show controllers vg-anylan

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

Cisco 7500 Series with VIP Cards

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

Cisco 7200 Series

show controllers vg-anylan *slot/port*

Syntax Description

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

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
11.3	This command was introduced.

Usage Guidelines

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

Examples

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

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

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


 MC68852 Registers:
 hw_id: 5048, hw_id & page: 7053, opr1=0x26, opr2=0x2C, opr3=0x00
  Page 0 - Performance:
  isr=0x3400, imr=0x0A0A, flreg=0x0000
```

```
 xfrct=0xC07E0080, rxcnt=0, txcnt=1F
 Page 1 - MAC Address/Hash Table:
 addrlow= 6009B9, addrhigh=9B1809B9,hash bytes=06 00 20 00 00 00 00 00
 Page 2 - Hardware Mapping:
 mmmsw=0x3785, mmlsw=0x0000, bmreg =0x04
 Page 4 - LAN Configuration:
 tccnf1=0x00, tccnf2=0x01
 vccnf=0x99, vtrrg=0x0020, valow1=0x0000, valow2=0x0000
 maccr1=0xBE, maccr2=0x00, maccr3=0x04, maccr4=0x03
 Page 5 - MMU Registers:
 rx mem stop addr=0xFF03, tx mem stop addr=0xFF07
MC68852 PCI registers:
 bus_no=6, device_no=0
 CFID=0x0005101A, CFCS=0x02800005, CFRV=0x02000000, CFLT=0x0000F800
 CBIO=0x00006001, CBMA=0x00000000, CFIT=0x20080100, CFDA=0x0000000C

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

show diag

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

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

Syntax Description

slot-number	(Optional) Slot number of the interface.
details	(Optional) Displays more details than the normal **show diag** output.
summary	(Optional) Displays a summary (one line per slot) of the chassis.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.2	This command was introduced.
11.2 GS	This command was implemented on the Cisco 12000 series.
12.0	This command was implemented on the Cisco AS5300.
12.0(7)T	This command was implemented on the Cisco 1750 router.
12.2(8)T	Support for this command was implemented for AIC cards and WIC cards on the Cisco 2600 series and the Cisco 3600 series.
12.2(13)T	Support for this command was implemented for AIM cards on the Cisco 2600 series, Cisco 3660, and Cisco 3700 series.

Usage Guidelines

Use this command to determine the type of hardware installed in your networking device. This command displays information for the EEPROM, motherboard, WAN interface cards (WICs), voice interface cards (VICs), ATM interface cards (AICs), and advanced integration modules (AIMs).

Examples

Example for a PA-12E/2FE Port Adapter

The following is sample output from the **show diag** command for a PA-12E/2FE port adapter in chassis slot 3 on a Cisco 7200 series router:

```
Router# show diag 3

Slot 3:
        Ethernet Switch port adapter, 14 ports
        Port adapter is analyzed
        Port adapter insertion time 20:51:22 ago
        Hardware revision 1.0 Board revision AO
        Serial number     4294967295    Part number 800-02611-05
        Test history      0xFF          RMA number     000-000-000
        EEPROM format version 255
        EEPROM contents (hex):
          0x20: FF 3F FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x30: FF FF FF FF FF FF FF FF FF FF FF FF FF OFF FF OFF
```

Example for a One-Port T3 Serial Port Adapter

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

```
Router# show diag 1

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

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

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

        Controller Memory Size: 16 MBytes DRAM, 1024 KBytes SRAM

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

Examples for a Cisco 12000 Series Internet Router

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

```
Router# show diag 3

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

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

```
Router# show diag summary

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

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

```
Router# show diag 4 details

SLOT 4  (RP/LC 4): 4 Port Packet Over SONET OC-3c/STM-1 Single Mode
  MAIN: type 33,  800-2389-01 rev 71 dev 16777215
        HW config: 0x00    SW key: FF-FF-FF
  PCA:  73-2275-03 rev 75 ver 3
        HW version 1.1  S/N 04529465
  MBUS: MBUS Agent (1)  73-2146-06 rev 73 dev 0
        HW version 1.1  S/N 04541395
        Test hist: 0xFF    RMA#: FF-FF-FF    RMA hist: 0xFF
  DIAG: Test count: 0x05000001    Test results: 0x00000000
  EEPROM contents (hex):
  00: 01 00 01 00  49 00 08 62  06 03 00 00  00 FF FF FF
  10: 30 34 35 34  31 33 39 35  FF FF FF FF  FF FF FF FF
  20: 01 01 00 00  00 00 00 FF  FF FF FF FF  FF FF FF FF
  30: A5 FF A5 A5  A5 A5 FF A5  A5 A5 A5 A5  A5 A5 A5 A5
  40: 00 21 01 01  00 49 00 08  E3 03 05 03  00 01 FF FF
  50: 03 20 00 09  55 01 01 FF  FF FF 00 FF  FF FF FF FF
  60: 30 34 35 32  39 34 36 35  FF FF FF FF  FF FF FF FF
  70: FF FF FF FF  FF FF FF FF  05 00 00 01  00 00 00 00
  MBUS Agent Software version 01.24 (RAM)
  Fabric Downloader version 00.0D
  Board is analyzed
  Flags: 0x4
  Board State is Line Card Enabled (IOS  RUN)
  Insertion time: 00:00:10 (00:04:51 ago)
  DRAM size: 33554432 bytes
  FrFab SDRAM size: 67108864 bytes
  ToFab SDRAM size: 16777216 bytes
```

Example for a WIC in a Cisco 1750 Series Router

The following is sample output from the **show diag** command for a WIC in chassis slot 0 on a Cisco 1750 series router:

```
Router# show diag 0

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

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

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

        WIC Slot 1:
        Dual FXS Voice Interface Card WAN daughtercard
        Hardware revision 1.1   Board revision C0
        Serial number     0010377882    Part number    800-02493-01
        Test history      0x00          RMA number     00-00-00
        Connector type    WAN Module
        EEPROM format version 1
        EEPROM contents (hex):
        0x20:  01 0E 01 01 00 9E 5A 9A 50 09 BD 01 00 00 00 00
        0x30:  60 00 00 00 98 09 10 01 FF FF FF FF FF FF FF FF

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

Quad T1/PRI Card in a Cisco AS5300

The following is sample output from the **show diag** command for a quad T1/PRI card in slot 2 of a Cisco AS5300:

```
Router# show diag 2

Slot 2:
Hardware is Quad T1 PRI CSU, 4 ports
Manufacture Cookie Info:
 EEPROM Type 0x0001, EEPROM Version 0x01, Board ID 0x42,
 Board Hardware Version 1.2, Item Number 73-2217-05,
 Board Revision B2, Serial Number 11817862,
 PLD/ISP Version 0.0,  Manufacture Date 29-Dec-1998.
 EEPROM format version 0
 EEPROM contents (hex):
   0x00: 00 01 01 42 01 02 00 49 00 08 A9 05 42 02 31 31
   0x10: 38 31 37 38 36 32 00 00 00 00 00 00 00 00 13 62
   0x20: 0C 1D 00 00 FF FF FF FF FF FF FF FF FF FF FF FF
   0x30: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
   0x40: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
   0x50: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
   0x60: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
   0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
```

ATM SAR AIM in a Cisco 3660

The following example shows one ATM 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

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

```
Router# show diag

Slot 0:
C2611 2E Mainboard Port adapter, 2 ports
Port adapter is analyzed
Port adapter insertion time unknown
EEPROM contents at hardware discovery:
Hardware Revision : 2.3
PCB Serial Number : JAD044808SG (1090473337)
Part Number : 73-2840-13
RMA History : 00
```

```
RMA Number : 0-0-0-0
Board Revision : C0
Deviation Number : 0-0
EEPROM format version 4
EEPROM contents (hex):
0x00: 04 FF 40 00 92 41 02 03 C1 18 4A 41 44 30 34 34
0x10: 38 30 38 53 47 20 28 31 30 39 30 34 37 33 33 33
0x20: 37 29 82 49 0B 18 0D 04 00 81 00 00 00 00 42 43
0x30: 30 80 00 00 00 00 FF FF FF FF FF FF FF FF FF FF
0x40: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x50: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x60: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x70: FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF

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

Table 68 describes significant fields shown in the display.

Table 68 show diag 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 Cisco 2611 series port adapter.
Port adapter insertion time	Elapsed time since insertion.
Hardware Revision	Version number of the Cisco 2611 series port adapter.
PCB Serial Number	Serial number of the printed circuit board.
Part Number	Part number of the port adapter.
RMA History	Counter that indicates how many times the port adapter has been returned and repaired.
RMA Number	Return material authorization number, which is an administrative number assigned if the port adapter needs to be returned for repair.
Board Revision	Revision number (signifying a minor revision) of the Cisco uBR7200 series port adapter.
Deviation Number	Revision number (signifying a minor deviation) of the Cisco uBR7200 series port adapter.

Table 68 show diag Field Descriptions

Field	Description
EEPROM format version	Version number of the EEPROM format.
EEPROM contents (hex)	Dumps of EEPROM programmed data.

The following is sample output from the **show diag** command that displays hardware-related information about the AIC:

```
Router# show diag

Slot 1:
        NM_AIC_64 Port adapter, 4 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        :DAN05060038
        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 33 38 FF FF FF
          0x20:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x30:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x40:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x50:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x60:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
          0x70:FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
```

Related Commands

Command	Description
dsl operating-mode (ADSL)	Modifies the operating mode of the digital subscriber line for an ATM interface.
show dsl interface atm	Shows all of the ADSL-specific information for a specified ATM interface.

show diagbus

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

show diagbus [*slot*]

Syntax Description

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

Command Modes

Privileged EXEC

Command History

Release	Modification
11.2	This command was introduced.

Examples

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

```
Router# show diagbus 8

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


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


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


        Controller Memory Size: 8 MBytes


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

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

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

```
Router# show diagbus 2

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

show interfaces content-engine

To display basic interface configuration information for a content engine (CE) network module, use the **show interfaces content-engine** command in privileged EXEC mode.

show interfaces content-engine *slot/unit*

Syntax Description

slot	Number of the router chassis slot for the network module.
unit	Number of the daughter card on the network module. For CE network modules, always use 0.

Command Modes

Privileged EXEC

Command History

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

Usage Guidelines

The output for this command contains the basic configuration for the interface, as well as the number of packets transmitted, output rate, and so forth.

Examples

The following example displays interface status and data for the CE network module in slot 1 for a Cisco 2600 series routers (except the Cisco 2691). Note that the bandwidth is 10 Mbps.

```
Router# show interfaces content-engine 1/0

Content-Engine1/0 is up, line protocol is up
  Hardware is I82559FE, address is 0006.280e.10b0 (bia 0006.280e.10b0)
  MTU 1500 bytes, BW 10000 Kbit, DLY 1000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:50, output 00:00:04, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue :0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     13 packets input, 5835 bytes, 0 no buffer
     Received 13 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 input packets with dribble condition detected
     71 packets output, 6285 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier
     0 output buffer failures, 0 output buffers swapped out
```

The following example displays interface status and data for a CE network module in slot 3 of a Cisco 2691. This example shows the 100-Mbps bandwidth of a Cisco 2691 and all the other supported routers except the remainder of the Cisco 2600 series.

```
Router# show interfaces content-engine 3/0

Content-Engine3/0 is up, line protocol is up
  Hardware is I82559FE, address is 0004.9a0b.4b30 (bia 0004.9a0b.4b30)
  MTU 1500 bytes, BW 100000 Kbit, DLY 100 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input 00:00:41, output 00:00:04, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue :0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     14 packets input, 6176 bytes, 0 no buffer
     Received 14 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 input packets with dribble condition detected
     109 packets output, 16881 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
```

Table 69 describes the significant fields shown in the display.

Table 69 show interfaces content-engine Field Descriptions

Field	Description
Content-Engine	Indicates whether the CE interface hardware is currently active. If the CE interface hardware is operational, the output states that “Content-Engine slot/port is up.” If it has been taken down by an administrator, the output states that “Content-Engine slot/port is administratively down.”
line protocol	Indicates whether the software processes that handle the line protocol consider the line usable or whether the line has been taken down by an administrator.
Hardware...address	Hardware type and address.
MTU	Maximum transmission unit (MTU) of the content engine interface.
BW	Bandwidth of the interface, in kilobits per second.
DLY	Delay of the interface, in microseconds.
reliability	Reliability of the interface as a fraction of 255 (255/255 is 100 percent reliability), calculated as an exponential average over 5 minutes.
txload	Transmit load on the interface as a fraction of 255 (255/255 is completely saturated), calculated as an exponential average over 5 minutes.

Table 69 show interfaces content-engine Field Descriptions (continued)

Field	Description
rxload	Receive 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 the interface.
loopback	Indicates whether loopback is set.
Keepalive	Indicates whether keepalives are set and the interval between keepalives if they have been set.
ARP type...Timeout	Type of Address Resolution Protocol (ARP) assigned and length of timeout.
Last input	Number of hours, minutes, and seconds since the last packet was successfully received by the interface and processed locally on the router. This field is useful for detecting when a dead interface failed. **Note** This field is not updated by fast-switched traffic.
output	Number of hours, minutes, and seconds since the last packet was successfully transmitted by the interface. This field is useful for detecting when a dead interface failed.
output hang	Number of hours, minutes, and seconds (or never) since the interface was last reset because a transmission 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. Asterisks (***) indicate that the elapsed time is too large to be displayed. A time of all zeroes (0:00:00) indicates that the counters were cleared more than 231 ms (and less than 232 ms) ago.
Input queue	Number of packets in the input queue. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped because of a full queue.
Total output drops	Number of packets in the output queue that have been dropped because of a full queue.
Queueing strategy	Queueing strategy applied to the interface, which is configurable under the interface. The default is FIFO.
Output queue	Number of packets in the output queue. Each number is followed by a slash, the maximum size of the queue, and the number of packets dropped because of a full queue.

Table 69 show interfaces content-engine Field Descriptions (continued)

Field	Description
5 minute input rate, 5 minute output rate	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 that it sends and receives (rather than all network traffic). 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 2 percent of the instantaneous rate of a uniform stream of traffic over that period. **Note** The 5-minute period referenced in this output is a load interval that is configurable under the interface. The default value is 5 minutes.
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	Number of broadcasts received.
runts	Number of packets that are discarded because they are smaller than the minimum packet size of the medium. 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 maximum packet size of the medium. For example, any Ethernet packet that is greater than 1518 bytes is considered a giant.
throttles	Number of times that the interface requested another interface within the router to slow down.
input errors	Errors that include runts, giants, no buffer, cyclic redundancy check (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	Errors created when the CRC 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 that is transmitting bad data.
frame	Number of packets received incorrectly that have a CRC error and a non integer number of octets. On a LAN, this is usually the result of collisions or a malfunctioning Ethernet device.

Table 69 show interfaces content-engine Field Descriptions (continued)

Field	Description
overrun	Number of times that 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 that were ignored by the interface because the interface hardware ran low on internal buffers. These buffers are different from system buffer space described. Broadcast storms and bursts of noise can cause the ignored count to increase.
input packets with dribble condition detected	Number of packets with dribble condition. 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 that have been transmitted by the system.
bytes	Total number of bytes, including data and MAC encapsulation, that have been transmitted by the system.
underruns	Number of times that the transmitter has run faster than the router could 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 content engine that is being examined. Note that this may not balance with the sum of the enumerated output errors, because 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 that have been retransmitted because of 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 that were 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.
babbles	Count of frames greater than 1518 bytes that have been transmitted, indicating that the transmitter has been on the interface longer than the time necessary to transmit the largest frame.
late collision	Number of late collisions. A collision becomes a late collision when it occurs after the preamble has been transmitted.

Table 69 show interfaces content-engine Field Descriptions (continued)

Field	Description
deferred	Deferred indicates that the chip, while ready to transmit a frame, had to defer because the carrier was asserted.
lost carrier	Number of times that the carrier was lost during transmission.
no carrier	Number of times that the carrier was not present during the transmission.
output buffer failures, output buffers swapped out	Number of failed buffers and number of buffers swapped out.

Related Commands

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

show redundancy

To display current or historical status and related information on planned or logged handovers, use the **show redundancy** command in privileged EXEC mode.

show redundancy [**clients** | **counters** | **debug-log** | **handover** | **history** | **states**]

Syntax Description

clients	(Optional) Redundancy-aware client-application list.
counters	(Optional) Redundancy-related operational measurements.
debug-log	(Optional) Log of up to 256 redundancy-related debug entries.
handover	(Optional) Details of any pending scheduled handover.
history	(Optional) Log of past status and related information about logged handovers. This is the only keyword supported on the Cisco AS5800.
states	(Optional) Redundancy-related states: disabled, initialization, standby, active (various substates for the latter two).

Defaults

This command is issued on a per-use basis.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.3(6)AA	This command was introduced.
12.2(8)T	This command was integrated into Cisco IOS Release 12.2(8)T. Support for the Cisco 5800 and Cisco AS5850 is not included in this release.
12.2(11)T	This command is supported on the Cisco AS5800, and Cisco AS5850 in this release.

Usage Guidelines

The command is issued on a once-each-time basis and therefore does not have to be turned off.

Cisco AS5800: Use this command from the router-shelf console to determine when failover is enabled. Use this command with the **history** keyword to log failover events.

Cisco AS5850: To use this command, you must have two route-switch-controller (RSC) cards installed and you must be connected to one of them.

Examples

The following is sample output from the show redundancy handover and show redundancy states commands on a Cisco AS5850:

```
Router# show redundancy handover

No busyout period specified
Handover pending at 23:00:00 PDT Wed May 9 2001
```

```
Router# show redundancy states

my state = 14 -ACTIVE_EXTRALOAD
peer state = 4 -STANDBY COLD
Mode = Duplex
Unit = Preferred Primary
Unit ID = 6
Redundancy Mode = Handover-split: If one RSC fails, the peer RSC will take over the
feature boards
Maintenance Mode = Disabled
Manual Swact = Disabled Reason: Progression in progress
Communications = Up
client count = 3
client_notification_TMR = 30000 milliseconds
keep_alive TMR = 4000 milliseconds
keep_alive count = 1
keep_alive threshold = 7
RF debug mask = 0x0
```

The following is sample output from the **show redundancy** command on a Cisco AS5800:

```
Router# show redundancy

DSC in slot 12:
Hub is in 'active' state.
Clock is in 'active' state.
DSC in slot 13:
Hub is in 'backup' state.
Clock is in 'backup' state.
```

The following is sample output from the **show redundancy history** command on a Cisco AS5800:

```
Router# show redundancy history

DSC Redundancy Status Change History:

981130 18:56 Slot 12 DSC: Hub, becoming active - RS instruction
981130 19:03 Slot 12 DSC: Hub, becoming active - D13 order
```

The following is sample output from two Cisco AS5800 router shelves configured as a failover pair. The active router shelf is initially RouterA. The **show redundancy history** and **show redundancy** commands have been issued. The **show redundancy** command shows that failover is enabled, shows the configured group number, and shows that this router shelf is the active one of the pair. Compare this output with that from the backup router shelf (RouterB) further below.

Note When RouterA is reloaded, thereby forcing a failover, new entries are shown on RouterB when a **show redundancy history** command is issued after failover has occurred.

Log from the First Router (RouterA)

```
RouterA# show redundancy history

DSC Redundancy Status Change History:

010215 18:17 Slot -1 DSC:Failover configured -> ACTIVE role by default.
010215 18:18 Slot -1 DSC:Failover -> BACKUP role.
010215 18:18 Slot 12 DSC:Failover -> ACTIVE role.
010215 18:18 Slot 12 DSC:Hub, becoming active - arb timeout

RouterA# show redundancy
failover mode enabled, failover group = 32
Currently ACTIVE role.
```

```
DSC in slot 12:
Hub is in 'active' state.
Clock is in 'active' state.
No connection to slot 13

RouterA# reload

Proceed with reload? [confirm] y
*Feb 15 20:19:11.059:%SYS-5-RELOAD:Reload requested
System Bootstrap, Version xxx
Copyright xxx by cisco Systems, Inc.
C7200 processor with 131072 Kbytes of main memory
```

Log from the Second Router (RouterB)

```
RouterB# show redundancy

failover mode enabled, failover group = 32
Currently BACKUP role.
No connection to slot 12
DSC in slot 13:
Hub is in 'backup' state.
Clock is in 'backup' state.

*Feb 16 03:24:53.931:%DSC_REDUNDANCY-3-BICLINK:Switching to DSC 13
*Feb 16 03:24:53.931:%DSC_REDUNDANCY-3-BICLINK:Failover:changing to active mode
*Feb 16 03:24:54.931:%DIAL13-3-MSG:
02:32:06:%DSC_REDUNDANCY-3-EVENT:Redundancy event:LINK_FAIL from other DSC
*Feb 16 03:24:55.491:%OIR-6-INSCARD:Card inserted in slot 12, interfaces administratively
shut down
*Feb 16 03:24:58.455:%DIAL13-3-MSG:
02:32:09:%DSC_REDUNDANCY-3-EVENT:Redundancy event:LINK_FAIL from other DSC
*Feb 16 03:25:04.939:%DIAL13-0-MSG:

RouterB# show redundancy

failover mode enabled, failover group = 32
Currently ACTIVE role.
No connection to slot 12
DSC in slot 13:
Hub is in 'active' state.
Clock is in 'backup' state.

RouterB# show redundancy history

DSC Redundancy Status Change History:

010216 03:09 Slot -1 DSC:Failover configured -> BACKUP role.
010216 03:24 Slot 13 DSC:Failover -> ACTIVE role.
010216 03:24 Slot 13 DSC:Hub, becoming active - D12 linkfail
010216 03:24 Slot 13 DSC:Hub, becoming active - D12 linkfail

*Feb 16 03:26:14.079:%DSIPPF-5-DS_HELLO:DSIP Hello from shelf 47 slot 1 Succeeded
*Feb 16 03:26:14.255:%DSIPPF-5-DS_HELLO:DSIP Hello from shelf 47 slot 3 Succeeded
*Feb 16 03:26:14.979:%DSIPPF-5-DS_HELLO:DSIP Hello from shelf 47 slot 10 Succeeded
```

Related Commands

Command	Description
debug redundancy	Displays information used for troubleshooting dual (redundant) router shelves (Cisco AS5800) or RSCs (Cisco AS5850).
hw-module	Enables the router shelf to stop a DSC or to restart a stopped DSC.

Command	Description
redundancy	Enters redundancy configuration mode.
show chassis	Displays, for a router with two RSCs, information about mode (handover-split or classic-split) , RSC configuration, and slot ownership.

show redundancy interlink

To display interlink utilization, use the **show redundancy interlink** command in user EXEC or privileged EXEC mode.

show redundancy interlink [**rx** | **tx** [**pps** | **bps**]] [**histogram**]

Syntax Description

rx	(Optional) Receive interlink utilization histograms.
tx	(Optional) Transmit interlink utilization histograms.
pps	(Optional) Packets per second (pps) histograms.
bps	(Optional) Bytes per second (bps) histograms.
histogram	(Optional) Usage information.

Command Default

Interlink utilization information is not displayed.

Command Modes

User EXEC
Privileged EXEC

Command History

Release	Modification
12.2(11)T	This command was introduced on the Cisco AS5850.
12.2(31)SB	This command was introduced on the Cisco 10000 series Internet routers. Support for the Cisco AS5850 is not included in this release.

Usage Guidelines

Use the **show redundancy interlink** command to display the current or historical status on interlink utilization.

Examples

The following histogram displays receive BPS interlink information for the past minute, the past hour, and the past three days:

```
Router# show redundancy interlink rx bps histogram

      1111111111111111111111111111111111111111111112222222222111
5000
4500
4000
3500
3000
2500
2000
1500
1000
  500
     0....5....1....1....2....2....3....3....4....4....5....5....
               0    5    0    5    0    5    0    5    0    5
                    Interlink Rx BPS (last 60 seconds)
```

```
                    # = Bits Per Second (x1000)

      211111211111212111112111111121111111111111111111111111111111
5000
4500
4000
3500
3000
2500
2000
1500
1000
  500
     0....5....1....1....2....2....3....3....4....4....5....5....
               0    5    0    5    0    5    0    5    0    5
                    Interlink Rx BPS (last 60 minutes)
            * = maximum BPS (x1000)    # = average BPS (x1000)


1111222221111111112111111111111111121121111111111111111211121111111111111
5000
4500
4000
3500
3000
2500
2000
1500
1000
  500

0....5....1....1....2....2....3....3....4....4....5....5....6....6....7.
               0    5    0    5    0    5    0    5    0    5    0
5    0
                    Interlink Rx BPS (last 72 hours)
            * = maximum BPS (x1000)    # = average BPS (x1000)
```

show service-module serial

To display the performance report for an integrated CSU/DSU, use the **show service-module serial** command in privileged EXEC mode.

show service-module serial *number* [**performance-statistics** [*interval-range*]]

Syntax Description

number	Interface number 0 or 1.
performance-statistics	(Optional) Displays the CSU/DSU performance statistics for the past 24 hours. This keyword applies only to the fractional T1/T1 module.
interval-range	(Optional) Specifies the number of 15-minute intervals displayed. You can choose a range from 1 to 96, where each value represents the CSU/DSU activity performed in that 15-minute interval. For example, a range of 2-3 displays the performance statistics for the intervals two and three.

Command Modes

Privileged EXEC

Command History

Release	Modification
11.2	This command was introduced.

Usage Guidelines

This command applies to the 2- and 4-wire 56/64-kbps CSU/DSU module and FT1/T1 CSU/DSU module. The **performance-statistics** keyword applies only to the FT1/T1 CSU/DSU module.

Examples

The following sample output shows CSU/DSU performance statistics on a Cisco 2524 or Cisco 2525 router for intervals 30 to 32. Each interval is 15 minutes long. All the data is zero because no errors were discovered on the T1 line:

```
Router# show service-module serial 1 performance-statistics 30-32

Total Data (last 58 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
Data in current interval (131 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 30:
    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 31:
    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 32:
    0 Line Code Violations, 0 Path Code Violations
    0 Slip Secs, 0 Fr Loss Secs, 0 Line Err Secs, 0 Degraded Mins
    0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 0 Unavail Secs
```

The following is sample output from the **show service-module serial** command for a fractional T1 line:

```
Router1# show service-module serial 0

Module type is T1/fractional
    Hardware revision is B, Software revision is 1.1 ,
    Image checksum is 0x2160B7C, Protocol revision is 1.1
Receiver has AIS alarm,
Unit is currently in test mode:
    line loopback is in progress
Framing is ESF, Line Code is B8ZS, Current clock source is line,
Fraction has 24 timeslots (64 Kbits/sec each), Net bandwidth is 1536 Kbits/sec.
Last user loopback performed:
    remote loopback
    Failed to loopup remote
Last module self-test (done at startup): Passed
Last clearing of alarm counters 0:05:50
    loss of signal        :    1, last occurred 0:01:50
    loss of frame         :    0,
    AIS alarm             :    1, current duration 0:00:49
    Remote alarm          :    0,
    Module access errors  :    0,
Total Data (last 0 15 minute intervals):
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 current interval (351 seconds elapsed):
    1466 Line Code Violations, 0 Path Code Violations
    25 Slip Secs, 49 Fr Loss Secs, 40 Line Err Secs, 1 Degraded Mins
    0 Errored Secs, 0 Bursty Err Secs, 0 Severely Err Secs, 49 Unavail Secs
```

The following sample output from the **show service-module serial** command displays the status of a switched 56-KB line:

```
Router1# show service-module serial 1

Module type is 4-wire Switched 56
    Hardware revision is B, Software revision is 1.00,
    Image checksum is 0x44453634, Protocol revision is 1.0
Connection state: active,
Receiver has loss of signal, loss of sealing current,
Unit is currently in test mode:
    line loopback is in progress
Current line rate is 56 Kbits/sec
Last user loopback performed:
    dte loopback
    duration 00:00:58
Last module self-test (done at startup): Passed
Last clearing of alarm counters 0:13:54
    oos/oof               :    3, last occurred 0:00:24
    loss of signal        :    3, current duration 0:00:24
    loss of sealing curren:    2, current duration 0:04:39
    loss of frame         :    0,
    rate adaption attempts:    0,
```

The following shows sample output from the **show service-module serial** command issued on a Cisco 3640 modular access router:

```
Router# show service-module serial 0/1
```

```
Module type is 4-wire Switched 56
    Hardware revision is B, Software revision is 1.00,
    Image checksum is 0x42364436, Protocol revision is 1.0
Connection state: Idle
Receiver has no alarms.
CSU/DSU Alarm mask is 0
Current line rate is 56 Kbits/sec
Last module self-test (done at startup): Passed
Last clearing of alarm counters 4d02h
    oos/oof               :    0,
    loss of signal        :    0,
    loss of sealing curren:    0,
    loss of frame         :    0,
    rate adaptation attemp:    0,
```

The following shows sample output from the **show service-module serial** command issued on a Cisco 1605 router:

```
Router# show service-module serial 0

Module type is 4-wire Switched 56
    Hardware revision is B, Software revision is 1.00,
    Image checksum is 0x42364436, Protocol revision is 1.0
Receiver has oos/oof, loss of signal,
CSU/DSU Alarm mask is 4
Current line rate is 56 Kbits/sec
Last module self-test (done at startup): Passed
Last clearing of alarm counters 1d02h
    oos/oof               :    1, current duration 1d02h
    loss of signal        :    1, current duration 1d02h
    loss of frame         :    0,
    rate adaptation attemp:    0,
```

Table 70 describes the fields displayed by the **show service-module serial** command.

Table 70 show service-module serial Field Descriptions

Field	Description
Module type	CSU/DSU module installed in the router. The possible modules are T1/fractional, 2-wire switched 56-kbps, and 4-wire 56/64-kbps.
Receiver has AIS alarm	Alarms detected by the FT1/T1 CSU/DSU module or 2- and 4-wire 56/64-kbps CSU/DSU modules. Possible T1 alarms are as follows: • Transmitter is sending remote alarm. • Transmitter is sending AIS. • Receiver has loss of signal. • Receiver has loss of frame. • Receiver has remote alarm. • Receiver has no alarms. Possible switched 56k alarms are as follows: • Receiver has loss of signal. • Receiver has loss of sealing current. • Receiver has loss of frame. • Receiver has rate adaptation attempts.
Unit is currently in test mode	Loopback tests are in progress.
Framing	Indicates frame type used on the line. Can be extended super frame or super frame.
Line Code	Indicated line-code type configured. Can be alternate mark inversion (AMI) or binary 8-zero substitution (B8ZS).
Current clock source	Clock source configured on the line, which can be supplied by the service provider (line) or the integrated CSU/DSU module (internal).
Fraction	Number of time slots defined for the FT1/T1 module, which can range from 1 to 24.
Net bandwidth	Total bandwidth of the line (for example, 24 time slots multiplied by 64 kbps equals a bandwidth of 1536 kbps).
Last user loopback performed	Type and outcome of the last performed loopback.
Last module self-test (done at startup): Passed	Status of the last self-test performed on an integrated CSU/DSU module.
Last clearing of alarm counters	List of network alarms that were detected and cleared on the CSU/DSU module.
Total Data Data in current interval	Shows the current accumulation period, which rolls into the 24-hour accumulation every 15 minutes. 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 or excessive zeroes error event.

Table 70 show service-module serial Field Descriptions (continued)

Field	Description
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 detection 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 is a second in which one or more line code violation errors are detected.
Errored Secs	In ESF and E1-CRC links, an errored second is a second in which one of the following is 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 violation also triggers an errored second.
Bursty Err Secs	Second with fewer than 320 and more than 1 path coding violation errors. No severely errored frame defects or incoming AIS defects are detected. Controlled slips are not included in this parameter.
Severely Err Secs	For ESF signals, a second with one of the following errors: 320 or more path code violation errors; one or more Out-of-Frame defects; a detected AIS defect. For D4 signals, a count of 1-second intervals with framing errors, or an Out-of-Frame defect, or 1544 line code violations.
Unavail Secs	Total time the line was out of service.

Related Commands

Command	Description
clear service-module serial	Resets an integrated CSU/DSU.

shutdown (controller)

To disable the Channelized T3 Interface Processor (CT3IP) in Cisco 7500 series routers, use the **shutdown** command in controller configuration mode. To restart a disabled CT3IP, use the **no** form of this command.

shutdown

no shutdown

Syntax Description

This command has no arguments or keywords.

Defaults

Using this command assumes that the controller is already enabled. By default, if this command is not issued the controller remains enabled.

Command Modes

Controller configuration

Command History

Release	Modification
11.3	This command was introduced.

Usage Guidelines

Shutting down the CT3IP disables all functions on the interface and sends a blue alarm to the network. The **shutdown** command marks the interface as unavailable. To check if the CT3IP is disabled, use the **show controller t3** command.

Examples

The following example shuts down the CT3IP:

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

Related Commands

Command	Description
show controllers t3	Displays the hardware and software driver information for a T3 controller.

shutdown (hub)

To shut down a port on an Ethernet hub of a Cisco 2505 or Cisco 2507 router, use the **shutdown** command in hub configuration mode. To restart the disabled hub, use the **no** form of this command.

shutdown

no shutdown

Syntax Description

This command has no arguments or keywords.

Defaults

Using this command assumes that the hub is already enabled. By default, if this command is not issued the hub remains enabled.

Command Modes

Hub configuration

Command History

Release	Modification
10.3	This command was introduced.

Examples

The following example shuts down hub 0, ports 1 through 3:

```
Router(config)# hub ethernet 0 1 3
Router(config-hub)# shutdown
```

Related Commands

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

t1

To create a logical T1 controller from each of the specified time slots of the T3 line, use the **t1** command in controller configuration mode. To delete the defined logical controller, use the **no** form of this command.

t1 *ds1* **controller**

no t1 *ds1* **controller**

Syntax Description

ds1	Time slot within the T3 line. The valid time-slot range is from 1 to 28.

Defaults

No default behavior or values.

Command Modes

Controller configuration

Command History

Release	Modification
11.3AAA	This command was introduced.

Usage Guidelines

The purpose of this command is to convert the collection of the 28 T1 controllers comprising the T3 controller into individual T1 controllers that the system can use. In other words, the Cisco AS5800 access server cannot pass data until a T1 controller is configured (using the **controller t1** command), and you cannot configure a T1 controller until it has been created using the **t1** command.

Examples

The following example configures a logical T1 controller at T1 time slot 1 for the T3 controller located in shelf 1, slot 4, port 0. Note that you have to enter the command from controller configuration mode.

```
Router(config)# controller t3 1/4/0
Router(config-controller)# t1 1 controller
Router(config-controller)# end
```

Related Commands

Command	Description
controller	Configures a T1 and other types of controller and enters controller configuration mode.
controller t3	Configures a T3 controller.

t1 bert

To enable or disable a bit error rate tester (BERT) test pattern for a T1 channel on the Channelized T3 Interface Processor (CT3IP) in Cisco 7500 series routers, use the **t1 bert** controller configuration command. To disable a BERT test pattern, use the **no** form of this command.

t1 *channel* **bert pattern** {**0s** | **1s** | **2^15** | **2^20** | **2^23**} **interval** *minutes*

no t1 *channel* **bert pattern** {**0s** | **1s** | **2^15** | **2^20** | **2^23**} **interval** *minutes*

Syntax Description

channel	Number between 1 and 28 that indicates the T1 channel.
pattern	Specifies the length of the repeating BERT test pattern.
0s	0s—Repeating pattern of zeros (...000...).
1s	1s—Repeating pattern of ones (...111...).
2^15	2^{15}—Pseudorandom repeating pattern that is 32,767 bits in length.
2^20	2^{20}—Pseudorandom repeating pattern that is 1,048,575 bits in length.
2^23	2^{23}—Pseudorandom repeating pattern that is 8,388,607 bits in length.
interval *minutes*	Specifies the duration of the BERT test. The interval can be a value from 1 to 14,400 minutes.

Defaults

No BERT test is performed.

Command Modes

Controller configuration

Command History

Release	Modification
11.3	This command was introduced.

Usage Guidelines

The BERT test patterns from the CT3IP are framed test patterns (that is, the test patterns are inserted into the payload of the framed T1 signal).

To view the BERT results, use the **show controller t3** or **show controller t3 brief** EXEC command. The BERT results include the following information:

- Type of test pattern selected
- Status of the test
- Interval selected
- Time remaining on the BERT test
- Total bit errors
- Total bits received

When the T1 channel has a BERT test running, the line state is DOWN. Also, when the BERT test is running and the Status field is Not Sync, the information in the total bit errors field is not valid. When the BERT test is done, the Status field is not relevant.

The **t1 bert** command is not written to NVRAM because it is only used for testing the T1 channel for a short predefined interval and for avoiding accidentally saving the command, which could cause the interface not to come up the next time the router reboots.

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

Examples

The following example runs a BERT test pattern of all zeros for 30 minutes on T1 channel 6 on the CT3IP in slot 9:

```
Router(config)# controller t3 9/0/0
Router(config-controller)# t1 6 bert pattern 0s interval 30
```

Related Commands

Command	Description
show controllers t3	Displays the hardware and software driver information for a T3 controller.

t1 clock source

To specify where the clock source is obtained for use by each T1 channel on the Channelized T3 Interface Processor (CT3IP) in Cisco 7500 series routers, use the **t1 clock source** command in controller configuration mode.

t1 *channel* **clock source** {**internal** | **line**}

Syntax Description

channel	Number between 1 and 28 that indicates the T1 channel.
internal	Specifies that the internal clock source is used. This is the default.
line	Specifies that the network clock source is used.

Defaults

Internal

Command Modes

Controller configuration

Command History

Release	Modification
11.3	This command was introduced.

Usage Guidelines

If you do not specify the **t1 clock source** command, the default clock source of **internal** is used by all the T1s on the CT3IP.

You can also set the clock source for the CT3IP by using the **clock source** (CT3IP) controller configuration command.

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

This command does not have a **no** form.

Examples

The following example sets the clock source for T1 6 and T1 8 on the CT3IP to line:

```
Router(config)# controller t3 9/0/0
Router(config-controller)# t1 6 clock source line
Router(config-controller)# t1 8 clock source line
```

Related Commands

Command	Description
clock source (CT3IP)	Specifies where the clock source is obtained for use by the CT3IP in Cisco 7500 series routers.

t1 external

To specify that a T1 channel on the Channelized T3 Interface Processor (CT3IP) in Cisco 7500 series routers is used as an external port so that the T1 channel can be further multiplexed on the Multichannel Interface Processor (MIP) or other multiplexing equipment, use the **t1 external** command in controller configuration mode. To remove a T1 as an external port, use the **no** form of this command.

t1 external *channel* [**cablelength** *feet*] [**linecode ami** | **b8zs**]

no t1 external *channel*

Syntax Description

channel	Number 1, 2, or 3 that indicates the T1 channel.
cablelength *feet*	(Optional) Specifies the cable length, in feet, from the T1 channel to the external CSU or MIP. Values are 0 to 655 feet. The default is 133 feet.
linecode ami | **b8zs**	(Optional) Specifies the line coding used by the T1. Values are alternate mark inversion (AMI) or bipolar 8 zero suppression (B8ZS). The default is B8ZS.

Defaults

No external T1 is specified.

The default cable length is 133 feet.

The default line coding is B8ZS.

Command Modes

Controller configuration

Command History

Release	Modification
11.3	This command was introduced.

Usage Guidelines

The first three T1 channels (1, 2, and 3) of the CT3IP can be broken out to the DSUP-15 connectors on the CPT3IP so that the T1 channel can be further demultiplexed by the MIP on the same router or on another router.

After you configure the external T1 channel, you can continue configuring it as a channelized T1 (also referred to as a *fractional* T1) from the MIP. All channelized T1 commands might not be applicable to the T1 interface. After you configure the channelized T1 on the MIP, you can continue configuring it as you would a normal serial interface. All serial interface commands might not be applicable to the T1 interface.

The line coding on the T1 channel and the MIP must be the same. Because the default line coding format on the T1 channel is B8ZS and the default line coding on the MIP is AMI, you must change the line coding on the MIP or on the T1 so that they match.

To determine if the external device connected to the external T1 port is configured and cabled correctly before configuring an external port, use the **show controllers t3** command and locate the line `Ext1...` in the display output. The line status can be one of the following:

- LOS—Loss of signal indicates that the port is not receiving a valid signal. This is the expected state if nothing is connected to the port.
- AIS—Alarm indication signal indicates that the port is receiving an all-ones signal.
- OK—A valid signal is being received and the signal is not an all-ones signal.

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

Note Although you can specify a cable length from 0 to 655 feet, the hardware only recognizes the following ranges: 0 to 133, 134 to 266, 267 to 399, 400 to 533, and 534 to 655. For example, entering 150 feet uses the 134 to 266 range. If you later change the cable length to 200 feet, there is no change because 200 is within the 134 to 266 range. However, if you change the cable length to 399, the 267 to 399 range is used. The actual number you enter is stored in the configuration file.

Examples

The following example configures the T1 1 on the CT3IP as an external port using AMI line coding and a cable length of 300 feet:

```
Router(config)# controllers t3 9/0/0
Router(config-controller)# t1 external 1 cablelength 300 linecode ami
```

Related Commands

Command	Description
show controllers t3	Displays the hardware and software driver information for a T3 controller.

t1 fdl ansi

To enable the 1-second transmission of the remote performance reports via the Facility Data Link (FDL) per ANSI T1.403 for a T1 channel on the Channelized T3 Interface Processor (CT3IP) in Cisco 7500 series routers, use the **t1 fdl ansi** command in controller configuration mode. To disable the performance report, use the **no** form of this command.

t1 *channel* **fdl ansi**

no t1 *channel* **fdl ansi**

Syntax Description

channel	Number between 1 and 28 that indicates the T1 channel.

Defaults

Disabled

Command Modes

Controller configuration

Command History

Release	Modification
11.3	This command was introduced.

Usage Guidelines

The **t1 fdl ansi** command can be used only if the T1 framing type is Extended Super Frame (ESF).

To display the remote performance report information, use the **show controllers t3 remote performance** command.

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

Examples

The following example generates the performance reports for T1 channel 8 on the CT3IP:

```
Router(config)# controller t3 9/0/0
Router(config-controller)#  t1 8 fdl ansi
```

Related Commands

Command	Description
show controllers t3	Displays the hardware and software driver information for a T3 controller.

t1 framing

To specify the type of framing used by the T1 channels on the Channelized T3 Interface Processor (CT3IP) in Cisco 7500 series routers, use the **t1 framing** command in controller configuration mode.

t1 *channel* **framing** {**esf** | **sf**}

Syntax Description

channel	Number between 1 and 28 that indicates the T1 channel.
esf	Specifies that Extended Super Frame (ESF) is used as the T1 framing type. This is the default.
sf	Specifies that Super Frame is used as the T1 framing type.

Defaults

Extended Super Frame (ESF)

Command Modes

Controller configuration

Command History

Release	Modification
11.3	This command was introduced.

Usage Guidelines

If you do not specify the **t1 framing** command, the default ESF is used.

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

This command does not have a **no** form.

Examples

The following example sets the framing for the T1 6 and T1 8 on the CT3IP to super frame:

```
Router(config)# controller t3 9/0/0
Router(config-controller)# t1 6 framing sf
Router(config-controller)# t1 8 framing sf
```

t1 linecode

To specify the type of line coding used by the T1 channels on the Channelized T3 Interface Processor (CT3IP) in Cisco 7500 series routers, use the **t1 linecode** command in controller configuration mode.

t1 *channel* **linecode** {**ami** | **b8zs**}

Syntax Description

channel	Number between 1 and 28 that indicates the T1 channel.
ami	Specifies that alternate mark inversion (AMI) line coding is used by the T1 channel.
b8zs	Specifies that bipolar 8 zero suppression (B8ZS) line coding is used by the T1 channel. This is the default.

Defaults

B8ZS

Command Modes

Controller configuration

Command History

Release	Modification
11.3	This command was introduced.

Usage Guidelines

If you do not specify the **t1 linecode** command, the default B8ZS is used.

AMI Line Coding

If you select **ami** line coding for the T1 channel, you must also invert the data on the T1 channel by using the **invert data** interface command. This is required because the T1 channel is bundled into the T3 signal, so there are no local T1 line drivers and receivers associated with it. Therefore, the **t1** *channel* **linecode ami** command does not modify local line driver settings. Rather, it advises the CT3IP what line code the remote T1 is using. The CT3IP uses this information solely for the purpose of determining whether or not to enable the pulse density enforcer for that T1 channel.

B8ZS Line Coding

When you select **b8zs** line coding, the pulse density enforcer is disabled. When you select **ami** line coding, the pulse density enforcer is enabled. To avoid having the pulse density enforcer corrupt data, the T1 channel should be configured for inverted data.

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

This command does not have a **no** form.

Examples

The following example sets the line coding for T1 channel 16 on the CT3IP to AMI:

```
Router(config)# controller t3 9/0/0
Router(config-controller)# t1 16 linecode ami
Router(config-controller)# exit
Router(config)# interface serial 9/0/0:16
Router(config-if)# invert data
```

Related Commands

Command	Description
loopback remote (interface)	Loops packets through a CSU/DSU, over a DS3 link or a channelized T1 link, to the remote CSU/DSU and back.
invert data	Inverts the data stream.

t1 test

To break out a T1 channel on the Channelized T3 Interface Processor (CT3IP) in Cisco 7500 series routers to the test port for testing, use the **t1 test** command in controller configuration mode. To remove the T1 channel from the test port, use the **no** form of this command.

t1 test *channel* [**cablelength** *feet*] [**linecode** {**ami** | **b8zs**}]

no t1 test *channel*

Syntax Description

channel	Number between 1 and 28 that indicates the T1 channel.
cablelength *feet*	(Optional) Specifies the cable length from the T1 channel to the external CSU or Multi-Channel Interface Processor (MIP). Values are 0 to 655 feet. The default cable length is 133 feet.
linecode {**ami** | **b8zs**}	(Optional) Specifies the line coding format used by the T1 channel. Values are alternate mark inversion (AMI) or bipolar 8 zero suppression (B8ZS). The default is B8ZS.

Defaults

No test port is configured.

The default cable length is 133 feet.

The default line coding is B8ZS.

Command Modes

Controller configuration

Command History

Release	Modification
11.3	This command was introduced.

Usage Guidelines

You can use the T1 test port available on the CT3IP to break out any of the 28 T1 channels for testing (for example, 24-hour bit error-rate tester (BERT)testing as is commonly done by telephone companies before a line is brought into service).

The T1 test port is also available as an external port. For more information on configuring an external port, see the **t1 external** controller configuration command.

To determine if the external device connected to the T1 test port is configured and cabled correctly before configuring a test port, use the **show controllers t3** command and locate the line `Ext1...` in the display output. The line status can be one of the following:

- LOS—Loss of signal indicates that the port is not receiving a valid signal. This is the expected state if nothing is connected to the port.
- AIS—Alarm indication signal indicates that the port is receiving an all-ones signal.
- OK—A valid signal is being received and the signal is not an all-ones signal.

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

Note Although you can specify a cable length from 0 to 655 feet, the hardware only recognizes the following ranges: 0 to 133, 134 to 266, 267 to 399, 400 to 533, and 534 to 655. For example, entering 150 feet uses the 134 to 266 range. If you later change the cable length to 200 feet, there is no change because 200 is within the 134 to 266 range. However, if you change the cable length to 399, the 267 to 399 range is used. The actual number you enter is stored in the configuration file.

Examples

The following example configures T1 6 on the CT3IP as a test port using the default cable length and line coding:

```
Router(config)# controller t3 9/0/0
Router(config-controller)#  t1 test 6
```

Related Commands

Command	Description
show controllers t3	Displays the hardware and software driver information for a T3 controller.
t1 external	Specifies that a T1 channel on the CT3IP in Cisco 7500 series routers is used as an external port so the T1 channel can be further multiplexed on the MIP or other multiplexing equipment.

t1 timeslot

To specify the time slots and data rate used on each T1 channel on the Channelized T3 Interface Processor (CT3IP) in Cisco 7500 series routers, use the **t1 timeslot** command in controller configuration mode. To remove the configured T1 channel, use the **no** form of this command.

t1 *channel* **timeslot** *range* [**speed** {**56** | **64**}]

no t1 *channel* **timeslot**

Syntax Description

channel	Number between 1 and 28 that indicates the T1 channel.
range	Specifies the time slots assigned to the T1 channel. The range can be 1 to 24. A dash represents a range of time slots, and a comma separates time slots. For example, 1-10,15-18 assigns time slots 1 through 10 and 15 through 18.
speed {**56** | **64**}	(Optional) Specifies the data rate for the T1 channel. Values are 56 kbps or 64 kbps. The default is 64 kbps. The 56-kbps speed is valid only for T1 channels 21 through 28.

Defaults

No time slots are specified for the T1 channel.

The default data rate is 64 kbps.

Command Modes

Controller configuration

Command History

Release	Modification
11.3	This command was introduced.

Usage Guidelines

You must specify the time slots used by each T1 channel.

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

Examples

The following example assigns time slots 1 through 24 to T1 1 for full T1 bandwidth usage:

```
Router(config)# controller t3 9/0/0
Router(config-controller)# t1 1 timeslots 1-24
```

The following example assigns time slots 1 to 5 and 20 to 23 to T1 6 for fractional T1 bandwidth usage:

```
Router(config)# controller t3 9/0/0
Router(config-controller)# t1 6 timeslots 1-5,20-23
```

The following example configures T1 8 for *n* x 56 (where *n* is 24) bandwidth usage:

```
Router(config)# controller t3 9/0/0
Router(config-controller)# t1 8 timeslots 1-24 speed 56
```

t1 yellow

To enable detection and generation of yellow alarms for a T1 channel on the Channelized T3 Interface Processor (CT3IP) in Cisco 7500 series routers, use the **t1 yellow** command in controller configuration mode. To disable the detection and generation of yellow alarms, use the **no** form of this command.

t1 *channel* **yellow** {**detection** | **generation**}

no t1 *channel* **yellow** {**detection** | **generation**}

Syntax Description

channel	Number between 1 and 28 that indicates the T1 channel.
detection	Detects yellow alarms. This is the default, along with **generation**.
generation	Generates yellow alarms. This is the default, along with **detection**.

Defaults

Yellow alarms are detected and generated on the T1 channel.

Command Modes

Controller configuration

Command History

Release	Modification
11.3	This command was introduced.

Usage Guidelines

If the T1 framing type is super frame (SF), you should consider disabling yellow alarm detection because the yellow alarm can be incorrectly detected with SF framing.

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

Examples

The following example disables the yellow alarm detection on T1 channel 6 on the CT3IP:

```
Router(config)# controller t3 9/0/0
Router(config-controller)# t1 6 framing sf
Router(config-controller)# no t1 6 yellow detection
```