits, Bits Received: 7 Mbits

```

The following is partial output from the **showcontrollerst3brief** command:

```

Router# show controllers t3 3/0/0 brief
T3 3/0/0 is up.
  CT3 H/W Version: 4, CT3 ROM Version: 0.116, CT3 F/W Version: 0.10.0
  Mxt H/W version: 2, Mxt ucode ver: 1.24
  Applique type is Channelized T3
  No alarms detected.
  FEAC code received: No code is being received
  Framing is M23, Line Code is B3ZS, Clock Source is Internal.
  Ext1: LOS, Ext2: LOS, Ext3: LOS, Test: OK
  T1 1 is up, speed: 1536 kbs, non-inverted data
  timeslots: 1-24
  FDL per ANSI T1.403 and AT&T 54016 spec.
  Configured for FDL Remotely Line Looped
  No alarms detected.
  Framing is ESF, LineCode is B8ZS, Clock Source is Internal.
  BERT test result (done)
    Test Pattern: All 0's, Status: Not Sync, Sync Detected: 1
    Interval: 4 minute(s), Tim Remain: 0 minute(s)
    Bit Errors(Sync BERT Started): 0 bits
    Bit Errors(Sync last Sync): 0 bits, Bits Received: 368 Mbits
.
.
.

```

The following is partial output from the **showcontrollerst3tabular** command:

```

Router# show controllers t3 3/0/0 tabular

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

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

```

```

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

```

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

```

Router# show controllers t3 6/0/0 tabular
T1 2 is up
timeslots: 1-24
FDL per AT&T 54016 spec.
No alarms detected.
Framing is ESF, Clock Source is Line, Rx throttles 47
INTERVAL      LCV   PCV   CSS   SELS   LES   DM   ES   BES   SES   UAS   SS
07:48-07:53   0     0     0     0     0     0     0     0     0     0     0

```

The following is partial output from the **showcontrollerst3remoteperformance** command. This information is available if the **t1fdlansi** controller configuration command is enabled for a T1 channel on a CT3IP.

```

Router# show controllers t3 3/0/0 remote performance
T3 3/0/0 is up.
CT3 H/W Version: 4, CT3 ROM Version: 0.116, CT3 F/W Version: 20.2.0
Mx H/W version: 2, Mx ucode ver: 1.25
T1 1 - Remote Performance Data
Data in current interval (356 seconds elapsed):
  0 Line Code Violations, 0 Path Code Violations
  0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
  0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs
  0 Unavail Secs
Data in Interval 1:
  1 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
  2 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs
  0 Unavail Secs
Data in Interval 2:
  0 Line Code Violations, 0 Path Code Violations
  0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
  0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs
  0 Unavail Secs
Total Data (last 2 15 minute intervals):
  1 Path Code Violations
  1 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins,
  2 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs
  0 Unavail Secs
.
.
.

```

The table below describes the fields shown in the display.

Table 11: show controllers t3 Field Descriptions--Cisco 7500 Series

| Field | Description |
|--------------------|---|
| T3 3/0/0 is up | T3 controller in slot 3 is operating. The controller's state can be up, down, or administratively down. Loopback conditions are shown by (Locally Looped) or (Remotely Looped). |
| CT3 H/W Version | Version number of the hardware. |
| CT3 ROM Version | Version number of the ROM. |
| CT3 F/W Version | Version number of the firmware. |
| Mx H/W version | Hardware version number of the HDLC controller chip. |
| Mx ucode ver | Microcode version of the HDLC controller chip. |
| Applique type | Controller type. |
| No alarms detected | Any alarms detected by the controller are displayed here. Possible alarms are as follows: <ul style="list-style-type: none"> • 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 | Status of the Maintenance Data Link (either enabled or disabled). |

| Field | Description |
|---------------------|---|
| FEAC code received | <p>Whether or not a far-end alarm code request is being received. Possible values are as follows:</p> <ul style="list-style-type: none"> • 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 Eqpt. Failure (NSA) • No code is being received |
| Framing | Framing type on the CT3IP. Values are M23, C-Bit, and Auto-detect. |
| Line Code | Line coding format on the CT3IP. |
| Clock Source | Clock source on the CT3IP. Values are internal or line. |
| RX-error throttling | Indicates that error throttling is enabled. The error throttling command disables the T1 level clock in order to stop receiving error data packets on a T1 controller. If any single interface receives a burst of errors over a short duration, such as 400 errors in 100 milliseconds, the T1 clock will be turned off for a period of 100 milliseconds. |
| RX throttles | The presence of the throttle count indicates that there are many input errors on lines. On the CT3 PA, the T1 is throttled when there are a number of input errors on an interface (400 errors in 100 milliseconds). The T1 is throttled even if one of the interfaces on it sees continuous errors. The 1-second periodic process checks for throttled interfaces and unthrottles them back. |

| Field | Description |
|---|--|
| BERT test result | <p>BERT test information is available if the t1bert controller configuration command is enabled for the T1 channel on the CT3IP. The BERT results include the following information:</p> <ul style="list-style-type: none"> • Test Pattern--Type of test pattern selected. • Status--Status of the test. • Sync Detected--Number of times the pattern sync is detected (that is, the number of times the pattern goes from No Sync to Sync). • Interval--Duration selected. • Tim 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 pattern sync was detected. • Bits Received--Total bits received. <p>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.</p> |
| Data in current interval (39 seconds elapsed) | Shows the current accumulation period, which rolls into the 24-hour accumulation every 15 minutes. Accumulation period is from 1 to 900 seconds. The oldest 15-minute period falls off the back of the 24-hour accumulation buffer. |
| Line Code Violations | Line Code Violations (LCVs) is a count of both Bipolar Violations (BPVs) and Excessive Zeros (EXZs) that occur over the accumulation period. An EXZ increments the LCV by one regardless of the length of the zero string. |
| P-bit Coding Violation | For all DS3 applications, a P-bit coding violation (PCV) error event is a P-bit parity error event. A P-bit parity error event is the occurrence of a received P-bit code on the DS3 M-frame that is not identical to the corresponding locally calculated code. |
| C-bit Coding Violation | For C-bit parity and SYNTRAN DS3 applications, the C-bit coding violation (CCV) is the count of coding violations reported via the C-bits. For C-bit parity, it is the count of CP-bit parity errors that occur during the accumulation interval. For SYNTRAN, it is a count of CRC-9 errors that occur during the accumulation interval. |
| 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. |

| Field | Description |
|--|--|
| P-bit Severely Err Secs | P-bit severely errored seconds (PSES) is a second with 44 or more PCVs, one or more out-of-frame defects, or a detected incoming AIS. This gauge is not incremented when unavailable seconds are counted. |
| Severely Err Framing Secs | Severely errored framing seconds (SEFS) is a second with one or more out-of-frame defects or a detected incoming AIS. |
| Unavailable Secs | The number of unavailable seconds (UAS) is calculated by counting the number of seconds for which the interface is unavailable. For more information, refer to RFC 1407, <i>DS3 MIB Variables</i> . |
| Line Errored Secs | Line errored seconds (LES) is a second in which one or more code violations or one or more LOS defects occurred. |
| C-bit Errored Secs | C-bit errored seconds (CES) is a second with one or more C-bit code violations (CCV), one or more out-of-frame defects, or a detected incoming AIS. This gauge is not incremented when UASs are counted. |
| C-bit Severely Errored Secs | C-bit severely errored seconds (CSES) is a second with 44 or more CCVs, one or more out-of-frame defects, or a detected incoming AIS. This gauge is not incremented when UASs are counted. |
| Total Data (last 15 minute intervals) | Shows the last 15-minute accumulation period. |
| T1 1 is up | T1 channel is operating. The channel's state can be up, down, or administratively down. Loopback conditions are shown by (Locally Looped) or (Remotely Looped). |
| speed | Speed of the T1 channel, in kbps. |
| non-inverted data | Indicates if the T1 channel is configured for inverted data. |
| timeslots | Time slots assigned to the T1 channel. |
| FDL per ANSI T1.403 and AT&T 54016 spec. | Performance monitoring is via Facility Data Link per ANSI T1.403 and AT&T standard specification number 54016. |
| No alarms detected | Any alarms detected by the T1 controller are displayed here. Possible alarms are as follows: <ul style="list-style-type: none"> • 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. |

| Field | Description |
|----------------------|---|
| Framing | Type of framing used on the T1 channel. Values are ESF or SF. |
| Line Code | Type of line coding used on the T1 channel. Values are B8ZS or AMI. |
| Clock Source | Clock source on the T1 channel. Values are internal or line. |
| Path Code Violations | Path coding violation (PCV) error event is a frame synchronization bit error in the D4 and E1-no-CRC formats or a CRC error in the ESF and E1-CRC formats. |
| Slip Secs | Controlled slip second (CSS) is a 1-second interval that contains one or more controlled slips. |
| Fr Loss Secs | Frame loss seconds (SELS) is the number of seconds for which an out-of-frame error is detected. |
| Line Err Secs | Line errored seconds (LES) is a second in which one or more line code violation errors are detected. |
| Degraded Mins | Degraded minute (DM) is a minute in which the estimated error rate exceeds 1E-6 but does not exceed 1E-3. For more information, refer to RFC 1406, <i>Definitions of Managed Objects for DS1 and E1 Interface Types</i> . |
| Errored Secs | Errored seconds (ES) is a second with one or more path coding violations, one or more out-of-frame defects, or one or more controlled slip events or a detected AIS defect. |
| Bursty Err Secs | Bursty errored seconds (BES) is a second with fewer than 320 and more than one path coding violation error events, no severely errored frame defects, and no detected incoming AIS defects. Controlled slips are not included in this parameter. |
| Severely Err Secs | Severely errored seconds (SES) is a second with 320 or more path code violation errors events, one or more out-of-frame defects, or a detected AIS defect. |
| Unavailable Secs | Number of seconds during which the interface was not available in this interval. Referred to as UAS. |
| Stuffed Secs | Stuffed seconds (SS) is a second in which one more bit stuffings take place. This happens when the Pulse Density Enforcer detects a potential violation in the output stream and inserts a 1 to prevent it. Such bit stuffings corrupt user data and indicate that the network is configured incorrectly. This counter can be used to help diagnose this situation. |

Cisco AS5800 Access Servers

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

```
Router# show controllers t3 1/4/0 brief
T3 1/4/0 is up.
  Applique type is Channelized T3
```

```

No alarms detected.
MDL transmission is disabled

FEAC code received: Multiple DS1 LOS/HBER
Framing is C-BIT Parity, Line Code is B3ZS, Clock Source is Line.
Data in current interval (491 seconds elapsed):
  0 Line Code Violations, 0 P-bit Coding Violation
  0 C-bit Coding Violation, 0 P-bit Err Secs
  0 P-bit Severely Err Secs, 0 Severely Err Framing Secs
  0 Unavailable Secs, 0 Line Errored Secs
  0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
Total Data (last 80 15 minute intervals):
  3 Line Code Violations, 4 P-bit Coding Violation,
  2 C-bit Coding Violation, 0 P-bit Err Secs,
  0 P-bit Severely Err Secs, 0 Severely Err Framing Secs,
  2 Unavailable Secs, 0 Line Errored Secs,
  0 C-bit Errored Secs, 0 C-bit Severely Errored Secs

```

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

```

Router# show controllers t3 1/4/0
T3 1/4/0 is up.
Applique type is Channelized T3
No alarms detected.
MDL transmission is disabled

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

```

```

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

```

The table below describes the fields shown in the display.

Table 12: show controllers t3 Field Descriptions--Cisco AS5800

| Field | Description |
|--------------------|---|
| T3 1/4/0 is up | T3 controller connected to this Cisco AS5800 access server in shelf 1, slot 4, port 0 is up. The controller's state can be up, down, or administratively down. Loopback conditions are shown by Locally Looped or Remotely Looped. |
| Applique type | Describes the type of controller. |
| No alarms detected | Any alarms detected by the controller are displayed here. Possible alarms are as follows: <ul style="list-style-type: none"> • 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 toward the far-end T3 unit. It is the counterpart of Facility Data Link (FDL) in a T1 link. |

| Field | Description |
|--|--|
| FEAC code received | Whether or not a far-end alarm code request is being received. Possible values are as follows: <ul style="list-style-type: none"> • 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 Eqpt. Failure (NSA) • No code is being received |
| Framing | Standard T3 framing type: M23, C-Bit, or Auto-detect. |
| Line Code | Standard T3 line-coding format. In this example, the line-coding format is bipolar 3-zero substitution (B3ZS). |
| Clock Source | The source of the synchronization signal (clock): line or internal. In this example, the line is providing the clock signal. |
| Data in current interval (... seconds elapsed) | Summary statistics for T3 signal quality for the current time interval of 900 seconds (15 minutes). In this example, the statistics are for current partial interval. Statistics roll into the 24-hour accumulation buffer every 15 minutes. The oldest 15-minute period falls off the back of the 24-hour accumulation buffer. |
| Line Code Violations | Count of both Bipolar Violations (BPVs) and Excessive Zeros (EXZs) that occur over the accumulation period. An EXZ increments the Line Code Violations (LCVs) by one regardless of the length of the zero string. |
| P-bit Coding Violation | P-bit parity error event. A P-bit parity error event is the occurrence of a received P-bit code on the DS3 M-frame that is not identical to the corresponding locally calculated code. Referred to as PCV. |
| C-bit Coding Violation | Count of coding violations reported via the C-bits. For C-bit parity, it is the count of CP-bit parity errors that occur during the accumulation interval. Referred to as CCV. |

| Field | Description |
|---|--|
| P-bit Err Secs | Number of seconds with one or more PCVs, one or more out-of-frame defects, or a detected incoming AIS. This gauge is not incremented when unavailable seconds are counted. |
| P-bit Severely Err Secs | Number of seconds with 44 or more PCVs, one or more out-of-frame defects, or a detected incoming AIS. This gauge is not incremented when unavailable seconds are counted. |
| Severely Err Framing Secs | Number of a seconds with one or more out-of-frame defects or a detected incoming AIS. |
| Unavailable Secs | Number of seconds during which the interface was not available in this interval. Referred to as UAS. |
| Line Errored Secs | Number of seconds in this interval during which one or more code violations or one or more LOS defects occurred. Referred to as LES. |
| C-bit Errored Secs | Number of seconds with one or more C-bit code violations (CCV), one or more out-of-frame defects, or a detected incoming AIS. This gauge is not incremented when UASs are counted. Referred to as CES. |
| C-bit Severely Errored Secs | Number of seconds with 44 or more CCVs, one or more out-of-frame defects, or a detected incoming AIS. This gauge is not incremented when UASs are counted. |
| Total Data (last ... 15 minute intervals) | Summary statistics for T3 signal quality for 15-minute intervals. Every 24 hours (96 intervals) the counters in this data block clear. |

Cisco 10000 Series Router Examples

The following examples from the show controller t3 command show the information that displays when the router is running Cisco IOS Release 12.2(33)SB and Cisco IOS Release 12.2(31)SB:

Cisco IOS Release 12.2(33)SB --No Line Code Information (CHSTM1 and 1CHOC12 Cards)

```
Router# show controllers t3 2/0/0.1
T3 2/0/0.1 is up. Hardware is C10K CHSTM1 line card
Applique type is Channelized T3
Controller is in channelized mode
No alarms detected.
MDL transmission is disabled
FEAC code received: No code is being received
Framing is C-BIT Parity (Detected), Clock Source is Internal
equipment customer loopback
Data in current interval (155 seconds elapsed):
290738 P-bit Coding Violation
290736 C-bit Coding Violation, 0 P-bit Err Secs
0 P-bit Severely Err Secs, 0 Severely Err Framing Secs
34 Unavailable Secs, 0 Line Errored Secs
0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
31 AIS Defect Secs, 0 FERF Defect Secs
```



```

1 Near-end path failures, 0 Far-end path failures
0 CP-bit Far-End Unavailable Secs, 107 Far-End Coding Violations
2 Far-End Errored Secs, 1 Far-End Severely Errored Secs

```

Cisco IOS Release 12.2(31)SB --Line Code Information (CHSTM1 and 1CHOC12 Cards)

```

Router# show controllers t3 2/0/0.1
T3 2/0/0.1 is up. Hardware is C10K CHSTM1 line card
Applique type is Channelized T3
Controller is in channelized mode
No alarms detected.
MDL transmission is disabled
FEAC code received: No code is being received
Framing is C-BIT Parity (Detected), Clock Source is Internal
equipment customer loopback
Data in current interval (155 seconds elapsed):
290738 P-bit Coding Violation
290736 C-bit Coding Violation, 0 P-bit Err Secs
0 P-bit Severely Err Secs, 0 Severely Err Framing Secs
34 Unavailable Secs, 0 Line Errored Secs
0 C-bit Errored Secs, 0 C-bit Severely Errored Secs

```

Cisco IOS Release 12.2(33)SB3-- CHSTM1 and 1CHOC12 Cards

```

Router# show controllers t3 2/0/0.1
T3 2/0/0.1 is up. Hardware is C10K CHSTM1 line card
Applique type is Channelized T3
Controller is in channelized mode
No alarms detected.
MDL transmission is disabled

FEAC code received: No code is being received
Framing is C-BIT Parity (Detected), Clock Source is Internal
equipment customer loopback
Data in current interval (155 seconds elapsed):
290738 P-bit Coding Violation
290736 C-bit Coding Violation, 0 P-bit Err Secs
0 P-bit Severely Err Secs, 0 Severely Err Framing Secs
34 Unavailable Secs, 0 Line Errored Secs
0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
31 AIS Defect Secs, 0 FERF Defect Secs
1 Near-end path failures, 0 Far-end path failures
0 CP-bit Far-End Unavailable Secs, 107 Far-End Coding Violations
2 Far-End Errored Secs, 1 Far-End Severely Errored Secs

```

Cisco IOS Release 12.2(33)SB3 --4HHCT3 and 6CHT3 Cards

```

Router# show controllers t3 8/0/0
T3 8/0/0 is down. Hardware is C10K Half Height CT3 line card
Applique type is Channelized T3
Controller is in channelized mode
Receiver has loss of signal.
MDL transmission is disabled

FEAC code received: No code is being received
Framing is C-BIT Parity (Configured)

```

```

Line Code is B3ZS, Clock Source is Internal
equipment customer loopback
Data in current interval (617 seconds elapsed):
  6120 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
  25 Unavailable Secs, 0 Line Errored Secs
  0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
  0 AIS Defect Secs, 25 LOS Defect Secs
  1 Near-end path failures
  0 Far-end path failures, 0 FERF Defect Secs
  24 CP-bit Far-End Unavailable Secs, 4771 Far-End Coding Violations
  0 Far-End Errored Secs, 0 Far-End Severely Errored Secs

```

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

Table 13: show controllers t3 Field Descriptions--Cisco 10000 series router

| Field | Description |
|--------------------|---|
| AIS | Alarm indication signal. |
| T3 2/0/0.1 is up | T3 controller connected to this Cisco 10000 series router in shelf 2, slot 0, port 0.1 is up. The controller's state can be up, down, or administratively down. Loopback conditions are shown by Locally Looped or Remotely Looped. |
| T3 8/0/0 is down | T3 controller connected to this Cisco 10000 series router in shelf 8, slot 0, port 0 is down. The controller's state can be up, down, or administratively down. Loopback conditions are shown by Locally Looped or Remotely Looped. |
| Applique type | Describes the type of controller. |
| No alarms detected | Any alarms detected by the controller are displayed here. Possible alarms are as follows: <ul style="list-style-type: none"> • Receiver has loss of frame (LOF). • Receiver has loss of signal (LOS). • Receiver has no alarms. • Receiver has remote alarm. • Receiver is getting AIS. • Transmitter is sending alarm indication signal (AIS). • Transmitter is sending remote alarm. |
| MDL transmission | Maintenance Data Link status (either enabled or disabled). Used for carrying performance information and control signals across the network toward the far-end T3 unit. It is the counterpart of Facility Data Link (FDL) in a T1 link. |

| Field | Description |
|--|--|
| FEAC code received | <p>Whether a far-end alarm code request is being received. Possible values are as follows:</p> <ul style="list-style-type: none"> • Common Eqpt. Failure (NSA) • DS1 Eqpt. Failure (NSA) • DS1 Eqpt. Failure • DS3 AIS Received • DS3 Eqpt. Failure (NSA) • DS3 Eqpt. Failure (SA) • DS3 IDLE Received • DS3 LOS/HBER • DS3 Out-of-Frame • Multiple DS1 LOS/HBER • No code is being received • Single DS1 LOS/HBER |
| Framing | Standard T3 framing type: M23, C-bit, or Auto-detect. |
| Line Code | Standard T3 line-coding format. In this example, the line-coding format is bipolar 3-zero substitution (B3ZS). |
| Clock Source | The source of the synchronization signal (clock): Line or Internal. In this example, the line is providing the clock signal. |
| Data in current interval (617 seconds elapsed) | Summary statistics for T3 signal quality for the current time interval of 900 seconds (15 minutes). In this example, the statistics are for current partial interval. Statistics roll into the 24-hour accumulation buffer every 15 minutes. The oldest 15-minute period falls off the back of the 24-hour accumulation buffer. |
| Line Code Violations | Count of both Bipolar Violations (BPVs) and Excessive Zeros (EXZs) that occur over the accumulation period. An EXZ increments the line code violations (LCVs) by one, regardless of the length of the zero string. |
| P-bit Coding Violation | P-bit parity error event. A P-bit parity error event is the occurrence of a received P-bit code on the DS3 M-frame that is not identical to the corresponding locally calculated code. Referred to as PCV. |
| C-bit Coding Violation | Count of coding violations reported via the C-bits. For C-bit parity, it is the count of CP-bit parity errors that occur during the accumulation interval. Referred to as CCV. |
| P-bit Err Secs | Number of seconds with one or more PCVs, one or more out-of-frame defects, or a detected incoming AIS. This gauge is not incremented when unavailable seconds are counted. |

| Field | Description |
|-----------------------------|--|
| P-bit Severely Err Secs | Number of seconds with 44 or more PCVs, one or more out-of-frame defects, or a detected incoming AIS. This gauge is not incremented when unavailable seconds are counted. |
| Severely Err Framing Secs | Number of a seconds with one or more out-of-frame defects or a detected incoming AIS. |
| Unavailable Secs | Number of seconds during which the interface was not available in this interval. Referred to as UAS. |
| Line Errored Secs | Number of seconds in this interval during which one or more code violations or one or more LOS defects occurred. Referred to as LES. |
| C-bit Errored Secs | Number of seconds with one or more C-bit code violations (CCV), one or more out-of-frame defects, or a detected incoming AIS. This gauge is not incremented when UASs are counted. Referred to as CES. |
| C-bit Severely Errored Secs | Number of seconds with 44 or more CCVs, one or more out-of-frame defects, or a detected incoming AIS. This gauge is not incremented when UASs are counted. |

Series Router

The following is a sample output from the **show controllers t3** command on the Cisco series routers:

```
Router# show controllers t3 0/4/40
T3 0/4/40 is up.
Hardware is -48T3E3-CE
Applique type is Clear Channel 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, Cablelength Short less than 225ft
BER thresholds: SF = 10e-10 SD = 10e-10
Clock Source is internal
Equipment customer loopback
Data in current interval (240 seconds elapsed):
  Near End
    0 Line Code Violations, 0 P-bit Coding Violations
    0 C-bit Coding Violations, 0 P-bit Err Secs
    0 P-bit Severely Err Secs, 0 Severely Err Framing Secs
    0 Unavailable Secs, 0 Line Errored Secs
    0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
    0 Severely Errored Line Secs, 0 Path Failures
    0 AIS Defect Secs, 0 LOS Defect Secs
  Far End
    0 Errored Secs, 0 Severely Errored Secs
    0 C-bit Unavailable Secs, 0 Path Failures
    0 Code Violations, 0 Service Affecting Secs
Data in Interval 1:
  Near End
    0 Line Code Violations, 0 P-bit Coding Violations
    0 C-bit Coding Violations, 0 P-bit Err Secs
    0 P-bit Severely Err Secs, 0 Severely Err Framing Secs
    20 Unavailable Secs, 20 Line Errored Secs
```

```

    0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
    20 Severely Errored Line Secs, 1 Path Failures
    0 AIS Defect Secs, 20 LOS Defect Secs
Far End
    0 Errored Secs, 0 Severely Errored Secs
    0 C-bit Unavailable Secs, 0 Path Failures
    0 Code Violations, 0 Service Affecting Secs
Total Data (last 1 15 minute intervals):
Near End
    0 Line Code Violations, 0 P-bit Coding Violations,
    0 C-bit Coding Violations, 0 P-bit Err Secs,
    0 P-bit Severely Err Secs, 0 Severely Err Framing Secs,
    20 Unavailable Secs, 20 Line Errored Secs,
    0 C-bit Errored Secs, 0 C-bit Severely Errored Secs
    20 Severely Errored Line Secs, 1 path failures
    0 AIS Defect Secs, 20 LOS Defect Secs
Far End
    0 Errored Secs, 0 Severely Errored Secs
    0 C-bit Unavailable Secs, 0 Path Failures
    0 Code Violations, 0 Service Affecting Secs
T1 1 is up
timeslots:
FDL per AT&T 54016 spec.
No alarms detected.
Framing is ESF, Clock Source is Internal
Data in current interval (250 seconds elapsed):
Near End
    0 Line Code Violations, 0 Path Code Violations
    0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
    0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs
    0 Unavailable Secs, 0 Stuffed Secs
    0 Path Failures, 0 SEF/AIS Secs
Far End
    0 Line Code Violations, 0 Path Code Violations
    0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
    0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs
    0 Unavailable Secs 0 Path Failures
Data in Interval 1:
Near End
    0 Line Code Violations, 0 Path Code Violations
    0 Slip Secs, 2 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
    2 Errored Secs, 0 Bursty Err Secs, 2 Severely Err Secs
    0 Unavailable Secs, 0 Stuffed Secs
    1 Path Failures, 2 SEF/AIS Secs
Far End
    0 Line Code Violations, 0 Path Code Violations
    0 Slip Secs, 2 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
    3 Errored Secs, 0 Bursty Err Secs, 3 Severely Err Secs
    0 Unavailable Secs 0 Path Failures
Total Data (last 1 15 minute intervals):
Near End
    0 Line Code Violations,0 Path Code Violations,
    0 Slip Secs, 2 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins,
    2 Errored Secs, 0 Bursty Err Secs, 2 Severely Err Secs
    0 Unavailable Secs, 0 Stuffed Secs
    1 Path Failures, 2 SEF/AIS Secs
Far End
    0 Line Code Violations,0 Path Code Violations
    0 Slip Secs, 2 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins,
    3 Errored Secs, 0 Bursty Err Secs, 3 Severely Err Secs
    0 Unavailable Secs, 0 Path Failures

```

Use **show controller t3 0/1/20 path** to verify DS3 CEP configuration:

```

rtr2#show controller t3 0/1/20 path

T3 0/1/20 PATH 1.

Asynchronous Mapping for DS3 into STS-1

TX : TDM to PSN direction
RX : PSN to TDM direction

Clock Source is internal

    AIS = 0          RDI = 0          REI = 349          BIP(B3) = 22
    LOP = 0          PSE = 0          NSE = 0           NEWPTR = 0
    LOM = 0          PLM = 0          UNEQ = 0

Active Defects: None
Detected Alarms: None
Asserted/Active Alarms: None
Alarm reporting enabled for: None

TCA threshold: B3 = 10e-6
Rx: C2 = FF
Tx: C2 = 01

Tx J1 Length : 64
Tx J1 Trace

    72 74 72 32 20 30 2F 31 2F 32 30 2E 31 00 00 00      rtr2 0/1/20.1...
    00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00      .....
    00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00      .....
    00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00      .....

Expected J1 Length : 64
Expected J1 Trace

    72 74 72 32 20 30 2F 31 2F 32 30 2E 31 00 00 00      rtr2 0/1/20.1...
    00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00      .....
    00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00      .....
    00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00      .....

PATH TRACE BUFFER : UNSTABLE

Rx J1 Length : 64
Rx J1 Trace

    72 73 70 32 20 30 2F 35 2F 31 32 2E 31 00 00 00      rsp2 0/5/12.1...
    00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00      .....
    00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00      .....
    00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00      .....

rtr2#

```



Note The verification output does not provide the alarm details.

show controllers t3 bert

To display BER test statistics, use the show controllers t3 bert command in user EXEC or privileged EXEC mode.

show controllers t3 *slot/subslot/port* [*/t1-number*] **bert**

| Syntax Description | slot | Chassis line card slot number. |
|--------------------|-----------|---|
| | subslot | Chassis line card subslot number. |
| | port | Interface number on the line card. |
| | t1-number | (Optional) Logical T1 interface number. |
| | bert | Displays BER test statistics. |

| Command Modes | User EXEC Privileged EXEC |
|---------------|------------------------------|
|---------------|------------------------------|

| Command History | Release | Modification |
|-----------------|------------|--|
| | 12.2(28)SB | This command was introduced on the Cisco 10000 series routers. |

Examples

The following example shows BER test statistics for an unchannelized T3 interface:

```
Router# show controllers t3 6/1/0 bert

T3 6/1/0 is up.
BERT test result (done)
Test Pattern : 2^15, Status : Not Sync, Sync Detected : 1
Interval : 5 minute(s), Time Remain : 0 minute(s)
Bit Errors (since BERT started): 0 bits,
Bits Received (since BERT started): 13025 Mbits
Bit Errors (since last sync): 0 bits
Bits Received (since last sync): 13025 Mbits
```

The following example shows BER test statistics for a channelized T3 interface:

```
Router# show controllers t3 6/1/0 bert

T3 6/1/0 is up.
BERT test result (running)
Test Pattern : 2^15, Status : Sync, Sync Detected : 1
Interval : 3 minute(s), Time Remain : 1 minute(s)
Bit Errors (since BERT started): 0 bits,
Bits Received (since BERT started): 5493 Mbits
Bit Errors (since last sync): 0 bits
Bits Received (since last sync): 5493 Mbits
```

The following example shows BER test statistics for a T1 interface:

```

Router# show controllers t3 6/1/1/1 bert

T3 6/1/1/1 is up. Hardware is C10K Half Height CT3 line card
T1 1
BERT test result (running)
Test Pattern : 2^15, Status : Sync, Sync Detected : 1
Interval : 5 minute(s), Time Remain : 5 minute(s)
Bit Errors (since BERT started): 0 bits,
Bits Received (since BERT started): 36 Mbits
Bit Errors (since last sync): 0 bits
Bits Received (since last sync): 36 Mbits

```

Related Commands

| Command | Description |
|------------------------|---|
| bert | Configures a BER test for an unchannelized or channelized T3 interface. |
| t1 bert pattern | Configures a BER test for a T1 interface. |

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 **showcontrollerstoken** command in privileged EXEC mode.

show controllers token

Syntax Description This command has no arguments or keywords.

Command Modes Privileged EXEC

| Command History | Release | Modification |
|-----------------|-------------|---|
| | 10.0 | This command was introduced. |
| | 11.3(3)T | The information was modified to include the PA-4R-FDX full-duplex Token Ring port adapter. |
| | 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |
| | 12.2SX | This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware. |

Usage Guidelines 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 **showcontrollerstoken** command displays is of primary use to Cisco technical personnel. Information that is useful to users can be obtained with the **showinterfacetokenring** command, which is described later in this chapter.

Examples

The following is sample output for the PA-4R-DTR from the **showcontrollerstoken** command. In this example, the current operating mode is classic Token Ring station.

```
Router# show controllers token
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
  Current operating mode:
    Classic token ring station
    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, txphtre: 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: 0000
  Ctrl ring state: 0001, Protocol join state: 0000
  Reserved: 0000, Protocol mon state: 0000

```

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

Table 14: show controllers token Field Descriptions

| Field | Description |
|--------------|---|
| Tokenring4/0 | Interface processor type, slot, and port. |

| Field | Description |
|------------------------|--|
| Last Ring Status | Last abnormal ring condition. Can be any of the following: <ul style="list-style-type: none"> • Signal Loss • HW Removal • Remote Removal • Counter Overflow • Only station • Ring Recovery |
| Current operating mode | Operating mode. Can be one of the following: <ul style="list-style-type: none"> • Classic token ring station (standard half-duplex Token Ring station) • DTR station (full-duplex Token Ring station) • DTR concentrator (concentrator port) |
| MAC state | The MAC state indicates the state of the Token Ring MAC layer protocol. Can be one of the following: <ul style="list-style-type: none"> • Not inserted (not connected to any ring) • Inserting (currently entering a ring) • Inserted (connected to an active Token ring) |

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 **showcontrollersvg-anylan** command in user EXEC or privileged EXEC mode.

Cisco 7200 Series

show controllers vg-anylan slot/port

Cisco 7500 Series with VIP Cards

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

Syntax Description

| | |
|-----------------------|---|
| <i>slot</i> | Slot number. Refer to the appropriate hardware manual for slot and port information. |
| <i>/ port</i> | Port number. Refer to the appropriate hardware manual for slot and port information. |
| <i>/ port-adapter</i> | Port adapter number. Refer to the appropriate hardware manual for information about port adapter compatibility. |

Command Modes

User EXEC Privileged EXEC

Command History

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

Usage Guidelines

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

Examples

The following is sample output from the **showcontrollersvg-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
xfrcr=0xC07E0080, rxcnt=0, txcnt=1F
Page 1 - MAC Address/Hash Table:
addr_low= 6009B9, addr_high=9B1809B9, hash bytes=06 00 20 00 00 00 00 00
Page 2 - Hardware Mapping:
mmmsw=0x3785, mmlsw=0x0000, bmreg =0x04
```

```
Page 4 - LAN Configuration:
tccnf1=0x00, tccnf2=0x01
vccnf=0x99, vtrrg=0x0020, valow1=0x0000, valow2=0x0000
maccr1=0xBE, maccr2=0x00, maccr3=0x04, maccr4=0x03
Page 5 - MMU Registers:
rx mem stop addr=0xFF03, tx mem stop addr=0xFF07
MC68852 PCI registers:
bus_no=6, device_no=0
CFID=0x0005101A, CFCS=0x02800005, CFRV=0x02000000, CFLT=0x0000F800
CBIO=0x00006001, CBMA=0x00000000, CFIT=0x20080100, CFDA=0x0000000C
Actel Hardware CAM Control Registers:
CAM DEVICE BASE: 0x3C300800 Register Address: 0x3C300C00
CSR: 0x8000 CAMCR: 0xFFFF
USAR: 0000 MSAR: 0000 LSAR: 0000
FIFO CR: 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 controllers wanphy

To display the SPA mode (LAN mode or WAN mode), alarms, and the J1 byte string value, use the **showcontrollerswanphy** command in Privileged EXEC mode.

show controllers wanphy slot/subslot/port

Syntax Description

| | |
|----------------|---|
| <i>slot</i> | The SIP slot number in which the Cisco 1-Port 10 Gigabit Ethernet LAN/WAN-PHY Shared Port Adapter has been installed. |
| <i>subslot</i> | The subslot number in which the Cisco 1-Port 10 Gigabit Ethernet LAN/WAN-PHY Shared Port Adapter has been installed. |
| <i>port</i> | The port number of the Cisco 1-Port 10 Gigabit Ethernet LAN/WAN-PHY Shared Port Adapter. Note There is only 1 port (0) in the Cisco 1-Port 10 Gigabit Ethernet LAN/WAN-PHY Shared Port Adapter. |

Command Default

No default values are available.

Command Modes

Privileged EXEC Mode (EXEC)

Command History

| Release | Modification |
|-----------------------------|---|
| Cisco IOS XE Release 3.3.0S | This command was introduced on the Cisco ASR 1000 Series Routers. |

Usage Guidelines

The **showcontrollerwanphy** command has been introduced on the Cisco ASR 1000 Series Router in Cisco IOS XE Release 3.3.0S. This command is used to display:

- LAN or WAN mode of operation in which the SPA is currently working
- Configured alarms and active alarms (if any)
- Remote J1 byte string value passed to check the connectivity from local SPA to the remote SPA
- SF-BER and SD-BER threshold values

Examples

The following example shows the output of **showcontrollerswanphy** command:

```
Router# show controllers wanphy 0/1/0
TenGigabitEthernet0/1/0
Mode of Operation: WAN Mode
SECTION
  LOF = 0                LOS    = 0                BIP(B1) = 0
LINE
  AIS = 0                RDI    = 0                FEBE = 0                BIP(B2) = 0
PATH
  AIS = 0                RDI    = 0                FEBE = 0                BIP(B3) = 0
  LOP = 0                NEWPTR = 0                PSE  = 0                NSE   = 0
WIS ALARMS
  SER    = 0                FELCDP = 0                FEAI SP = 0
```

```

WLOS   = 0           PLCD   = 0
LFEBIP = 0           PBEC   = 0
Active Alarms[All defects]: SWLOF LAIS PAIS SER
Active Alarms[Highest Alarms]: SWLOF
Alarm reporting enabled for: SF SWLOF B1-TCA B2-TCA PLOP WLOS
  Rx(K1/K2): 00/00  Tx(K1/K2): 00/00
  S1S0 = 00, C2 = 0x1A
PATH TRACE BUFFER: UNSTABLE
  Remote J1 Byte :
BER thresholds:  SD = 10e-6  SF = 10e-3
TCA thresholds:  B1 = 10e-6  B2 = 10e-6  B3 = 10e-6

```

Related Commands

| Command | Description |
|--------------------------------|---|
| clear controller wanphy | Clears the counter of alarms generated, and resets it back to zero. |

show controllers wlan-controller

To show the Cisco Wireless Local Area Network (WLAN) controller network module on the router, use the **showcontrollerswlan-controller** command in privileged EXEC mode.

show controllers wlan-controller slot/unit

| | |
|---------------------------|--|
| Syntax Description | slot/unit Specifies the router slot and unit numbers for the WLAN controller network module. |
|---------------------------|--|

Command Default None

Command Modes Privileged EXEC

| Command History | Release | Modification |
|------------------------|----------------|--|
| | 12.4(2)XA1 | This command was introduced on the router software. |
| | 12.4(6)T | This command was integrated into Cisco IOS Release 12.4(6)T. |

Examples

The following example shows how to display interface information for the WLAN controller network module:

```
Router# show controllers wlan-controllers 1/0
Interface wlan-controller1/0
Hardware is Intel 82559 FastEthernet
IDB: 67796B08, FASTSEND: 60E073CC, MCI_INDEX: 0

INSTANCE=0x67797BE8
  Rx Ring entries = 64
  Rx Shadow = 0x67797ED0
  Rx Ring = 0x2DCC1840
  Rx Ring Head = 5
  Rx Ring Last = 4
  Rx Buffer Descr = 0x2DCC3040
  Rx Buffer Descr Head = 5
  Rx Buffer Descr Last = 4
  Rx Shadow (malloc) = 0x67797ED0
  Rx Ring (malloc) = 0x2DCC1840
  Rx Buffer Descr (malloc) = 0x2DCC3040
  Tx Ring entries = 128
  Tx Shadow = 0x67798008
  Tx Shadow Head = 13
  Tx Shadow Tail = 13
  Tx Shadow Free = 128
  Tx Ring = 0x2DCFAA40
  Tx Head = 15
  Tx Last = 14
  Tx Tail = 15
  Tx Count = 0
  Tx Buffer Descr = 0x2DCF9080
  Tx Buffer Descr Head = 0
  Tx Buffer Descr Tail = 0
  Tx Shadow (malloc) = 0x67798008
  Tx Ring (malloc) = 0x2DCFAA40
```


Tx Buffer Descr (malloc) = 0x2DCF9080

CONTROL AND STATUS REGISTERS (CSR)=0x4B000000

SCB Intr Mask = 00
 SCB CU/RU Cmd = 00
 SCB Intr Status = 00
 SCB CU Status = 01
 SCB RU Status = 04
 SCB General Ptr = 00000000
 PORT = 00000000
 EEPROM = 0008
 FLASH = 0002
 MDI = 1821782D
 Rx Byte Count = 00000608
 PMDR = 80
 FC Cmd = 00
 FC Threshold = 03
 Early Rx = 00
 General Status = 07
 General Control = 00

PHY REGISTERS

| | | | | | | | | |
|----------------|------|------|------|------|------|------|------|------|
| Register 0x00: | 1000 | 782D | 02A8 | 0154 | 0501 | 45E1 | 0003 | 0000 |
| Register 0x08: | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 | 0000 |
| Register 0x10: | 0203 | 0000 | 0001 | 0000 | 0000 | 0000 | 0000 | 0000 |
| Register 0x18: | 0001 | 0000 | 8B10 | 0000 | 0000 | 0000 | 0000 | 0000 |

HARDWARE STATISTICS

Rx good frames: 69
 Rx CRC: 0
 Rx alignment: 0
 Rx resource: 0
 Rx overrun: 0
 Rx collision detects: 0
 Rx short: 0
 Tx good frames: 13
 Tx maximum collisions: 0
 Tx late collisions: 0
 Tx underruns: 0
 Tx lost carrier sense: 0
 Tx deferred: 0
 Tx single collisions: 0
 Tx multiple collisions: 0
 Tx total collisions: 0
 FC Tx pause: 0
 FC Rx pause: 0
 FC Rx unsupported: 0

INTERRUPT STATISTICS

CX = 468239
 FR = 2393445
 CNA = 0
 RNR = 0
 MDI = 0
 SWI = 0
 FCP = 0

Receive All Multicasts = enabled
 Receive Promiscuous = disabled
 Loopback Mode = disabled

Module Reset Statistics:
 CLI reset count = 0

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

show counters interface

To display the information about the interface counter, use the **showcountersinterface** command in user EXEC or privileged EXEC mode.

show counters interface *type mod/port* [**delta**]

| Syntax Description | | |
|--------------------|--|--|
| <i>type</i> | Interface type; possible valid values are ethernet , fastethernet , gigabitethernet , tengigabitethernet , port-channel , pos , atm , null , tunnel , and ge-wan | |
| <i>mod / port</i> | Module and port number. | |
| <i>delta</i> | (Optional) Displays the interface counters values since the last clearcounters command. | |

Command Default This command has no default settings.

Command Modes User EXEC Privileged EXEC

| Command History | Release | Modification |
|-----------------|--------------|---|
| | 12.2(14)SX | Support for this command was introduced on the Supervisor Engine 720. |
| | 12.2(17d)SXB | Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB. |
| | 12.2(18)SXE | This command was changed to support the delta keyword on the Supervisor Engine 720 only. |
| | 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |

Usage Guidelines The **showcountersinterface** command is not supported on SVIs.

The **showcountersinterfacedelta** command displays a detailed list of the last-saved counter values.

Examples

This example shows how to display the information about the interface counter:

```
Router# show counters interface fastethernet 5/2
64 bit counters:
 0. rxHCTotalPkts = 1
 1. txHCTotalPkts = 1
 2. rxHCUnicastPkts = 0
 3. txHCUnicastPkts = 0
 4. rxHCMulticastPkts = 0
 5. txHCMulticastPkts = 0
 6. rxHCBroadcastPkts = 1
 7. txHCBroadcastPkts = 1
 8. rxHCOctets = 78
 9. txHCOctets = 78
10. rxTxHCPkts64Octets = 0
11. rxTxHCPkts65to127Octets = 2
12. rxTxHCPkts128to255Octets = 0
13. rxTxHCPkts256to511Octets = 0
14. rxTxHCPkts512to1023Octets = 0
```

show counters interface

```

15.          rxTxHCPkts1024to1518Octets = 0
16.          txHCTrunkFrames = 0
17.          rxHCTrunkFrames = 0
18.          rxHCDropEvents = 0
32 bit counters:
0.          rxCRCAAlignErrors = 0
1.          rxUndersizedPkts = 0
2.          rxOversizedPkts = 0
3.          rxFragmentPkts = 0
4.          rxJabbers = 0
5.          txCollisions = 0
6.          ifInErrors = 0
7.          ifOutErrors = 0
8.          ifInDiscards = 0
9.          ifInUnknownProtos = 0
10.         ifOutDiscards = 0
11.         txDelayExceededDiscards = 0
12.         txCRC = 0
13.         linkChange = 1
14.         wrongEncapFrames = 0
All Port Counters
1.          InPackets = 1
2.          InOctets = 78
3.          InUcastPkts = 0
4.          InMcastPkts = 0
5.          InBcastPkts = 1
6.          OutPackets = 1
7.          OutOctets = 78
8.          OutUcastPkts = 0
9.          OutMcastPkts = 0
10.         OutBcastPkts = 1
11.         AlignErr = 0
12.         FCSErr = 0
13.         XmitErr = 0
14.         RcvErr = 0
15.         UnderSize = 0
16.         SingleCol = 0
17.         MultiCol = 0
18.         LateCol = 0
19.         ExcessiveCol = 0
20.         CarrierSense = 0
21.         Runts = 0
22.         Giants = 0
23.         InDiscards = 0
24.         OutDiscards = 0
25.         InErrors = 0
26.         OutErrors = 0
27.         TrunkFramesTx = 0
28.         TrunkFramesRx = 0
29.         WrongEncap = 0
30.         Broadcast_suppression_discards = 0
31.         Multicast_suppression_discards = 0
32.         Unicast_suppression_discards = 0
33.         rxTxHCPkts64Octets = 0
34.         rxTxHCPkts65to127Octets = 2
35.         rxTxHCPkts128to255Octets = 0
36.         rxTxHCPkts256to511Octets = 0
37.         rxTxHCPkts512to1023Octets = 0
38.         rxTxHCPkts1024to1518Octets = 0
39.         DropEvents = 0
40.         CRCAAlignErrors = 0
41.         UndersizedPkts = 0
42.         OversizedPkts = 0
43.         FragmentPkts = 0

```

```

44.                Jabbers = 0
45.                Collisions = 0
46.      DelayExceededDiscards = 0
47.                bpduOutlost = 0
48.                qos0Outlost = 0
49.                qos1Outlost = 0
50.                qos2Outlost = 0
51.                qos3Outlost = 0
52.      bpduCbicOutlost = 0
53.      qos0CbicOutlost = 0
54.      qos1CbicOutlost = 0
55.      qos2CbicOutlost = 0
56.      qos3CbicOutlost = 0
57.      bpduInlost = 0
58.      qos0Inlost = 0
59.      qos1Inlost = 0
60.      qos2Inlost = 0
61.      qos3Inlost = 0
62.      qos4Inlost = 0
63.      qos5Inlost = 0
64.      qos6Inlost = 0
65.      qos7Inlost = 0
66.      pqueInlost = 0
67.      Overruns = 0
68.      maxIndex = 0
Router#

```

This example shows how to display the values for the interface counters since the last **clearcounters** command:

```

Router# show counters interface gigabitethernet 5/2 delta

Time since last clear
-----
1d08h
64 bit counters:
0. rxHCTotalPkts = 508473
1. txHCTotalPkts = 2366
2. rxHCUnicastPkts = 411611
3. txHCUnicastPkts = 193
4. rxHCMulticastPkts = 81868
5. txHCMulticastPkts = 2155
6. rxHCBroadcastPkts = 14994
7. txHCBroadcastPkts = 18
8. rxHCOctets = 36961992
.
.
.
Router#

```

Related Commands

| Command | Description |
|-----------------------|--------------------------------|
| clear counters | Clears the interface counters. |

show diag

To display hardware and diagnostic information for a networking device, line card, processor, jacket card, chassis, or network module, use the **show diag** command in privileged EXEC mode.

show diag [*slot-number*] [**details** | **summary**]

Cisco 7304 Router

show diag [*slot-number* | **chassis** | **subslot** *slot/subslot*] [**details** | **summary**]

Shared Port Adapters

show diag [**subslot** *slot/subslot*] [**details** | **summary**]

Network Module

show diag [*slot-number*]

Cisco 10000 Series Router

show diag [*slot/subslot*] [**details** | **summary**] [**crashdump**]

Cisco uBR10012 Universal Broadband Router

show diag [*slot/subslot* | *slot/subslot/port*] **summary**]

Cisco uBR7225VXR and Cisco uBR7246VXR Universal Broadband Routers

show diag *slot*

Cisco ASR 1000 Series Aggregation Services Routers

show diag [**all** | **chassis** | **slot** | **subslot**] **eprom**

Cisco 4400 Series Integrated Services Router

show diag [**all** | **chassis** | **slot** | **subslot**] **eprom**

Syntax Description

| | |
|--------------------|--|
| <i>slot-number</i> | (Optional) Slot number of the interface. If a slot number is not specified, diagnostic information for all slots is displayed. |
| details | (Optional) Displays more details than the normal show diag output. |
| summary | (Optional) Displays a summary (one line per slot) of the chassis. |
| chassis | (Optional) Specifies the display of diagnostic information about the backplane, power supplies, and fan modules. |

| | |
|---|--|
| <p>subslot <i>slot / subslot</i></p> | <p>(Optional) Shared Port Adapters</p> <p>Specifies the display of diagnostic information about the shared port adapter (SPA), where:</p> <ul style="list-style-type: none"> • <i>slot</i> --Chassis slot number. <p>See the appropriate hardware manual for slot information. For SPA interface processor (SIP), refer to the platform-specific SPA hardware installation guide or the corresponding “Identifying Slots and Subslots for SIPs and SPAs” topic in the platform-specific SPA software configuration guide.</p> <ul style="list-style-type: none"> • <i>subslot</i> --Secondary slot number on a SIP where a SPA is installed. <p>See the platform-specific SPA hardware installation guide and the corresponding “Specifying the Interface Address on a SPA” topic in the platform-specific SPA software configuration guide for subslot information.</p> <p>(Optional) Specifies subslot location information for the connected network modules and interfaces.</p> |
| <p><i>slot / subslot/port</i></p> | <p>(Optional) Cisco uBR10012 Universal Broadband Router</p> <p>Displays diagnostic information about the specified line card, where:</p> <ul style="list-style-type: none"> • <i>slot</i> --Slot number of the line card in the uBR10012 router. The range is 0 to 8. • <i>subslot</i> --Subslot of the half-height line card in the uBR10012 router. The value is either 0 or 1. • <i>port</i> --Port number on the cable interface. Valid values are 0 to 4 (depending on the cable interface). |
| <p><i>slot</i></p> | <p>(Optional) Cisco uBR7225VXR and Cisco uBR7246VXR Universal Broadband Routers</p> <p>Displays diagnostic information about the specified line card, where:</p> <ul style="list-style-type: none"> • <i>slot</i> --Slot number of the line card in the Cisco uBR7225VXR or Cisco uBR7246VXR router. <p>Cisco uBR7246VXR router: The range is 3 to 6. Cisco uBR7225VXR router: The range is 1 to 2.</p> |
| <p>all</p> | <p>(Optional) Displays all diagnostic information related to EEPROM.</p> |

Command Modes Privileged EXEC (#)

| Command History | Release | Modification |
|-----------------|---------|--|
| | 11.1CA | This command was introduced. |
| | 11.2 | This command was integrated into Cisco IOS Release 11.2. |

| Release | Modification |
|------------|---|
| 11.2P | This command output was modified for the PA-12E/2FE port adapter, PA-E3 port adapter, and PA-T3 port adapter. |
| 11.2GS | This command was implemented on the Cisco 12000 series Internet router. |
| 11.3 XA | This command was integrated in Cisco IOS Release 11.3 XA. |
| 12.0 | This command was implemented on the Cisco AS5300. |
| 12.0(5)XQ | This command was implemented on the Cisco 1750 router. |
| 12.0(7)T | This command was integrated into Cisco IOS Release 12.0(7)T. |
| 12.1(9)EX | This command was introduced on the Cisco 7300 series routers, and the <i>slot-number</i> argument and chassis keyword were added. |
| 12.1(10)EX | This command was enhanced to display information about Field-Programmable Gate Array (FPGA) image versions on installed NSEs and line cards on Cisco 7304 routers. |
| 12.2(11)YZ | Support was added for the 7300-CC-PA. |
| 12.2(8)T | This command was implemented for AIC and WIC cards on the Cisco 2600 series routers and the Cisco 3600 series routers. |
| 12.2(13)T | This command was implemented for the AIM-VPN/EPII and AIM-VPN/HPII cards on the Cisco 2691, Cisco 3660, Cisco 3725, and Cisco 3745 routers. |
| 12.2(15)ZJ | This command was implemented for the AIM-VPN/BPII card on the Cisco 2610XM, Cisco 2611XM, Cisco 2620XM, Cisco 2621XM, Cisco 2650XM, and Cisco 2651XM routers. |
| 12.2(18)S | This command was integrated into Cisco IOS Release 12.2(18)S and implemented on the Cisco 7304 router. |
| 12.3(4)T | Support for the AIM-VPN/BPII card on the Cisco 2600XM series was integrated into Cisco IOS Release 12.3(4)T. |
| 12.2(20)S2 | This command was integrated into Cisco IOS Release 12.2(20)S2 and the subslotslotsubslot keyword and arguments were added to support SPAs on the Cisco 7304 router. |
| 12.0(31)S | This command was integrated into Cisco IOS Release 12.0(31)S and the subslotslotsubslot keyword and arguments were added to support SIPs and SPAs on the Cisco 12000 series Internet router. |
| 12.4(4)T | This command was implemented for the HWIC-1ADSL and HWIC-1ADSLI interface cards on the following platforms: Cisco 1800 (modular) series, Cisco 2800 series, and Cisco 3800 series routers. |
| 12.4(9)T | This command was implemented for the NME-AON-K9= enhanced network module on the following platforms: Cisco 2811, Cisco 2821, Cisco 2851, Cisco 3725, and Cisco 3745 routers. |

| Release | Modification |
|-------------|--|
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |
| 12.2SX | This command is supported in the Cisco IOS Release 12.2SX train. Support in a specific 12.2SX release of this train depends on your feature set, platform, and platform hardware. |
| 12.2(33)SB | This command was enhanced with a crashdump option to enable you to display crashdump files collected on the SIP. This was implemented on the Cisco 10000 series router for the PRE3 and PRE4. |
| 12.2(33)SCC | The output for this command was modified to display the diagnostic mode for the Cisco uBR10-MC5X20H cable interface line card on the uBR10012 router, when the field diagnostic image is loaded. |
| 12.2(33)SCD | This command was modified. Support was added for the Cisco uBR7225VXR and Cisco uBR7246VXR routers. |
| 12.2(33)XNE | This command was modified. The all keyword was added. |
| 12.2(33)SCG | This command was modified. The output was modified to display all hardware and EEPROM information, including PID and PCB information for the Cisco uBR10-MC5X20H cable interface line card on the Cisco uBR10012 router. |
| IOS XE 3.9S | This command was integrated into Cisco IOS XE Release 3.9S. |

Usage Guidelines

Use this command to determine the type of hardware installed in your router and to show detailed hardware information and EEPROM version information.

This command displays information for the motherboard, WAN interface cards (WICs), voice interface cards (VICs), high-speed WICs (HWICs), ATM interface cards (AICs), advanced integration modules (AIMs), port adapters, shared port adapters (SPAs), modular services cards (MSCs), SPA interface processors (SIPs), and enhanced network modules (NME).

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

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

Shared Port Adapter Usage Guidelines

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

Cisco 10000 Series Router Usage Guidelines

The **crashdump** keyword of the **show diag** command enables you to display any crashdump files collected on the SIP. The SIP stores the crashdump files by a reference number from 1 to 60.

To view a crashdump file, do the following:

1. Determine the most recent crashdump number:
 - a. Enter the show diag slot/subslot command.
 - b. Look for the latest crashdump number in the following section of the command output:

```
Number of crashdumps : output number
```

- c. Enter the following command to view the crashdump file:

```
show diag slot/subslot crashdump number
```



Note The subslot value is always zero for the SIP.

Cisco uBR10012 Router Usage Guidelines

- In the command syntax, the argument *slot/subslot* refers to a half-height line-card on the Cisco uBR10012 Router.
- This command applies to all cable interface line cards. The output for this command additionally displays the diagnostic mode when the Cisco uBR10-MC5X20H line card is enabled with the Field Diagnostic image.

Examples

1-Port T3 Serial Port Adapter: Example

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

```
Router# show diag 1

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

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

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

Controller Memory Size: 16 MBytes DRAM, 1024 KBytes SRAM

PA Bay 0 Information:
  T3 Serial PA, 1 ports
```

```
EEPROM format version 1
HW rev FF.FF, Board revision UNKNOWN
Serial number: 4294967295 Part number: 255-65535-255
```

Cisco 12000 Series Internet Router: Example

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

```
Router# show diag 3

SLOT 3 (RP/LC 3 ): 4 Port Packet Over SONET OC-3c/STM-1 Multi Mode
  MAIN: type 33, 00-0000-00 rev 70 dev 0
        HW config: 0x01 SW key: 00-00-00
  PCA: 73-2147-02 rev 94 ver 2
        HW version 1.0 S/N 04499695
  MBUS: MBUS Agent (1) 73-2146-05 rev 73 dev 0
        HW version 1.1 S/N 04494882
        Test hist: 0x00 RMA#: 00-00-00 RMA hist: 0x00
  DIAG: Test count: 0x05000001 Test results: 0x00000000

MBUS Agent Software version 01.27 (RAM) using CAN Bus A
ROM Monitor version 00.0D
Fabric Downloader version used 00.0D (ROM version is 00.0D)
Board is analyzed
Board State is Line Card Enabled (IOS RUN )
Insertion time: 00:00:10 (00:04:51 ago)
DRAM size: 33554432 bytes
FrFab SDRAM size: 67108864 bytes
ToFab SDRAM size: 16777216 bytes
```

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

```
Router# show diag summary

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

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

```
Router# show diag 4 details

SLOT 4 (RP/LC 4 ): 4 Port Packet Over SONET OC-3c/STM-1 Single Mode
  MAIN: type 33, 800-2389-01 rev 71 dev 16777215
        HW config: 0x00 SW key: FF-FF-FF
  PCA: 73-2275-03 rev 75 ver 3
        HW version 1.1 S/N 04529465
```

```

MBUS: MBUS Agent (1) 73-2146-06 rev 73 dev 0
      HW version 1.1 S/N 04541395
      Test hist: 0xFF RMA#: FF-FF-FF RMA hist: 0xFF
DIAG: Test count: 0x05000001 Test results: 0x00000000

```

```

EEPROM contents (hex):
00: 01 00 01 00 49 00 08 62 06 03 00 00 00 FF FF FF
10: 30 34 35 34 31 33 39 35 FF FF FF FF FF FF FF FF
20: 01 01 00 00 00 00 00 FF FF FF FF FF FF FF FF
30: A5 FF A5 A5 A5 A5 FF A5 A5 A5 A5 A5 A5 A5 A5
40: 00 21 01 01 00 49 00 08 E3 03 05 03 00 01 FF FF
50: 03 20 00 09 55 01 01 FF FF FF 00 FF FF FF FF FF
60: 30 34 35 32 39 34 36 35 FF FF FF FF FF FF FF FF
70: FF FF FF FF FF FF FF FF 05 00 00 01 00 00 00 00

```

```

MBUS Agent Software version 01.24 (RAM)
Fabric Downloader version 00.0D
Board is analyzed
Flags: 0x4
Board State is Line Card Enabled (IOS RUN)
Insertion time: 00:00:10 (00:04:51 ago)
DRAM size: 33554432 bytes
FrFab SDRAM size: 67108864 bytes
ToFab SDRAM size: 16777216 bytes

```

ATM SAR AIM in a Cisco 3660: Example

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

```

Router# show diag 0

3660 Chassis type: ENTERPRISE

c3600 Backplane EEPROM:
Hardware Revision      : 1.0
Top Assy. Part Number  : 800-04740-02
.
.
.

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

```

NM-AIC-64 Installed in a Cisco 2611: Example

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

```

Router# show diag

```

```

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

```

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

The table below describes significant fields shown in the display.

Table 15: show diag (AIC) Field Descriptions

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

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

AIM-VPN in a Cisco 2611XM: Example

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

```
Router# show diag 0
```

```
Encryption AIM 1:
```

```
Hardware Revision :1.0
```

```
Top Assy. Part Number :800-03700-01
```

```
Board Revision :A0
```

```
Deviation Number :0-0
```

```
Fab Version :02
```

```
PCB Serial Number :JAB9801ABCD
```

```
RMA Test History :00
```

```
RMA Number :0-0-0-0
```

```
RMA History :00
```

```
EEPROM format version 4
```

```
EEPROM contents (hex):
```

```
0x00:04 FF 40 03 0B 41 01 00 C0 46 03 20 00 0E 74 01
```

```
0x10:42 41 30 80 00 00 00 00 02 02 C1 8B 4A 41 42 39
```

```
0x20:38 30 31 41 42 43 44 03 00 81 00 00 00 00 04 00
```

```
0x30:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
```

```
0x40:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
```

```
0x50:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
```

```
0x60:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
```

0x70:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

The table below describes significant fields shown in the display.

Table 16: show diag (AIM-VPN) Field Descriptions

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

MSC-100 on the Cisco 7304 Router: Example

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

```
Router# show diag 4
```

```
Slot 4:
```

```
7304-MSC-100 SPA Carrier Card Line Card
Line Card state: Active
Insertion time: 00:08:49 ago
Bandwidth points: 4000000
EEPROM contents at hardware discovery:
Hardware Revision      : 0.18
Boot Time out         : 0000
PCB Serial Number     : CSJ07288905
Part Number           : 73-8789-01
Board Revision        : A0
Fab Version           : 02
RMA Test History      : 00
RMA Number            : 0-0-0-0
RMA History           : 00
Deviation Number      : 0-0
Product Number        : 7304-MSC-100
Top Assy. Part Number : 68-1163-04
Manufacturing Test Data : 00 00 00 00 00 00 00 00
Field Diagnostics Data : 00 00 00 00 00 00 00 00
Calibration Data      : Minimum: 0 dBmV, Maximum: 0 dBmV
```

```

Calibration values :
EEPROM format version 4

EEPROM contents (hex):
0x00: 04 FF 40 04 50 41 00 12 46 00 00 C1 8B 43 53 4A
0x10: 30 37 32 38 38 39 30 35 82 49 22 55 01 42 41 30
0x20: 02 02 03 00 81 00 00 00 00 04 00 80 00 00 00 00
0x30: CB 94 37 33 30 34 2D 4D 53 43 2D 31 30 30 20 20
0x40: 20 20 20 20 20 20 20 87 44 04 8B 04 C4 08 00 00 00
0x50: 00 00 00 00 00 C5 08 00 00 00 00 00 00 00 00 C8
0x60: 09 00 00 00 00 00 00 00 00 00 00 C7 7C F6 44 3F 30
0x70: 00 00 00 00 00 00 00 00 00 00 00 00 02 EE FF C8
0x80: C8 37 26 05 DC 64 28 1E 37 26 09 C4 64 32 28 32
0x90: DD 0C E4 64 32 28 43 24 2E E0 AA 82 64 F4 24 00
0xA0: 00 00 00 00 00 00 F0 2E FF FF FF FF FF FF FF FF
0xB0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0xC0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0xD0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0xE0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0xF0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x100: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x110: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x120: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x130: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x140: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x150: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x160: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x170: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x180: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x190: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x1A0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x1B0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x1C0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x1D0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x1E0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x1F0: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

```

```

FPGA information:
Current FPGA version      : 00.23
IOS bundled FPGA version : 00.23
CPLD version              : 01.02

```

```

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

```

NSE-100 on the Cisco 7304 Router: Example

The following example displays diagnostic information about the NSE-100 in slot 0 of a Cisco 7304 router:

```

Router# show diag 0

Slot 0/1:
  NSE Card state:Primary
  Insertion time:00:03:47 ago
C7300 NSE Mainboard EEPROM:
  Hardware Revision      :2.3

```



```

PCB Serial Number      :CAB0532JYYT
Part Number            :73-5198-02
Board Revision         :A0
Fab Version            :02
RMA Test History       :00
RMA Number             :0-0-0-0
RMA History            :00
Deviation Number       :0-0
Product Number         :7300-NSE-100
Top Assy. Part Number  :68-1002-02
Manufacturing Test Data :00 00 00 00 00 00 00 00
Field Diagnostics Data :00 00 00 00 00 00 00 00
Calibration Data       :Minimum:0 dBmV, Maximum:0 dBmV
    Calibration values :
EEPROM format version 4
    
```

```

EEPROM contents (hex):
0x00:04 FF 40 02 8B 41 02 03 C1 8B 43 41 42 30 35 33
0x10:32 4A 59 59 54 82 49 14 4E 02 42 41 30 02 02 03
0x20:00 81 00 00 00 00 04 00 80 00 00 00 00 CB 94 37
0x30:33 30 30 2D 4E 53 45 2D 31 30 30 20 20 20 20 20
0x40:20 20 20 87 44 03 EA 02 C4 08 00 00 00 00 00 00
0x50:00 00 C5 08 00 00 00 00 00 00 00 00 00 C8 09 00 00
0x60:00 00 00 00 00 00 00 C7 7C F6 44 3F 30 F6 44 3F
0x70:30 F6 44 3F 30 00 00 00 00 07 08 64 32 28 37 26
0x80:09 C4 5A 32 28 32 DD 0C E4 5A 2D 23 43 24 13 88
0x90:64 32 28 65 BA 2E E0 AA 82 64 F4 24 00 00 00 00
0xA0:00 00 00 EF 1C FF FF FF FF FF FF FF FF FF FF FF
0xB0:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0xC0:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0xD0:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0xE0:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0xF0:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
    
```

C7300 NSE Daughterboard EEPROM:

```

Hardware Revision      :2.0
PCB Serial Number      :CAB0533K3PP
Part Number            :73-5673-03
Board Revision         :A0
Fab Version            :03
RMA Test History       :00
RMA Number             :0-0-0-0
RMA History            :00
Deviation Number       :0-0
Product Number         :7300-NSE-100
Top Assy. Part Number  :68-1002-02
Manufacturing Test Data :00 00 00 00 00 00 00 00
Field Diagnostics Data :00 00 00 00 00 00 00 00
Calibration Data       :Minimum:0 dBmV, Maximum:0 dBmV
    Calibration values :
EEPROM format version 4
    
```

```

EEPROM contents (hex):
0x00:04 FF 40 02 8C 41 02 00 C1 8B 43 41 42 30 35 33
0x10:33 4B 33 50 50 82 49 16 29 03 42 41 30 02 03 03
0x20:00 81 00 00 00 00 04 00 80 00 00 00 00 CB 94 37
0x30:33 30 30 2D 4E 53 45 2D 31 30 30 20 20 20 20 20
0x40:20 20 20 87 44 03 EA 02 C4 08 00 00 00 00 00 00
0x50:00 00 C5 08 00 00 00 00 00 00 00 00 00 C8 09 00 00
0x60:00 00 00 00 00 00 00 C7 7C F6 44 3F 30 00 00 00
0x70:00 00 00 00 00 00 00 00 00 06 72 64 1E 1C 37 26
0x80:07 08 64 32 28 37 26 00 00 00 00 00 00 00 00 00
0x90:00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0xA0:00 00 00 FB BA FF FF FF FF FF FF FF FF FF FF FF
0xB0:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
    
```

```

0xC0:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0xD0:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0xE0:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0xF0:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

FPGA information:
  Current NSE MB FPGA version      :0.3
  IOS bundled NSE MB FPGA version  :0.12
  Current NSE DB FPGA version      :0.3
  IOS bundled NSE DB FPGA version  :0.10
Fault History Buffer:
7300 Software (C7300-IS-M), Experimental Version 12.1(20011206:191841) [user-ws1 179]
Compiled Tue 29-Jan-02 08:10 by
Signal = 22, Code = 0x0, Uptime 00:00:48
$0 :FFFFFFFF, AT :47001098, v0 :10020028, v1 :0000006F
a0 :A0000000, a1 :00000005, a2 :00000001, a3 :10020028
t0 :00000028, t1 :3401E101, t2 :34018100, t3 :FFFF00FF
t4 :40332E68, t5 :43204650, t6 :70646174, t7 :69707065
s0 :FFFFFFFF, s1 :FFFFFFFF, s2 :FFFFFFFF, s3 :FFFFFFFF
s4 :FFFFFFFF, s5 :FFFFFFFF, s6 :FFFFFFFF, s7 :FFFFFFFF
t8 :00000000, t9 :00000000, k0 :3041D001, k1 :30410000
gp :FFFFFFFF, sp :41AA8F20, s8 :FFFFFFFF, ra :4036B6A4
EPC :4036B69C, SREG :3401E103, Cause :FFFFFFFF
Error EPC :FFFFFFFF, BadVaddr :FFFFFFFF

ROMMON Last Error Info:
count:19, reason:reset
pc:0x4020BFBC, error address:0x00000000
Stack Trace:
FP:0x00000000, PC:0x00000000
FP:0x00000000, PC:0x00000000

```

Shared Port Adapters on the Cisco 7304 Router: Example

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

```

Router# show diag subslot 4/1

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

```

```

CLEI Code           : CNS9420AAA
Base MAC Address    : 0000.0000.0000
MAC Address block size : 1024
Manufacturing Test Data : 00 00 00 00 00 00 00 00
Field Diagnostics Data : 00 00 00 00 00 00 00 00
Field Diagnostics Data : 00 00 00 00 00 00 00 00
                     : 00 00 00 00 00 00 00 00
                     : 00 00 00 00 00 00 00 00
                     : 00 00 00 00 00 00 00 00
                     : 00 00 00 00 00 00 00 00
                     : 00 00 00 00 00 00 00 00
                     : 00 00 00 00 00 00 00 00
                     : 00 00 00 00 00 00 00 00
                     : 00 00 00 00 00 00 00 00
                     : 00 00 00 00
Calibration Data    : Minimum: 0 dBmV, Maximum: 0 dBmV
  Calibration values :
Power Consumption    : 160000mW max
  Mode 1 : 0mW
  Mode 2 : 0mW
  Mode 3 : 0mW
EEPROM format version 4
EEPROM contents (hex):
0x00: 04 FF 40 04 35 41 01 00 46 01 90 C1 8B 4A 41 42
0x10: 30 37 33 32 30 34 47 35 82 49 22 0D 03 8A 30 31
0x20: 20 20 02 02 03 00 81 00 00 00 00 04 00 88 00 00
0x30: 00 00 CB 94 53 50 41 2D 34 46 45 2D 37 33 30 34
0x40: 20 20 20 20 20 20 20 20 89 56 30 31 20 87 44 08
0x50: 85 01 8A 41 30 20 20 C6 8A 43 4E 53 39 34 32 30
0x60: 41 41 41 CF 06 00 00 00 00 00 00 43 04 00 C4 08
0x70: 00 00 00 00 00 00 00 00 C5 08 00 00 00 00 00 00
0x80: 00 00 F4 00 64 00 00 00 00 00 00 00 00 00 00 00
0x90: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0xA0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0xB0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0xC0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0xD0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0xE0: 00 00 00 00 00 00 00 00 00 00 C8 09 00 00 00 00
0xF0: 00 00 00 00 D7 08 3E 80 00 00 00 00 00 00 F3 00
0x100: 41 01 08 F6 48 43 34 F6 49 44 35 02 31 04 B0 B4
0x110: A0 8C 00 00 05 DC 64 46 32 00 00 07 08 64 46 32
0x120: 00 00 09 C4 64 46 32 00 00 0C E4 64 46 32 00 00
0x130: 00 00 00 00 00 00 00 00 00 00 00 00 00 FE 02
0x140: F2 A6 FF FF FF FF FF FF FF FF FF FF FF FF FF
0x150: CC A0 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x160: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x170: 00 00 D4 A0 00 00 00 00 00 00 00 00 00 00 00 00
0x180: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x190: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x1A0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x1B0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x1C0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x1D0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x1E0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x1F0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
FPGA version:
Software version : 04.17
Hardware version : 04.17

```

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

```
Router# show diag subslot 4/0

Subslot 4/0:
Shared port adapter: SPA-2GE-7304, 2 ports
Info: hw-ver=0x17, sw-ver=0x0 fpga-ver=0x0
State: ok
Insertion time: 00:08:47 ago
Bandwidth: 2000000 kbps
EEPROM contents:
Hardware Revision : 0.23
Boot Time out : 0190
PCB Serial Number : JAB073406YH
Part Number : 73-8792-02
73/68 Level Revision : 01
Fab Version : 02
RMA Test History : 00
RMA Number : 0-0-0-0
RMA History : 00
Deviation Number : 0
Product Number : SPA-2GE-7304
Product Version Id : V01
Top Assy. Part Number : 68-2181-01
73/68 Level Revision : A0
CLEI Code : CNS9420AAA
Base MAC Address : 0000.0000.0000
MAC Address block size : 1024

Manufacturing Test Data : 00 00 00 00 00 00 00 00
Field Diagnostics Data : 00 00 00 00 00 00 00 00
Field Diagnostics Data : 00 00 00 00 00 00 00 00
                        00 00 00 00 00 00 00 00
                        00 00 00 00 00 00 00 00
                        00 00 00 00 00 00 00 00
                        00 00 00 00 00 00 00 00
                        00 00 00 00 00 00 00 00
                        00 00 00 00 00 00 00 00
                        00 00 00 00 00 00 00 00
                        00 00 00 00 00 00 00 00
                        00 00 00 00 00 00 00 00
                        00 00 00 00 00 00 00 00
                        00 00 00 00 00 00 00 00
                        00 00 00 00 00 00 00 00
                        00 00 00 00

Calibration Data : Minimum: 0 dBmV, Maximum: 0 dBmV
Calibration values :
Power Consumption : 160000mW max
Mode 1 : 0mW
Mode 2 : 0mW
Mode 3 : 0mW

EEPROM format version 4
EEPROM contents (hex):
0x00: 04 FF 40 04 36 41 00 17 46 01 90 C1 8B 4A 41 42
0x10: 30 37 33 34 30 36 59 48 82 49 22 58 02 8A 30 31
0x20: 20 20 02 02 03 00 81 00 00 00 00 04 00 88 00 00
0x30: 00 00 CB 94 53 50 41 2D 32 47 45 2D 37 33 30 34
0x40: 20 20 20 20 20 20 20 20 89 56 30 31 20 87 44 08
0x50: 85 01 8A 41 30 20 20 C6 8A 43 4E 53 39 34 32 30
0x60: 41 41 41 CF 06 00 00 00 00 00 00 43 04 00 C4 08
```

```

0x70: 00 00 00 00 00 00 00 00 00 C5 08 00 00 00 00 00 00
0x80: 00 00 F4 00 64 00 00 00 00 00 00 00 00 00 00 00
0x90: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0xA0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0xB0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0xC0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0xD0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0xE0: 00 00 00 00 00 00 00 00 00 00 C8 09 00 00 00 00
0xF0: 00 00 00 00 00 D7 08 3E 80 00 00 00 00 00 00 F3 00
0x100: 41 01 08 F6 48 43 34 F6 49 44 35 02 31 03 E8 B4
0x110: A0 8C 37 26 05 DC 64 46 32 37 26 07 08 64 46 32
0x120: 37 26 09 C4 64 46 32 32 DD 0C E4 64 46 32 43 24
0x130: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 FE 02
0x140: EF E2 FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x150: CC A0 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x160: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x170: 00 00 D4 A0 00 00 00 00 00 00 00 00 00 00 00 00
0x180: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x190: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x1A0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x1B0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x1C0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x1D0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x1E0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x1F0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
    
```

```

FPGA version:
Software version : 04.17
Hardware version : 04.17
    
```

Shared Port Adapter on a Cisco 12000 Series Internet Router: Example

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

```

Router# show diag subslot 1/1

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

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

Table 17: show diag subslot Field Descriptions for Cisco 12000 Series Internet Routers

| Field | Description |
|--------------------------|---|
| Product Identifier (PID) | Product number of the SPA. |
| Version Identifier (VID) | Version number of the SPA. |
| PCB Serial Number | Serial number of the printed circuit board. |

| Field | Description |
|-----------------------|--|
| Top Assy. Part Number | Part number of the SPA. |
| Top Assy. Revision | Revision number (signifying a minor revision) of the SPA. |
| Hardware Revision | Revision number (signifying a minor revision) of the SPA hardware. |
| CLEI Code | Common Language Equipment Identification number. |
| Insertion Time | Time when the SPA was installed, and elapsed time between that insertion time and the current time. |
| Operational Status | Current status of the SPA. For more information about the status field descriptions, refer to the show hw-module subslot oir command. |

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

```
Router# show diag subslot 1/1 details
```

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

```

00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
Asset ID           :
Asset Alias        :
Insertion Time     : 00:00:10 (13:14:24 ago)
Operational Status : ok

```

SPA Interface Processor on a Cisco 12000 Series Internet Router: Example

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

```

Router# show diag 2

SLOT 2 (RP/LC 2 ): Modular 10G SPA Interface Card
  MAIN: type 149, 800-26270-01 rev 84
        Deviation: 0
        HW config: 0x00 SW key: 00-00-00
  PCA: 73-9607-01 rev 91 ver 1
        Design Release 1.0 S/N SAD08460678
  MBUS: Embedded Agent
        Test hist: 0x00 RMA#: 00-00-00 RMA hist: 0x00
  DIAG: Test count: 0x00000000 Test results: 0x00000000
  FRU: Linecard/Module: 12000-SIP-650
  FRU: Linecard/Module: 12000-SIP-650
        Processor Memory: MEM-LC5-1024=(Non-Replaceable)
        Packet Memory: MEM-LC5-PKT-256=(Non-Replaceable)
  L3 Engine: 5 - ISE OC192 (10 Gbps)
  MBUS Agent Software version 1.114 (RAM) (ROM version is 3.4)
  ROM Monitor version 255.255
  Fabric Downloader version used 3.7 (ROM version is 255.255)
  Primary clock is CSC 1
  Board is analyzed
  Board State is Line Card Enabled (IOS RUN )
  Insertion time: 1d00h (2d08h ago)
  Processor Memory size: 1073741824 bytes
  TX Packet Memory size: 268435456 bytes, Packet Memory pagesize: 32768 bytes
  RX Packet Memory size: 268435456 bytes, Packet Memory pagesize: 32768 bytes
  0 crashes since restart
  SPA Information:
    subslot 2/0: SPA-OC192POS-XFP (0x44C), status is ok
    subslot 2/1: Empty
    subslot 2/2: Empty
    subslot 2/3: Empty

```

ADSL HWICs: Example

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

```
Router# show diag 0
```

```
Slot 0:
```

```

C2811 Motherboard with 2FE and integrated VPN Port adapter, 2 ports
  Port adapter is analyzed

```

```

Port adapter insertion time unknown
Onboard VPN          : v2.2.0
EEPROM contents at hardware discovery:
PCB Serial Number    : FOC09052HHA
Hardware Revision    : 2.0
Top Assy. Part Number : 800-21849-02
Board Revision       : B0
Deviation Number     : 0
Fab Version          : 06
RMA Test History     : 00
RMA Number           : 0-0-0-0
RMA History          : 00
Processor type       : 87
Hardware date code   : 20050205
Chassis Serial Number : FTX0908A0B0
Chassis MAC Address   : 0013.1ac2.2848
MAC Address block size : 24
CLEI Code            : CNMJ7N0BRA
Product (FRU) Number : CISCO2811
Part Number          : 73-7214-09
Version Identifier    : NA
EEPROM format version 4
EEPROM contents (hex):
0x00: 04 FF C1 8B 46 4F 43 30 39 30 35 32 48 48 41 40
0x10: 03 E7 41 02 00 C0 46 03 20 00 55 59 02 42 42 30
0x20: 88 00 00 00 00 02 06 03 00 81 00 00 00 00 04 00
0x30: 09 87 83 01 31 F1 1D C2 8B 46 54 58 30 39 30 38
0x40: 41 30 42 30 C3 06 00 13 1A C2 28 48 43 00 18 C6
0x50: 8A 43 4E 4D 4A 37 4E 30 42 52 41 CB 8F 43 49 53
0x60: 43 4F 32 38 31 31 20 20 20 20 20 20 82 49 1C 2E
0x70: 09 89 20 20 4E 41 D9 02 40 C1 FF FF FF FF FF FF

```

WIC Slot 1:

```

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

```

EM Slot 0:

```

ADSL over POTS non-removable daughtercard
Hardware Revision    : 5.0
Part Number          : 73-9307-05
Board Revision       : 03
Deviation Number     : 0
Fab Version          : 05
PCB Serial Number    : FHH0936006E

```



```

RMA Test History      : 00
RMA Number           : 0-0-0-0
RMA History          : 00
Fab Part Number      : 28-6607-05
Manufacturing Test Data : 00 00 00 00 00 00 00 00
Field Diagnostics Data : 00 00 00 00 00 00 00 00
Connector Type       : 01
Version Identifier    : V01
Product (FRU) Number :
EEPROM format version 4
EEPROM contents (hex):
 0x00: 04 FF 40 04 7A 41 05 00 82 49 24 5B 05 42 30 33
 0x10: 88 00 00 00 00 02 05 C1 8B 46 48 48 30 39 33 36
 0x20: 30 30 36 45 03 00 81 00 00 00 00 04 00 85 1C 19
 0x30: CF 05 C4 08 00 00 00 00 00 00 00 00 C5 08 00 00
 0x40: 00 00 00 00 00 00 05 01 89 56 30 31 20 FF FF FF
 0x50: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 0x60: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
 0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

```

WIC Slot 2:

```

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

```

EM Slot 0:

```

ADSL over ISDN non-removable daughtercard
Hardware Revision    : 5.0
Part Number         : 73-9308-05
Board Revision      : 03
Deviation Number    : 0
Fab Version         : 05
PCB Serial Number   : FHH0936008M
RMA Test History    : 00
RMA Number         : 0-0-0-0
RMA History        : 00
Fab Part Number     : 28-6607-05
Manufacturing Test Data : 00 00 00 00 00 00 00 00
Field Diagnostics Data : 00 00 00 00 00 00 00 00
Connector Type      : 01
Version Identifier   : V01
Product (FRU) Number :
EEPROM format version 4
EEPROM contents (hex):
 0x00: 04 FF 40 04 7B 41 05 00 82 49 24 5C 05 42 30 33

```

```

0x10: 88 00 00 00 00 02 05 C1 8B 46 48 48 30 39 33 36
0x20: 30 30 38 4D 03 00 81 00 00 00 00 04 00 85 1C 19
0x30: CF 05 C4 08 00 00 00 00 00 00 00 00 C5 08 00 00
0x40: 00 00 00 00 00 00 05 01 89 56 30 31 20 FF FF FF
0x50: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x60: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

```

NME-AON-K9= Installed in a Cisco 3845: Example

The following is a sample output from the **show diag** command for an integrated-service-engine port adapter in slot 2 on a Cisco 3845 router:

```

Slot 2:
Integrated Service Engine Port adapter, 1 port
Port adapter is analyzed
Port adapter insertion time unknown
EEPROM contents at hardware discovery:
Hardware Revision       : 1.0
Top Assy. Part Number   : 800-28152-01
Board Revision          : 03
Deviation Number        : 0
Fab Version             : 01
PCB Serial Number       : FOC101430NK
RMA Test History        : 00
RMA Number              : 0-0-0-0
RMA History             : 00
Version Identifier      : NA
CLEI Code               : TDB
Product (FRU) Number    : NME-AON-K9
EEPROM format version 4
EEPROM contents (hex):
0x00: 04 FF 40 05 5B 41 01 00 C0 46 03 20 00 6D F8 01
0x10: 42 30 33 88 00 00 00 00 02 01 C1 8B 46 4F 43 31
0x20: 30 31 34 33 30 4E 4B 03 00 81 00 00 00 00 04 00
0x30: 89 4E 41 00 00 D9 02 40 C1 C6 8A 54 44 42 00 00
0x40: 00 00 00 00 00 CB 88 4E 4D 45 2D 52 56 50 4E FF
0x50: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x60: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

```

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

Table 18: show diag subplot Field Descriptions for Cisco 3845 Series Routers

| Field | Description |
|--------------------------|--|
| Hardware Revision | Revision number (signifying a minor revision) of the SPA hardware. |
| Top Assy. Part Number | Part number of the SPA. |
| Product Identifier (PID) | Product number of the SPA. |
| Board Revision | Revision number of the circuit board in the module. |
| Deviation Number | Deviation number of the module. |
| Fab Version | Fabrication version of the module. |

| Field | Description |
|-----------------------|---|
| PCB Serial Number | Serial number of the printed circuit board. |
| Top Assy. Revision | Revision number (signifying a minor revision) of the SPA. |
| RMA Test History | History of RMA testing. |
| RMA Number | RMA number of the module. |
| RMA History | History of RMA on this module. |
| Version Identifier | Nonapplicable to this module. |
| CLEI Code | Common Language Equipment Identification number. (nonapplicable on this module) |
| Product (FRU) Number | Product identification number. |
| EEPROM Format Version | Version of EEPROM format. |
| EEPROM Contents | Contents of EEPROM output. |

Cisco uBR10012 and uBR7200 Series Broadband Routers

The following is a sample output from the **show diag** command displaying diagnostic information for the cable clock card:

```
router# show diag

Clockcard:
National clock card with T1 controller
EEPROM contents at hardware discovery:
Hardware Revision      :1.1
Part Number           :800-05867-02
Board Revision        :11
Deviation Number      :0-0
Fab Version           :02
PCB Serial Number     :CAB04046NXV
RMA Test History      :00
RMA Number            :0-0-0-0
RMA History           :00
EEPROM format version 4
EEPROM contents (hex):
 0x00:04 FF 40 01 AC 41 01 01 C0 46 03 20 00 16 EB 02
 0x10:42 31 31 80 00 00 00 02 02 C1 8B 43 41 42 30
 0x20:34 30 34 36 4E 58 56 03 00 81 00 00 00 04 00
```

The table below describes the fields displayed by the **show diag** command.

Table 19: show diag Field Descriptions for Cisco uBR10012 and uBR7200 Series Routers

| Field | Description |
|--|---|
| National clock card with T1 controller | The system has identified the cable clock card. |

| Field | Description |
|---------------------------------------|---|
| EEPROM contents at hardware discovery | EEPROM programmed data present when the system identified the clock card. |
| Hardware Revision | Version number of the card. |
| Part Number | Part number of the card. |
| Board Revision | Revision number (signifying a minor revision) of the card. |
| Deviation Number | Revision number (signifying a minor deviation) of the card. |
| Fab Version | Manufacturing fabrication version number. |
| PCB Serial Number | Serial number of the printed circuit board. |
| RMA Test History | Counter indicating how many times diagnostics have been performed on this card. |
| RMA Number | Return material authorization number, which is an administrative number assigned if the card needs to be returned for repair. |
| RMA History | Counter indicating how many times the card has been returned and repaired. |
| EEPROM format version | Version number of the EEPROM format. |
| EEPROM contents (hex) | Dumps of EEPROM programmed data. |

The following is a sample output from the **show diag** command displaying revision-level information for the cable line card (slot 6):

Router# **show diag**

Slot 6:

```

MC11 port adapter, 1 port
Port adapter is analyzed
Port adapter insertion time 02:37:10 ago
Hardware Revision      : 1.2
Part Number           : 800-02455-02
Board Revision        : 03
Deviation Number      : 0-3
Fab Version           : 03
PCB Serial Number     : 00004500239
RMA Test History      : 00
RMA Number            : 0-0-0-0
RMA History           : 00
Calibration Data      : Minimum: -8 dBmV, Maximum: 8 dBmV
    Calibration values : 0x5D43 0x3F05 0x1794
Unknown Field (type 0083): 83 FF FF FF
EEPROM format version 4
EEPROM contents (hex):
0x00: 04 FF 40 00 F1 41 01 02 C0 46 03 20 00 09 97 02
0x10: 42 30 33 80 00 00 00 03 02 03 C1 8B 30 30 30 30
0x20: 34 35 30 30 32 33 39 03 00 81 00 00 00 00 04 00
0x30: C8 09 F8 08 03 5D 43 3F 05 17 94 83 83 FF FF FF
0x40: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

```

```

0x50: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x60: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

```

The table below describes the fields displayed by the **show diag** command for the cable line card (slot 6).

Table 20: show diag Field Descriptions for Cable Line Card

| Field | Description |
|-----------------------------|---|
| MC11 port adapter | Line card type. |
| Port adapter is analyzed | The system has identified the Cisco CMTS port adapter. |
| Port adapter insertion time | Elapsed time since insertion. |
| Hardware Revision | Version number of the Cisco CMTS port adapter. |
| Part Number | In the Cisco CMTS, the part number of the port adapter. |
| Board Revision | Revision number (signifying a minor revision) of the Cisco CMTS port adapter. |
| Deviation Number | Revision number (signifying a minor deviation) of the Cisco CMTS port adapter. |
| Fab Version | Manufacturing fabrication version number. |
| PCB Serial Number | Serial number of the printed circuit board. |
| RMA Test History | Counter indicating how many times diagnostics have been performed on this port adapter. |
| RMA Number | Return material authorization number, which is an administrative number assigned if port adapter needs to be returned for repair. |
| RMA History | Counter indicating how many times the port adapter has been returned and repaired. |
| Calibration Data | Input power calibration range. |
| Calibration values | Upstream port gain calibration constant. |
| Unknown Field (type) | Unrecognized EEPROM fields. |
| EEPROM format version | Version number of the EEPROM format. |
| EEPROM contents (hex) | Dumps of EEPROM programmed data. |



Tip In Cisco IOS Release 12.1(12)EC, Release 12.2(8)BC1, and later releases, you can add a timestamp to **show** commands using the **exec prompt timestamp** command in line configuration mode.

The following is a sample output displaying information on the Cisco Ethernet SPA:

```
Router# show diag 1/0
```

```

SPA Information:
bay 1/0          SPA-5X1GE-V2          ok
SW Version 1.0
Expected Switchover Action: NO INFORMATION
Product Identifier (PID) : SPA-5X1GE-V2
Version Identifier (VID) : V02
PCB Serial Number      : JAE1224L5DQ
Top Assy. Part Number  : 68-2616-02
Top Assy. Revision     : B0
Hardware Revision      : 1.2
CLEI Code              : CNUIAWYAAA
No Transceiver in slot 1 subslot 0 port 1 .
No Transceiver in slot 1 subslot 0 port 2 .
No Transceiver in slot 1 subslot 0 port 3 .
No Transceiver in slot 1 subslot 0 port 4 .

```

ETHERNET SPA Information: // Output displaying the additional Ethernet SPA information//

slot/bay 1/0:

```

SPA-5X1GE-V2 card, 5 ports
Card is half slot size
Card is analyzed
Card detected 00:10:29 ago
Card uptime: Not Supported
Card idle time: Not Supported
Voltage status:
Nominal 3300mV, Current 3314mV
Nominal 2500mV, Current 2527mV
Nominal 1500mV, Current 1524mV
Nominal 1200mV, Current 1209mV

```

EERPOM contents, slot/bay 1/0:

```

Controller Type      : 1290
Hardware Revision    : 1.2
Boot Timeout        : 400 msecs
PCB Serial Number    : JAE1224L5DQ
PCB Part Number     : 73-10421-02
PCB Revision        : B0
Fab Version         : 01
RMA Test History    : 00
RMA Number          : 0-0-0-0
RMA History         : 00
Deviation Number    : 0

Product Identifier (PID) : SPA-5X1GE-V2
Version Identifier (VID) : V02
Top Assy. Part Number   : 68-2616-02
Top Assy. Revision     : B0
IDPROM Format Revision  : 36
System Clock Frequency : 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00
CLEI Code            : CNUIAWYAAA
Base MAC Address     : 00 00 00 00 00 00
MAC Address block size : 0
Manufacturing Test Data : 00 00 00 00 00 00 00 00
Field Diagnostics Data : 00 00 00 00 00 00 00 00
Calibration Data     : Minimum: 0 dBmV, Maximum: 0 dBmV

Calibration values :
Power Consumption    : 13100 mWatts (Maximum)

```

```

Environment Monitor Data : 03 30 0C E4 46 32 09 C4
46 32 05 DC 46 32 04 B0
46 32 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 FE 02 F9 9B
Processor Label          : 00 00 00 00 00 00 00
Platform features       : 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
Asset ID                :
Asset Alias             :

```

SPA Information: //Output displaying the Ethernet SPA summary information.//

```

bay 1/1          SPA-1X10GE-L-V2      ok

```

```

SW Version 1.0
Expected Switchover Action: NO INFORMATION
Product Identifier (PID) : SPA-1X10GE-L-V2
Version Identifier (VID) : V02
PCB Serial Number       : JAE1209A3LA
Top Assy. Part Number   : 68-2614-02
Top Assy. Revision      : B0
Hardware Revision       : 1.2
CLEI Code               : IPUIA5VRAA
No Transceiver in slot 1 subslot 1 port 0 .
ETHERNET SPA Information: //Output displaying the additional Ethernet SPA information//

```

slot/bay 1/1:

```

SPA-1XTENGE-XFP-V2 card, 1 ports
Card is half slot size
Card is analyzed
Card detected 00:10:33 ago
Card uptime: Not Supported
Card idle time: Not Supported

```

```

Voltage status:
Nominal 3300mV, Current 3307mV
Nominal 2500mV, Current 2524mV
Nominal 1500mV, Current 1518mV
Nominal 1200mV, Current 1212mV
Nominal 1800mV, Current 1807mV
Nominal 1200mV, Current 1223mV
Nominal 1800mV, Current 1797mV
Nominal 5000mV, Current 4990mV
Nominal -5200mV, Current -5233mV

```

EERPOM contents, slot/bay 1/1:

```

Controller Type          : 1292
Hardware Revision       : 1.2
Boot Timeout            : 400 msecs
PCB Serial Number       : JAE1209A3LA
PCB Part Number         : 73-10419-02
PCB Revision            : A0
Fab Version             : 02
RMA Test History        : 00
RMA Number              : 0-0-0-0
RMA History             : 00
Deviation Number        : 0

```

```

Product Identifier (PID) : SPA-1X10GE-L-V2
Version Identifier (VID) : V02
Top Assy. Part Number   : 68-2614-02
Top Assy. Revision      : B0
IDPROM Format Revision   : 36
System Clock Frequency  : 00 00 00 00 00 00 00 00
                        : 00 00 00 00 00 00 00 00
                        : 00 00 00 00 00 00

CLEI Code                : IPUIA5VRAA
Base MAC Address         : 00 00 00 00 00 00
MAC Address block size   : 0
Manufacturing Test Data  : 00 00 00 00 00 00 00 00
Field Diagnostics Data   : 00 00 00 00 00 00 00 00
Calibration Data        : Minimum: 0 dBmV, Maximum: 0 dBmV
Calibration values :
Power Consumption        : 17400 mWatts (Maximum)
Environment Monitor Data : 03 30 0C E4 46 32 09 C4
46 32 05 DC 46 32 04 B0
46 32 07 08 46 32 04 B0
46 32 07 08 46 32 13 88
46 32 EB B0 46 32 00 00
00 00 00 00 00 00 00 00
00 00 FE 02 F4 3B
Processor Label          : 00 00 00 00 00 00 00 00
Platform features        : 00 00 00 00 00 00 00 00
                        : 00 00 00 00 00 00 00 00
                        : 00 00 00 00 00 00 00 00
                        : 00 00 00 00 00 00 00 00

Asset ID                 :
Asset Alias               :

```

The following is a sample output displaying the Cisco Wideband SPA information:

```
Router# show diag 1/0
```

```

SPA Information:
bay 1/2 SPA-24XDS-SFP ok
SW Version 1.0
Expected Switchover Action: NO INFORMATION
Product Identifier (PID) : SPA-24XDS-SFP
Version Identifier (VID) : V01
PCB Serial Number : CAT11105RXX
Top Assy. Part Number : 68-2562-03
Top Assy. Revision : B0
Hardware Revision : 1.0
CLEI Code : IPUIA1JRRA
The Transceiver in slot 1 subslot 2 port 0 is ENABLED.
The Transceiver in slot 1 subslot 2 port 1 is ENABLED.

```

```
Wideband Information: //Output displaying the Wideband SPA information for slot/bay 1/2//
```

```
slot/bay 1/2:
```

```

24rfchannel-spa-1 card, 1 port + 1 redundant port
Card is half slot size
Card is analyzed
Card detected 00:07:51 ago
Card uptime: Not Supported
Card idle time: Not Supported
Voltage status: 3.3V (+3.286) NOMINAL 2.5V (+2.490) NOMINAL
1.2V (+1.196) NOMINAL 1.8V (+1.816) FIXED

```


EEPROM contents, slot/bay 1/2:

```

Controller Type          : 1198
Hardware Revision       : 1.0
Boot Timeout           : 500 msecs
PCB Serial Number      : CAT11105RXX
PCB Part Number        : 73-9597-03
PCB Revision           : A0
Fab Version            : 03
RMA Test History       : 00
RMA Number             : 0-0-0-0
RMA History            : 00
Deviation Number       : 90114

Product Identifier (PID) : SPA-24XDS-SFP
Version Identifier (VID) : V01
Top Assy. Part Number    : 68-2562-03
Top Assy. Revision      : B0
IDPROM Format Revision   : 36
System Clock Frequency  : 00 00 00 00 00 00 00 00
00 00 00 00 00 00 00 00
00 00 00 00 00 00 00
CLEI Code               : IPU1A1JRAA
Base MAC Address        : 00 1A A1 32 79 72
MAC Address block size  : 1
Manufacturing Test Data : 00 00 00 00 00 00 00 00
Field Diagnostics Data  : 00 00 00 00 00 00 00 00
Calibration Data       : Minimum: 0 dBmV, Maximum: 0 dBmV
Calibration values :

Power Consumption       : 14000 mWatts (Maximum)
Environment Monitor Data : 03 30 0C E4 46 32 09 C4
                        46 32 00 00 00 00 04 B0
                        46 32 00 00 00 00 07 08
                        46 32 00 00 00 00 00 00
                        00 00 00 00 00 00 00 00
                        00 00 00 00 00 00 00 00
                        00 00 FE 02 FA 6D

Processor Label         : 00 00 00 00 00 00 00
Platform features      : 00 00 00 00 00 00 00 00
                        00 00 00 00 00 00 00 00
                        00 00 00 00 00 00 00 00
                        00 00 00 00 00 00 00

Asset ID               :
Asset Alias            :

```

The following is a sample output from the **show diag** command for a Cisco uBR10-MC5X20H cable line card on a Cisco uBR10012 router using Cisco IOS Release 12.2(33)SCG:

```

Router# show diag 6/0

Slot/Subslot 6/0:
5cable-mc520h-d card, 5 ports
Card is half slot size
Card is analyzed
Card detected 00:01:18 ago
Card uptime 0 days, 0 hours, 1 minutes, 42 seconds
Card idle time N/A
Voltage status: 5V Nominal 3.3V Nominal 2.5V Nominal EEPROM contents,

slot 6/0:
Controller Type : 1159

```

```

Hardware Revision : 5.0
Top Assy. Part Number : 800-25212-05
Board Revision : B0
Product Identifier (PID) : UBR10-MC5X20H-D
CLEI Code : IPUCAHEBAA
Deviation Number : 0
Fab Version : 05
PCB Serial Number : CAT10505HA9
RMA Test History : 00
RMA Number : 0-0-0-0
RMA History : 00
Version Identifier (VID) : V01

```

```

LCMON version, slot 6/0
IOS (tm) 7200 Software (UBR10KCLC-LC-M), Experimental Version
12.3(20060207:230254) [xxxxx-after_520h 103]
Compiled Thu 09-Feb-06 11:59 by xxxxxx
Reset due to: power-on
Operational Image version, slot 6/0
Cisco IOS Software, 10000 Software (UBR10KCLC-LCK8-M), Version 12.2(32.9.8)SCG,
EXPERIMENTAL IMAGE ENGINEERING C10K_WEEKLY BUILD, synced to V122_32_8_SCG

```

```

Compiled Mon 02-Jul-12 17:20 by xxxxxx
SW Version 1.0
Code MD5 D41D8CD98F00B204E9800998ECF8427E
FPGA MD5 00000000000000000000000000000000
Expected Switchover Action: NO INFORMATION

```

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

Table 21: show diag Field Descriptions for Cable Line Card

| Field | Description |
|-----------------------|---|
| Hardware Revision | Version number of the card. |
| Top Assy. Part Number | Part number of the port adapter. |
| Board Revision | Revision number (signifying a minor revision) of the Cisco CMTS port adapter. |
| CLEI Code | Common language equipment identifier codes that are used by Telcordia licenses to uniquely identify the telecommunication equipment in their network. |
| Deviation Number | Revision number (signifying a minor deviation) of the Cisco CMTS port adapter. |
| Fab Version | Manufacturing fabrication version number. |
| PCB Serial Number | Serial number of the printed circuit board. |
| RMA Test History | Counter indicating how many times diagnostics have been performed on this port adapter. |
| RMA Number | Return material authorization number, which is an administrative number assigned if port adapter needs to be returned for repair. |

| Field | Description |
|-------------|--|
| RMA History | Counter indicating how many times the port adapter has been returned and repaired. |

Cisco uBR7225VXR and Cisco uBR7246VXR Universal Broadband Routers: Example

The following is a sample output from the **show diag** command for a Cisco uBR-MC88V cable interface line card, on a Cisco uBR7246VXR universal broadband router. The output shows that the diagnostic mode on the line card is enabled.

Router# show diag5

Slot 5:

```

DOCSIS Modem Card (Universal) 8 Down/8 Up (F-connector) with
  Integrated Up-converter Port adapter, 2 ports
Port adapter is analyzed
Port adapter insertion time 3wld ago
EEPROM contents at hardware discovery:
Controller Type       : 1653
PCB Serial Number    : CSJ12514210
Hardware Revision    : 6.5
Top Assy. Part Number : 800-17733-09
Top Assy. Revision   : A0
Product Identifier (PID) : UBR-MC88V
Version Identifier (VID) : V04
CLEI Code            : IPUIA5XRAA
Deviation Number     : 0
Fab Version          : 06
RMA Test History     : 00
RMA Number           : 0-0-0-0
RMA History          : 00
Licensing Transaction ID : 8
EEPROM format version 4

EEPROM contents (hex):
0x00: 04 FF 40 06 75 C1 8B 43 53 4A 31 32 35 31 34 32
0x10: 31 30 41 06 05 C0 46 03 20 00 45 45 09 8D 41 30
0x20: 20 20 CB 89 55 42 52 2D 4D 43 38 38 55 89 56 30
0x30: 34 20 C6 8A 49 50 55 49 41 35 58 52 41 41 88 00
0x40: 00 00 00 02 06 03 00 81 00 00 00 00 04 00 8B 00
0x50: 00 00 08 D9 03 40 C1 CB FF FF FF FF FF FF FF FF
0x60: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x80: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0x90: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0xA0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0xB0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0xC0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0xD0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0xE0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00
0xF0: 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00

License                : 8X8
Calibration Data

```

```

Number of US points: 8
Number of freqs      : 3
                    measured gain
US  freq(kHz)      0db      1db      2db      4db      8db
16db
0  5000            34.8876  33.8322  32.7126  30.6040  26.4336
18.4096
1  5000            34.8876  33.9016  32.7126  30.6342  26.6766
18.4096
2  5000            35.3706  34.3750  33.3282  31.3718  27.2786
19.0466
3  5000            35.3706  34.3750  33.3282  31.3626  27.1574
19.0466
4  5000            35.7702  34.8876  33.8322  31.3902  27.3962
19.3112
5  5000            35.3706  34.3750  33.3282  31.3532  26.9278
18.7344
6  5000            35.8262  34.8876  33.8322  31.3992  27.5134
19.3112
7  5000            34.8876  33.8322  32.7126  30.6242  26.5632
18.4096

                    measured gain
US  freq(kHz)      0db      1db      2db      4db      8db
16db
0  30000           32.1330  31.3626  30.5834  28.2632  24.0922
15.8262
1  30000           32.7126  31.3992  30.6142  28.5760  24.4296
16.2078
2  30000           33.3282  32.0502  31.3532  29.1476  24.9126
16.6738
3  30000           33.3282  32.0502  31.3436  29.0630  24.8932
16.6240
4  30000           33.3282  32.0502  31.3532  29.2424  25.0476
17.0212
5  30000           32.7126  32.0502  30.6440  28.8658  24.5942
16.6240
6  30000           33.3282  32.7126  31.3718  29.4198  25.2018
17.0212
7  30000           32.7126  31.3810  30.6040  28.4732  24.2630
16.2078

                    measured gain
US  freq(kHz)      0db      1db      2db      4db      8db
16db
0  65000           29.8170  29.0630  28.0608  26.0302  21.8206
13.8322
1  65000           30.6142  29.6032  28.5760  26.5632  22.2546
13.9016
2  65000           31.3532  29.8276  29.1596  27.1574  22.8458
14.8876
3  65000           31.3340  29.8062  28.9646  26.9278  22.6460
14.3750
4  65000           31.3532  29.8170  29.1476  27.0630  22.8458
14.8876
5  65000           30.6342  29.7842  28.7668  26.6926  22.4660
14.3750
6  65000           31.3718  30.5938  29.4198  27.2936  23.0430
14.8876
7  65000           30.6142  29.5240  28.5632  26.4336  22.2546
13.9016

```

The table below describes significant fields shown in the display.

Table 22: show diag Field Descriptions for Cisco uBR7225VXR and Cisco uBR7246VXR Series Routers

| Field | Description |
|--------------------------|---|
| Controller Type | Line card type. |
| PCB Serial Number | Serial number of the printed circuit board. |
| Hardware Revision | Version number of the port adapter. |
| Top Assy. Part Number | Part number of the port adapter. |
| Top Assy. Revision | Revision number (signifying a minor revision) of the port adapter. |
| Product Identifier (PID) | Cisco product ID. |
| Version Identifier (VID) | Used to track the version of the customer orderable PID. |
| CLEI Code | Common language equipment identifier codes that are used by Telcordia licenses to uniquely identify the telecommunication equipment in their network. |
| Deviation Number | Revision number (signifying a minor deviation) of the port adapter. |
| Fab Version | Version number (signifying a major version) of the port adapter. |
| RMA Test History | Counter indicating the number of times the port adapter has been returned and repaired. |
| RMA Number | Return material authorization number. An administrative number assigned when the port adapter is returned for repair. |
| RMA History | Counter indicating the number of times the port adapter has been returned and repaired. |
| Licensing Transaction ID | License transaction identifier. |
| EEPROM contents (hex) | Dumps of EEPROM programmed data. |
| License | License type. |
| Calibration Data | Calibration data of upstream VGA chips. |
| Number of US points | Number of physical upstream channels supported by the port adapter. |
| Number of freqs | Number of upstream frequencies used in the upstream calibration process (5, 30, and 65 MHz). |

Cisco ASR 1000 Series Aggregation Services Routers: Example

The following is a sample output from the **show diag** command for a Cisco ASR 1000 Series Router.

```
Router# show diag all eeprom
```

```
MIDPLANE EEPROM data:
```

```

Product Identifier (PID) : ASR1006
Version Identifier (VID) : V01
PCB Serial Number      : NWG122200GZ
Top Assy. Part Number  : 68-2584-05
Hardware Revision      : 1.0
Asset ID               :
CLEI Code              : COMUD00ARA

Power/Fan Module P0 EEPROM data:
Product Identifier (PID) : ASR1006-PWR-AC
Version Identifier (VID) : V01
PCB Serial Number      : ART1226Q00L
Hardware Revision      : 3.0
Asset ID               :
CLEI Code              : COUPACBBAA

Power/Fan Module P1 EEPROM data:
Product Identifier (PID) : ASR1006-PWR-AC
Version Identifier (VID) : V01
PCB Serial Number      : ART1226Q00Q
Hardware Revision      : 3.0
Asset ID               :
CLEI Code              : COUPACBBAA

Slot R0 EEPROM data:
Product Identifier (PID) : ASR1000-RP1
Version Identifier (VID) : V03
PCB Serial Number      : JAE12056VBZ
Top Assy. Part Number  : 68-2625-08
Hardware Revision      : 1.0
CLEI Code              : COUCAENCAC

Slot R1 EEPROM data:
Product Identifier (PID) : ASR1000-RP1
Version Identifier (VID) : V03
PCB Serial Number      : JAE1225MQIY
Top Assy. Part Number  : 68-2625-08
Hardware Revision      : 1.0
CLEI Code              : COUCAENCAC

Slot F0 EEPROM data:
Product Identifier (PID) : ASR1000-ESP10
Version Identifier (VID) : V03
PCB Serial Number      : JAE1228OBVV
Top Assy. Part Number  : 68-2633-10
Hardware Revision      : 1.1
CLEI Code              : COUCAERCAC

Slot F1 EEPROM data:
Product Identifier (PID) : ASR1000-ESP10
Version Identifier (VID) : V03
PCB Serial Number      : JAE1227NNN1
Top Assy. Part Number  : 68-2633-10
Hardware Revision      : 1.1
CLEI Code              : COUCAERCAC

Slot 0 EEPROM data:
Product Identifier (PID) : ASR1000-SIP10
Version Identifier (VID) : V03
PCB Serial Number      : JAE1224L050
Top Assy. Part Number  : 68-2629-07
Hardware Revision      : 1.0
CLEI Code              : COUCAEPCAC

```

```

Slot 1 EEPROM data is not initialized
Slot 2 EEPROM data is not initialized

SPA EEPROM data for subslot 0/0:
  Product Identifier (PID) : SPA-2X1GE-V2
  Version Identifier (VID) : V01
  PCB Serial Number      : JAE1227NK77
  Top Assy. Part Number  : 68-2707-02
  Top Assy. Revision     : B0
  Hardware Revision      : 1.0
  CLEI Code              : CNUIANBAAA

SPA EEPROM data for subslot 0/1:
  Product Identifier (PID) : SPA-2XOC3-POS
  Version Identifier (VID) : V01
  PCB Serial Number      : JAE1225M5AO
  Top Assy. Part Number  : 68-2168-01
  Top Assy. Revision     : J0
  Hardware Revision      : 1.0
  CLEI Code              : IPUIAFMRAA

SPA EEPROM data for subslot 0/2 is not available
SPA EEPROM data for subslot 0/3 is not available
SPA EEPROM data for subslot 1/0 is not available
SPA EEPROM data for subslot 1/1 is not available
SPA EEPROM data for subslot 1/2 is not available
SPA EEPROM data for subslot 1/3 is not available
SPA EEPROM data for subslot 2/0 is not available
SPA EEPROM data for subslot 2/1 is not available
SPA EEPROM data for subslot 2/2 is not available
SPA EEPROM data for subslot 2/3 is not available

```

The table below describes significant fields shown in the display.

Table 23: show diag Field Descriptions for Cisco ASR 1000 Series Routers

| Field | Description |
|--------------------------|--|
| Asset ID | Power or fan module identifier. |
| CLEI Code | Common language equipment identifier codes that are used by licensees to uniquely identify the telecommunication equipment in their network. |
| Hardware Revision | Version number of the port adapter. |
| PCB Serial Number | Serial number of the printed circuit board. |
| Product Identifier (PID) | Cisco product ID. |
| Top Assy. Part Number | Part number of the port adapter. |
| Top Assy. Revision | Revision number (signifying a minor revision) of the port adapter. |
| Version Identifier (VID) | Used to track the version of the customer orderable PID. |

Cisco 4400 Series Integrated Services Router: Example

The following is a sample output from `show diag all eeprom detail` for Cisco 4400 Series Integrated Services Router.

Router# `show diag all eeprom detail`

MIDPLANE EEPROM data:

```

EEPROM version           : 4
Compatible Type          : 0xFF
PCB Serial Number        : FOC15520B7L
Controller Type          : 1902
Hardware Revision        : 1.0
PCB Part Number          : 73-13854-02
Top Assy. Part Number    : 800-36894-01
Board Revision           : 05
Deviation Number         : 123968
Fab Version              : 02
Product Identifier (PID) : ISR4451/K9
Version Identifier (VID) : V01
CLEI Code                : TDBTDBTDBT
Processor type           : D0
Chassis Serial Number    : FGL1601129D
Chassis MAC Address      : 30f7.0d53.c7e0
MAC Address block size   : 144
Manufacturing Test Data  : 00 00 00 00 00 00 00 00
Asset ID                 : P1B-R2C

```

Power/Fan Module P0 EEPROM data:

```

EEPROM version           : 4
Compatible Type          : 0xFF
Controller Type          : 1509
Unknown Field (type 00DF): 1.85.1.236.1
Deviation Number         : 0
PCB Serial Number        : DCA1547X037
RMA Test History         : 00
RMA Number               : 0-0-0-0
RMA History              : 00
Version Identifier (VID) : XXX
Product Identifier (PID) : XXX-XXXX-XX
CLEI Code                : 0000000000
Environment Monitor Data : 41 01 C2 42 00 05 F8 00
                          50 01 F4 1B 58 03 E8 1F
                          4A 05 DC 21 34 07 D0 21
                          FC 09 C4 22 60 0B B8 22
                          92 0D AC 22 D8 0F A0 22
                          F8 11 94 22 F6 13 88 23
                          3C 15 7C 23 28 17 70 23
                          00 19 64 22 D8 1B 58 22
                          C4 1D 4C 22 BA 1F 40 22
                          A6 21 34 22 9C 23 28 22
                          92 25 1C 22 88 27 10 22
                          60

```

Board Revision : P0

Power/Fan Module P1 EEPROM data is not initialized

Power/Fan Module P2 EEPROM data is not initialized

Slot R0 EEPROM data:

```

EEPROM version           : 4
Compatible Type          : 0xFF

```



```

PCB Serial Number      : FOC15520B7L
Controller Type        : 1902
Hardware Revision      : 1.0
PCB Part Number        : 73-13854-02
Top Assy. Part Number  : 800-36894-01
Board Revision         : 05
Deviation Number       : 123968
Fab Version            : 02
Product Identifier (PID) : ISR4451/K9
Version Identifier (VID) : V01
CLEI Code              : TDBTDBTDBT
Processor type         : D0
Chassis Serial Number  : FGL1601129D
Chassis MAC Address    : 30f7.0d53.c7e0
MAC Address block size : 144
Manufacturing Test Data : 00 00 00 00 00 00 00 00
Asset ID               : P1B-R2C
Asset ID               :
Slot F0 EEPROM data:

EEPROM version         : 4
Compatible Type        : 0xFF
Controller Type        : 3567
Hardware Revision      : 4.1
PCB Part Number        : 73-12387-01
MAC Address block size : 15
Chassis MAC Address    : aabb.ccdd.eeff
Product Identifier (PID) : ISR4451-FP
Version Identifier (VID) : V00
PCB Serial Number      : FP123456789
Asset ID               :
Slot 0 EEPROM data:

EEPROM version         : 4
Compatible Type        : 0xFF
Controller Type        : 1612
Hardware Revision      : 4.1
PCB Part Number        : 73-12387-01
MAC Address block size : 15
Chassis MAC Address    : aabb.ccdd.eeff
Product Identifier (PID) : ISR4451-NGSM
Version Identifier (VID) : V00
PCB Serial Number      : NGSM1234567
Asset ID               :
Slot 1 EEPROM data:

EEPROM version         : 4
Compatible Type        : 0xFF
Controller Type        : 1612
Hardware Revision      : 4.1
PCB Part Number        : 73-12387-01
MAC Address block size : 15
Chassis MAC Address    : aabb.ccdd.eeff
Product Identifier (PID) : ISR4451-NGSM
Version Identifier (VID) : V00
PCB Serial Number      : NGSM1234567
Asset ID               :
Slot 2 EEPROM data:

EEPROM version         : 4
Compatible Type        : 0xFF
Controller Type        : 1612
Hardware Revision      : 4.1
PCB Part Number        : 73-12387-01

```

```

MAC Address block size      : 15
Chassis MAC Address        : aabb.ccdd.eeff
Product Identifier (PID)    : ISR4451-NGSM
Version Identifier (VID)    : V00
PCB Serial Number          : NGSM1234567
Asset ID                   :
SPA EEPROM data for subslot 0/0:

EEPROM version             : 5
Compatible Type            : 0xFF
Controller Type            : 1902
Hardware Revision          : 2.2
Boot Timeout               : 400 msecs
PCB Serial Number          : JAB092709EL
PCB Part Number            : 73-8700-01
PCB Revision               : A0
Fab Version                : 01
RMA Test History           : 00
RMA Number                 : 0-0-0-0
RMA History                : 00
Deviation Number           : 78409
Product Identifier (PID)   : ISR4451-4X1GE
Version Identifier (VID)   : V01
Top Assy. Part Number      : 68-2236-01
Top Assy. Revision         : A0
IDPROM Format Revision     : 36
System Clock Frequency     : 00 00 00 00 00 00 00 00 00
                             00 00 00 00 00 00 00 00
                             00 00 00 00 00 00

CLEI Code                  : CNUIAHSAAA
Base MAC Address           : 00 00 00 00 00 00
MAC Address block size    : 0
Manufacturing Test Data   : 00 00 00 00 00 00 00 00
Field Diagnostics Data    : 00 00 00 00 00 00 00 00
Calibration Data          : Minimum: 0 dBmV, Maximum: 0 dBmV
  Calibration values      :
Power Consumption         : 13100 mWatts (Maximum)
Environment Monitor Data  : 03 30 0C E4 46 32 09 C4
                             46 32 05 DC 46 32 05 DC
                             46 32 00 00 00 00 00 00
                             00 00 00 00 00 00 00 00
                             00 00 00 00 00 00 00 00
                             00 00 00 00 00 00 00 00
                             00 00 FE 02 F9 6E

Processor Label           : 00 00 00 00 00 00 00
Platform features        : 00 00 00 00 00 00 00 00
                             00 00 00 00 00 00 00 00
                             00 00 00 00 00 00 00 00
                             00 00 00 00 00 00 00

Asset ID                  :
Asset Alias               :
SPA EEPROM data for subslot 0/1 is not available

SPA EEPROM data for subslot 0/2 is not available

SPA EEPROM data for subslot 0/3 is not available

SPA EEPROM data for subslot 0/4 is not available

SPA EEPROM data for subslot 1/0 is not available

SPA EEPROM data for subslot 1/1 is not available

SPA EEPROM data for subslot 1/2 is not available

```

```

SPA EEPROM data for subslot 1/3 is not available
SPA EEPROM data for subslot 1/4 is not available
SPA EEPROM data for subslot 2/0 is not available
SPA EEPROM data for subslot 2/1 is not available
SPA EEPROM data for subslot 2/2 is not available
SPA EEPROM data for subslot 2/3 is not available
SPA EEPROM data for subslot 2/4 is not available

```

Related Commands

| Command | Description |
|---|--|
| dsl operating-mode (ADSL) | Modifies the operating mode of the digital subscriber line for an ATM interface. |
| show c7300 | Displays the types of hardware (processors, line cards, jacket cards, and so on) installed in the Cisco 7304 router slots, including the bundled Flash, and current FPGA versions. |
| show c7300 errorlog | Displays error information on a Cisco 7304 router. |
| show dsl interface atm | Shows all ADSL-specific information for a specified ATM interface. |
| showcontrollers fastethernet | Displays Fast Ethernet interface information, transmission statistics and errors, and applicable MAC destination address and VLAN filtering tables. |
| show controllers gigabitethernet | Displays Gigabit Ethernet interface information, transmission statistics and errors, and applicable MAC destination address and VLAN filtering tables. |
| show controllers integrated-service-engine | Displays controller information for integrated-service-engine network modules. |
| showinterfaces integrated-service-engine | Displays basic interface configuration information for integrated-service-engine network modules. |

show diagnostic bootup level

To display the coverage level for the configured bootup diagnostics, use the **showdiagnosticbootuplevel** command in user EXEC or privileged EXEC mode.

show diagnostic bootup level

Syntax Description This command has no arguments or keywords.

Command Default This command has no default settings.

Command Modes User EXEC (>) Privileged EXEC (#)

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

Usage Guidelines This command displays the bootup diagnostic level configured on the switch. The bootup diagnostic level determines which diagnostic tests will be performed when the device boots. The following bootup diagnostic levels can be displayed in the output of this command:

| Level | Explanation |
|----------|---|
| Bypass | The device performs no bootup diagnostic tests. |
| Complete | The device performs all diagnostic tests marked with attribute M (Minimal) or C (Complete) in the output of the showdiagnosticcontentmodule command. |
| Minimal | The device performs all diagnostic tests marked with attribute M (Minimal) in the output of the showdiagnosticcontentmodule command. |

Examples

This example shows how to display the configured bootup diagnostic level:

```
Router# show diagnostic bootup level
Current Bootup Diagnostic Level = Complete
```

Related Commands

| Command | Description |
|---------------------------------------|--|
| diagnostic bootup level | Sets the bootup diagnostic level. |
| show diagnostic content module | Displays the available diagnostic tests. |

show diagnostic content module

To display information about available tests, including test ID, test attributes, and supported coverage test levels for each test and for all modules, use the **showdiagnosticcontentmodule** command in user EXEC or privileged EXEC mode.

show diagnostic content module {*all*|*list*|*slot*/*subslot*}

| Syntax Description | all | Displays information about available tests for all modules. |
|--------------------|-----------------------|---|
| | <i>list</i> | List of modules in the following format: <ul style="list-style-type: none"> • Entries are separated by a comma, for example, 1,4,6-10. • Ranges are specified with a hyphen, for example, 1-4,6-10. |
| | <i>slot</i> | Single module by slot number. |
| | <i>slot / subslot</i> | Single submodule by slot number and subslot or bay within the module. |

Command Modes User EXEC (>) Privileged EXEC (#)

| Command History | Release | Modification |
|-----------------|--------------|---|
| | 12.2(14)SX | This command was introduced for the Supervisor Engine 720. |
| | 12.2(17d)SXB | Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB. |
| | 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |
| | 12.2(33)SXI4 | This command was integrated into Cisco IOS Release 12.2(33)SXI4. A health-monitoring (HM) test, TestAclFpgaMonitor, was introduced for ABA cards. |

Usage Guidelines For each available diagnostic test, a set of attributes is displayed as a series of characters in the Attributes field of the command output. An asterisk (*) in the character location indicates that the attribute is not applicable to the test. The following set of attributes is displayed:

| Character | Attribute | Description |
|-----------|-----------|--|
| 1 | M | The test runs when the bootup diagnostic level is set to either Minimal or Complete. |
| | C | The test runs when the bootup diagnostic level is set to Complete. |
| 2 | B | The test runs when the diagnosticstartplatformtestbasic command is entered. |
| 3 | P | The test runs on a port, not the entire device (per-port test). |
| | V | The test runs on the entire device (per-device test). |

| Character | Attribute | Description |
|-----------|-----------|---|
| 4 | D | The test disrupts the network traffic (disruptive test). |
| | N | The test can be run when the system is online without disrupting the network traffic (nondisruptive test). |
| 5 | S | If the card under test is a standby card, only the standby card runs the test. The test does not run from the active card. If the card under test is an active card, the active card runs the test on itself. |
| 6 | X | The test is not an HM test. |
| 7 | F | The monitoring interval of the test cannot be modified by the user (fixed monitoring test). |
| 8 | E | The user cannot disable the test (always enabled test). |
| 9 | A | Monitoring is active for this test. |
| | I | Monitoring is inactive for this test. |
| 10 | R | The test cycles power to the line cards and reloads the supervisor engine. |
| 11 | K | The test resets the line card after completion. |
| 12 | T | The test shuts down all ports and reloads the supervisor engine. |

If a test is configured to run periodically, the interval will be displayed in the Test Interval field of the command output in the format ddd hh:mm:ss.ms, indicating days, hours, minutes, seconds, and milliseconds. For example, the test interval of a test that will run every 15 minutes will be displayed as 000 00:15:00.00. The test interval of a test that will run every 14 days will be displayed as 014 00:00:00.00.

If a test failure is determined by multiple errors rather than a single error, the error threshold will be displayed in the Threshold field of the command output.

You can use the **showdiagnosticdescriptionmodule** command to see a detailed description of a diagnostic test.

Examples

The following example shows how to display the test suite, the monitoring interval, and test attributes for module 5:

```
Router# show diagnostic content module 5
Module 5: Supervisor Engine 2T 10GE w/ CTS (Active)
Diagnostics test suite attributes:
  M/C/* - Minimal bootup level test / Complete bootup level test / NA
  B/* - Basic ondemand test / NA
  P/V/* - Per port test / Per device test / NA
  D/N/* - Disruptive test / Non-disruptive test / NA
  S/* - Only applicable to standby unit / NA
  X/* - Not a health monitoring test / NA
  F/* - Fixed monitoring interval test / NA
  E/* - Always enabled monitoring test / NA
  A/I - Monitoring is active / Monitoring is inactive
  R/* - Power-down line cards and need reload supervisor / NA
  K/* - Require resetting the line card after the test has completed / NA
```

T/* - Shut down all ports and need reload supervisor / NA

| ID | Test Name | Attributes | Test Interval day hh:mm:ss.ms | Thre- day shold |
|-----|------------------------------|--------------|----------------------------------|--------------------|
| 1) | TestScratchRegister | ***N***A*** | 000 00:00:30.00 | 5 |
| 2) | TestSPRPInbandPing | ***N***A*** | 000 00:00:15.00 | 10 |
| 3) | TestTransceiverIntegrity | **PD***I*** | not configured | n/a |
| 4) | TestActiveToStandbyLoopback | M*PDSX**I*** | not configured | n/a |
| 5) | TestLoopback | M*PD*X**I*** | not configured | n/a |
| 6) | TestTxPathMonitoring | M**N***A*** | 000 00:00:02.00 | 10 |
| 7) | TestNewIndexLearn | M**N***I*** | 000 00:00:15.00 | 10 |
| 8) | TestDontConditionalLearn | M**N***I*** | 000 00:00:15.00 | 10 |
| 9) | TestBadBpduTrap | M**D*X**I*** | not configured | n/a |
| 10) | TestMatchCapture | M**D*X**I*** | not configured | n/a |
| 11) | TestProtocolMatchChannel | M**D*X**I*** | not configured | n/a |
| 12) | TestFibDevices | M**N***I*** | 000 00:00:15.00 | 10 |
| 13) | TestIPv4FibShortcut | M**N***I*** | 000 00:00:15.00 | 10 |
| 14) | TestL3Capture2 | M**D*X**I*** | not configured | n/a |
| 15) | TestIPv6FibShortcut | M**N***I*** | 000 00:00:15.00 | 10 |
| 16) | TestMPLSFibShortcut | M**N***I*** | 000 00:00:15.00 | 10 |
| 17) | TestNATFibShortcut | M**N***I*** | 000 00:00:15.00 | 10 |
| 18) | TestAclPermit | M**D*X**I*** | not configured | n/a |
| 19) | TestAclDeny | M**D*X**I*** | not configured | n/a |
| 20) | TestQoS_Tcam | M**D*X**I*** | not configured | n/a |
| 21) | TestL3VlanMet | M**D*X**I*** | not configured | n/a |
| 22) | TestIngressSpan | M**D*X**I*** | not configured | n/a |
| 23) | TestEgressSpan | M**D*X**I*** | not configured | n/a |
| 24) | TestNetflowInlineRewrite | C*PD*X**I*** | not configured | n/a |
| 25) | TestTrafficStress | **D*X**I**T | not configured | n/a |
| 26) | TestFibTcamSSRAM | **D*X**IR** | not configured | n/a |
| 27) | TestAsicMemory | **D*X**IR** | not configured | n/a |
| 28) | TestAclQoS_Tcam | **D*X**IR** | not configured | n/a |
| 29) | TestNetflowTcam | **D*X**IR** | not configured | n/a |
| 30) | ScheduleSwitchover | **D*X**I*** | not configured | n/a |
| 31) | TestFirmwareDiagStatus | M**N***I*** | 000 00:00:15.00 | 10 |
| 32) | TestAsicSync | ***N***A*** | 000 00:00:15.00 | 10 |
| 33) | TestUnusedPortLoopback | **PN***A*** | 000 00:01:00.00 | 10 |
| 34) | TestErrorCounterMonitor | ***N***A*** | 000 00:00:30.00 | 10 |
| 35) | TestPortTxMonitoring | **PN***A*** | 000 00:01:15.00 | 5 |
| 36) | TestL3HealthMonitoring | ***N**FEA*** | 000 00:00:05.00 | 10 |
| 37) | TestCFRW | M*VN*X**I*** | not configured | n/a |
| 38) | TestRwEngineOverSubscription | ***N***I*** | 000 00:00:01.00 | 10 |
| 39) | TestAclFpgaMonitor | ***N***A*** | 000 00:00:00.80 | 1 |
| 40) | TestNVRAMBatteryMonitor | ***N**F*A*** | 000 01:00:00.00 | 72 |



Note The HM test, TestAclFpgaMonitor, is applicable only for Aphrodite, Berytos, and Anteros (ABA) cards. This test is run to monitor the access control list (ACL) ternary content addressable memory (TCAM) reply status.



Note The HM test TestNVRAMBatteryMonitor monitors the NVRAM battery status and is applicable only to the Supervisor Engine 2T.

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

Table 24: show diagnostic content module Field Descriptions

| Field | Description |
|---------------|--|
| ID | Unique identifier of the diagnostic test. |
| Test Name | Name of the diagnostic test. |
| Attributes | Health state of the diagnostic. |
| Test Interval | Periodic interval at which the test is run. |
| Threshold | Maximum number of consecutive test failures required by the diagnostic test to take recovery action. |

Related Commands

| Command | Description |
|---|---|
| diagnostic bootup level | Sets the bootup diagnostic level. |
| diagnostic monitor | Configures the HM diagnostic testing. |
| diagnostic ondemand | Configures the on-demand diagnostics. |
| diagnostic schedule test | Sets the scheduling of test-based diagnostic testing for a specific module or schedules a supervisor engine switchover. |
| show diagnostic description module | Describes the diagnostic tests. |

show diagnostic cns

To display the information about the CNS subject, use the **show diagnostic cns** command in user EXEC or privileged EXEC mode.

```
show diagnostic cns {publish | subscribe}
```

| Syntax Description | publish | Displays the subject with which the diagnostic results is published. |
|--------------------|-----------|--|
| | subscribe | Displays the subscribed subjects. |

Command Default This command has no default settings.

Command Modes User EXEC Privileged EXEC

| Command History | Release | Modification |
|-----------------|-------------|---|
| | 12.2(14)SX | Support for this command was introduced on the Supervisor Engine 720. |
| | 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |

Usage Guidelines This command is not supported on Cisco 7600 series routers that are configured with a Supervisor Engine 2. The CNS subsystem communicates with remote network applications through the CNS-event agent and follows the publish and subscribe model. An application sets itself up to receive events by subscribing to the appropriate event subject name.

Examples

This example shows how to display the subject with which the diagnostic results is published:

```
Router# show diagnostic cns publish
Subject: cisco.cns.device.diag_results
```

This example shows how to display the subscribed subject:

```
Router# show diagnostic cns subscribe
Subject: cisco.cns.device.diag_get_results
```

| Related Commands | Command | Description |
|------------------|-----------------------|---------------------------------|
| | diagnostic cns | Configures the CNS diagnostics. |

show diagnostic description module

To display a detailed description of a diagnostic test available on a module, use the **showdiagnosticdescriptionmodule** command in user EXEC or privileged EXEC mode.

show diagnostic description module {slot | slot/subslot} test {all | test-id | test-name}

Syntax Description

| | |
|---------------------|--|
| <i>slot</i> | Specifies a module by slot number. |
| <i>slot/subslot</i> | Specifies a submodule by slot number and subslot or bay within the module. |
| all | Displays descriptions of all available tests. |
| <i>test-id</i> | Test identification number. See the Usage Guidelines for a list of tests. |
| <i>test-name</i> | Test name. See the Usage Guidelines for a list of tests. |

Command Default

This command has no default settings.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

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

Usage Guidelines

You can display detailed descriptions of diagnostic tests by specifying the test ID, the test name, or the **all** keyword in this command. The test ID and test name for available diagnostic tests are displayed in the output of the **showdiagnosticcontentmodule** command.

Examples

This example shows how to display the description of TestIPv6FibShortcut on module 1:

```
Router# show diagnostic description module 1 test TestIPv6FibShortcut
TestIPv6FibShortcut :
    This test verifies the IPv6 FIB forwarding of the layer 3 forwarding
    engine. One diagnostic IPv6 FIB and an adjacency entry are installed
    and a diagnostic IPv6 packet is sent to make sure it is forwarded
    accordingly based on rewritten MAC and VLAN information.
```

This example shows how to display the description of test number 15 on module 1:

```
Router# show diagnostic description module 1 test 15
TestIPv6FibShortcut :
    This test verifies the IPv6 FIB forwarding of the layer 3 forwarding
    engine. One diagnostic IPv6 FIB and an adjacency entry are installed
    and a diagnostic IPv6 packet is sent to make sure it is forwarded
    accordingly based on rewritten MAC and VLAN information.
```

Related Commands

| Command | Description |
|--------------------------------|--|
| show diagnostic content module | Displays the available diagnostic tests. |

show diagnostic events

To display the diagnostic event log, use the **showdiagnosticevents** command in user EXEC or privileged EXEC mode.

```
show diagnostic events [event-type event-type | module {allslotslot/subslot}]
```

Cisco ASR 1000 Series Aggregation Services Routers

```
show diagnostic events [event-type event-type | slot {number | all}]
```

| Syntax Description | event-type event-type | (Optional) Displays events of a specified type, where <i>event-type</i> values are error , info , and warning . |
|--------------------|----------------------------|---|
| | module | (Optional) Displays the event log for a module, where: <ul style="list-style-type: none"> • all --Displays the event log for all modules. • <i>slot</i> --Chassis slot location of the module. • <i>slot / subslot</i> --Subslot or bay location of the submodule. |
| | slot {number all} | (Optional--Cisco ASR 1000 Series Routers) Displays the event log for the specified hardware slots, where: <ul style="list-style-type: none"> • <i>number</i> --Chassis slot location of the hardware, such as R0 for route processor 0. • all --Displays the event log for hardware in all supported slots. |

Command Default When no optional keywords are specified, the **showdiagnosticevents** command displays all events for all hardware module or slot locations.

Command Modes User EXEC (>) Privileged EXEC (#)

| Command History | Release | Modification |
|-----------------|--------------------------|---|
| | 12.2(14)SX | This command was introduced for the Supervisor Engine 720. |
| | 12.2(17d)SXB | Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB. |
| | 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |
| | Cisco IOS XE Release 2.6 | This command was integrated into Cisco IOS XE Release 2.6. |

Usage Guidelines If you do not enter a **module** keyword and argument for the **showdiagnosticevents** command, the event log for all modules is displayed.

On the Cisco ASR 1000 Series Aggregation Services Routers, if no optional keywords are entered, the event log for all supported slots is displayed.

The following fields are displayed in the command output:

| Field | Description |
|---------------|--|
| Time Stamp | Date and time of the diagnostic event, in the format MM:DD hh:mm:ss.mss. |
| ET | Type of event (I=Info, W=Warning, E=Error). |
| Card | Module associated with the event. |
| Event Message | Event description. |

Examples

The following example shows how to display the diagnostic event log for events of type Info:

```
Router# show diagnostic events event-type info
Diagnostic events (storage for 500 events, 14 events recorded)
Number of events matching above criteria = 10
Event Type (ET): I - Info, W - Warning, E - Error
Time Stamp      ET [Card] Event Message
-----
08/26 15:51:04.335 I [1] TestIndexLearn Passed
08/26 15:51:04.335 I [1] Diagnostics Passed
08/26 15:51:15.511 I [8] TestLoopback Passed
08/26 15:51:15.511 I [8] Diagnostics Passed
08/26 16:15:02.247 I [1] TestDontLearn Passed
08/26 16:15:02.247 I [1] Diagnostics Passed
08/26 16:15:12.683 I [8] TestNetflowInlineRewrite Passed
08/26 16:15:12.683 I [8] Diagnostics Passed
08/26 16:15:42.207 I [2] TestActiveToStandbyLoopback Passed
08/26 16:15:42.207 I [2] Diagnostics Passed
```

The following example shows the results of all events for the predefined TestErrorCounterMonitor test on route processor 0 on a Cisco ASR 1000 Aggregation Services Router:

```
Router# show diagnostic events slot R0

Diagnostic events (storage for 10 events, 10 events recorded)
Number of events matching above criteria = 10
Event Type (ET): I - Info, W - Warning, E - Error
Time Stamp      ET [Card] Event Message
-----
10/13 04:29:00.384 E [R0] TestErrorCounterMonitor Failed
10/13 04:29:05.501 E [R0] TestErrorCounterMonitor Failed
10/13 04:29:10.607 E [R0] TestErrorCounterMonitor Failed
10/13 04:29:15.730 E [R0] TestErrorCounterMonitor Failed
10/13 04:29:20.835 E [R0] TestErrorCounterMonitor Failed
10/13 04:29:25.939 E [R0] TestErrorCounterMonitor Failed
10/13 04:29:31.044 E [R0] TestErrorCounterMonitor Failed
10/13 04:29:36.149 E [R0] TestErrorCounterMonitor Failed
10/13 04:29:41.252 E [R0] TestErrorCounterMonitor Failed
10/13 04:29:46.356 E [R0] TestErrorCounterMonitor Failed
```

Related Commands

| Command | Description |
|----------------------------------|--|
| diagnostic event-log size | Modifies the diagnostic event log size dynamically. |
| diagnostic monitor | Configures the health-monitoring diagnostic testing. |

| Command | Description |
|---------------------------------|--|
| diagnostic ondemand | Configures the on-demand diagnostics. |
| diagnostic schedule test | Sets the scheduling of test-based diagnostic testing for a specific module or schedule a supervisor engine switchover. |
| diagnostic start | Runs the specified diagnostic test. |
| diagnostic stop | Stops the testing process. |

show diagnostic result slot

To display diagnostic test results for supported hardware slot locations, use the **showdiagnosticresultslot** command in privileged EXEC configuration mode.

show diagnostic result slot [*number* [**detail** | **failure** [**detail**] | **test** *testid* [**detail**] | **xml**] | **all** [**detail** | **failure** [**detail**]]]

| Syntax Description | |
|----------------------------|---|
| <i>number</i> | (Optional) Slot location of the hardware for which you want diagnostic test results, such as R0 for route processor slot 0. |
| detail | (Optional) Displays additional detailed information for the specified diagnostic test. |
| failure | (Optional) Displays only failed diagnostic test results. |
| test <i>test-id</i> | (Optional) Displays diagnostic test results for one or more specific tests, where <i>test-id</i> is one of the following: <ul style="list-style-type: none"> • Name of a diagnostic test. • Number of a diagnostic test. • Range of diagnostic test numbers (startrange-endrange). • List of diagnostic test numbers or range of numbers, separated by commas. • all --Keyword specifying all diagnostic tests. |
| xml | (Optional) Displays diagnostic text results in Extensible Markup Language (XML) format. |
| all | (Optional) Displays diagnostic test results for all supported hardware locations. |

Command Default If you do not specify any options, the command displays diagnostic test results for all supported hardware slot locations.

Command Modes Privileged EXEC (#)

| Command History | Release | Modification |
|-----------------|--------------------------|------------------------------|
| | Cisco IOS XE Release 2.6 | This command was introduced. |

Usage Guidelines If a test does not exist for the hardware, “*Diagnostic is not available*” is shown.

In the command output, the possible testing results are as follows:

- Passed (.)
- Failed (F)
- Unknown (U)

Examples

The following example shows a passed diagnostic test (indicated by a “.”) called TestErrorCounterMonitor on route processor slot 0, and no supported diagnostic tests on slot F0 and slot 0:

```
Router# show diagnostic result slot all
Current bootup diagnostic level: minimal
slot R0: ASR1000-RP1      SerialNo : JAE1218GSMR
  Overall Diagnostic Result for slot R0 : PASS
  Diagnostic level at card bootup: minimal
  Test results: (. = Pass, F = Fail, U = Untested)
    1) TestErrorCounterMonitor -----> .
Diagnostic[slot F0]: Diagnostic is not available.
Diagnostic[slot 0]: Diagnostic is not available.
```

The following example shows detailed information about the diagnostic test on the hardware in slot R0:

```
Router# show diagnostic result slot R0 detail

Current bootup diagnostic level: minimal
slot R0: ASR1000-RP1      SerialNo : JAE1224L2QP
  Overall Diagnostic Result for slot R0 : PASS
  Diagnostic level at card bootup: minimal
  Test results: (. = Pass, F = Fail, U = Untested)

-----
  1) TestErrorCounterMonitor -----> .
      Error code -----> 0 (DIAG_SUCCESS)
      Total run count -----> 871
      Last test testing type -----> Health Monitoring
      Last test execution time -----> Oct 13 2009 03:15:47
      First test failure time -----> Oct 13 2009 02:02:32
      Last test failure time -----> Oct 13 2009 03:10:09
      Last test pass time -----> Oct 13 2009 03:15:47
      Total failure count -----> 10
      Consecutive failure count ---> 0
-----
```


show diagnostic simulation failure

To display a list of simulated test failures installed by the user for a module, use the **showdiagnosticsimulationfailure** command in user EXEC or privileged EXEC mode.

show diagnostic simulation failure [**all** | **module** {**all***list slot* | *slot/subslot*}]

| Syntax Description | Parameter | Description |
|--------------------|-----------------------|---|
| | all | (Optional) Displays the diagnostic simulation failure for all modules. |
| | module | (Optional) Specifies the module number. |
| | <i>list</i> | A list of modules in the following format: <ul style="list-style-type: none"> • Entries are separated by a comma, for example, 1,4,6-10. • Ranges are specified with a hyphen, for example, 1-4,6-10. |
| | <i>slot</i> | Specifies a single module by slot number. |
| | <i>slot / subslot</i> | Specifies a single submodule by slot number and subslot or bay within the module. |

Command Modes User EXEC (>) Privileged EXEC (#)

| Command History | Release | Modification |
|-----------------|--------------|---|
| | 12.2(14)SX | This command was introduced on the Supervisor Engine 720. |
| | 12.2(17d)SXB | This command was implemented on the Supervisor Engine 2. |
| | 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |

Usage Guidelines If you do not enter a **module** keyword and argument for this command, information for all modules is displayed. A diagnostic test configured for failure simulation is identified in the output of this command by its test ID number. You can use the **showdiagnosticedescriptionmodule** command to see the name and detailed description of a diagnostic test.

Examples The following example shows how to display the simulated test failures installed by the user on module 1:

```
Router# show diagnostic simulation failure module 1
Module 1:
  Test #17: Simulation = Always Fail
```

| Related Commands | Command | Description |
|------------------|---|--|
| | show diagnostic description module | Describes the diagnostic tests. |
| | test diagnostic simulation | Configures simulated diagnostic test conditions. |

show diagnostic health

To display the output for the health checks performed, use the **showdiagnostichealth** command in user EXEC or privileged EXEC mode.

show diagnostic health

Syntax Description This command has no arguments or keywords.

Command Default This command has no default settings.

Command Modes User EXEC (>) Privileged EXEC (#)

| Command History | Release | Modification |
|-----------------|-------------|------------------------------|
| | 12.2(33)SXI | This command was introduced. |

Usage Guidelines The command output displays the following system health check information:

- CPU and memory utilization
 - Displays warning if the CPU utilization in the last five minutes is greater than 70%
 - Displays total, free, and reserved memory statistics
- EARL recovery patch occurrences, shown as a log
- Nonzero ASIC error registers on all modules using the output listing of TestErrorCounterMonitor
- Nonzero port level error counters for all ports

Examples

This example shows how to display the output for the health checks performed:

```
Router# show diagnostic health
CPU utilization for the past 5 mins is greater than 70%
five minutes: 81%
EARL reset history:
Module 1 : WS-SUP32-GE-3B EARL patch log -
Num. of times patch applied      : 0
Num. of times patch requested   : 0
Non-zero port counters for 1/8 -
13.                               linkChange = 338702
Non-zero port counters for 1/9 -
0.                               rxCRCAAlignErrors = 2
3.                               rxFragmentPkts = 9
6.                               ifInErrors = 30
13.                              linkChange = 1
Current bootup diagnostic level: minimal
Test results: (. = Pass, F = Fail, U = Untested)
36) TestErrorCounterMonitor -----> F
Error code -----> 1 (DIAG_FAILURE)
Total run count -----> 29
Last test execution time ----> Mar 16 2008 19:04:02
First test failure time ----> Mar 16 2008 19:03:21
Last test failure time -----> Mar 16 2008 19:04:02
```

```

Last test pass time -----> Mar 16 2008 19:03:19
Total failure count -----> 4
Consecutive failure count ---> 4
Error Records as following.
ID -- Asic Identification
IN -- Asic Instance
PO -- Asic Port Number
RE -- Register Identification
RM -- Register Identification More
EG -- Error Group
DV -- Delta Value
CF -- Consecutive Failure
TF -- Total Failure
ID IN PO RE RM DV EG CF TF
-----
26 0 0 338 255 256 2 13 13
26 0 0 344 255 256 2 13 13
26 0 0 358 255 256 2 13 13
System Memory: 524288K total, 353225K used, 171063K free, 1000K kernel reserved
Lowest(b) : 171020288
Process kernel, type POSIX, PID = 1
0K total, 0K text, 0K data, 0K stack, 0K dynamic
Process sbin/chkptd.proc, type POSIX, PID = 16386
2296K total, 1988K text, 120K data, 12K stack, 176K dynamic
65536 heapsize, 55356 allocated, 8084 free
    
```

Related Commands

| Command | Description |
|---------------------------|--|
| diagnostic monitor | Configures the health-monitoring diagnostic testing. |

show diagnostic ondemand settings

To display the settings for the on-demand diagnostics, use the **showdiagnosticondemandsettings** command in user EXEC or privileged EXEC mode.

show diagnostic ondemand settings

Syntax Description This command has no arguments or keywords.

Command Default This command has no default settings.

Command Modes User EXEC (>) Privileged EXEC (#)

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

Usage Guidelines The command output shows the number of test iterations to be performed and the action to be taken on a test failure. Possible actions are:

- continue--Continue the ondemand tests until the test failure limit is reached.
- stop--Stop the ondemand tests immediately if a test fails.

Examples

This example shows how to display the settings for the on-demand diagnostics:

```
Router# show diagnostic ondemand settings
Test iterations = 1
Action on test failure = continue
```

Related Commands

| Command | Description |
|----------------------------|---------------------------------------|
| diagnostic ondemand | Configures the on-demand diagnostics. |

show diagnostic result module

To display the diagnostic test results for a module, use the **showdiagnosticresult** command in user EXEC or privileged EXEC mode.

show diagnostic result module {*all*|*list*|*slot*/*subslot*} [**detail**|**failure** [**detail**]|**test** *test-id* [**detail**]|**xml**]

| Syntax Description | Parameter | Description |
|--------------------|----------------------------|---|
| | all | Displays diagnostic test results for all modules. |
| | <i>list</i> | A list of modules in the following format: <ul style="list-style-type: none"> • Entries are separated by a comma, for example, 1,4,6-10. • Ranges are specified with a hyphen, for example, 1-4,6-10. |
| | <i>slot</i> | Specifies a single module by slot number. |
| | <i>slot/subslot</i> | Specifies a single submodule by slot number and subslot or bay within the module. |
| | detail | (Optional) Displays the detailed test results. |
| | failure | (Optional) Displays the failed test results. |
| | test <i>test-id</i> | (Optional) Displays the test results only for the specified test. See the Usage Guidelines for a list of tests. |
| | xml | (Optional) Displays the test results in XML form. |

Command Default This command has no default settings.

Command Modes User EXEC (>) Privileged EXEC (#)

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

Usage Guidelines In the command output, the possible testing results are as follows:

- Passed (.)
- Failed (F)
- Unknown (U)

To display only the results of failed diagnostic tests, use the **failure** keyword.

To display the results of a specific diagnostic test, specify the *test-id* number using the **test***test-id* keyword and argument. The *test-id* numbers for available diagnostic tests are displayed in the output of the **showdiagnosticcontentmodule** command.

You can use the **showdiagnosticdescriptionmodule** command to see a detailed description of a diagnostic test.

Examples

This example shows how to display a summary of all diagnostic test results for the module in slot 3:

```
Router# show diagnostic result module 3
Current bootup diagnostic level:complete
Module 3:
Overall Diagnostic Result for Module 8 :PASS
Diagnostic level at card bootup:complete
Test results:(. = Pass, F = Fail, U = Untested)
  1) TestLoopback :
     Port  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
     -----
     . . . . .
     Port 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
     -----
     . . . . .
  2) TestNewLearn -----> .
  3) TestIndexLearn -----> .
  4) TestDontLearn -----> .
  5) TestConditionalLearn -----> .
  6) TestDontLearn -----> .
  7) TestConditionalLearn -----> .
  8) TestBadBpdu -----> .
  9) TestTrap -----> .
 10) TestMatch -----> .
 11) TestCapture -----> .
 12) TestProtocolMatch -----> .
 13) TestChannel -----> .
 14) TestIPFibShortcut -----> .
 15) TestDontShortcut -----> .
 16) TestL3Capture2 -----> .
 17) TestL3VlanMet -----> .
 18) TestIngressSpan -----> .
 19) TestEgressSpan -----> .
 20) TestAclPermit -----> .
 21) TestAclDeny -----> .
 22) TestNetflowInlineRewrite:
     Port  1  2  3  4  5  6  7  8  9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
     -----
     . . . . .
     Port 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
     -----
     . . . . .
```

This example shows how to display the detailed test results for the module in slot 1:

```
Router# show diagnostic result module 1 detail
Current bootup diagnostic level:complete
Module 1:
Overall Diagnostic Result for Module 1 :PASS
Diagnostic level at card bootup:complete
Test results:(. = Pass, F = Fail, U = Untested)
-----
 1) TestDummy -----> .
```

```

Error code -----> 0 (DIAG_SUCCESS)
Total run count -----> 90
Last test execution time ----> Dec 10 2002 12:34:30
First test failure time -----> Dec 10 2002 11:57:39
Last test failure time -----> Dec 10 2002 12:34:10
Last test pass time -----> Dec 10 2002 11:34:30
Total failure count -----> 65
Consecutive failure count ---> 0
    
```

2) TestLoopback:

```

Port 1 2
-----
    
```

```

. .
Error code -----> 0 (DIAG_SUCCESS)
Total run count -----> 1
Last test execution time ----> Dec 10 2002 12:37:18
First test failure time -----> n/a
Last test failure time -----> n/a
Last test pass time -----> Dec 10 2002 12:37:18
Total failure count -----> 0
Consecutive failure count ---> 0
    
```

```

.
.
.
[...continues...]
    
```

Related Commands

| Command | Description |
|---|--|
| show diagnostic content module | Displays the available diagnostic tests. |
| show diagnostic description module | Describes the diagnostic tests. |

show diagnostic sanity

To display sanity check results, use the **show diagnostic sanity** command in privileged EXEC mode.

show diagnostic sanity

Syntax Description

This command has no arguments or keywords.

Command Default

Displays information for all the Gigabit Ethernet WAN interfaces in the Cisco 7600 series router.

Command Modes

Privileged EXEC

Command History

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

Usage Guidelines

The sanity check runs a set of predetermined checks on the configuration with a possible combination of certain system states to compile a list of warning conditions. The checks are designed to look for anything that seems out of place and are intended to serve as an aid to maintaining the system sanity.

The following is a list of the checks that are run and the action taken when the condition is found:

- Checks whether the default gateways are reachable. If so, the system stops pinging.
- If a port auto-negotiates to half duplex, the system flags it.

Trunking Checks

- If a trunk port has the mode set to “on,” the system flags it.
- If a port is trunking and mode is auto, the system flags it.
- If a trunk port is not trunking and the mode is desirable, the system flags it.
- If a trunk port negotiates to half duplex, the system flags it.

Channeling Checks

- If a port has channeling mode set to on, the system flags it.
- If a port is not channeling and the mode is set to desirable, the system flags it.
- If a VLAN has a Spanning-Tree root of 32K (root is not set), the system flags it.

Spanning-Tree VLAN Checks

- If a VLAN has a max age on the Spanning-Tree root that is different than the default, the system flags it.
- If a VLAN has a fwd delay on the Spanning-Tree root that is different than the default, the system flags it.
- If a VLAN has a fwd delay on the bridge that is different than the default, the system flags it.

- If a VLAN has a fwd delay on the bridge that is different than the default, the system flags it.
- If a VLAN has a hello time on the bridge that is different than the default, the system flags it.

Spanning-Tree Port Checks

- If a port has a port cost that is different than the default, the system flags it.
- If a port has a port priority that is different than the default, the system flags it.

UDLD Checks

- If a port has UDLD disabled, the system flags it.
- If a port had UDLD shut down, the system flags it.
- If a port had a UDLD undetermined state, the system flags it.

Assorted Port Checks

- If a port had receive flow control disabled, the system flags it.
- If a trunk port had PortFast enabled, the system flags it.
- If an inline power port has any of the following states:
 - denied
 - faulty
 - other
 - off

The system flags it.

- If a port has a native VLAN mismatch, the system flags it.
- If a port has a duplex mismatch, the system flags it.

Bootstring and Config Register Checks

- The config register on the primary supervisor engine (and on the secondary supervisor engine if present) must be one of the following values: 0x2, 0x102, or 0x2102.
- The system verifies the bootstring on the primary supervisor engine (and on the secondary supervisor engine if present). The system displays a message if the bootstring is empty.
- The system verifies that every file is specified in the bootstring. The system displays a message if the file is absent or shows up with a wrong checksum.

If only *device* : is specified as a filename, then the system verifies that the first file is on the device.

Assorted Checks

- The system displays a message if IGMP snooping is disabled.
- The system displays a message if any of the values of the snmp community access strings {RO,RW,RW-ALL} is the same as the default.
- The system displays a message if any of the modules are in states other than “Ok.”

- The system displays a message that lists all the tests that failed (displayed as an “F”) in the **show test all** command.
- The system displays a message if *fast is not configured on the switch anywhere.
- The system displays a message if there is enough room for the crashinfo file on the bootflash:.
- The system displays a message if multicast routing is enabled globally but is not applied to all interfaces.
- The system displays a message if IGMP snooping is disabled and RGMP is enabled.

Examples

This example displays samples of the messages that could be displayed with the **show diagnostic sanity** command:

```
Router# show diagnostic sanity
Pinging default gateway 10.6.141.1 ....
Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 10.6.141.1, timeout is 2 seconds:
..!!
Success rate is 0 percent (0/5)
IGMP snooping disabled please enable it for optimum config.
IGMP snooping disabled but RGMP enabled on the following interfaces,
please enable IGMP for proper config :
Vlan1, Vlan2, GigabitEthernet1/1
Multicast routing is enabled globally but not enabled on the following
interfaces:
GigabitEthernet1/1, GigabitEthernet1/2
A programming algorithm mismatch was found on the device bootflash:
Formatting the device is recommended.
The bootflash: does not have enough free space to accomodate the crashinfo file.
Please check your confreg value : 0x0.
Please check your confreg value on standby: 0x0.
The boot string is empty. Please enter a valid boot string .
Could not verify boot image "disk0:" specified in the boot string on the
slave.
Invalid boot image "bootflash:asdasd" specified in the boot string on the
slave.
Please check your boot string on the slave.
UDLD has been disabled globally - port-level UDLD sanity checks are
being bypassed.
OR
[
The following ports have UDLD disabled. Please enable UDLD for optimum
config:
Fa9/45
The following ports have an unknown UDLD link state. Please enable UDLD
on both sides of the link:
Fa9/45
]
The following ports have portfast enabled:
Fa9/35, Fa9/45
The following ports have trunk mode set to on:
Fa4/1, Fa4/13
The following trunks have mode set to auto:
Fa4/2, Fa4/3
The following ports with mode set to desirable are not trunking:
Fa4/3, Fa4/4
The following trunk ports have negotiated to half-duplex:
Fa4/3, Fa4/4
The following ports are configured for channel mode on:
Fa4/1, Fa4/2, Fa4/3, Fa4/4
```

The following ports, not channeling are configured for channel mode desirable:
Fa4/14
The following vlan(s) have a spanning tree root of 32768:
1
The following vlan(s) have max age on the spanning tree root different from the default:
1-2
The following vlan(s) have forward delay on the spanning tree root different from the default:
1-2
The following vlan(s) have hello time on the spanning tree root different from the default:
1-2
The following vlan(s) have max age on the bridge different from the default:
1-2
The following vlan(s) have fwd delay on the bridge different from the default:
1-2
The following vlan(s) have hello time on the bridge different from the default:
1-2
The following vlan(s) have a different port priority than the default on the port FastEthernet4/1
1-2
The following ports have recieve flow control disabled:
Fa9/35, Fa9/45
The following inline power ports have power-deny/faulty status:
Gi7/1, Gi7/2
The following ports have negotiated to half-duplex:
Fa9/45
The following vlans have a duplex mismatch:
Fas 9/45

The following interafaces have a native vlan mismatch:
interface (native vlan - neighbor vlan)
Fas 9/45 (1 - 64)
The value for Community-Access on read-only operations for SNMP is the same as default. Please verify that this is the best value from a security point of view.
The value for Community-Access on write-only operations for SNMP is the same as default. Please verify that this is the best value from a security point of view.
The value for Community-Access on read-write operations for SNMP is the same as default. Please verify that this is the best value from a security point of view.
Please check the status of the following modules:
8,9
Module 2 had a MINOR_ERROR.
The Module 2 failed the following tests:
TestIngressSpan
The following ports from Module2 failed test1:
1,2,4,48

show diagnostic schedule module

To display the current scheduled diagnostic tasks, use the **showdiagnosticschedulemodule** command in user EXEC or privileged EXEC mode.

show diagnostic schedule module {*all*|*list*|*slot*|*subslot*}

Syntax Description

| | |
|---------------------|---|
| all | Displays the current scheduled diagnostic tasks for all modules. |
| list | A list of modules in the following format: <ul style="list-style-type: none"> • Entries are separated by a comma, for example, 1,4,6-10. • Ranges are specified with a hyphen, for example, 1-4,6-10. |
| slot | Specifies a single module by slot number. |
| slot/subslot | Specifies a single submodule by slot number and subslot or bay within the module. |

Command Default

This command has no default settings.

Command Modes

User EXEC (>) Privileged EXEC (#)

Command History

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

Usage Guidelines

A scheduled diagnostic test is identified in the output of this command by its test ID number. With the test ID number, you can see the name and detailed description of the diagnostic test by using the **showdiagnosticdescriptionmodule** command.

Examples

This example shows how to display the current scheduled diagnostic tasks for the module in slot 1:

```
Router# show diagnostic schedule module 1
Current Time = 07:55:30 UTC Fri August 2 2002
Diagnostic for Module 1:
Schedule #1:
  To be run on January 3 2003 23:32
  Test ID(s) to be executed:1.
Schedule #2:
  To be run daily 14:45
  Test ID(s) to be executed:2.
Schedule #3:
  To be run weekly Monday 3:33
  Test ID(s) to be executed:all.
```

Related Commands

| Command | Description |
|---|--|
| diagnostic schedule test | Sets the scheduling of test-based diagnostic testing for a specific module or schedule a supervisor engine switchover. |
| show diagnostic description module | Describes the diagnostic tests. |

show diagnostic status

To display the currently running diagnostics tests, use the **showdiagnosticstatus** command in user EXEC or privileged EXEC mode.

show diagnostic status

Syntax Description This command has no arguments or keywords.

Command Default This command has no default settings.

Command Modes User EXEC (>) Privileged EXEC (#)

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

Usage Guidelines For each installed module, the following fields are displayed in the command output:

| Field | Description |
|----------------------|--|
| Card | The slot number of the module associated with the event |
| Description | A description of the module |
| Current Running Test | The diagnostic test running on the module |
| Run by | The diagnostic test category that initiated the running test. The categories are: <ul style="list-style-type: none"> • BU--This test is running as a part of the bootup diagnostics • HM--This test is running as a part of the health monitoring diagnostics • OD--This was initiated as an ondemand diagnostic test • SCH--This test is running as a scheduled diagnostic test |

Examples

This example shows how to display the currently running diagnostics tests:

```
Router# show diagnostic status
<BU> - Bootup Diagnostics, <HM> - Health Monitoring Diagnostics, <OD> - OnDemand Diagnostics,
<SCH> - Scheduled Diagnostics
=====
Card   Description                               Current Running Test      Run by
-----
3      CEF720 48 port 10/100/1000mb Ethe TestLoopback              <OD>
5      Supervisor Engine 720 (Hot) TestScratchRegister       <HM>
6      Supervisor Engine 720 (Active) N/A                        N/A
```

```

8      CEF720 8 port 10GE with DFC      N/A      N/A
=====

```

Related Commands

| Command | Description |
|---|--|
| diagnostic start | Runs the specified diagnostic test. |
| diagnostic stop | Stops the testing process. |
| show diagnostic content module | Displays the available diagnostic tests. |
| show diagnostic description module | Describes the diagnostic tests. |

show dsc clock

To display information about the dial shelf controller clock, use the **showdsclock** command in privileged EXEC mode with the line card execute (**execute-on**) command.

execute-on {slot *slot-number* | all} **show dsc clock**

Syntax Description

| | |
|--------------------------------|--|
| execute-on | Executes commands remotely on a line card. |
| slot <i>slot-number</i> | Displays information for a specific slot. Slot number (12 or 13) must be occupied by a DSC card. |
| all | Executes the command on all line cards. |

Command Modes

EXEC

Command History

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

Usage Guidelines

You must use the **showdsclock** command from the router using the **execute-on** command.

Examples

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

```
Router# execute-on slot 12
  show dsc clock
Router#
Primary Clock:
-----
Slot: 3, Port 1, Line 0, Priority = 3 up since 00:37:56
Time elapsed since last failure of the primary = 00:38:59

Backup clocks:
Source Slot Port Line Priority Status State
-----
Trunk 1 2 0 10 Good Configured
```

All feature boards present are getting good clock from DSC

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

Table 25: show dcs clock Field Descriptions

| Field | Description |
|---------------|--|
| Primary clock | The clock designated as the master timing clock. |

| Field | Description |
|---------------|---|
| Priority | The order in which a clock is designated to back up the primary clock or the next higher priority clock in case of its failure. |
| Backup Source | The clock signal source, such as a trunk, internal clock, or external generator. |
| Feature board | An application-specific card in the dial shelf, such as a line card. |
| Trunk | The trunk line connected to the ISP or central office. |
| Status | Whether the clock source is capable of providing a synch source signal. |
| State | Whether the clock source is connected and assigned a priority. |

Related Commands

| Command | Description |
|-------------------|--|
| execute-on | Executes commands remotely on a line card. |

show dsi

To display information about the dial shelf interconnect (DSI) port adapter parameters, use the **showdsi** command in privileged EXEC mode with the line card execute (**execute-on**) command.

execute-on {*slot slot-number* | **all**} **show dsi**

Syntax Description

| | |
|--------------------------------|--|
| execute-on | Executes commands remotely on a line card. |
| slot <i>slot-number</i> | Displays information for a specific slot. Slot number (12 or 13) must be occupied by a DSC card. |
| all | Executes the command on all line cards. |

Command Modes

Privileged EXEC

Command History

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

Usage Guidelines

The dial shelf interconnect (DSI) port adapter connects the Cisco 5814 dial shelf to the Cisco 7206 router shelf. The DSI port adapter allows data transfers between the dial shelf and the router shelf. Data is converted into packets by the feature cards, transmitted to a hub on the dial shelf controller card, and from there sent to the router shelf. Conversely, packets from the router shelf are sent to the dial shelf controller card, where they are transmitted over the backplane to the modem and trunk cards. The show dsi command is used to show information about the dial shelf interconnect hardware, interface, physical link, PCI registers, and address filters.

Examples

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

```
Router# execute-on slot 1 show dsi
DSI-Tx-FastEthernet0 is up, line protocol is up
  Hardware is DEC21140A, address is 0008.26b7.b008 (bia 0008.26b7.b008)
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec, rely 255/255, load 1/255
  Encapsulation ARPA, loopback not set, keepalive set (10 sec)
  Half-duplex, 100Mb/s, 100BaseTX/FX
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 01:17:09, output 00:00:00, output hang never
  Last clearing of "show interface" counters never
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 0/75, 0 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
    6 packets input, 596 bytes, 0 no buffer
  Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
  0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
  0 watchdog, 0 multicast
```

```

    0 input packets with dribble condition detected
    6170 packets output, 813483 bytes, 0 underruns
    0 output errors, 0 collisions, 1 interface resets
    0 babbles, 0 late collision, 0 deferred
    0 lost carrier, 0 no carrier
    0 output buffer failures, 0 output buffers swapped out
DSI-Rx-FastEthernet1 is up, line protocol is up
Hardware is DEC21140A, address is 0008.26b7.b008 (bia 0008.26b7.b008)
MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec, rely 255/255, load 1/255
Encapsulation ARPA, loopback not set, keepalive set (10 sec)
Full-duplex, 100Mb/s, 100BaseTX/FX
ARP type: ARPA, ARP Timeout 04:00:00
Last input 00:00:00, output never, output hang never
Last clearing of "show interface" counters never
Queueing strategy: fifo
Output queue 0/40, 0 drops; input queue 0/75, 0 drops
5 minute input rate 0 bits/sec, 0 packets/sec
5 minute output rate 0 bits/sec, 0 packets/sec
 6280 packets input, 362493 bytes, 0 no buffer
  Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
  0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
  0 watchdog, 0 multicast
  0 input packets with dribble condition detected
  0 packets output, 0 bytes, 0 underruns
  0 output errors, 0 collisions, 1 interface resets
  0 babbles, 0 late collision, 0 deferred
  0 lost carrier, 0 no carrier
  0 output buffer failures, 0 output buffers swapped out
Interface DSI-Tx-FastEthernet0
Hardware is DEC21140A
dec21140_ds=0x604C9FC4, registers=0x3C000000, ib=0x1912E00
rx ring entries=128, tx ring entries=256
rxring=0x1912F00, rxr shadow=0x604CA16C, rx_head=6, rx_tail=0
txring=0x1913740, txr shadow=0x604CA398, tx_head=138, tx_tail=138, tx_count=0
PHY link up
CSR0=0xFE024882, CSR3=0x1912F00, CSR4=0x1913740, CSR5=0xFC660000
CSR6=0x320CA002, CSR7=0xFFFFA261, CSR8=0xE0000000, CSR9=0xFFFFDC3FF
CSR11=0xFFFFE0000, CSR12=0xFFFFF09, CSR15=0xFFFFFEC8
DEC21140 PCI registers:
  bus_no=0, device_no=1
  CFID=0x00091011, CFCS=0x02800006, CFRV=0x02000022, CFLT=0x0000FF00
  CBIO=0x00000001, CBMA=0x48000000, CFIT=0x28140100, CFDA=0x00000000
MII registers:
Register 0x00:  FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF
Register 0x08:  FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF
Register 0x10:  FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF
Register 0x18:  FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF
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=0
tx_no_carrier=0, tx_late_collision=0, tx_excess_coll=0
tx_collision_cnt=0, tx_deferred=0, fatal_tx_err=0, tbl_overflow=0
HW addr filter: 0x604CABC4, ISL Disabled
Entry= 0:  Addr=FFFF.FFFF.FFFF
Entry= 1:  Addr=FFFF.FFFF.FFFF
Entry= 2:  Addr=FFFF.FFFF.FFFF
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=0008.26B7.B008

Interface DSI-Rx-FastEthernet1
Hardware is DEC21140A
dec21140_ds=0x604DDA4C, registers=0x3C000800, ib=0x1A01FC0
rx ring entries=128, tx ring entries=256
rxring=0x1A020C0, rxr shadow=0x604DDBF4, rx_head=55, rx_tail=0
txring=0x1A02900, txr shadow=0x604DDE20, tx_head=2, tx_tail=2, tx_count=0
PHY link up
CSR0=0xFE024882, CSR3=0x1A020C0, CSR4=0x1A02900, CSR5=0xFC660000
CSR6=0x320CA202, CSR7=0xFFFFA261, CSR8=0xE0000000, CSR9=0xFFFD3FF
CSR11=0xFFFE0000, CSR12=0xFFFFFFFF09, CSR15=0xFFFFFEC8
DEC21140 PCI registers:
bus_no=0, device_no=2
CFID=0x00091011, CFCS=0x02800006, CFRV=0x02000022, CFLT=0x0000FF00
CBIO=0x00000001, CBMA=0x48000800, CFIT=0x28140100, CFDA=0x00000000
MII registers:
Register 0x00: FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF
Register 0x08: FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF
Register 0x10: FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF
Register 0x18: FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF
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=0
tx_no_carrier=0, tx_late_collision=0, tx_excess_coll=0
tx_collision_cnt=0, tx_deferred=0, fatal_tx_err=0, tbl_overflow=0
HW addr filter: 0x604DE64C, ISL Disabled
Entry= 0: Addr=FFFF.FFFF.FFFF
Entry= 1: Addr=FFFF.FFFF.FFFF
Entry= 2: Addr=FFFF.FFFF.FFFF
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=0008.26B7.B008

```

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

Table 26: show dsi Field Descriptions

| Field | Description |
|---|---|
| FastEthernet0 ... is up ... is administratively down | Indicates whether the interface hardware is currently active and if it has been taken down by an administrator. |
| line protocol is | Indicates whether the software processes that handle the line protocol consider the line usable or if it has been taken down by an administrator. |
| Hardware | Hardware type (for example, MCI Ethernet, SCI, ¹ CBus ² Ethernet) and address. |

| Field | Description |
|---|--|
| Internet address | Internet address followed by subnet mask. |
| MTU | Maximum Transmission Unit of the interface. |
| BW | Bandwidth of the interface in kilobits per second. |
| DLY | Delay of the interface in microseconds. |
| rely | Reliability of the interface as a fraction of 255 (255/255 is 100% reliability), calculated as an exponential average over 5 minutes. |
| load | Load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes. |
| Encapsulation | Encapsulation method assigned to interface. |
| ARP type: | Type of Address Resolution Protocol assigned. |
| loopback | Indicates whether loopback is set or not. |
| keepalive | Indicates whether keepalives are set or not. |
| Last input | Number of hours, minutes, and seconds since the last packet was successfully received by an interface. Useful for knowing when a dead interface failed. |
| output | Number of hours, minutes, and seconds since the last packet was successfully transmitted by the interface. Useful for knowing when a dead interface failed. |
| output hang | Number of hours, minutes, and seconds (or never) since the interface was last reset because of a transmission that took too long. When the number of hours in any of the "last" fields exceeds 24 hours, the number of days and hours is printed. If that field overflows, asterisks are printed. |
| Last clearing | Time at which the counters that measure cumulative statistics (such as number of bytes transmitted and received) shown in this report were last reset to zero. Note that variables that might affect routing (for example, load and reliability) are not cleared when the counters are cleared. *** indicates the elapsed time is too large to be displayed. 0:00:00 indicates the counters were cleared more than 231 ms (and less than 232ms) ago. |
| Output queue, input queue, drops | Number of packets in output and input queues. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped due to a full queue. |
| 5 minute input rate, 5 minute output rate | <p>Average number of bits and packets transmitted per second in the last 5 minutes. If the interface is not in promiscuous mode, it senses network traffic it sends and receives (rather than all network traffic).</p> <p>The 5-minute input and output rates should be used only as an approximation of traffic per second during a given 5-minute period. These rates are exponentially weighted averages with a time constant of 5 minutes. A period of four time constants must pass before the average will be within two percent of the instantaneous rate of a uniform stream of traffic over that period.</p> |

| Field | Description |
|-------------------------|--|
| 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. |
| no buffer | Number of received packets discarded because there was no buffer space in the main system. Compare with ignored count. Broadcast storms on Ethernets and bursts of noise on serial lines are often responsible for no input buffer events. |
| Received ... broadcasts | Total number of broadcast or multicast packets received by the interface. |
| runts | Number of packets that are discarded because they are smaller than the medium's minimum packet size. For instance, any Ethernet packet that is less than 64 bytes is considered a runt. |
| giants | Number of packets that are discarded because they exceed the medium's maximum packet size. For example, any Ethernet packet that is greater than 1518 bytes is considered a giant. |
| input errors | Includes runts, giants, no buffer, CRC, frame, overrun, and ignored counts. Other input-related errors can also cause the input errors count to be increased, and some datagrams may have more than one error; therefore, this sum may not balance with the sum of enumerated input error counts. |
| CRC | Cyclic redundancy checksum generated by the originating LAN station or far-end device does not match the checksum calculated from the data received. On a LAN, this usually indicates noise or transmission problems on the LAN interface or the LAN bus itself. A high number of CRCs is usually the result of collisions or a station transmitting bad data. |
| frame | Number of packets received incorrectly having a CRC error and a noninteger number of octets. On a LAN, this is usually the result of collisions or a malfunctioning Ethernet device. |
| overrun | Number of times the receiver hardware was unable to hand received data to a hardware buffer because the input rate exceeded the receiver's ability to handle the data. |
| ignored | Number of received packets ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different than the system buffers mentioned previously in the buffer description. Broadcast storms and bursts of noise can cause the ignored count to be increased. |
| abort | Number of packets whose receipt was aborted. |
| watchdog | Number of times watchdog receive timer expired. It happens when receiving a packet with length greater than 2048. |
| multicast | Number of multicast packets received. |

| Field | Description |
|---|--|
| input packets with dribble condition detected | Dribble bit error indicates that a frame is slightly too long. This frame error counter is incremented just for informational purposes; the router accepts the frame. |
| packets output | Total number of messages transmitted by the system. |
| bytes | Total number of bytes, including data and MAC encapsulation, transmitted by the system. |
| underruns | Number of times that the transmitter has been running faster than the router can handle. This may never be reported on some interfaces. |
| output errors | Sum of all errors that prevented the final transmission of datagrams out of the interface being examined. Note that this may not balance with the sum of the enumerated output errors, as some datagrams may have more than one error, and others may have errors that do not fall into any of the specifically tabulated categories. |
| collisions | Number of messages retransmitted due to an Ethernet collision. This is usually the result of an overextended LAN (Ethernet or transceiver cable too long, more than two repeaters between stations, or too many cascaded multiport transceivers). A packet that collides is counted only once in output packets. |
| interface resets | Number of times an interface has been completely reset. This can happen if packets queued for transmission were not sent within several seconds. On a serial line, this can be caused by a malfunctioning modem that is not supplying the transmit clock signal, or by a cable problem. If the system notices that the carrier detect line of a serial interface is up, but the line protocol is down, it periodically resets the interface in an effort to restart it. Interface resets can also occur when an interface is looped back or shut down. |
| restarts | Number of times a Type 2 Ethernet controller was restarted because of errors. |
| babbles | The transmit jabber timer expired. |
| late collision | Number of late collisions. Late collision happens when a collision occurs after transmitting the preamble. |
| deferred | Deferred indicates that the chip had to defer while ready to transmit a frame because the carrier was asserted. |
| lost carrier | Number of times the carrier was lost during transmission. |
| no carrier | Number of times the carrier was not present during the transmission. |
| output buffer failures | Number of failed buffers and number of buffers swapped out. |

¹ SCI = Single Cell Input

² CBus = Command Bus

| Command | Description |
|---------------------|---|
| execute-on | Executes commands on a line card. |
| show dsip | Displays all information about the DSIP. |
| show version | Displays the configuration of the system hardware, the software version, the names and sources of configuration files, and the boot images. |

show dsip

To display all information about the Distributed System Interconnect Protocol (DSIP) on a Cisco AS5800, use the **showdsip** command in EXEC mode.

show dsip

Syntax Description This command has no arguments or keywords.

Command Modes EXEC

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

Usage Guidelines Your Cisco AS5800 universal access server uses a protocol used by the Cisco 7206 router shelf to communicate back and forth with the Cisco 5814 dial shelf controller card(s) and feature cards. Although dial shelf interconnect (DSI) configuration is transparent to the user, there are several show commands to help you view your setup, and debug commands to help you troubleshoot your system.

To display a subset of this information, use the **showdsipclients**, **showdsipnodes**, **showdsipports**, **showdsipqueue**, **showdsiptracing**, **showdsiptransport**, and **showdsipversion** commands.

Examples

The following is sample output from the **showdsip** command. For a description of the fields shown in the sample output, refer to the individual **showdsip** commands listed in the “Usage Guidelines” section.

```
Router# show dsip

DSIP Transport Statistics:
IPC : input msgs=8233, bytes=699488; output msgs=8233, bytes=483558
      total consumed ipc msgs=682; total freed ipc msgs = 682
      transmit contexts in use = 11, free = 245, zombie = 0, invalid = 0
      ipc getmsg failures = 0, ipc timeouts=0
      core getbuffer failures=0, api getbuffer failures=0
dsip test msgs rcvd = 2770, sent = 0
CNTL: input msgs=1112, bytes=91272; output msgs=146, bytes=8760
      getbuffer failures=0
DATA: input msgs=0, bytes=0; output msgs=426, bytes=5112

DSIP Private Buffer Pool Hits = 0

DSIP Registered Addresses:
Shelf0 : Master: 00e0.b093.2238, Status=local
Shelf1 : Slot1 : 0007.5387.4808, Status=remote
Shelf1 : Slot5 : 0007.5387.4828, Status=remote
Shelf1 : Slot6 : 0007.5387.4830, Status=remote
Shelf1 : Slot7 : 0007.5387.4838, Status=remote
```

show dsip

```

Shelf1 : Slot8 : 0007.5387.4840, Status=remote
Shelf1 : Slot9 : 0007.5387.4848, Status=remote
Shelf1 : Slot11: 0007.5387.4858, Status=remote
Shelf1 : Slot12: 0007.4b67.8260, Status=remote
DSIP Clients:
-----
ID      Name
0       Console
1       Clock
2       Modem
3       Logger
4       Trunk
5       Async data
6       TDM
7       Dial shelf manager
8       Environment Mon
9       DSIP Test
Dsip Local Ports:
-----
Client:Portname          Portid   In-Msgs  Bytes    Last-i/p
Console:Master           10004    0         0        never
Clock:Master             10005    29        3464     00:00:40
Modem:Master             10006    90        70162    00:23:44
Logger:Master            10007    0         0        never
Trunk:Master             10008    1765     140480   00:00:08
Async data:Master        10009    0         0        never
TDM:Master               1000A    7         112     00:24:19
Dial shelf manager:Master 1000B    28        4752     00:00:36
DSIP Test:Master         1000C    2922     2922     00:00:00

Dsip Remote Ports:
-----
Client:Portname          Portid   Out-Msgs Bytes    Last-o/p  Last-act
Clock:Slave1             101005F  1         24       00:24:21  00:24:21
Trunk:Slave1             1010061  12        1776     00:24:21  00:24:21
Modem:Slave5             1050050  96        2148     00:23:56  00:24:19
Modem:Slave6             1060050  105       2040     00:24:00  00:24:22
Modem:Slave7             1070050  106       2188     00:23:56  00:24:20
Modem:Slave8             1080050  112       2212     00:24:13  00:24:35
Modem:Slave9             1090050  115       2224     00:24:09  00:24:35
Modem:Slave11            10B0050  107       2192     00:24:09  00:24:32
Clock:Slave12            10C000D  1         24       00:24:37  00:24:37
Dial shelf manager:Slave12 10C000E  28        4752     00:00:49  00:24:35
DSIP Test:Slave12       10C000F  0         0        never     00:24:35

DSIP ipc queue:
-----
There are 0 IPC messages waiting for acknowledgement in the transmit queue.
There are 0 messages currently in use by the system.

DSIP ipc seats:
-----
There are 9 nodes in this IPC realm.

```

| ID | Type | Name | Last Sent | Last Heard |
|---------|-------|--------------|-----------|------------|
| 10000 | Local | IPC Master | 0 | 0 |
| 1060000 | DSIP | Seat:Slave6 | 10 | 10 |
| 10C0000 | DSIP | Seat:Slave12 | 2963 | 13 |
| 1080000 | DSIP | Seat:Slave8 | 10 | 10 |
| 1090000 | DSIP | Seat:Slave9 | 10 | 10 |
| 1010000 | DSIP | Seat:Slave1 | 16 | 16 |
| 1070000 | DSIP | Seat:Slave7 | 10 | 10 |
| 10B0000 | DSIP | Seat:Slave11 | 10 | 10 |
| 1050000 | DSIP | Seat:Slave5 | 10 | 10 |

```

DSIP version information:
-----
Local DSIP major version = 3,   minor version = 2

All DS slots are running DSIP versions compatible with RS
Local Clients Registered Versions:
-----
Client Name      Major Version  Minor Version
Console         3              2
Clock           1              1
Modem           0              0
Logger          No version    No version
Trunk           No version    No version
Async data      No version    No version
TDM             No version    No version
DSIP Test       No version    No version

Mismatched Remote Client Versions:
-----

```

Related Commands

| Command | Description |
|----------------------------|---|
| show dsip clients | Lists the clients registered with DSIP on a system. |
| show dsip nodes | Displays information about the processors running the DSIP. |
| show dsip ports | Displays information about local and remote ports. |
| show dsip queue | Displays the number of messages in the retransmit queue waiting for acknowledgment. |
| show dsip tracing | Displays DSIP tracing buffer information. |
| show dsip transport | Displays information about the DSIP transport statistics for the control/data and IPC packets and registered addresses. |
| show dsip version | Displays DSIP version information. |
| show version | Displays the configuration of the system hardware, the software version, the names and sources of configuration files, and the boot images. |

show dsip clients

To display information about Distributed System Interconnect Protocol (DSIP) clients, use the **showdsipclients** command in EXEC mode.

show dsip clients

Syntax Description This command has no arguments or keywords.

Command Modes EXEC

Command History

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

Usage Guidelines

Use this command to see whether a client is actually registered with DSIP and using its services.

Consider the following example: a client “Trunk” seems to be defunct on a particular node with absolutely no input/output activity. The command show dsip ports does not show any Trunk port among its local ports though all other client ports show up. The problem might be that the Trunk client did not even register with DSIP. To confirm this, use the show dsip clients command.

Examples

The following is sample output from the **showdsipclients** command. This command lists the clients.

```
Router# show dsip clients
ID      Name
0       Console
1       Clock
2       Modem
3       Logger
4       Trunk
5       Async data
6       TDM
7       Dial shelf manager
8       Environment Mon
9       DSIP Test
```

Related Commands

| Command | Description |
|------------------------|---|
| show dsip nodes | Displays information about the processors running the DSIP. |
| show dsip ports | Displays information about local and remote ports |
| show dsip queue | Displays the number of messages in the retransmit queue waiting for acknowledgment. |

| Command | Description |
|----------------------------|---|
| show dsip tracing | Displays DSIP tracing buffer information. |
| show dsip transport | Displays information about the DSIP transport statistics for the control/data and IPC packets and registered addresses. |
| show dsip version | Displays DSIP version information. |

show dsip nodes

To display information about the processors running the Distributed System Interconnect Protocol (DSIP), use the **showdsipnodes** command in EXEC mode.

show dsip nodes

Syntax Description This command has no arguments or keywords.

Command Modes EXEC

Command History

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

Usage Guidelines

Use show dsip nodes to see the nodes (slots) connected by DSIP and the node specific sequence numbers. The former information is also available from show dsip transport. The sequence numbers are useful for support engineers while debugging a problem.

Examples

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

```
Router# show dsip nodes

DSIP ipc nodes:
-----
There are 9 nodes in this IPC realm.
  ID      Type      Name                               Last Sent  Last Heard
  10000   Local      IPC Master                         0         0
  1130000 DSIP       Dial Shelf:Slave12                 12        12
  1080000 DSIP       Dial Shelf:Slave1                   1         1
  10A0000 DSIP       Dial Shelf:Slave3                    1         1
  10C0000 DSIP       Dial Shelf:Slave5                     1         1
  10D0000 DSIP       Dial Shelf:Slave6                     1         1
  10E0000 DSIP       Dial Shelf:Slave7                     1         1
  10F0000 DSIP       Dial Shelf:Slave8                     1         1
  1100000 DSIP       Dial Shelf:Slave9                     1         1
```

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

Table 27: show dsip nodes Field Descriptions

| Field | Description |
|----------------------|--|
| ID | DSIP uses Cisco's IPC (Inter Process Communication) module for nondata related (client control messages etc.) traffic. A seat or node is a computational element, such as a processor, that can be communicated with using IPC services. A seat is where entities and IPC ports reside. The IPC maintains a seat table which contains the seatids of all the seats in the system. Normally this seatid is a function of the slot number. |
| Type | Local: Local node. DSIP: Remote DSIP node. |
| Name | Each seat (node) has a name to easily identify it. There is only one primary node and rest are subordinate nodes. The master node name is "IPC Master" and the slave node name is "Seat:Slave X", where "X" is the slot number of the node. |
| Last Sent/Last Heard | Each node maintains two sequence numbers for the last sent and last heard. |
| Last Sent | Whenever a message is sent out, the "last sent" counter is updated. |
| Last Heard | Whenever a message is received from a remote node, "last heard" is updated. |

Related Commands

| Command | Description |
|----------------------------|---|
| show dsip clients | Lists the clients registered with DSIP on a system. |
| show dsip ports | Displays information about local and remote ports |
| show dsip queue | Displays the number of messages in the retransmit queue waiting for acknowledgment. |
| show dsip tracing | Displays DSIP tracing buffer information. |
| show dsip transport | Displays information about the DSIP transport statistics for the control/data and IPC packets and registered addresses. |
| show dsip version | Displays DSIP version information. |

show dsip ports

To display information about local and remote ports, use the **showdsipports** command in EXEC mode.

show dsip ports [**local** | **remote** [**slot**]]

Syntax Description

| | |
|---------------|---|
| local | (Optional) Displays information for local ports. The local port is the port created at a seat's local end. |
| remote | (Optional) Displays information for remote ports. The remote port is the port residing on a remote seat to which DSIP IPC based connection is open. |
| <i>slot</i> | (Optional) Specifies a slot number to display information for a specific card on the dial shelf. |

Command Modes

EXEC

Command History

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

Usage Guidelines

The DSIP communication going through the IPC stack uses ports. The creation of a port returns a 32-bit port ID which is the endpoint for communication between two IPC clients.

The show dsip ports command is used to check clients that are up and running:

- To see the local ports that are created and the activity on them.
- To see the remote ports which are connected and to see the activity on them.

If no options are specified, information is displayed for both local and remote ports.

Examples

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

```
Router# show dsip ports

Dsip Local Ports:
-----
Client:Portname          Portid   In-Msgs  Bytes   Last-i/p
Console:Master          10004    0         0       never
Clock:Master            10005    16        1800    00:00:05
Modem:Master            10006    90        70162   00:10:08
Logger:Master           10007    0         0       never
Trunk:Master            10008    792       62640   00:00:03
Async data:Master       10009    0         0       never
TDM:Master              1000A    7         112     00:10:44
Dial shelf manager:Master 1000B    15        2256    00:00:27
DSIP Test:Master        1000C    1294     1294    00:00:00
```


Dsip Remote Ports:

```

-----
Client:Portname          Portid    Out-Msgs  Bytes    Last-o/p  Last-act
Clock:Slave1            101005F  1         24       00:10:46  00:10:46
Trunk:Slave1            1010061  12        1776     00:10:46  00:10:46
Modem:Slave5            1050050  96        2148     00:10:21  00:10:44
Modem:Slave6            1060050  105       2040     00:10:25  00:10:48
Modem:Slave7            1070050  106       2188     00:10:21  00:10:45
Modem:Slave8            1080050  112       2212     00:10:25  00:10:47
Modem:Slave9            1090050  115       2224     00:10:39  00:11:05
Modem:Slave11           10B0050  107       2192     00:10:39  00:11:02
Clock:Slave12           10C000D  1         24       00:11:07  00:11:07
Dial shelf manager:Slave12 10C000E  15        2256     00:00:45  00:11:05
DSIP Test:Slave12      10C000F  0         0        never     00:11:05

```

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

Table 28: show dsip ports Field Descriptions

| Field | Description |
|-----------------|--|
| Client:Portname | <p>Client name and port name. Port Name. The port names can be determined because they are based on a uniform naming convention that includes the following elements:</p> <ul style="list-style-type: none"> • Client name • Master/slave status • Slot number <p>Any client can derive the port name of the other client it wants to talk to once it knows its physical location, using the following formula:</p> <p>Master/Slave Status Port Name Syntax</p> <p>Master <i>Client-Name:Master</i>, for example, Console:Master</p> <p>Slave <i>Client-Name:SlaveSlot</i>, for example, Clock:Slave1</p> |
| Portid | <p>Port ID. The Port ID is a 32-bit identifier comprised of seatid and the port-number. The IPC maintains a seat table which contains the seatids of all the seats in the system. A seat is where clients and ports reside.</p> <p>The seat ID is a function of the slot number. Port number is the sequential number of the port that is being created on a particular seat, for example: 0, 1, 2, etc.</p> |
| In-Msgs/ | The total number of input messages that were received on a particular port. |
| Out-Msgs | The total number of output messages that were sent to a particular remote port. |
| Bytes(in/out) | The total number of bytes that were received on a particular port or sent to a remote port. The number of bytes on this port up to the time of the execution of the show command. |
| Last-i/p | Elapsed time since the last input was received on a local port. |
| Last-o/p | Elapsed time since the last message was sent to a particular remote port. |
| Last-act | Elapsed time since the connection to a remote port was opened. |

Related Commands

| Command | Description |
|----------------------------|---|
| show dsip clients | Lists the clients registered with DSIP on a system. |
| show dsip nodes | Displays information about the nodes (slots) connected by DSIP on a system. |
| show dsip queue | Displays the number of messages in the retransmit queue waiting for acknowledgment. |
| show dsip tracing | Displays DSIP tracing buffer information. |
| show dsip transport | Displays information about the DSIP transport statistics for the control/data and IPC packets and registered addresses. |
| show dsip version | Displays DSIP version information. |
| show version | Displays the configuration of the system hardware, the software version, the names and sources of configuration files, and the boot images. |

show dsip queue

To display the number of IPC messages in the transmission queue waiting for acknowledgment, use the **showdsipqueue** command in EXEC mode.

show dsip queue

Syntax Description

This command has no arguments or keywords.

Command Modes

EXEC

Command History

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

Usage Guidelines

IPC is inter-process communication. Processes communicate by exchanging messages held in queue buffers. Use the **show dsip queue** to display the status of these queue buffers.

Examples

The following is sample output from the **showdsipqueue** command when the system is operating correctly:

```
Router# show dsip queue

DSIP ipc queue:
-----
There are 0 IPC messages waiting for acknowledgment in the transmit queue.
There are 0 messages currently in use by the system.
```

Related Commands

| Command | Description |
|----------------------------|---|
| show dsip clients | Lists the clients registered with DSIP on a system. |
| show dsip nodes | Displays information about the nodes (slots) connected by DSIP on a system. |
| show dsip ports | Displays information about local and remote ports. |
| show dsip tracing | Displays DSIP tracing buffer information. |
| show dsip transport | Displays information about the DSIP transport statistics for the control/data and IPC packets and registered addresses. |
| show dsip version | Displays DSIP version information. |
| show version | Displays the configuration of the system hardware, the software version, the names and sources of configuration files, and the boot images. |

show dsip tracing

To display Distributed System Interconnect Protocol (DSIP) tracing buffer information, use the **showdsiptracing** command in EXEC mode.

show dsip tracing [**control** | **data** | **ipc**] [*slot* | **entries** *entry-number* [*slot*]]

Syntax Description

| | |
|------------------------------------|--|
| control | (Optional) Displays the control tracing buffer. |
| data | (Optional) Displays the data tracing buffer. |
| ipc | (Optional) Displays the inter-process communication tracing buffer. |
| <i>slot</i> | (Optional) Specifies a specific slot number on the dial shelf. Slot number can range from 0 to 14. |
| entries <i>entry-number</i> | (Optional) Specifies the number of entries to trace. Entries can be 1 to 500. |

Command Modes

EXEC

Command History

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

Usage Guidelines

This feature allows logging of DSIP media header information. Use the **showdsiptracing** command to obtain important information of the various classes of DSIP packets (Control/Data/IPC) coming in. You must first use the **debugdsiptracing** command then use the **showdsiptracing** command to display the logged contents. To clear the information, use the **cleardsiptracing** command.

Examples

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

```
Router# debug dsip tracing
DSIP tracing debugging is on
Router#
Router# show dsip tracing
Dsip Control Packet Trace:
-----
Dest:00e0.b093.2238 Src:0007.5387.4808 Type:200B SrcShelf:1 SrcSlot:1 MsgType:0 MsgLen:82
Timestamp: 00:00:03
-----
Dest:00e0.b093.2238 Src:0007.5387.4838 Type:200B SrcShelf:1 SrcSlot:7 MsgType:0 MsgLen:82
Timestamp: 00:00:03
-----
Dest:00e0.b093.2238 Src:0007.4b67.8260 Type:200B SrcShelf:1 SrcSlot:12 MsgType:0 MsgLen:82
Timestamp: 00:00:03
-----
Dest:00e0.b093.2238 Src:0007.5387.4858 Type:200B SrcShelf:1 SrcSlot:11 MsgType:0 MsgLen:82
```

```
Timestamp: 00:00:03
```

```
-----
Dest:00e0.b093.2238 Src:0007.5387.4848 Type:200B SrcShelf:1 SrcSlot:9 MsgType:0 MsgLen:82
Timestamp: 00:00:03
```

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

Table 29: show dsip tracing Field Descriptions

| Field | Description |
|-----------|---|
| Dest | The destination MAC address in the DSIP packet. |
| Src | The source MAC address in the DSIP packet. |
| Type | There are three types of DSIP packets: <ul style="list-style-type: none"> • Control--0x200B • IPC--0x200C • Data--0x200D |
| SrcShelf | The source shelf ID of the DSIP packet. |
| SrcSlot | The source slot of the DSIP packet. |
| MsgType | Used to further demultiplex Data packets. Not used for Control and IPC type packets. |
| MsgLen | Length of the message excluding the DSIP header. |
| Timestamp | Time elapsed since the packet was received. |

Related Commands

| Command | Description |
|----------------------------|---|
| clear dsip tracing | Clears DSIP tracing logs. |
| debug dsip tracing | Enables DSIP trace logging for use with the show dsip tracing commands. |
| show dsip clients | Lists the clients registered with DSIP on a system. |
| show dsip nodes | Displays information about the nodes (slots) connected by DSIP on a system. |
| show dsip ports | Displays information about local and remote ports. |
| show dsip queue | Displays the number of messages in the retransmit queue waiting for acknowledgment. |
| show dsip transport | Displays information about the DSIP transport statistics for the control/data and IPC packets and registered addresses. |
| show dsip version | Displays DSIP version information. |

show dsip transport

To display information about the Distributed System Interconnect Protocol (DSIP) transport statistics for the control/data and IPC packets and registered addresses, use the **showdsiptransport** command in EXEC mode.

show dsip transport

Syntax Description This command has no arguments or keywords.

Command Modes EXEC

Command History

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

Examples

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

```
Router# show dsip transport
DSIP Transport Statistics:
  IPC : input msgs=4105, bytes=375628; output msgs=4105, bytes=248324
        total consumed ipc msgs=669; total freed ipc msgs = 669
        transmit contexts in use = 11, free = 245, zombie = 0, invalid = 0
        ipc getmsg failures = 0, ipc timeouts=0
        core getbuffer failures=0, api getbuffer failures=0
dsip test msgs rcvd = 1200, sent = 0
CNTL: input msgs=488, bytes=40104; output msgs=68, bytes=4080
      getbuffer failures=0
DATA: input msgs=0, bytes=0; output msgs=426, bytes=5112

DSIP Private Buffer Pool Hits = 0

DSIP Registered Addresses:
Shelf0 : Master: 00e0.b093.2238, Status=local
Shelf1 : Slot1 : 0007.5387.4808, Status=remote
Shelf1 : Slot5 : 0007.5387.4828, Status=remote
Shelf1 : Slot6 : 0007.5387.4830, Status=remote
Shelf1 : Slot7 : 0007.5387.4838, Status=remote
Shelf1 : Slot8 : 0007.5387.4840, Status=remote
Shelf1 : Slot9 : 0007.5387.4848, Status=remote
Shelf1 : Slot11: 0007.5387.4858, Status=remote
Shelf1 : Slot12: 0007.4b67.8260, Status=remote
Router#
```

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

Table 30: show dsip transport Field Descriptions

| Field | Description |
|------------------------------|---|
| DSIP Transport Statistics: | There are basically three kinds of communication channels between the DSIP modules running on two processors: <ol style="list-style-type: none"> 1. IPC: DSIP IPC-based reliable/best-effort channel. 2. CNTL: Control packet channel for DSIP modules to communicate between themselves. For example, keepalive messages and initial handshake messages between two DSIP modules are exchanged over this channel. 3. DATA: DSIP fast data packet channel. |
| input msgs/output msgs | The number of input/output packets on a particular channel. |
| bytes | The number of input bytes received or sent on a particular channel. |
| total consumed ipc msgs | The total number of IPC messages consumed so far from the IPC buffer pool. |
| total freed ipc msgs | The total number of IPC messages returned to the IPC buffer pool so far. |
| transmit contexts in use | DSIP for each active reliable connection to a remote port keeps a transmit context. This context holds all the important information pertaining to the remote connection, such as, destination portid, port name, number of message and bytes sent to that port etc. This is created when first time a connection is opened to a remote port and is reused for all subsequent communication to that port. |
| free | Free transmit context is available. |
| zombie | When DSIP tears down a connection to a remote slot, all the transmit contexts to that slot should return to the free pool. But instead of immediately returning to the free pool, all such contexts first end up on a zombie queue, spend their last few seconds here and then eventually return to the free queue. |
| invalid | Each transmit context has a magic number. While returning contexts to the free queue, if any transmit context is found to be corrupted, it is marked as invalid and is not returned to the free queue. |
| ipc getmsg failures | Number of times we failed to get an ipc message. |
| ipc timeouts | The retry timeouts of the reliable DSIP transport stack. |
| core getbuffer failures | The number of times DSIP transport layer has failed to allocate buffers for the IPC transport. |
| aip getbuffer failures | The number of times DSIP transport has failed to allocate buffers while preparing to transmit data received from the clients. |
| dsip test msgs received/sent | The DSIP test messages received and sent by invoking received/sent the “DSIP Test” client. |

| Field | Description |
|-------------------------------|--|
| DSIP Private Buffer Pool Hits | DSIP by default gets all its buffers from the public buffer pools. If for some reason, it runs out of those buffers, it falls back on a DSIP private pool. This number indicates the number of times DSIP has used this fallback pool. |
| DSIP Registered Addresses | The MAC addresses of nodes (slots) participating in DSIP communication including the local node. The master sees N slaves whereas slave sees only master (excluding themselves). The information is presented in the following form: ShelfX: Master SlotY : MACAddress : Status= local remote |

Related Commands

| Command | Description |
|--------------------------|---|
| show dsip clients | Lists the clients registered with DSIP on a system. |
| show dsip nodes | Displays information about the nodes (slots) connected by DSIP on a system. |
| show dsip ports | Displays information about local and remote DSIP ports. |
| show dsip queue | Displays the number of messages in the retransmit queue waiting for acknowledgment. |
| show dsip tracing | Displays DSIP tracing buffer information. |
| show dsip version | Displays DSIP version information. |
| show version | Displays the configuration of the system hardware, the software version, the names and sources of configuration files, and the boot images. |

show dsip version

To display Distributed System Interconnect Protocol (DSIP) version information, use the **showdsipversion** command in EXEC mode.

show dsip version

Syntax Description This command has no arguments or keywords.

Command Modes EXEC

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

Examples

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

```
Router# show dsip version

DSIP version information:
-----
Local DSIP major version = 5,    minor version = 2

All feature boards are running DSIP versions compatible with router shelf

Local Clients Registered Versions:
-----
Client Name      Major Version  Minor Version
Console          52
Clock            1              1
Modem            0              0
Logger           No version    No version
Trunk            No version    No version
Async data       No version    No version
TDM              No version    No version
DSIP Test        No version    No version

Mismatched Remote Client Versions:
-----
```

DSIP is version-controlled software that should be identified and kept current.

| Related Commands | Command | Description |
|------------------|--------------------------|---|
| | show dsip clients | Lists the clients registered with DSIP on a system. |
| | show dsip nodes | Displays information about the nodes (slots) connected by DSIP on a system. |

| Command | Description |
|----------------------------|---|
| show dsip ports | Displays information about local and remote DSIP ports. |
| show dsip queue | Displays the number of messages in the retransmit queue waiting for acknowledgment. |
| show dsip tracing | Displays DSIP tracing buffer information. |
| show dsip transport | Displays information about the DSIP transport statistics for the control/data and IPC packets and registered addresses. |
| show version | Displays the configuration of the system hardware, the software version, the names and sources of configuration files, and the boot images. |

show dtp interface

To display the desktop publishing (DTP) interface details, use the **show dtp interface** command in user EXEC or privileged EXEC mode.

show dtp interface [*type number*]

| Syntax Description | <i>type</i> | Interface type. For more information, use the question mark (?) online help function. |
|--------------------|---------------|---|
| | <i>number</i> | Interface or subinterface number. For more information about the numbering syntax for your networking device, use the question mark (?) online help function. |

Command Modes User EXEC (>) Privileged EXEC (#)

| Command History | Release | Modification |
|-----------------|-----------|--|
| | 12.4(22)T | This command was introduced in a release earlier than Cisco IOS Release 12.4(22)T. |

Examples

The following is sample output from the **show dtp interface** command:

```
Router# show dtp interface gigabitEthernet 0/0
DTP Interface Information:
  TOS/TAS/TNS:                ACCESS/UNKNOWN/ACCESS
  TOT/TAT/TNT:                UNKNOWN/UNKNOWN/UNKNOWN
  Neighbor address 1:         000000000000
  Neighbor address 2:         000000000000
  Hello timer expiration ms/state: 0/STOPPED
  Access timer expiration ms/state: 0/STOPPED
  Negotiation timer expiration ms/state: 0/STOPPED
  Multidrop timer expiration ms/state: 0/STOPPED
  FSM state:                  S1:OFF
  # times multi & trunk:      0
  Enabled:                    0
  In STP:                     0
```

The following is sample output from the **show dtp interface** command on a Catalyst 3000 series router:

```
Router# show dtp interface
DTP information for GigabitEthernet0/1:
  TOS/TAS/TNS:                ACCESS/AUTO/ACCESS
  TOT/TAT/TNT:                NATIVE/NEGOTIATE/NATIVE
  Neighbor address 1:         000000000000
  Neighbor address 2:         000000000000
  Hello timer expiration (sec/state): 3/RUNNING
  Access timer expiration (sec/state): never/STOPPED
  Negotiation timer expiration (sec/state): never/STOPPED
  Multidrop timer expiration (sec/state): never/STOPPED
  FSM state:                  S2:ACCESS
  # times multi & trunk:      0
  Enabled:                    yes
  In STP:                     no

Statistics
```

```

-----
112868 packets received (0 good)
112868 packets dropped
    0 nonegotiate, 0 bad version, 112868 domain mismatches,
    0 bad TLVs, 0 bad TAS, 0 bad TAT, 0 bad TOT, 0 other
225650 packets output (225650 good)
    112825 native, 112825 software encap isl, 0 isl hardware native
0 output errors
0 trunk timeouts
1 link ups, last link up on Mon Mar 01 1993, 00:01:16
0 link downs

```

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

Table 31: show dtp interface Field Descriptions

| Field | Description |
|----------------------|---|
| TOS | Indicates the Operational Trunk state of the port, except when the port is in the Negotiation phase. In the Negotiation phase, the status is either Trunk or Access. |
| TAS | Indicates the Trunk Admin state of the port, which is one of the following: ON/OFF/AUTO/DESIRABLE. |
| TNS | Indicates the Trunk Admin state to be sent in DTP packets when the port is in S3 or S5 DTP negotiation state. |
| TAT | Indicates the Trunk Admin (Encapsulation) Type of the port which is one of the following: Negotiation/Native/ISL/DOT1Q |
| TOT | Indicates the Trunk Operation Type or current Operational Encapsulation Type of the port, which is one of the following: Native/ISL/DOT1Q. |
| TNT | Indicates the Trunk Operational Type to be sent in DTP packets when the port is in either S3 or S5 DTP negotiation state. |
| Neighbor address 1/2 | Indicates the MAC address of the neighbor connected or the Neighbor Port MAC Address 1/2 in case of multi-neighbors on the same port. |
| Hello timer | Indicates that a DTP advertisement is sent after the timer expires. The timer keeps running as long as DTP is enabled and the port is capable of negotiating. The time interval during negotiation is 1 second, and 30 seconds when the port is in spanning tree protocol (STP) or has reached a final DTP state. |
| Access timer | This timer is started when the port is in Trunk state, participates in STP (state S6), and the mode is AUTO/DESIRABLE. When the timer expires, the port is set to Access state. The interval for this timer is "10 * Hello Timer." The interval gets reset/restarted whenever the port (which is in S6 state) receives a DTP packet and confirms its present state. |
| Negotiation timer | This timer is started when the port enters into an S3 or S5 DTP negotiation state. When the timer expires, the DTP state of the port moves into either Trunk/Non-Trunk. The time interval is 3 seconds and the timer is restarted if the received DTP packet changes the Trunk state or type. |

| Field | Description |
|-----------------------|--|
| Multidrop timer | <p>This timer is started when the port (which is in Trunk/AUTO/DESIRABLE mode) detects multiple neighbors. The port is then configured as Access port or S4 state. When the timer expires the port moves to negotiation or S2 state. After 3 seconds, port stays in S4 state and manual intervention is needed to move it to Trunk state.</p> <p>The interval for this timer is “10 * Hello Timer” and it gets reset or restarted whenever the port receives a DTP packet from multiple neighbors.</p> |
| FSM state | <p>Indicates the Finite State Machine State or DTP port state. There are 5 FSM states as follows:</p> <ul style="list-style-type: none"> • S1: OFF: Physical port is not in the operational state. There is no data packet transmission or receipt. • S2: ACCESS: Port state is non-Trunk and is added to the STP. • S3: NT-DTP: Port state is in negotiation phase. The port is not added to the STP and there is no data packet transmission or receipt. • S4: ACCESS-M: Port state is non-Trunk and is added to the STP. Port receives the DTP packets from multiple neighbors. • S5: T-DTP: Port is in ISL/.1Q Trunk mode. Port is not added to the STP and there is no data packet transmission or receipt. • S6: TRUNK: Port state is ISL/.1Q Trunk mode and is added to the STP. <p>Note In DTP, once the final state is negotiated, the port added to the STP is either in Trunk or Access state.</p> |
| # times multi & trunk | Indicates the presence of multi-neighbors and their count. |
| Enabled/Disabled | Indicates if DTP is enabled or disabled |
| In STP | Indicates if the port is added to the STP or not. |

Related Commands

| Command | Description |
|------------------------------|--|
| show interfaces trunk | Displays interface trunking information. |

show eobc

To display the information about the Ethernet out-of-band channel (EOBC) interface, use the **showeobc** command in user EXEC or privileged EXEC mode.

show eobc

Syntax Description This command has no arguments or keywords.

Command Default This command has no default settings.

Command Modes User EXEC Privileged EXEC

Command History

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

Examples

This example shows how to display the information about the EOBC interface:

```
Router>
show eobc
EOBC0/0 is up, line protocol is up
  Hardware is DEC21143, address is 0000.2100.0000 (bia 0000.2100.0000)
  MTU 0 bytes, BW 100000 Kbit, DLY 100 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive not set
  Unknown duplex, Unknown Speed, MII
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input never, output 00:00:00, output hang never
  Last clearing of "show interface" counters never
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 25/2147483647, 0 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
    172196 packets input, 11912131 bytes
      Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
    0 watchdog, 0 multicast
    0 input packets with dribble condition detected
  172144 packets output, 11363476 bytes, 0 underruns
  0 output errors, 0 collisions, 1 interface resets
  0 babbles, 0 late collision, 0 deferred
  0 lost carrier, 0 no carrier
  0 output buffer failures, 0 output buffers swapped out
Interface EOBC0/0
Hardware is DEC21143
dec21140_ds=0x618FB938, registers=0x3C018000, ib=0x38A9180
rx ring entries=128, tx ring entries=256, af setup failed=0
rxring=0x38A9280, rxr shadow=0x618FBB20, rx_head=28, rx_tail=0
txring=0x38A9AC0, txr shadow=0x618FBD4C, tx_head=72, tx_tail=72, tx_count=0
```

```

PHY link up
CSR0=0xF8024882, CSR1=0xFFFFFFFF, CSR2=0xFFFFFFFF, CSR3=0x38A9280
CSR4=0x38A9AC0, CSR5=0xF0660000, CSR6=0x320CA002, CSR7=0xF3FFA261
CSR8=0xE0000000, CSR9=0xFFFD33FF, CSR10=0xFFFFFFFF, CSR11=0x0
CSR12=0xC6, CSR13=0xFFFF0000, CSR14=0xFFFFFFFF, CSR15=0x8FF80000
DEC21143 PCI registers:
  bus_no=0, device_no=6
  CFID=0x00191011, CFCS=0x02800006, CFRV=0x02000041, CFLT=0x0000FF00
  CBIO=0x20000801, CBMA=0x48018000, CFIT=0x28140120, CFDD=0x00000400
MII registers:
  Register 0x00:  FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF
  Register 0x08:  FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF
  Register 0x10:  FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF
  Register 0x18:  FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF
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=0
tx_no_carrier=0, tx_late_collision=0, tx_excess_coll=0
tx_collision_cnt=0, tx_deferred=0, fatal_tx_err=0, tbl_overflow=0
HW addr filter: 0x38D2EE0, ISL Disabled
  Entry= 0:  Addr=0000.0000.0000
  Entry= 1:  Addr=0000.0000.0000
  Entry= 2:  Addr=0000.0000.0000
  Entry= 3:  Addr=0000.0000.0000
  Entry= 4:  Addr=0000.0000.0000
  Entry= 5:  Addr=0000.0000.0000
  Entry= 6:  Addr=0000.0000.0000
  Entry= 7:  Addr=0000.0000.0000
  Entry= 8:  Addr=0000.0000.0000
  Entry= 9:  Addr=0000.0000.0000
  Entry=10:  Addr=0000.0000.0000
  Entry=11:  Addr=0000.0000.0000
  Entry=12:  Addr=0000.0000.0000
  Entry=13:  Addr=0000.0000.0000
  Entry=14:  Addr=0000.0000.0000
  Entry=15:  Addr=0000.2100.0000
Router>

```

This example shows how to display the information about the EOBC interface but excludes lines that contain the word output:

```

Router>
show eobc
| exclude output
EOBC0/0 is up, line protocol is up
  Hardware is DEC21143, address is 0000.2100.0000 (bia 0000.2100.0000)
  MTU 0 bytes, BW 100000 Kbit, DLY 100 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive not set
  Unknown duplex, Unknown Speed, MII
  ARP type: ARPA, ARP Timeout 04:00:00
  Last clearing of "show interface" counters never
  Queueing strategy: fifo
  Output queue 0/40, 0 drops; input queue 25/2147483647, 0 drops
  5 minute input rate 0 bits/sec, 0 packets/sec
    175919 packets input, 12196443 bytes
    Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
    0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
    0 watchdog, 0 multicast
    0 input packets with dribble condition detected
    0 babbles, 0 late collision, 0 deferred

```

```

    0 lost carrier, 0 no carrier
Interface EOBC0/0
Hardware is DEC21143
dec21140_ds=0x618FB938, registers=0x3C018000, ib=0x38A9180
rx ring entries=128, tx ring entries=256, af setup failed=0
rxring=0x38A9280, rxr shadow=0x618FBB20, rx_head=7, rx_tail=0
txring=0x38A9AC0, txr shadow=0x618FBD4C, tx_head=209, tx_tail=209, tx_count=0
PHY link up
CSR0=0xF8024882, CSR1=0xFFFFFFFF, CSR2=0xFFFFFFFF, CSR3=0x38A9280
CSR4=0x38A9AC0, CSR5=0xF0660000, CSR6=0x320CA002, CSR7=0xF3FFA261
CSR8=0xE0000000, CSR9=0xFFFDC3FF, CSR10=0xFFFFFFFF, CSR11=0x0
CSR12=0xC6, CSR13=0xFFFF0000, CSR14=0xFFFFFFFF, CSR15=0x8FF80000
DEC21143 PCI registers:
  bus_no=0, device_no=6
  CFID=0x00191011, CFCS=0x02800006, CFRV=0x02000041, CFLT=0x0000FF00
  CBIO=0x20000801, CBMA=0x48018000, CFIT=0x28140120, CFDD=0x00000400
MII registers:
  Register 0x00:  FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF
  Register 0x08:  FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF
  Register 0x10:  FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF
  Register 0x18:  FFFF FFFF FFFF FFFF FFFF FFFF FFFF FFFF
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=0
tx_no_carrier=0, tx_late_collision=0, tx_excess_coll=0
tx_collision_cnt=0, tx_deferred=0, fatal_tx_err=0, tbl_overflow=0
HW addr filter: 0x38D2EE0, ISL Disabled
Entry= 0:  Addr=0000.0000.0000
Entry= 1:  Addr=0000.0000.0000
Entry= 2:  Addr=0000.0000.0000
Entry= 3:  Addr=0000.0000.0000
Entry= 4:  Addr=0000.0000.0000
Entry= 5:  Addr=0000.0000.0000
Entry= 6:  Addr=0000.0000.0000
Entry= 7:  Addr=0000.0000.0000
Entry= 8:  Addr=0000.0000.0000
Entry= 9:  Addr=0000.0000.0000
Entry=10:  Addr=0000.0000.0000
Entry=11:  Addr=0000.0000.0000
Entry=12:  Addr=0000.0000.0000
Entry=13:  Addr=0000.0000.0000
Entry=14:  Addr=0000.0000.0000
Entry=15:  Addr=0000.2100.0000
Router>

```

Related Commands

| Command | Description |
|--------------------------------|--|
| show environment alarm | Displays the information about the environmental alarm. |
| show environment status | Displays the information about the operational FRU status. |

show errdisable detect

To display the error-disable detection status, use the **show errdisable detect** command in user EXEC or privileged EXEC mode.

show errdisable detect

Syntax Description This command has no arguments or keywords.

Command Default This command has no default settings.

Command Modes User EXEC Privileged EXEC

| Command History | Release | Modification |
|-----------------|--------------|---|
| | 12.2(14)SX | Support for this command was introduced on the Supervisor Engine 720. |
| | 12.2(17b)SXA | This command was changed to include packet-buffer error status information. |
| | 12.2(17d)SXB | Support for this command on the Supervisor Engine 2 was extended to Release 12.2(17d)SXB. |
| | 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |

Examples

This example shows how to display the error-disable detection status:

```
Router>
show errdisable detect
ErrDisable Reason      Detection status
-----
udld                    Enabled
bpduguard              Enabled
rootguard              Enabled
packet-buffer-err      Enabled
pagp-flap              Enabled
dtp-flap               Enabled
link-flap              Enabled
Router#
```

| Related Commands | Command | Description |
|------------------|-------------------------|--------------------------------------|
| | errdisable detect cause | Enables the error-disable detection. |

show errdisable recovery

To display the information about the error-disable recovery timer, use the **show errdisable recovery** command in EXEC mode.

show errdisable recovery

Syntax Description This command has no arguments or keywords.

Command Default This command has no default settings.

Command Modes EXEC

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

Examples

This example shows how to display the information about the error-disable recovery timer:

```
Router#
show errdisable recovery
ErrDisable Reason      Timer Status
-----
udld                    Enabled
bpduguard              Enabled
rootguard              Enabled
pagp-flap              Enabled
dtp-flap               Enabled
link-flap              Enabled
Timer interval:300 seconds
Interfaces that will be enabled at the next timeout:
Interface  Errdisable reason  Time left(sec)
-----
Fa9/4      link-flap          279
```

Related Commands

| Command | Description |
|-------------------------------|---|
| errdisable recovery | Configures the recovery mechanism variables. |
| show interfaces status | Displays the interface status or a list of interfaces in an error-disabled state on LAN ports only. |

show esmc

To display the Ethernet synchronization message channel (ESMC) processes on a device, use the **show esmc** command in privileged EXEC mode.

show esmc [**detail** | **interface** *type number*]

| Syntax Description | detail | (Optional) Provides a detailed display of ESMC processes. |
|--------------------|-------------------------------------|---|
| | interface <i>type number</i> | (Optional) Specifies the interface type and interface number. For more information, use the question mark (?) online help function. |

Command Modes Privileged EXEC (#)

| Command History | Release | Modification |
|-----------------|---------------------------|---|
| | 15.0(1)S | This command was introduced. |
| | 15.1(2) SNI | This command was introduced into Cisco ASR 901 Aggregation Services Router. |
| | Cisco IOS XE Release 3.8S | This command was integrated into Cisco IOS XE Release 3.8S. |

Examples

The following example shows the ESMC processes enabled on a device:

```
Device# show esmc detail

Interface: GigabitEthernet0/0/0
Administrative configurations:
  Mode: Synchronous
  ESMC TX: Enable
  ESMC RX : Enable
  QL RX configured : NA
  QL TX configured : NA
Operational status:
  Port status: UP
  QL Receive: QL-SSU-B
  ESMC Information rate : 1 packet/second
  ESMC Expiry: 5 second
```

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

Table 32: show esmc Field Descriptions

| Field | Description |
|---------|--|
| Mode | Synchronous or asynchronous mode of packet transmission. |
| ESMC TX | Option for transmitting ESMC data. |
| ESMC RX | Option for receiving ESMC data. |

| Field | Description |
|-----------------------|--|
| QL RX configured | Quality level receive configuration. |
| QL TX configured | Quality level transmit configuration. |
| ESMC Information rate | Rate at which ESMC information Protocol Data Unit (PDU) is transmitted in packet per second. |
| ESMC Expiry | Duration in which the ESMC receipt is expired. |

Related Commands

| Command | Description |
|-----------------------------------|---|
| esmc mode ql-disabled | Disables the ESMC on an interface. |
| esmc process | Enables the ESMC process in a device. |
| show interfaces accounting | Displays the number of packets of each protocol type that have been sent through all configured interfaces. |

show etherchannel

To display EtherChannel information for a channel, use the **show etherchannel** command in privileged EXEC mode.

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

show etherchannel [*channel-group*] {**port-channel** | **brief** | **detail** | **summary** | **port** | **load-balance**}

Cisco Catalyst Switches

show etherchannel [*channel-group*] {**port-channel** | **brief** | **detail** | **summary** | **port** | **load-balance** | **protocol**} [*expression*]

| Syntax Description | |
|-----------------------|---|
| <i>channel -group</i> | (Optional) Number of the channel group. If you do not specify a value for the <i>channel -group</i> argument, all channel groups are displayed. |
| port -channel | Displays port channel information. |
| brief | Displays a summary of EtherChannel information. |
| detail | Displays detailed EtherChannel information. |
| summary | Displays a one-line summary per channel group. |
| port | Displays EtherChannel port information. |
| load -balance | Displays load-balance information. |
| protocol | Displays the enabled protocol. |
| <i>expression</i> | (Optional) Expression in the output to use as a reference point. |

Command Modes Privileged EXEC (#)

| Command History | Release | Modification |
|-----------------|--------------|--|
| | 12.0(7)XE | This command was introduced on Cisco Catalyst 6000 family switches. |
| | 12.1(3a)E3 | This command was modified. The number of valid values for the <i>channel -group</i> argument were changed. |
| | 12.1(5c)EX | This command was modified. The number of valid values for the <i>channel-group</i> argument were changed. |
| | 12.2(2)XT | This command was modified to support switchport creation on Cisco 2600 series, Cisco 3600 series, and Cisco 3700 series routers. |
| | 12.2(14)SX | This command was implemented on the Supervisor Engine 720. |
| | 12.2(17a)SX1 | This command was modified. The output of the show etherchannel load-balance command was changed to include IPv6 information. The display was changed to include Multiprotocol Label Switching (MPLS) information. |

| Release | Modification |
|--------------|---|
| 12.2(17d)SXB | This command was modified to support the Supervisor Engine 2. |
| 12.2(8)T | This command was modified to support switchport creation. |
| 12.2(33)SXH | This command was modified. The output of the showetherchannelport-channel and the showetherchanneldetail commands was changed to include Link Aggregation Control Protocol (LACP) fast switchover status. The number of valid values for the <i>channel -group</i> argument was changed. |
| 12.2(33)SRC | This command was modified. The output of the showetherchannelport-channel and the showetherchanneldetail commands was changed to show the status of the LACP Single Fault Direct Load Balance Swap feature, to show the last applied hash distribution algorithm, and to include LACP fast switchover status. |
| 12.2(33)SXI3 | This command was modified. The output of the showetherchannelsummary , showetherchannelport-channel , and showetherchanneldetail commands was changed to show the standalone disable option. |

Usage Guidelines

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

The *channel-group* argument supports six EtherChannels and eight ports in each channel.

If you do not specify a value for the *channel-group* argument, all channel groups are displayed.

Cisco Catalyst Switches

The number of valid values for the *channel-group* argument depends on the software release. For software releases prior to Cisco IOS Release 12.1(3a)E3, valid values are from 1 to 256; for Cisco IOS Release 12.1(3a)E3, 12.1(3a)E4, and 12.1(4)E1, valid values are from 1 to 64. Cisco IOS Release 12.1(5c)EX and later support a maximum of 64 values ranging from 1 to 256. Cisco IOS Release 12.2(33)SXH supports a maximum of 64 values ranging from 1 to 282.

If you do not specify a value for the *channel-group* argument, all channel groups are displayed.

In the output, the Passive port list field is displayed for Layer 3 port channels only. This field means that the physical interface, which is still not up, is configured to be in the channel group (and indirectly in the only port channel in the channel group).

The *channel-group* values from 257 to 282 are supported on the Catalyst 6500 series Cisco Services Module (CSM) and the Catalyst 6500 series Firewall Services Module (FWSM) only.

In the output, the Passive port list field is displayed for Layer 3 port channels only. This field means that the physical interface, which is still not up, is configured to be in the channel group (and indirectly is the only port channel in the channel group).

If the interface is configured as part of the channel in ON mode, the **showetherchannelprotocol** command displays Protocol: - (Mode ON).

In the output of the **showetherchannelsummary** command, the following conventions apply:

- In the column that displays the protocol that is used for the channel, if the channel mode is ON, a hyphen (-) is displayed.
- For LACP, multiple aggregators are supported. For example, if two different bundles are created, Po1 indicates the primary aggregator, and Po1A and Po1B indicates the secondary aggregators.

In the output of the **show etherchannel load-balance** command, the following conventions apply:

- For EtherChannel load balancing of IPv6 traffic, if the traffic is bridged onto an EtherChannel (for example, it is a Layer 2 channel and traffic in the same VLAN is bridged across it), the traffic is always load balanced by the IPv6 addresses or src, dest, or src-dest, depending on the configuration. For this reason, the switch ignores the MAC/IP/ports for bridged IPv6 traffic. If you configure src-dst-mac, the src-dst-ip(v6) address is displayed. If you configure src-mac, the src-ip(v6) address is displayed.
- IPv6 traffic that is routed over a Layer 2 or a Layer 3 channel is load balanced based on MAC addresses or IPv6 addresses, depending on the configuration. The MAC/IP and the src/dst/src-dest are supported, but load balancing that is based on Layer 4 ports is not supported. If you use the **port** keyword, the IPv6 addresses or either src, dst, or src-dest, is displayed.

Examples

Protocol Information

The following example shows how to display the enabled protocol:

```
Router# show etherchannel protocol
Channel-group listing:
-----
Group: 12
-----
Protocol: PAgP
Group: 24
-----
Protocol: - (Mode ON)
Router#
```

Port Channel Information for a Specific Group

The following example shows how to display port channel information for a specific group:

```
Router# show etherchannel 12 port-channel
Group: 12
-----
Port-channels in the group:
-----
Port-channel: Po1
-----
Age of the Port-channel = 143h:01m:12s
Logical slot/port = 14/1          Number of ports = 2
GC = -                          HotStandBy port = null
Port state = Port-channel Ag-Inuse
Protocol = LACP
Fast-switchover = enabled
Ports in the Port-channel:
Index Load Port EC state
-----+-----+-----+-----
 0    55 Fa4/1 active
 1    AA Fa4/2 active
Time since last port bundled: 16h:28m:58s Fa4/1
Time since last port Un-bundled: 16h:29m:00s Fa4/4
```

The following example shows that direct load swapping is enabled.

```

Router# show etherchannel 15 port-channel
      Port-channels in the group:
Port-channel: Po15      (Primary Aggregator)
Age of the Port-channel = 0d:18h:16m:49s
Logical slot/port      = 14/7      Number of ports = 1
HotStandBy port = null
Port state              = Port-channel Ag-Inuse
Protocol                = LACP
! The following line of output is added with support
of the LACP Single Fault Direct Load Swapping feature. !
Direct Load Swap = enabled
Ports in the Port-channel:
Index  Load  Port      EC state      No of bits
-----+-----+-----+-----+-----
   0    FF    Fa4/1     Active        8
Time since last port bundled:  0d:00h:06m:12s  Fa4/1

```

Load Balancing

The following examples show how to display load-balancing information:

```

Router#
  show etherchannel load-balance
Source XOR Destination mac address
Router#
  show etherchannel load-balance
EtherChannel Load-Balancing Configuration:
      dst-mac
      mpls label-ip
EtherChannel Load-Balancing Addresses Used Per-Protocol:
Non-IP: Destination MAC address
  IPv4: Destination MAC address
  IPv6: Destination MAC address (routed packets)
      Destination IP address (bridged packets)
MPLS: Label or IP

```

Summary Information for a Specific Group

The following example shows how to display a summary of information for a specific group:

```

Router#
  show etherchannel 1 brief
Group state = L3
Ports: 2      Maxports = 8
port-channels: 1 Max port-channels = 1
Partner's information:

```

The following example shows the hash distribution algorithm that was last applied:

```

Router# show etherchannel
  10 summary
Flags: D - down          P - bundled in port-channel
      I - stand-alone    S - suspended
      H - Hot-standby (LACP only)
      R - Layer3        S - Layer2
      U - in use        N - not in use, no aggregation
      f - failed to allocate aggregator

```



```

<snip>
Group Port-channel Protocol Ports
-----+-----+-----+-----
10 Po10(RU) LACP Gi3/7(P) Gi3/9(P)
! The following line of output is added with support
of the EtherChannel Load Distribution feature. !
Last applied Hash Distribution Algorithm: Fixed
Router#

```

Detailed Information for a Specific Group

The following example shows how to display detailed information for a specific group:

```

Router#
show etherchannel 12 detail
Group state = L2
Ports: 1 Maxports = 8
Port-channels: 1 Max Port-channels = 1
Protocol: PAgP
Fast-switchover = enabled
      Ports in the group:
      -----
Port: Fa5/2
-----
Port state      = Down Not-in-Bndl
Channel group = 12          Mode = Desirable-Sl      Gcchange = 0
Port-channel   = null      GC   = 0x00000000      Pseudo port-channel = Po1
2
Port index     = 0          Load = 0x00          Protocol = PAgP
Flags: S - Device is sending Slow LACPDUs F - Device is sending fast LACPDUs
      A - Device is in active mode      P - Device is in passive mode
Local information:
Port  Flags  State  LACP Port  Admin  Oper  Port  Port
Fa4/1 SA    bndl   32768     100   100   0xc1  0x75
Partner's information:
      Partner          Partner          Partner
Port  System ID        Port Number    Age  Flags
Fa4/1 8000,00b0.c23e.d861 0x81         14s  SP
      LACP Partner  Partner
      Port Priority  Oper Key  Port State
      32768         128    0x81
Age of the port in the current state: 16h:27m:42s
      Port-channels in the group:
      -----
Port-channel: Po12
-----
Age of the Port-channel = 04d:02h:52m:26s
Logical slot/port = 14/1          Number of ports = 0
GC = 0x00000000          HotStandBy port = null
Port state = Port-channel Ag-Not-Inuse
Protocol = PAgP

```



Note When LACP 1:1 redundancy is configured, the **show etherchannel detail** command also displays fast-switchover status information.

One-Line Summary per Channel Group

The following example shows how to display a one-line summary per channel group:

```
Router#
show etherchannel summary
U-in use I-in port-channel S-suspended D-down i-stand-alone d-default
Group Port-channel Ports
-----
1 Po1(U) Fa5/4(I) Fa5/5(I)
2 Po2(U) Fa5/6(I) Fa5/7(I)
255 Fa5/9(i)
256 Fa5/8(i)
```

Port Information for All Groups

The following example shows how to display EtherChannel port information for all ports and all groups:

```
Router#
show etherchannel port
Channel-group listing:
-----
Group: 1
-----
Ports in the group:
-----
Port: Fa5/4
-----
Port state = EC-Enbld Down Not-in-Bndl Usr-Config
Channel group = 1 Mode = Desirable Gchange = 0
Port-channel = null GC = 0x00000000 Pseudo-agport = Po1
Port indx = 0 Load = 0x00
Flags: S - Device is sending Slow hello. C - Device is in Consistent state.
A - Device is in Auto mode. P - Device learns on physical port.
Timers: H - Hello timer is running. Q - Quit timer is running.
S - Switching timer is running. I - Interface timer is running.
Local information:
Port Flags State Timers Hello Partner PAgP Learning Group
Fa5/4 d U1/S1 1s 0 128 Any 0
Age of the port in the current state: 02h:40m:35s
Port: Fa5/5
-----
Port state = EC-Enbld Down Not-in-Bndl Usr-Config
Channel group = 1 Mode = Desirable Gchange = 0
Port-channel = null GC = 0x00000000 Pseudo-agport = Po1
Port indx = 0 Load = 0x00
Flags: S - Device is sending Slow hello. C - Device is in Consistent state.
A - Device is in Auto mode. P - Device learns on physical port.
Timers: H - Hello timer is running. Q - Quit timer is running.
S - Switching timer is running. I - Interface timer is running.
```

Port Information for a Specific Group

The following example shows how to display the information about the EtherChannel port for a specific group:

```
Router#
show etherchannel 1 port
      Channel-group listing:
      -----
Group: 1
-----
      Ports in the group:
      -----
Port: Fa5/4
-----
Port state      = EC-Enbld Down Not-in-Bndl Usr-Config
Channel group  = 1          Mode = Desirable      Gcchange = 0
Port-channel   = null      GC   = 0x00000000    Psudo-agport = Pol
Port index     = 0          Load = 0x00          Protocol = LACP
Flags:  S - Device is sending Slow LACPDU  F - Device is sending fast LACPDU
        A - Device is in active mode        P - Device is in passive mode
Local information:
Port      Flags   State      LACP Port   Admin   Oper   Port   Port
Fa5/4    SA     bndl      32768      100    100   0xc1   0x75
Partner's information:
Port      Partner          Partner          Partner
Fa5/4    System ID      Port Number     Age   Flags
        8000,00b0.c23e.d861  0x81           14s   SP
        LACP Partner      Partner
        Port Priority   Oper Key   Port State
        32768           128      0x81
Age of the port in the current state: 04d:02h:57m:38s
```

Port Channel Information for the Standalone Disabled Option

The following example shows the **show etherchannel summary** command output with a port in suspended state:

```
Router# show etherchannel 42 summary
Flags:  D - down          P - bundled in port-channel
        I - stand-alone  s - suspended
        H - Hot-standby (LACP only)
        R - Layer3       S - Layer2
        U - in use       f - failed to allocate aggregator
        M - not in use, minimum links not met
        u - unsuitable for bundling
        w - waiting to be aggregated
Number of channel-groups in use: 8
Number of aggregators:          8
Group Port-channel Protocol Ports
-----+-----+-----+-----
2      Po42(SU)      LACP   Fa1/17(s) Fa1/18(P) Fa1/19(P) Fa1/20(P)
```

The following example shows the **show etherchannel port-channel** command output with the status of Standalone Disable option:

```
Router# show etherchannel 42 port-channel
```

```

Port-channels in the group:
-----
Port-channel: Po42    (Primary Aggregator)
-----
Age of the Port-channel   = 0d:21h:28m:22s
Logical slot/port        = 14/42          Number of ports = 3
HotStandBy port = null
Port state                = Port-channel Ag-Inuse
Protocol                  = LACP
Fast-switchover          = disabled
Load share deferral      = disabled
Standalone Disable       = enabled
Ports in the Port-channel:
Index  Load      Port              EC state      No of bits
-----+-----+-----+-----+-----
  2     49       Fa1/18            Active        3
  1     92       Fa1/19            Active        3
  3     24       Fa1/20            Active        2
Time since last port bundled:  0d:03h:37m:07s  Fa1/18
Time since last port Un-bundled: 0d:03h:34m:27s  Fa1/17
Last applied Hash Distribution Algorithm: Fixed

```

The following example shows the **show etherchannel detail** command output with the status of Standalone Disable option:

```

Router# show etherchannel 42 detail

Group state = L2
Ports: 4    Maxports = 16
Port-channels: 1 Max Port-channels = 16
Protocol: LACP
Minimum Links: 2
Standalone Disable: enabled
          Ports in the group:
          -----
Port: Fa1/17
-----
Port state      = Up Cnt-bndl Suspend Not-in-Bndl
Channel group = 42          Mode = Active      Gcchange = -
Port-channel   = null      GC = -          Pseudo port-channel = Po2
Port index    = 0          Load = 0x00      Protocol = LACP
Flags: S - Device is sending Slow LACPDUS  F - Device is sending fast LACPDUS.
      A - Device is in active mode.        P - Device is in passive mode.
Local information:
Port      Flags  State      LACP port  Admin  Oper  Port  Port
Fa1/17   FP    susp      1          0x2   0x2   0x112 0x82
Partner's information:
Port      Flags  State      Partner LACP Partner Partner Partner Partner
Fa1/17   FP    susp      1          0x0   0x2   0x312 0x36
Age of the port in the current state: 0d:03h:44m:04s
Port: Fa1/18
-----
Port state      = Up Mstr In-Bndl
Channel group = 42          Mode = Active      Gcchange = -
Port-channel   = Po2      GC = -          Pseudo port-channel = Po2
Port index    = 2          Load = 0x49      Protocol = LACP
Flags: S - Device is sending Slow LACPDUS  F - Device is sending fast LACPDUS.
      A - Device is in active mode.        P - Device is in passive mode.
Local information:
Port      Flags  State      LACP port  Admin  Oper  Port  Port
Fa1/18   FP    susp      1          0x0   0x2   0x312 0x36

```

```

Fa1/18 SA bndl 2 0x2 0x2 0x113 0x3D
Partner's information:
      Partner Partner LACP Partner Partner Partner Partner
Port  Flags  State  Port Priority Admin Key Oper Key Port Number Port State
Fa1/18 SA bndl 2 0x0 0x2 0x313 0x3D
Age of the port in the current state: 0d:03h:43m:24s
Port-channels in the group:
Port-channel: Po42 (Primary Aggregator)
Age of the Port-channel = 0d:21h:34m:45s
Logical slot/port = 14/42 Number of ports = 3
HotStandBy port = null
Port state = Port-channel Ag-Inuse
Protocol = LACP
Fast-switchover = disabled
Load share deferral = disabled
Standalone Disable = enabled
Ports in the Port-channel:
Index Load Port EC state No of bits
-----+-----+-----+-----+-----
 2 49 Fa1/18 Active 3
 1 92 Fa1/19 Active 3
 3 24 Fa1/20 Active 2
Time since last port bundled: 0d:03h:43m:30s Fa1/18
Time since last port Un-bundled: 0d:03h:40m:50s Fa1/17
Last applied Hash Distribution Algorithm: Fixed
    
```

Related Commands

| Command | Description |
|-------------------------------|--|
| channel-group | Assigns and configures an EtherChannel interface to an EtherChannel group. |
| channel-protocol | Sets the protocol that is used on an interface to manage channeling. |
| interface port-channel | Accesses or creates the IDB port channel. |

show etherchannel load-balancing

To display the load-balancing method applied to Gigabit EtherChannel (GEC) interfaces, use the **show etherchannel load-balancing** command in user EXEC or privileged EXEC mode.

show etherchannel load-balancing

Syntax Description This command has no arguments or keywords.

Command Modes User EXEC (>) Privileged EXEC (#)

Command History

| Release | Modification |
|--------------------------|--|
| Cisco IOS XE Release 2.1 | This command was introduced. |
| Cisco IOS XE Release 2.5 | This command was modified. Information about the port-channel configuration and flow-based load balancing was added to the output. |

Usage Guidelines

The **show etherchannel load-balancing** command shows which load-balancing method is applied to the port channels of a GEC interface, both at the global level and for each port channel.

There are two methods of load balancing on a GEC interface:

- **VLAN-manual**--All packets forwarded over the same VLAN subinterface are considered part of the same flow and are mapped to the member link specified in the configuration.
- **Flow-based**--Traffic flows are mapped to different member links based on the packet header.

Examples

The following example shows output from this command for a port channel configured with VLAN-manual load balancing:

```
Router# show etherchannel load-balancing

EtherChannel Load-Balancing Method:
Global LB Method: vlan-manual

Port-Channel:                LB Method
Port-channel1                :  vlan-manual
```

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

Table 33: show etherchannel load-balancing Field Descriptions

| Field | Description |
|------------------------|---|
| Global LB Method | Load balancing method set globally for all port channels with the port-channel load-balancing vlan-manual command. |
| Port Channel LB Method | Load balancing method set for the specific port channels with the load-balancing command. This configuration takes precedence over the global configuration. |

Related Commands

| Command | Description |
|--|---|
| load-balancing | Applies a load-balancing method to a GEC interface. |
| port-channel load-balancing vlan-manual | Applies the VLAN-manual load-balancing method globally to all GEC interfaces. |
| show interfaces port-channel etherchannel | Displays the load-balancing bucket distribution currently in use for a GEC interface. |

show fabric

To display the information about the crossbar fabric, use the **showfabric** command in EXEC mode.

```
show fabric [active]
show fabric {channel-counters | errors | status} [slot | all]
show fabric switching-mode [module {slot | all}]
show fabric utilization [slot | all]
```

Syntax Description

| | |
|-------------------------|--|
| active | (Optional) Displays the redundancy status for the Switch Fabric Module. |
| channel-counters | Displays the fabric channel-counter information. |
| errors | Displays the errors that are associated with the crossbar fabric; see the “Usage Guidelines” section for additional information. |
| status | Displays the current status of the fabric channel. |
| <i>slot</i> | (Optional) Number of the slot. |
| all | (Optional) Displays the information for all modules using the crossbar fabric. |
| switching-mode | Displays the module switching mode; see the “Usage Guidelines” section for additional information. |
| module slot | (Optional) Displays the switching mode for the specified slot. |
| module all | (Optional) Displays the switching mode for all installed modules. |
| utilization | Displays the percentage utilization for each fabric channel. |

Command Default

This command has no default settings.

Command Modes

EXEC

Command History

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

Usage Guidelines

This command is not supported on Cisco 7600 series routers that are configured with a Supervisor Engine 32.

If you specify *slot*, the information is displayed for the specified slot. If you specify **all**, the information for all slots using the crossbar fabric is displayed. If you do not specify *slot* or **all**, the display is the same as if you entered **all**.

To display all the related crossbar fabric information, enter the **showfabric** command without keywords.

A fabric channel is each connection between a module and the crossbar fabric module. Each module can have zero, one, or two fabric channels. The more fabric channels that a module has, the more overall bandwidth is available to the module.

The following errors are associated with the crossbar fabrics:

- Synchronization errors--General errors are the most common types of errors.
- Heartbeat errors--The supervisor engine sends out periodic heartbeat packets to each module using the crossbar fabric. If any of these modules or the crossbar fabric fail to detect heartbeat packets for a period of time, this error is reported.
- CRC errors--All packets crossing the crossbar fabric are CRC protected. If any of the ASICs between a module and the crossbar fabric module detect a CRC error, this error is reported.

The three types of fabric switching modes are as follows:

- Bus--Packets that travel across the traditional backplane and that are shared by all modules to be switched by the supervisor engine. Modules without the crossbar fabric connectors are restricted to this mode. The 48-port 10/100TX RJ-45 module is an example of this module type.
- Crossbar--Packets with headers only that travel across the traditional backplane to be switched by the supervisor engine and that travel across the crossbar fabric. The 16-port Gigabit Ethernet GBIC switching module is an example of this module type.
- dCEF--Packets that are switched by the module and that travel across the crossbar fabric. The 16-port Gigabit Ethernet GBIC switching module and the 16-port Gigabit Ethernet module are examples of this module type. The 16-port Gigabit Ethernet GBIC switching module can be in any of these three modes, but the 16-port Gigabit Ethernet module can only be in dCEF mode.

The threshold information is shown only when you enter the **nofabricswitching-modeallowtruncated** command.

In the **showfabricswitching-mode** command output, the possible global switching modes are as follows:

- Flow-through (Bus)--Mode that the switch uses for traffic between nonfabric-enabled modules and for traffic between a nonfabric-enabled module and a fabric-enabled module. In this mode, all traffic passes between the local bus and the supervisor engine bus.
- Truncated--Mode that the switch uses for traffic between fabric-enabled modules when both fabric-enabled and nonfabric-enabled modules are installed. In this mode, the switch sends a truncated version of the traffic (the first 64 bytes of the frame) over the switch fabric channel.
- Compact--Mode that the switch uses for all traffic when only fabric-enabled modules are installed. In this mode, a compact version of the DBus header is forwarded over the switch fabric channel, which provides the best possible performance.

In the **showfabricswitching-mode** command output, depending on the supervisor engine installed, the following messages appear:

- With a Supervisor Engine 2, this message is included in the output:

```
An enabled Switch Fabric is not required for the system to operate
```

- With a Supervisor Engine 720, this message is included in the output:

Fabric module is not required for system to operate

Examples

This example shows how to display the redundancy status of the Switch Fabric Module:

```
Router# show fabric active
Active fabric card in slot 5
No backup fabric card in the system
Router#
```

This example shows how to display the channel-counter information:

```
Router# show fabric channel-counters
slot channel  rxErrors  txErrors  txDropped
1           0          0          0          0
Router#
```

This example shows how to display the errors that are associated with the crossbar fabric:

```
Router# show fabric errors
Module errors:
slot      channel      crc      hbeat      sync      DDR sync
1         0          0        0          0          0
8         0          0        0          0          0
8         0          0        0          0          0
9         0          0        0          0          0
Fabric errors:
slot      channel      sync      buffer      timeout
1         0          0         0          0
8         0          0         0          0
8         0          0         0          0
9         0          0         0          0
Router#
```

This example shows how to display the module switching mode:

```
Router# show fabric switching-mode
Global switching mode is Truncated
An enabled Switch Fabric is not required for the system to operate
Modules are allowed to operate in bus mode
Truncated mode is not allowed unless threshold is met
Threshold for truncated mode operation is 2 SFM-capable cards
Module Slot      Switching Mode
1                Bus
2                Crossbar
3                Crossbar
4                Bus
5                No Interfaces
7                DCEF
9                DCEF
Router#
```

This example shows how to display the fabric-channel status:

```
Router# show fabric status
slot  channel  speed      module      fabric
      channel  speed      status      status
1     0       8G        OK          OK
5     0       8G        OK          Up- Timeout
6     0       20G       OK          Up- BufError
```

```
      8          0          8G          OK          OK
      8          1          8G          OK          OK
      9          0          8G      Down- DDRsync      OK
Router#
```

This example shows how to display the percentage utilizations for all fabric-enabled channels:

```
Router# show fabric utilization all
slot  channel  Ingress %  Egress %
   1      0          0          0
crc   hbeat    sync      sync
   1      0          0          0          0          0
Router#
```

show fm features

To display the information about the feature manager, use the **showfmfeatures** command in user EXEC or privileged EXEC mode.

show fm features

Syntax Description This command has no arguments or keywords.

Command Default This command has no default settings.

Command Modes User EXEC Privileged EXEC

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

Examples

This example shows how to display the information about the feature manager:

```
Router>
show fm features
Designated MSFC:1 Non-designated MSFC:1
Redundancy Status:designated
Interface:FastEthernet2/10 IP is enabled
  hw[EGRESS] = 1, hw[INGRESS] = 1
  hw_force_default[EGRESS] = 0, hw_force_default[INGRESS] = 0
  mcast = 0
  priority = 2
  reflexive = 0
  inbound label:1
    protocol:ip
      feature #:1
      feature id:FM_IP_ACCESS
      ACL:106
  outbound label:2
    protocol:ip
      feature #:1
      feature id:FM_IP_ACCESS
      ACL:106
Interface:FastEthernet2/26 IP is enabled
  hw[EGRESS] = 1, hw[INGRESS] = 0
  hw_force_default[EGRESS] = 0, hw_force_default[INGRESS] = 1
  mcast = 0
  priority = 2
  reflexive = 0
  inbound label:24
    protocol:ip
      feature #:1
      feature id:FM_IP_ACCESS
      ACL:113
  outbound label:3
```

```

        protocol:ip
        feature #:1
id:FM_IP_WCCP
    Service ID:0
    Service Type:0
Interface:Vlan55 IP is enabled
    hw[EGRESS] = 1, hw[INGRESS] = 1
    hw_force_default[EGRESS] = 0, hw_force_default[INGRESS] = 0
    mcast = 0
    priority = 2
    reflexive = 0
    inbound label:4
        protocol:ip
        feature #:1
        feature id:FM_IP_ACCESS
        ACL:111
Interface:Vlan101 IP is enabled
    hw[EGRESS] = 1, hw[INGRESS] = 1
    hw_force_default[EGRESS] = 0, hw_force_default[INGRESS] = 0
    mcast = 0
    priority = 2
    reflexive = 0
    inbound label:5
        protocol:ip
        feature #:1
        feature id:FM_IP_ACCESS
        ACL:101
    outbound label:6
        protocol:ip
        feature #:1
        feature id:FM_IP_ACCESS
        ACL:101
Router>

```

This example shows how to display the lines of feature manager information starting with the line that begins with Redundancy:

```

Router>
show fm features | begin Redundancy
Redundancy Status: designated
Router>

```

Related Commands

| Command | Description |
|------------------------|---------------------------------------|
| show fm summary | Displays a summary of FM Information. |

show fm inband-counters

To display the number of inband packets that are sent by the Multilayer Switching Feature Card (MSFC) for server load balancing (SLB) and Web Cache Coprocessor Protocol (WCCP), use the **showfm inband-counters** command in privileged EXEC mode.

show fm inband-counters

Syntax Description This command has no arguments or keywords.

Command Default This command has no default settings.

Command Modes Privileged EXEC

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

Usage Guidelines The output display for the **showfm inband-counters** command includes the number of SLB inband packets that are sent by the MSFC and the number of WCCP inband packets that are sent by the MSFC.

If CBAC is configured, the command output displays the number of packets that are sent for CBAC by the MSFC.

Examples

This example shows how to display the number of SLB and WCCP inband packets that are sent by the MSFC:

```
Router# show fm inband-counters
Inband Packets Sent
Slot  WCCP      SLB
1     0          0
2     0          0
3     0          0
4     0          0
5     0          0
6     0          0
7     0          0
8     0          0
9     0          0
10    0          0
11    0          0
12    0          0
13    0          0
Router#
```

show gnss

To display the output of the GNSS configuration, use the **show gnss** command in privileged EXEC mode.

show gnss [**location** | **satellite** | **status** | **time** | **device**]

| Syntax Description | Parameter | Description |
|--------------------|------------------|---|
| | location | (Optional) Displays the location of the GNSS module. |
| | satellite | (Optional) Displays the satellites configured or detected by the GNSS module. |
| | status | (Optional) Displays the status of the GNSS module. |
| | time | (Optional) Displays the time on the GNSS module. |
| | device | (Optional) Displays the hardware information of the active GNSS module. |

Command Modes Privileged EXEC (#)

| Command History | Release | Modification |
|-----------------|---------------------------|------------------------------|
| | Cisco IOS XE Release 3.17 | This command was introduced. |

Usage Guidelines Use this command to verify the GNSS configuration.

Examples

The following examples show the output generated by this command:

```
Router# show gnss

Current GNSS Location:

LOC: 12:56.183600 N 77:41.768000 E 819.10 m

Router# show gnss satellite all

All Satellites Info:

SV PRN No    Channel No      Acq Flg    Ephemeris Flg    SV Type    Sig Strength
-----
21           0                1          1                0          47
14           1                1          1                0          48
18           2                1          1                0          49
22           3                1          1                0          46
27           4                1          1                0          44
24           5                1          1                0          44
31           6                1          1                0          47

Router# show gnss status

GNSS status:

GNSS device: detected
Lock status: Power-up
Receiver Status: Auto
Clock Progress: Phase Locking
```

```
Survey progress: 100
Satellite count: 7
Holdover Duration: 0
PDOP: 1.01 TDOP: 1.00
HDOP: 0.71 VDOP: 0.72
Minor Alarm: ANTENNA_OPEN NOT_DISCIPLINING_OSC
Major Alarm: None
```

```
Router# show gnss time
```

```
Current GNSS Time:
```

```
Time: 2015/11/30 10:20:33 UTC Offset: 17
```

```
Router# show gnss device
```

```
GNSS device:
```

```
Serial number: FOC2130ND5X
Firmware version: 1.4
Firmware update progress: NA
Authentication: Passed
```

In the **show gnss device** command output, serial number and authentication information is shown only for pluggable GNSS module like Cisco ASR 903. It is not shown for Cisco ASR 920.

show gtp

To display information related to Enhanced Wireless Access Gateway (EWAG) General Packet Radio Service (GPRS) Tunneling Protocol (GTP), use the **show gtp** command in privileged EXEC mode.

```
show gtp {apn [statistics] {apn-index | all} | mcsa statistics | parameters | path {all | [statistics]
remote-address path-address [vrf vrf-name]} | pdp-context {all | apn apn-index | imsi imsi-value
[detail] | ms-address end-user-address [vrf vrf-name] [detail] | msisdn msisdn-value [detail] | teid-u
user-teid [detail]} | statistics | tunnel interface type}
```

Syntax Description

| | |
|---|---|
| apn | Displays Access Point Name (APN) information. |
| <i>apn-index</i> | Index of the APN. |
| all | Displays information about all APNs. |
| statistics | (Optional) Displays information about APN counters. |
| mcsa statistics | Displays statistical information about Mobile Client Service Abstraction (MCSA) counters. |
| parameters | Displays information about GTP parameters. |
| path | Displays information about GTP path. |
| all | Displays information about all GTP paths. |
| statistics | Displays statistics related to a path. |
| remote-address <i>path-address</i> | Displays GTP path for a specified path address. |
| vrf <i>vrf-name</i> | Specifies the virtual routing and forwarding (VRF) containing the IP address. |
| pdp-context | Displays information about GTP Packet Data Protocol (PDP) data structures. |
| all | Displays information about all PDPs. |
| apn <i>apn_index</i> | Displays information about PDPs for the specified APN. |

| | |
|---|--|
| imsi <i>imsi_value</i> | Displays information about PDPs for the specified International Mobile Subscriber Identity (IMSI) value. |
| detail | Displays information about PDPs for the specified IMSI value in detail. |
| ms-address <i>end-user-address</i> | Displays information about PDPs for a specified end-user IPv4 address. |
| teid-u <i>user-teid</i> | Displays information about PDPs for a specified Tunnel Endpoint Identifier (TEID) user. |
| statistics | Displays information about GTP counters. |
| tunnel <i>interface type</i> | Displays information about GTP tunnels. |

Command Default

This command has no defaults.

Command Modes

Privileged EXEC (#)

Command History

| Release | Modification |
|---------------------------|------------------------------|
| Cisco IOS Release XE 3.8S | This command was introduced. |

Usage Guidelines**Examples**

The following is sample output of **show gtp apn** command:

```
Device# show gtp apn 1

apn_index   : 1                apn_name = starent.com
GGSN Addr  : 10.1.2.1
Primary DNS : 10.1.2.1
DHCP Addr  : 10.10.197.1     DHCP Lease: 6000
Tunnel MTU : 1500
Number of active PDPs in this APN : 0

Default GW      Prefix Length Name      MAC Address      PDP Count
```

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

Table 34: show gtp apn Field Descriptions

| Field | Description |
|-----------------------------------|---|
| apn_index | Index of the APN. |
| apn_name | Name of the APN. |
| GGSN Addr | Gateway GPRS Support Node (GGSN) IP address of the APN. |
| Primary DNS | Primary Domain Name System (DNS) Address of the APN. |
| DHCP Addr | DHCP Address of the APN |
| Tunnel MTU | Maximum Transmission unit of a tunnel. |
| DHCP Lease | DHCP lease time in seconds. |
| Number of active PDPs in this APN | Number of active PDPs in the APN. |

Related Commands

| Command | Description |
|------------------|-------------------|
| debug gtp | Debugs EWAG GTP. |
| gtp | Enables EWAG GTP. |

show hspw-aps-icrm

To view information about hot standby pseudowires (HSPW), use the **show hspw-aps-icrm** command in privileged EXEC mode.

show hspw-aps-icrm {**group** *group-id* | **all**}

Syntax Description

| | |
|-----------------|---|
| group | Specifies the HSPW Automatic Protection Switching (APS) group. |
| <i>group-id</i> | HSPW APS group identifier. |
| all | Displays all the HSPW APS and inter chassis redundancy manager (ICRM) groups. |

Command Modes

Privileged EXEC (#)

Command History

| Release | Modification |
|--------------------|--|
| Cisco IOS 15.2(1)S | This command was introduced. |
| Cisco IOS XE 3.11S | This command was integrated into Cisco IOS XE Release 3.11S. |

Usage Guidelines

Use this command to display information about a particular HSPW APS group or all HSPW APS and ICRM groups.

The following is sample output from the **show hspw-aps-icrm** command when **group** *group-id* is used to display information about a particular HSPW APS group:

```
Router# show hspw-aps-icrm group 100

ICRM group id 100, Flags : My core isolated No,Peer core isolated No,
State Connect
APS Group id 1 hw_if_index 33 APS valid:Yes
Total aps grp attached to ICRM group 100 is 1
```

Displaying Information About All HSPW APS and ICRM Groups

The following is sample output from the **show hspw-aps-icrm** command when **all** is used to display information about all the HSPW APS and ICRM groups:

```
Router# show hspw-aps-icrm all

ICRM group id 100, Flags : My core isolated No,Peer core isolated No,
State Connect
APS Group id 1 hw_if_index 33 APS valid:Yes
Total aps grp attached to ICRM group 100 is 1 ICRM group count
attached to MR-APS HSPW feature is 1
```

Related Commands

| Command | Description |
|-----------------|---|
| show aps | Displays information about the current APS feature on the router. |

show hub

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

show hub command `show hub [ethernet number [port [end-port]]]`

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

Command Modes User EXEC Privileged EXEC

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

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

Information for a Specific Port

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

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

```

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

```

Information for All Ports

The following is sample output from the **showhub** 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

```

The table below describes significant fields shown in the display.

Table 35: 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: <ul style="list-style-type: none"> • The link-state test failed. • The MAC address mismatched when source address configured. • It has been taken down by an administrator. |

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

| Field | Description |
|--|--|
| 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. |

show hw-module all fpd

To display the current versions of all field-programmable devices (FPDs) for all of the supported card types on a router, enter the **show hw-module all fpd** command in privileged EXEC mode.

show hw-module all fpd

Syntax Description This command has no arguments or keywords.

Command Default No default behavior or values.

Command Modes Privileged EXEC (#)

| Command History | Release | Modification |
|-----------------|---------------------------|---|
| | 12.2(18)SXE | This command was introduced. |
| | 12.0(31)S | This command was integrated into Cisco IOS Release 12.0(31)S. |
| | 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |
| | 12.4(4)XD | This command was integrated into Cisco IOS Release 12.4(4)XD. |
| | 12.4(11)T | This command was integrated into Cisco IOS Release 12.4(11)T. |
| | 12.2(31)SB2 | This command was integrated into Cisco IOS Release 12.2(31)SB2. |
| | 12.4(15)T | Added an example for the PA-MC-T3-EC port adapter. |
| | 12.2(33)SCB | This command was integrated into Cisco IOS Release 12.2(33)SCB. |
| | Cisco IOS XE Release 3.9S | This command was implemented on Cisco 4400 Series ISRs in Cisco IOS XE Release 3.9S |

Usage Guidelines Other than the FPD version information, the output for this command can also contain useful FPD-related notes.

For more information about FPD upgrades on SPA interface processors (SIPs) and shared port adapters (SPAs), see the Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide.

In Cisco IOS Release 12.2(33)SCB, the FPD image upgrade is supported only for the SPAs inserted in the SIP-600 jacket card on a Cisco uBR10012 router.

Examples

Cisco 7200 VXR

The following example shows an FPD image file version that requires an upgrade (indicated by the asterisk) for the NPE-G2 network processing engine in the Cisco 7200 VXR router:

```
Router# show hw-module all fpd
====
H/W      Field Programmable  Current  Min. Required
```

show hw-module all fpd

```

Slot Card Type          Ver.  Device: ID-Name      Version      Version
=====
npe NPE-G2              1.5   1-NPEG2 I/O FPGA    0.18        0.20 *
-----
0 VSA                   0.0   1-VSA                0.10        0.10
=====

```

NOTES:

- FPD images that are required to be upgraded are indicated with a '*' character in the Minimal Required Version field.
- The following FPD image package file is required for the upgrade:
c7200-fpd-pkg.124-4.XD.pkg

The following example shows that all FPDs for the port adapter have the minimum required version. For the NPE-400, the "####" characters in the ID-Name, Current Version, and Min, Required Version fields indicate that FPD does not apply to the NPE-400.

```

Router# show hw-module all fpd
=====
Slot Card Type          H/W  Field Programmable  Current  Min. Required
Ver.  Device: 'ID-Name'  Version  Version
=====
npe NPE-400              1.1   #####              #.#      #.#
-----
1 PA-MC-1T3-EC          1.0   1-ToySurprise FPGA  1.2      1.1
                        2-Subrate FPGA     1.4      1.4
                        3-Rommon/IPL       2.0      2.0
=====

```

Cisco 7600 Series

The following example shows FPD image file versions for all SIPs and SPAs in the Cisco 7600 series router:

```

Router# show hw-module all fpd
=====
Slot Card Type          H/W  Field Programmable  Current  Min. Required
Ver.  Device: ID-Name    Version  Version
=====
4 7600-SIP-200          0.132 1-I/O FPGA          0.19     0.18
                        2-EOS FPGA          0.22     0.22
                        3-PEGASUS TX FPGA  0.121    0.121
                        4-PEGASUS RX FPGA  0.13     0.13
                        5-ROMMON            1.1      1.1
-----
4/0 SPA-4XOC3-ATM      1.0   1-I/O FPGA          0.121    0.121
-----
4/1 SPA-8XCHT1/E1      0.117 1-ROMMON            2.12     2.12
                        2-I/O FPGA          0.22     0.22
-----
4/3 SPA-4XCT3/DS0      0.253 1-ROMMON            2.12     2.12
                        2-I/O FPGA          0.21     0.21
                        3-T3 SUBRATE FPGA  0.15     0.15
=====

```

The following example shows FPD image file versions that require an upgrade (indicated by the asterisk) for two SIPs in the Cisco 7600 series router. The SIPs are disabled due to the version mismatch.

```
Router# show hw-module all fpd
```

```

=====
Slot Card Type                H/W   Field Programmable   Current   Min. Required
                               Ver.   Device: ID-Name      Version   Version
=====
  1 7600-SIP... <DISABLED> 0.550 1-I/O FPGA           1.1       1.1
                               2-EOS FPGA           1.211     1.211
                               3-PEGASUS TX FPGA   1.129     1.129
                               4-PEGASUS RX FPGA   1.3       1.3
                               5-ROMMON             1.1       1.2      *
-----
  4 7600-SIP... <DISABLED> 0.550 1-I/O FPGA           1.1       1.1
                               2-EOS FPGA           1.211     1.211
                               3-PEGASUS TX FPGA   1.129     1.129
                               4-PEGASUS RX FPGA   1.3       1.3
                               5-ROMMON             1.1       1.2      *
=====

```

NOTES:

- FPD images that are required to be upgraded are indicated with a '*' character in the Minimal Required Version field.
- The following FPD image package file is required for the upgrade:
c7600-fpd-pkg.122-18.SXE.pkg

Cisco uBR10012 Universal Broadband Router

The following example shows the FPD versions on SPAs that meet the minimum requirements in the Cisco uBR10012 router:

```
Router# show hw-module all fpd
```

```

=====
Slot Card Type                H/W   Field Programmable   Current   Min. Required
                               Ver.   Device: ID-Name      Version   Version
=====
 1/0 SPA-24XDS-SFP            1.0   1-Modena BLAZE FPG  1285.1444 1285.1444
-----
 1/1 SPA-24XDS-SFP            1.0   1-Modena BLAZE FPG  1285.1444 1285.1444
-----
 1/2 SPA-24XDS-SFP            1.0   1-Modena BLAZE FPG  1285.1444 1285.1444
-----
 1/3 SPA-5X1GE-V2             1.2   1-5xGE V2 I/O FPGA  1.10       1.10
-----
 3/0 SPA-24XDS-SFP            1.0   1-Modena BLAZE FPG  1285.1444 1285.1444
-----
 3/1 SPA-24XDS-SFP            1.0   1-Modena BLAZE FPG  1285.1444 1285.1444
-----
 3/2 SPA-24XDS-SFP            1.0   1-Modena BLAZE FPG  1285.1444 1285.1444
-----
 3/3 SPA-1X10GE-L-V2          1.2   1-10GE V2 I/O FPGA  1.9        1.9
=====

```

Example: Cisco 4400 Series ISRs

will be added later

Related Commands

| Command | Description |
|-----------------------------------|--|
| show hw-module slot fpd | Displays the current versions of all FPDs for a SIP in the specified slot location and for all of the SPAs installed in that SIP or any FPD-capable cards. |
| show hw-module subslot fpd | Displays the current versions of all FPDs for a particular SPA or all of the active SPAs on a router. |

show hw-module slot (6500)

To display information for a SPA interface processor (SIP) or a module, use the **showhw-moduleslot** command in privileged EXEC configuration mode.

show hw-module slot slot {clear-block | oversubscription | port-group-mapping}

| Syntax Description | slot | clear-block | oversubscription | port-group-mapping |
|--------------------|--|--|--|----------------------------------|
| | Specifies the chassis slot number. See the appropriate hardware manual for slot information. For SIPs, refer to the platform-specific SPA hardware installation guide or the corresponding “Identifying Slots and Subslots for SIPs and SPAs” topic in the platform-specific SPA software configuration guide. | Displays the clearing of the head-of-line blocking status. | Displays the oversubscription mode of each port-group. | Displays the port group mapping. |

Command Default None

Command Modes Privileged EXEC

| Command History | Release | Modification |
|-----------------|--------------|---|
| | 12.2(18)SXF5 | Support for this command was introduced (Catalyst 6500 series switch). |
| | 12.(33)SXH1 | This command was changed to add the oversubscription and the port-group-mapping keywords (Catalyst 6500 series switch). |
| | 12.2(33)SXH2 | This command was changed to support the following modules: <ul style="list-style-type: none"> • WS-X6716-10G-3C • WS-X6716-10G-3CXL |

Usage Guidelines This command is supported on the following modules:

- WS-X6708-10G-3C--The port-group**mapping** and the clear-block keywords are not supported.
- WS-X6708-10G-3CXL--The port-group *num* and the clear-block keywords and argument are not supported.
- WS-X6716-10G-3C
- WS-X6716-10G-3CXL

The port-group mappings for the WS-X6716-10G-3C and the WS-X6716-10G-3CXL modules are as follows:

- Group 1--Ports 1 to 4. Port 1 is enabled in transparent mode.
- Group 2--Ports 5 to 8. Port 5 is enabled in transparent mode.
- Group 3--Ports 9 to 12. Port 9 is enabled in transparent mode.

- Group 4--Ports 13 to 16. Port 13 is enabled in transparent mode.

For the WS-X6716-10G-3C and the WS-X6716-10G-3CXL modules in transparent mode, ports 2, 3, 4, 6, 7, 8, 10, 11, 12, 14, 15, 16 are disabled.

Examples

This example shows how to display the current configuration status for the four port-groups:

```
Router# show hw-module slot 2 clear-block
Port-group Clear-block
1           Enabled
2           Disabled
3           Disabled
4           Enabled
Router#
```

This example shows how to display the port group mapping of each port group:

```
Router# show hw-module slot 2 port-group-mapping
Port-group Ports
1           1, 2, 3, 4
2           5, 6, 7, 8
3           9, 10, 11, 12
4           13, 14, 15, 16
```

This example shows how to display the oversubscription mode of each port group:

```
Router# show hw-module slot 3 oversubscription
Port-group oversubscription mode
1           Enabled
2           Disabled
3           Enabled
4           Disabled
Router#
```

Related Commands

| Command | Description |
|-----------------------------------|--|
| hw-module oversubscription | Administratively enables or disables the oversubscribed ports on a module. |

show hw-module slot align

To display alignment data for a SPA interface processor (SIP) or other module, use the **show hw-moduleslotalign** command in privileged EXEC configuration mode.

```
show hw-module slot slot align [cpu {0 | 1}]
```

| | | |
|---------------------------|------------------|--|
| Syntax Description | <i>slot</i> | Chassis slot number. Refer to the appropriate hardware manual for slot information. For SIPs, refer to the platform-specific SPA hardware installation guide or the corresponding “Identifying Slots and Subslots for SIPs and SPAs” topic in the platform-specific SPA software configuration guide. |
| | cpu 0 1 | (Optional) Number of the CPU (0 or 1) for which you want to display data. |

Command Default No default behavior or values

Command Modes Privileged EXEC

| | | |
|------------------------|----------------|---|
| Command History | Release | Modification |
| | 12.2(18)SXE | This command was introduced. |
| | 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |

Usage Guidelines The number of CPUs available varies by the type of SIP. Although the Cisco 7600 SIP-200 has two CPUs, you can display alignment data for the first CPU (CPU 0) only.

Examples

The following example shows that there has not been any alignment data for the SIP installed in slot 2 of the router:

```
Router# show hw-module slot 2 align
No alignment data has been recorded.
No spurious memory references have been recorded.
```

show hw-module slot fpd

To display the current versions of all field-programmable devices (FPDs) for a SIP in the specified slot location and for all of the SPAs installed in that SIP, or to display the current versions of any FPD-capable cards, enter the **showhw-moduleslotfpd** command in privileged EXEC mode.

Cisco 7200 VXR

show hw-module slot {*slot* | *npe*} **fpd**

Cisco 7304, Cisco 7600 Series, Cisco 12000 Series

show hw-module slot *slot* **fpd**

Syntax Description

| | |
|-------------|--|
| <i>slot</i> | Chassis slot number. Refer to the appropriate hardware manual for slot information. For SIPs, refer to the platform-specific SPA hardware installation guide or the corresponding “Identifying Slots and Subslots for SIPs and SPAs” topic in the platform-specific SPA software configuration guide. For slot numbering in the Cisco 7200 VXR router, refer to the Cisco 7200 VXR Installation and Configuration Guide . |
| <i>npe</i> | NPE-G2 network processing engine in the Cisco 7200 VXR router. |

Command Default

No default behavior or values

Command Modes

Privileged EXEC (#)

Command History

| Release | Modification |
|-------------|--|
| 12.2(18)SXE | This command was introduced. |
| 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |
| 12.4(4)XD | This command was integrated into Cisco IOS Release 12.4(4)XD, and the npe keyword was added. |
| 12.4(11)T | This command was integrated into Cisco IOS Release 12.4(11)T. |
| 12.2(31)SB2 | This command was integrated into Cisco IOS Release 12.2(31)SB2. |

Usage Guidelines

Use the **showhw-moduleslotfpd** command to show the FPD image version information for a particular SIP and all of its installed SPAs, or to display the current versions of FPD-capable cards in the Cisco 7200 VXR router. To display FPD information for all of the supported card types on a router, use the **showhw-moduleallfpd** command.

Other than the FPD version information, the output for this command can also contain useful FPD-related notes.

For more information about FPD upgrades on SPA interface processors (SIPs) and shared port adapters (SPAs), see the Cisco 7600 Series Router SIP, SSC, and SPA Software Configuration Guide.

Examples

Cisco 7200 VXR

The following example shows that the FPD version on the NPE-G2 meets the minimum FPD version requirements:

```
Router# show hw-module slot npe fpd
=====
Slot Card Type          H/W   Field Programmable   Current   Min. Required
Ver.   Device: "ID-Name"   Version   Version
=====
npe NPE-G2              1.3   1-NPEG2 I/O FPGA    0.19     0.1
=====
```

The following example shows FPD information for the VPN Services Adapter (VSA) in slot 0:

```
Router# show hw-module slot 0 fpd
=====
Slot Card Type          H/W   Field Programmable   Current   Min. Required
Ver.   Device: "ID-Name"   Version   Version
=====
0 VSA              0.0   1-VSA                0.9      0.8
=====
```

Cisco 7600 Series

The following example shows that the FPD versions on the SIP installed in chassis slot 4, and each of its installed SPAs, meet the minimum FPD version requirements:

```
Router# show hw-module slot 4 fpd
=====
Slot Card Type          H/W   Field Programmable   Current   Min. Required
Ver.   Device: "ID-Name"   Version   Version
=====
4 7600-SIP-200          0.550 1-I/O FPGA           1.1      1.1
                               2-EOS FPGA           1.211    1.211
                               3-PEGASUS TX FPGA    1.129    1.129
                               4-PEGASUS RX FPGA    1.3      1.3
                               5-ROMMON             1.2      1.2
-----
4/0 SPA-2XT3/E3        1.0   1-ROMMON             2.12     2.12
                               2-I/O FPGA           0.24     0.24
                               3-E3 FPGA            0.6      0.6
                               4-T3 FPGA            0.14     0.14
-----
4/1 SPA-4XOC3-POS      0.209 1-I/O FPGA           3.4      3.4
-----
4/2 SPA-8XCHT1/E1     0.117 1-ROMMON             2.12     2.12
                               2-I/O FPGA           1.2      1.2
=====
```

Related Commands

| Command | Description |
|-------------------------------------|--|
| <code>show hw-module all fpd</code> | Displays the current versions of all FPDs for all of the supported card types on a router. |

| Command | Description |
|-----------------------------------|---|
| show hw-module subslot fpd | Displays the current versions of all FPDs for a particular SPA or all of the active SPAs on a router. |

show hw-module slot logging

To display logging information for a SPA interface processor (SIP) or other module, use the **show hw-moduleslotlogging** command in privileged EXEC configuration mode.

show hw-module slot slot logging [cpu {0|1}]

| | | |
|---------------------------|------------------|--|
| Syntax Description | <i>slot</i> | Chassis slot number. Refer to the appropriate hardware manual for slot information. For SIPs, refer to the platform-specific SPA hardware installation guide or the corresponding “Identifying Slots and Subslots for SIPs and SPAs” topic in the platform-specific SPA software configuration guide. |
| | cpu 0 1 | (Optional) Number of the CPU (0 or 1) for which you want to display data. |

Command Default No default behavior or values

Command Modes Privileged EXEC

| | | |
|------------------------|----------------|---|
| Command History | Release | Modification |
| | 12.2(18)SXE | This command was introduced. |
| | 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |

Usage Guidelines The number of CPUs available varies by the type of SIP. Although the Cisco 7600 SIP-200 has two CPUs, you can display alignment data for the first CPU (CPU 0) only.

Examples

The following example shows logging information and messages for the SIP installed in slot 2 of the router:

```
Router# show hw-module slot 2 logging
Syslog logging: enabled (0 messages dropped, 2 messages rate-limited, 0 flushes,
 0 overruns)
  Console logging: level debugging, 90 messages logged
  Monitor logging: level debugging, 0 messages logged
  Buffer logging: level debugging, 92 messages logged
  Exception Logging: size (4096 bytes)
  Count and timestamp logging messages: disabled
Log Buffer (8192 bytes):
00:00:01: hyp_dev_attach
00:00:01: hyp_dev_init
00:00:01: hyp_init
00:00:01: hyp_dev_disable_intr
00:00:01: hyp_mx_sub_core_reset
00:00:01: hyp_mx_sub_core_unreset
00:00:01: hyp_mx_slv_reset
00:00:01: hyp_mx_slv_unreset
00:00:01: hyp_reg_config
00:00:01: hyp_fi_fr_reg_config
00:00:01: hyp_set_oper_mode
00:00:01: hyp_dev_enable_intr
00:00:03: Initializing rate limit function ===!!!
```

show hw-module slot logging

```

00:00:04: Currently running ROMMON from ROM F2
SLOT 2/0: 00:00:04: %SYS-5-RESTART: System restarted --
Cisco Internetwork Operating System Software
IOS (tm) cwlC Software (sip1-DW-M), Experimental Version 12.2(20040824:180829) [
dperez-pikespeak 3 174]
Copyright (c) 1986-2004 by cisco Systems, Inc.
Compiled Wed 01-Sep-04 13:54 by dperez
00:00:05: hyp_init
00:00:05: hyp_dev_disable_intr
00:00:05: hyp_mx_sub_core_reset
00:00:05: hyp_mx_sub_core_unreset
00:00:05: hyp_mx_slv_reset
00:00:05: hyp_mx_slv_unreset
00:00:05: hyp_reg_config
00:00:05: hyp_fi_fr_reg_config
00:00:05: hyp_set_oper_mode
00:00:05: hyp_dev_enable_intr
SLOT 2/0: 00:00:05: %HYPERION-5-BUS_MODE_CHANGE: The System Switching Bus Mode c
hanged to Compact mode
00:00:05:
00:00:05: hyp_fabric_intf_cnfg
00:00:05: Fabric Information
00:00:05: =====
00:00:05: Speed = 8G
00:00:05: Channel mode = Mode2-SSA/SSO
00:00:05: Channel = Secondary
00:00:05: hyp_rbh_reg_clear
00:00:05: Serial Secondary Channel SYNC SUCCESS!
SLOT 2/0: 00:00:05: %SCP-5-ENABLE: Module enabled
00:00:05: hyp_fabric_intf_cnfg
00:00:05: hyp_fpoe_chan_init
00:00:05: sip_hyp_check_sync_100ms:Opened SSA DDR
00:00:05: sip_hyp_check_sync_100ms:Opened n/w DDR
SLOT 2/0: 00:00:08: %SCP-5-ONLINE: Module online
00:00:09: % FPD_MGMT[65535]: Sending FPD version check request
00:00:09: % FPD_MGMT[65535]: Change FPD upgrade state to FPD_STATE_UPGRADE_IN_PR
OGRESS
00:00:09: % FPD_MGMT[65535]: Change FPD upgrade state to FPD_STATE_NO_UPGRADE_NE
EDED
SLOT 2/0: 00:00:09: %SIPSPA-6-OIR: Bay 3 SPA Power changed to On
SLOT 2/0: 00:00:10: %SIPSPA-6-OIR: Bay 3 SPA OK changed to On
00:00:10: % FPD_MGMT[3]: Sending FPD version check request
00:00:10: % FPD_MGMT[3]: Change FPD upgrade state to FPD_STATE_UPGRADE_IN_PROGRE
SS
00:00:10: % FPD_MGMT[3]: Change FPD upgrade state to FPD_STATE_NO_UPGRADE_NEEDED
SLOT 2/0: 00:00:13: %SCC-2-PROTO_HW: Module (2/3) is a registered proto-type for
Cisco Lab use only, and not certified for live network operation.
SLOT 2/0: 00:00:15: %LINK-3-UPDOWN: Interface POS2/3/0, changed state to down

```

show hw-module slot proc cpu

To display CPU utilization for each process on a SPA interface processor (SIP) or other module, use the **show hw-moduleslotproccpu** command in privileged EXEC configuration mode.

show hw-module slot slot proc cpu [cpu {0 | 1}]

| Syntax Description | slot | Chassis slot number. Refer to the appropriate hardware manual for slot information. For SIPs, refer to the platform-specific SPA hardware installation guide or the corresponding “Identifying Slots and Subslots for SIPs and SPAs” topic in the platform-specific SPA software configuration guide. |
|--------------------|------------------|--|
| | cpu 0 1 | (Optional) Number of the CPU (0 or 1) for which you want to display data. |

Command Default No default behavior or values

Command Modes Privileged EXEC

| Command History | Release | Modification |
|-----------------|-------------|---|
| | 12.2(18)SXE | This command was introduced. |
| | 12.2(33)SRA | This command was integrated into Cisco IOS Release 12.2(33)SRA. |

Usage Guidelines The number of CPUs available varies by the type of SIP. Although the Cisco 7600 SIP-200 has two CPUs, you can display alignment data for the first CPU (CPU 0) only.

Examples

The following example shows CPU utilization per process for the SIP installed in slot 2 of the router:

```
Router# show hw-module slot 2 proc cpu
CPU utilization for five seconds: 0%/0%; one minute: 0%; five minutes: 0%
  PID Runtime(ms)  Invoked    uSecs   5Sec   1Min   5Min  TTY Process
    1         0         1           0  0.00%  0.00%  0.00%  0 Chunk Manager
    2         0    255569           0  0.00%  0.00%  0.00%  0 Load Meter
    3         4   1884015           0  0.00%  0.00%  0.00%  0 CEF process
    4    86532   129737       666  0.08%  0.00%  0.00%  0 Check heaps
    5         0         743           0  0.00%  0.00%  0.00%  0 Pool Manager
    6         0         2           0  0.00%  0.00%  0.00%  0 Timers
    7         0         1           0  0.00%  0.00%  0.00%  0 AAA_SERVER_DEADT
    8         0         2           0  0.00%  0.00%  0.00%  0 AAA high-capacit
    9         0         2           0  0.00%  0.00%  0.00%  0 Serial Background
   10         0   255598           0  0.00%  0.00%  0.00%  0 ENVM Background
   11         0   21298           0  0.00%  0.00%  0.00%  0 IPC Dynamic Cach
   12         56   21300           2  0.00%  0.00%  0.00%  0 PROCMIB LC Proce
   13         0         1           0  0.00%  0.00%  0.00%  0 IPC BackPressure
   14         0  1277836           0  0.00%  0.00%  0.00%  0 IPC Periodic Tim
   15         0  1277836           0  0.00%  0.00%  0.00%  0 IPC Deferred Por
   16         0         13           0  0.00%  0.00%  0.00%  0 IPC Seat Manager
   17         0         1           0  0.00%  0.00%  0.00%  0 SERIAL A'detect
   18    2820         39      72307  0.00%  0.00%  0.00%  0 SMART
   19         0         1           0  0.00%  0.00%  0.00%  0 Critical Bkgnd
   20         4   383354           0  0.00%  0.00%  0.00%  0 Net Background
```

show hw-module slot proc cpu

| | | | | | | | | |
|----|------|-----------|-----|-------|-------|-------|---|------------------|
| 21 | 0 | 36 | 0 | 0.00% | 0.00% | 0.00% | 0 | Logger |
| 22 | 8 | 1277832 | 0 | 0.00% | 0.00% | 0.00% | 0 | TTY Background |
| 23 | 0 | 1277846 | 0 | 0.00% | 0.00% | 0.00% | 0 | Per-Second Jobs |
| 24 | 0 | 22041 | 0 | 0.00% | 0.00% | 0.00% | 0 | Per-minute Jobs |
| 25 | 0 | 2 | 0 | 0.00% | 0.00% | 0.00% | 0 | SCP Multicast |
| 26 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | Inode Table Dest |
| 27 | 0 | 4 | 0 | 0.00% | 0.00% | 0.00% | 0 | LC to RP defere |
| 28 | 8 | 428 | 18 | 0.00% | 0.00% | 0.00% | 0 | CWLC IFCOM Proce |
| 29 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | IPC RTTYC Messag |
| 30 | 0 | 2 | 0 | 0.00% | 0.00% | 0.00% | 0 | INTR MGR PROCESS |
| 31 | 0 | 2 | 0 | 0.00% | 0.00% | 0.00% | 0 | EFC queue monito |
| 32 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | LC interrupt, J1 |
| 33 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | SIP interrupt, P |
| 34 | 0 | 2 | 0 | 0.00% | 0.00% | 0.00% | 0 | SDCC Input |
| 35 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | CWAN LTL manager |
| 36 | 0 | 8 | 0 | 0.00% | 0.00% | 0.00% | 0 | SIP SWBus Sync P |
| 37 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | CWSLC Bus Stall |
| 38 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | VIP Encap IPC Ba |
| 39 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | CWPA Bridging Ra |
| 40 | 0 | 255568 | 0 | 0.00% | 0.00% | 0.00% | 0 | CPU Monitor |
| 41 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | MLP Input |
| 42 | 592 | 42648 | 13 | 0.00% | 0.00% | 0.00% | 0 | SPA OIR 2/0 |
| 43 | 644 | 42644 | 15 | 0.00% | 0.00% | 0.00% | 0 | SPA OIR 2/1 |
| 44 | 572 | 42644 | 13 | 0.00% | 0.00% | 0.00% | 0 | SPA OIR 2/2 |
| 45 | 1088 | 42697 | 25 | 0.00% | 0.00% | 0.00% | 0 | SPA OIR 2/3 |
| 46 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | LC FPD Upgrade P |
| 47 | 0 | 2 | 0 | 0.00% | 0.00% | 0.00% | 0 | AAA Dictionary R |
| 48 | 0 | 2 | 0 | 0.00% | 0.00% | 0.00% | 0 | AAA Server |
| 49 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | AAA ACCT Proc |
| 50 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | ACCT Periodic Pr |
| 51 | 0 | 2 | 0 | 0.00% | 0.00% | 0.00% | 0 | ATMLS task |
| 52 | 0 | 127785 | 0 | 0.00% | 0.00% | 0.00% | 0 | LC Process for u |
| 53 | 0 | 3 | 0 | 0.00% | 0.00% | 0.00% | 0 | IP Hdr Comp Proc |
| 54 | 140 | 12778349 | 0 | 0.00% | 0.00% | 0.00% | 0 | SSA FABLINK Proc |
| 55 | 0 | 255568 | 0 | 0.00% | 0.00% | 0.00% | 0 | HYP ACCU FAB COU |
| 56 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | SCP async: CWAN- |
| 57 | 0 | 2 | 0 | 0.00% | 0.00% | 0.00% | 0 | CWTLC SSO Proces |
| 58 | 3272 | 85294 | 38 | 0.00% | 0.00% | 0.00% | 0 | SCP Hybrid proce |
| 59 | 1004 | 12717003 | 0 | 0.00% | 0.00% | 0.00% | 0 | CEF LC IPC Backg |
| 60 | 8 | 1653487 | 0 | 0.00% | 0.00% | 0.00% | 0 | CEF LC Stats |
| 61 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | CEF MQC IPC Back |
| 62 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | TFIB LC cleanup |
| 63 | 0 | 3 | 0 | 0.00% | 0.00% | 0.00% | 0 | Any Transport ov |
| 64 | 0 | 7 | 0 | 0.00% | 0.00% | 0.00% | 0 | HQF Shaper Backg |
| 65 | 8 | 319458609 | 0 | 0.00% | 0.00% | 0.00% | 0 | HQF Input Shaper |
| 66 | 0 | 2 | 0 | 0.00% | 0.00% | 0.00% | 0 | LOCAL AAA |
| 67 | 0 | 2 | 0 | 0.00% | 0.00% | 0.00% | 0 | AAA Cached Serve |
| 68 | 0 | 90366 | 0 | 0.00% | 0.00% | 0.00% | 0 | CEF Scanner |
| 69 | 0 | 3 | 0 | 0.00% | 0.00% | 0.00% | 0 | RADIUS TEST CMD |
| 70 | 0 | 2 | 0 | 0.00% | 0.00% | 0.00% | 0 | AAA SEND STOP EV |
| 71 | 0 | 4 | 0 | 0.00% | 0.00% | 0.00% | 0 | IPv6 CEF process |
| 72 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | SONET alarm time |
| 73 | 0 | 1 | 0 | 0.00% | 0.00% | 0.00% | 0 | Net Input |
| 74 | 0 | 255571 | 0 | 0.00% | 0.00% | 0.00% | 0 | Compute load avg |
| 75 | 16 | 80 | 200 | 0.08% | 0.00% | 0.00% | 1 | console_rpc_serv |