



Monitoring and Troubleshooting Wideband Components

This chapter provides an introduction to monitoring and troubleshooting the wideband components of the Cisco Cable Wideband Solution, Release 1.0. The chapter includes the following topics:

- [Monitoring Wideband Components, page 5-1](#)
- [Troubleshooting Wideband Components, page 5-13](#)

Monitoring Wideband Components

The Cisco IOS command-line interface includes commands that can be issued on the CMTS for the following:

- [Monitoring Wideband SIPs, page 5-2](#)
- [Monitoring Wideband SPAs, page 5-3](#)
- [Monitoring Wideband Channels, page 5-6](#)
- [Monitoring RF Channels, page 5-10](#)
- [Monitoring Wideband Cable Modems, page 5-10](#)

For detailed information on the syntax, usage, and additional examples for each command, see the documents shown in [Table 5-1](#).



Note

Many of the commands used to configure the Cisco uBR10012 router and the Cisco Wideband SIP and SPA *are not* currently part of the command set that can be searched with the Cisco Command Lookup Tool (available on Cisco.com). Use the documents listed in [Table 5-1](#) to find information on these commands.

Table 5-1 *Wideband Command Reference Documentation*

Document	Command Described
<i>Cisco uBR10012 Universal Broadband Router SIP and SPA Software Configuration Guide</i>	Commands for the Wideband SIP and Wideband SPA, including commands for RF and wideband channels

Table 5-1 Wideband Command Reference Documentation

Document	Command Described
Cisco Broadband Cable Command Reference Guide	Commands for cable modems and wideband-cable interfaces (wideband channels)
Cisco IOS Release 12.3 Commands Master Commands List	Commands for IOS Release 12.3 that are not cable-specific

Monitoring Wideband SIPs

The following command is useful for monitoring a Cisco Wideband SIP: [show diag](#).

In addition, the **show controllers jacket** command displays Wideband SIP register values. The **show controllers jacket** is intended for use by Cisco Systems technical support personnel.

show diag

To verify that the Wideband SIP is powered on, use the **show diag** command. If **show diag** displays any output, the Wideband SIP is powered on. The **show diag** command provides a variety of information on the Wideband SIP. For example, the hardware type of the Wideband SIP is 2jacket-1 card.

```
Router# show diag 1/0

Slot/Subslot 1/0:
    2jacket-1 card, 0 ports
    Card is full slot size
    Card is analyzed
    Card detected 16:46:44 ago
    Card uptime 0 days, 16 hours, 46 minutes, 36 seconds
    Card idle time 0 days, 14 hours, 22 minutes, 34 seconds
    Voltage status: 3.3V Nominal 2.5V Nominal 1.5V Nominal 12V Nominal
EEPROM contents, slot 1/0:
    Hardware Revision      : 1.0
    Top Assy. Part Number  : 800-22843-04
    Board Revision        : 01
    Deviation Number      : 0-0
    Fab Version           : 04
    PCB Serial Number     : CSJ09030613
    RMA Test History      : 00
    RMA Number            : 0-0-0-0
    RMA History           : 00
    CLEI Code             :
...

```

If **show diag** displays no output, the Wideband SIP is not powered on.

```
Router# show diag 1/0 // Displays no output
Router#

```

Monitoring Wideband SPAs

The following commands are useful for monitoring a Cisco Wideband SPA:

- `show hw-module bay oir`
- `show diag`
- `show controllers modular-cable`

show hw-module bay oir

To verify that the Wideband SPA is powered on, use the `show hw-module bay oir` command. If the Operational Status is “ok”, the Wideband SPA is powered on and operational.

```
Router#show hw-module bay 1/0/0 oir
```

Module	Model	Operational Status
bay 1/0/0	SPA-24XDS-SFP	ok

If `show hw-module bay oir` displays “admin down” in the Operational Status field, the Wideband SPA has been administratively disabled.

```
Router#show hw-module bay 1/0/0 oir
```

Module	Model	Operational Status
bay 1/0/0	SPA-24XDS-SFP	admin down

show diag

To display hardware and diagnostic information for a Wideband SPA, use the `show diag` command.

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

```
Slot/Subslot/Port 1/0/0:
 24rfchannel-spa-1 card, 1 port + 1 redundant port
Card is half slot size
Card is analyzed
Card detected 16:47:55 ago
Card uptime: Not Supported
Card idle time: Not Supported
Voltage status: 3.3V (+3.291) NOMINAL 2.5V (+2.495) NOMINAL
                  1.2V (+1.201) NOMINAL 1.8V (+1.811) FIXED
EEPROM contents, slot 1/0/0:
Hardware Revision      : 1.0
Boot Timeout          : 500
PCB Serial Number     : CSJ09379726
Part Number           : 73-9597-03
Part Number Revision  : 05
Fab Version           : 03
RMA Test History      : 00
RMA Number            : 0-0-0-0
RMA History           : 00
Deviation Number      : 0
Product (FRU) Number  : SPA-24XDS-SFP
Version Identifier (VID) : V01
Top Assy. Part Number : 68-2562-03
Board Revision        : 05
```

```

CLEI Code          :
MAC Address        : 0019.06a5.d9b2
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 :
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

```

show controllers modular-cable

With Cisco IOS commands, the Wideband SPA and its Gigabit Ethernet ports are not considered standard user-configurable interfaces and do not appear in the output of the **show interfaces** command. The Wideband SPA is a controller and the **show controller modular-cable** command displays information about the SPA, its Gigabit Ethernet ports, installed SFPs, wideband channels, and so on.

The following example provides sample **show controller modular-cable** output for the Wideband SPA located in slot 1, subslot 0, bay 0 of a Cisco uBR10012 router. In the output, the Gigabit Ethernet Port Selected field indicates that Port 0 is the active Gigabit Ethernet port on the Wideband SPA.

```

Router# show controller modular-cable 1/0/0 brief
SPA 0 is present
status LED: [green]
Host 12V is enabled and is okay.
Power has been enabled to the SPA.
SPA reports power enabled and okay.
SPA reports it is okay and is NOT held in reset.

Gigabit Ethernet Port Selected : Port 1
Receive Interface      : In Reset
Receive Interface      : Disabled
Transmit Interface     : Out of Reset
Transmit Interface     : Enabled
Primary Receive Clock  : Disabled
Backup Receive Clock   : Disabled
SFP [Port 0] : 1000BASE-SX Present
Tx Enabled , LOS Detected , TxFault Not Detected
Link Status [Port 0] : DOWN

SFP [Port 1] : 1000BASE-T Present
Tx Enabled , LOS Not Detected , TxFault Not Detected
Link Status [Port 1] : UP

Wideband Channel information
Channel  RF bitmap  Police Info: Bytes  Interval
0        0x3      0                    0 ms
1        0xC      0                    0 ms
2        0x30     0                    0 ms
3        0xC0     0                    0 ms
4        0x300    0                    0 ms
5        0xC00    0                    0 ms
6        0x3000   0                    0 ms
7        0xC000   0                    0 ms
8        0x30000  0                    0 ms
9        0x0      0                    0 ms
10       0x0      0                    0 ms
11       0x0      0                    0 ms

```

```

RF Channel information
Modulation corresponds to : QAM 256
Annex corresponds to : Annex B
Modulation Data :GE Interframe Gap = 12 , MPEG-TS Frames per pkt = 4
SPA IP address = 0.0.0.0          SPA MAC Addr = 0012.001A.888B
QAM      Channel Rate      Rate adjust  State
0        0                 1           Enabled
1        0                 1           Enabled
2        0                 1           Enabled
3        0                 1           Enabled
4        0                 1           Enabled
5        0                 1           Enabled
6        0                 1           Enabled
7        0                 1           Enabled
8        0                 1           Enabled
9        0                 1           Enabled
10       0                 1           Enabled
11       0                 1           Enabled
12       0                 1           Enabled
13       0                 1           Enabled
14       0                 1           Enabled
15       0                 1           Enabled
16       0                 1           Enabled
17       0                 1           Enabled
18       0                 1           Enabled
19       0                 1           Enabled
20       0                 1           Enabled
21       0                 1           Enabled
22       0                 1           Enabled
23       0                 1           Enabled

```

```

Interrupt Counts
Idx  Interrupt Register      Interrupt Bit      Total Count  Masked:
69   blz_sp_int_stat_reg_0    spi_train_vld     24           YES
84   spa_brd_int_stat_reg     sp_int_0          24           NO
85   spa_brd_int_stat_reg     scc_int           2            NO
86   spa_brd_int_stat_reg     phy1_int          1            NO
87   spa_brd_int_stat_reg     phy0_int          1            NO
92   spa_brd_int_stat_reg     temp1_int         2            NO
93   spa_brd_int_stat_reg     temp0_int         2            NO
97   bm_int_stat_reg         bm_spa_brd        26           NO

```

To display information about the SFP module in a Wideband SPA port, use the **show controllers modular-cable** with the **sfp** keyword. In the following example, the information is for the SFP module in port 1.

```
show controllers modular-cable 1/0/0 sfp port 1
```

```

SFP in port 1
SFP is present
SFP LOS is not detected
SFP TX FAULT is not detected
SFP TX is enabled

```

```

ID: SFP
  Extended ID: 4
  Connector: LC
  SONET compliance: not specified
  Gigabit Ethernet compliance: 1000BASE-SX
  Fibre Channel link length: not specified
  Fibre Channel transmitter technology: not specified
  Fibre Channel transmission media: not specified
  Fibre Channel speed: not specified
  Encoding: 8B10B

```

```

Bit Rate: 1300 Mbps
50 micron-multimode fiber supported length: 550 m
62.5 micron-multimode fiber supported length: 270 m
Upper bit rate limit: not specified
Lower bit rate limit: not specified
Date code (yy/mm/dd): 05/02/23
Vendor name: CISCO-AGILENT
Vendor OUI: 12499
Vendor Part Number (PN): QFBR-5766LP           Vendor Rev:
Vendor SN (SN): AGS090855CE
Options implemented:
    LOS Signal
    TX Fault Signal
    TX Disable Signal
Enhanced options implemented: none
Diagnostic monitoring implemented: none
Idprom contents (hex):
0x00:  03 04 07 00 00 00 01 00 00 00 00 01 0D 00 00 00
0x10:  37 1B 00 00 43 49 53 43 4F 2D 41 47 49 4C 45 4E
0x20:  54 20 20 20 00 00 30 D3 51 46 42 52 2D 35 37 36
0x30:  36 4C 50 20 20 20 20 20 20 20 20 03 52 00 B5
0x40:  00 1A 00 00 41 47 53 30 39 30 38 35 35 43 45 20
0x50:  20 20 20 20 30 35 30 32 32 33 20 20 00 00 00 C4
0x60:  00 00 06 C9 F0 FA 7C 01 B3 C8 41 6B 39 04 FC 85
0x70:  BB 20 9E 00 00 00 00 00 00 00 00 00 B4 94 52 CC
0x80:  FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
0x90:  FF FF FF FF FF FF FF FF FF FF FF FF FF FF FF
State: Initalized
Phased Initialization
Phase Reached: 4
Phase Exit Code: 0
Phase Read Offset: 0
...

```

Monitoring Wideband Channels

The following commands are useful for monitoring wideband channels:

- [show interface wideband-cable](#)
- [show hw-module bay](#)

show interface wideband-cable

To display information about a wideband-cable interface (wideband channel), use the **show interface wideband-cable** command. Wideband channels are similar to cable interfaces and information about them is also displayed with the **show ip interfaces** and **show interfaces** commands.

The following example displays **show interface wideband-cable** command output for wideband channel 0 on the Wideband SPA in slot/subslot/bay 1/0/0.

```
Router# show interface wideband-cable 1/0/0:0

Wideband-Cable1/0/0:0 is up, line protocol is up
  Hardware is Wideband CMTS Cable interface, address is 0012.001a.8896 (bia
0012.001a.8896)
  MTU 1500 bytes, BW 74730 Kbit, def 74730 Kbit DLY 1000 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation MCNS, loopback not set
  Keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input never, output 00:00:16, 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)
  30 second input rate 0 bits/sec, 0 packets/sec
  30 second output rate 0 bits/sec, 0 packets/sec
    0 packets input, 0 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
    17470 packets output, 1810488 bytes, 0 underruns
    0 output errors, 0 collisions, 0 interface resets
    0 output buffer failures, 0 output buffers swapped out
```

Hardware Status and Line Protocol Status for a Wideband-Channel Cable Interface

When a wideband-channel cable interface is specified in **show interface wideband-cable** or another Cisco IOS command that displays hardware status and line protocol status for a cable interface, the following applies:

- The hardware status for a wideband-channel cable interface will be up if the Wideband SPA is installed in the Wideband SIP and both are powered on.
- The line protocol for a wideband-channel cable interface will be up if the wideband channel is associated with at least one RF channel and the following parameters have been set for the RF channel:
 - RF channel frequency
 - MAC address of the edge QAM device or next-hop router
 - IP address of the edge QAM device
 - UDP port number for the QAM that is used for the RF channel

If the line protocol for a wideband-channel cable interface is up, all wideband-channel configuration information needed to successfully send data is present. However, additional configuration information may be needed to complete the Wideband SPA configuration process. For information on Wideband SPA configuration procedures, see the *Cisco uBR10012 Universal Broadband Router SIP and SPA Software Configuration Guide*.

show hw-module bay

To display additional information about a wideband channel, use the **show hw-module bay** command with the **wideband-channel** keyword. You also have to specify one of the following keywords indicating the particular type of information you want to show:

- **association**—Displays wideband-to-narrowband (traditional DOCSIS) channel association information. The association of a wideband channel to a traditional DOCSIS downstream channel is made when a primary downstream channel for the fiber node is configured with the **downstream cable** command.
- **config**—Displays wideband channel configuration information.
- **counters**—Displays wideband channel statistics.
- **mapping**—Displays the mapping of RF channels to wideband channels.

To display wideband-to-narrowband channel association information, use **show hw-module bay** with the **association** and **wideband-channel** keywords. If you specify a wideband channel number after **wideband-channel**, output is for that channel only. For example:

```
Router# show hw-module bay 1/0/0 association wideband-channel 0
```

WB channel	BG ID	Bundle num	NB channel	NB chan ID	Reserved CIR	Avail CIR
Wideband-Cable1/0/0:0	24	123	Cable5/0/1	120	0	0

In the preceding example, the following information is displayed for each wideband channel:

- **WB channel**—Wideband-cable interface (wideband channel).
- **BG ID**—Bonding Group ID for the wideband channel.
- **Bundle num**—The number of the virtual bundle interface in which the wideband channel is a member.
- **NB channel**—The slot/subslot/port of the primary downstream channel (narrowband channel or traditional DOCSIS channel) for the wideband channel.
- **NB channel ID**—Channel ID for the primary downstream channel.
- **Reserved CIR**—The reserved committed information rate (CIR). Because CIR is not currently supported for wideband traffic, reserved CIR is always 0.
- **Avail CIR**—The part of the CIR that is currently available. Because CIR is not currently supported for wideband traffic, available CIR is always 0.

To display configuration information for a wideband channel, use **show hw-module bay** with the **config** and **wideband-channel** keywords. If you do not specify a wideband channel number after **wideband-channel**, output is for all wideband channels. For example:

```
Router# show hw-module bay 1/0/0 config wideband-channel
```

WB channel	BG ID	Bundle num	WB Host Slot/Subslot	Primary BG
Wideband-Cable1/0/0:0	24	123	5/0	Yes
Wideband-Cable1/0/0:1	25	123	5/0	Yes
Wideband-Cable1/0/0:2	26	123	5/0	Yes
Wideband-Cable1/0/0:3	27	123	5/0	Yes
Wideband-Cable1/0/0:4	28	123	5/0	Yes
Wideband-Cable1/0/0:5	29	123	5/0	Yes
Wideband-Cable1/0/0:6	30	123	5/0	Yes
Wideband-Cable1/0/0:7	31	123	5/0	Yes
Wideband-Cable1/0/0:8	32	123	5/0	Yes
Wideband-Cable1/0/0:9	33	123	5/0	Yes
Wideband-Cable1/0/0:10	34	123	5/0	Yes
Wideband-Cable1/0/0:11	35	123	5/0	Yes

In the preceding example, the following information is displayed for each wideband channel.

- **BG ID**—Bonding Group ID.

- **Bundle num**—The number of the virtual bundle interface in which the wideband channel is a member.
- **WB Host Slot/Subslot**—The cable interface line card that has been configured for Wideband protocol operations. For information, see the **modular-host subslot** command in the *Cisco uBR10012 Universal Broadband Router SIP and SPA Software Configuration Guide*.
- **Primary BG**—Yes indicates that the wideband channel is a primary bonding group (primary wideband channel).

To display wideband-channel statistics, use **show hw-module bay** with the **counters** and **wideband-channel** keywords.

```
Router#show hw-module bay 1/0/0 counters wideband-channel 0
```

SPA	WB channel	Tx packets	Tx octets
1/0/0	0	29069	4032392

To display RF-channels that have been configured for a wideband channel, use **show hw-module bay** with the **mapping** and **wideband-channel** keywords. The **BW %** column is the percent of the RF channel's bandwidth that is assigned to the wideband channel with the **cable rf-channel** command.

```
Router# show hw-module bay 1/0/0 mapping wideband-channel
```

SPA	WB channel	RF channel	BW %
1/0/0	0	0	100
		1	100
1/0/0	1	2	100
		3	100
1/0/0	2	4	100
		5	100
1/0/0	3	6	100
		7	100
1/0/0	4	8	100
		9	100
1/0/0	5	10	100
		11	100
1/0/0	6	12	100
		13	100
1/0/0	7	14	100
		15	100
1/0/0	8	16	100
		17	100
1/0/0	9	18	100
		19	100
1/0/0	10	20	100
		21	100
1/0/0	11	22	100
		23	100

Monitoring RF Channels

The following command is useful for monitoring RF channels on a Wideband SPA: [show hw-module bay](#).

show hw-module bay

To display information about RF channels on a Wideband SPA, use the **show hw-module bay** command with the **rf-channel** keyword. You also have to specify one of the following keywords indicating the particular type of information you want to show:

- **config**—Displays RF channel configuration information.
- **counters**—Displays RF channel statistics.
- **mapping**—Displays the mapping of RF channels to wideband channels.

To display configuration information for an RF channel, use **show hw-module bay** with the **config** and **rf-channel** keywords. If you specify an RF channel number after **rf-channel**, output is for that channel only. For example, the following output is for RF channel 0 on the Wideband SPA located in slot/subslot/bay 1/0/0.

```
Router# show hw-module bay 1/0/0 config rf-channel 0

SPA      RF      Freq      Mod      Annex  IP Address      MAC Address      UDP
channel
1/0/0    0        699000000 64qam    B       192.168.200.30  0011.920e.a9ff  49152
```

In the preceding output, these fields provide information on the edge QAM device that is associated with the RF channel:

- IP Address—The IP address of the edge QAM device.
- MAC address—The MAC address of the next-hop or edge QAM device.
- UDP port—The UDP port number for the edge QAM that will be used for this RF channel.

To display MPEG packets transmitted for an RF channel, use **show hw-module bay** with the **counters** and **rf-channel** keywords.

```
Router#show hw-module bay 1/0/0 counters rf-channel 0

SPA      RF channel  MPEG packets tx
1/0/0    0           334815
```

Monitoring Wideband Cable Modems

The following commands are useful for monitoring wideband cable modem:

- [show cable modem wideband](#)
- [show cable modem summary](#)

Many other **show cable** commands display information on wideband cable modems if a wideband cable modem or a cable interface used for a wideband cable modem is specified in the command's arguments. Some examples of these commands are:

- **show cable modem vendor**
- **show cable modem cnr**

- **show cable modem errors**
- **show cable modulation profile**
- **show interface cable privacy**

show cable modem wideband

To display information for registered and unregistered wideband cable modems, use the **show cable modem wideband** command. For example:

```
Router# show cable modem wideband
```

```
MAC Address      IP Address      I/F      MAC          Prim  WB      DSID MD-DS-SG
                  State          Sid  Ch  ID
0014.bfbe.3cc0  1.11.0.1       C5/0/1/U0 w-online(pt)  3    24    24   N/A
0016.92f0.90d6  1.11.0.4       C5/0/1/U0 w-online(pt)  5    24    272  1
0014.bfbe.3cb8  1.11.0.2       C6/0/1/U0 w-online(pt)  3    36    36   N/A
0016.92f0.90d8  1.11.0.3       C6/0/1/U0 w-online(pt)  5    36    274  1
```

With the **show cable modem wideband** command, you can specify a particular wideband cable modem by IP address or MAC address. You can also specify a set of wideband cable modems that are on a particular cable interface.

[Table 5-2](#) describes the fields that are shown in the **show cable modem wideband** display.

Table 5-2 Descriptions for the show cable modem wideband Fields

Field	Description
MAC Address	The MAC address for the CM.
IP Address	The IP address that the DHCP server has assigned to the CM.
I/F	The cable interface providing the upstream for this CM.
MAC State	The current state of the MAC layer. For information on MAC states, see the show cable modem wideband command in the <i>Cisco Broadband Cable Command Reference Guide</i> .
Prim SID	The primary SID assigned to this CM.
WB Ch ID	The identifier of the primary wideband channel.
DSID	The Downstream Service Identifier.
MD-DS-SG	The MAC Domain Downstream Service Group, the downstream channels of a single MAC domain that reach the cable modem.

If you specify **show cable modem wideband registered-traditional-docsis**, the command displays wideband-capable modems that are registered as DOCSIS 1.X or DOCSIS 2.0 modems.

show cable modem summary

To display summary information for cable modems including modems registered as wideband cable modems, use the **show cable modem summary** command.

```
Router# show cable modem summary
```

```
Interface      Cable Modem      Description
              Total  Reg  Unreg  Offline  Wideband  initRC  initD  initIO  initO
C5/0/1/U0      2      2    0      0         2         0       0     0       0
C6/0/1/U0      2      2    0      0         2         0       0     0       0
```

Router#

The following example displays summary information and totals for the set of modems on a range of cable interfaces (in this example, cable 5/1/1 to cable 5/1/2).

Router# **show cable modem summary c5/1/1 c5/1/2 total**

Interface	Cable Modem				Description				
	Total	Reg	Unreg	Offline	Wideband	initRC	initD	initIO	initO
C5/1/1/U0	84	84	0	0	84	0	0	0	0
C5/1/1/U1	84	84	0	0	83	0	0	0	0
C5/1/1/U2	83	83	0	0	83	0	0	0	0
C5/1/1/U3	83	83	0	0	83	0	0	0	0
C5/1/2/U0	84	84	0	0	84	0	0	0	0
C5/1/2/U1	84	84	0	0	84	0	0	0	0
C5/1/2/U2	83	83	0	0	83	0	0	0	0
C5/1/2/U3	83	83	0	0	83	0	0	0	0
Total:	668	668	0	0	667	0	0	0	0

Router#

Troubleshooting Wideband Components

This section provides an introduction to troubleshooting the wideband components of the Cisco Cable Wideband Solution:

- [Troubleshooting Wideband SIPs and Wideband SPAs, page 5-13](#)
- [Troubleshooting Wideband Channels, page 5-17](#)
- [Troubleshooting Wideband Cable Modems, page 5-19](#)

The following Cisco cable documents provide useful information on troubleshooting the non-wideband components of the uBR10012 router:

- *Cisco uBR10012 Universal Broadband Router Troubleshooting Guide*
- “Troubleshooting the System” chapter in the *Cisco uBR10012 Universal Broadband Router Software Configuration Guide*
- *Online Offline Diagnostics—Field Diagnostics on Cisco uBR10012 Router User’s Guide*

For information on troubleshooting non-Cisco components (such as edge QAM devices) used in the Cisco Cable Wideband Solution, see the vendor documentation for the device.

Troubleshooting Wideband SIPs and Wideband SPAs

This section describes troubleshooting techniques for a Wideband SIP or Wideband SPA. It includes the following sections:

- [Performing Basic Troubleshooting on a Wideband SIP and Wideband SPA, page 5-13](#)
- [Verifying That a Wideband SPA’s Active Gigabit Ethernet Port Is Up, page 5-14](#)
- [Verifying That a Wideband SPA Is Correctly Configured for SPA-to-EQAM Communications, page 5-16](#)
- [Verifying That a Wideband SPA Is Able to Communicate with the Edge QAM Device, page 5-16](#)

Performing Basic Troubleshooting on a Wideband SIP and Wideband SPA

To perform basic troubleshooting on a Wideband SIP and Wideband SPA, complete the following steps:

	Action	More Information or Example						
Step 1	Use the show diag command to check that a Wideband SIP is powered on.	<pre>Router# show diag 1/0 Slot/Subslot 1/0: 2jacket-1 card, 0 ports Card is full slot size Card is analyzed Card detected 0:3:16 ago Card uptime 0 days, 0 hours, 3 minutes, 17 seconds ...</pre> <p>If show diag displays output, the Wideband SIP is powered on. If show diag displays no output, the Wideband SIP is not powered on.</p>						
Step 2	Check that the Wideband SIP's FAIL LED is not on.	The FAIL LED is turned on by default and turned off by software after basic board functionality has been verified. If the SIP's FAIL LED remains on, the SIP has failed to initialize or has encountered an error.						
Step 3	Use the show hw-module bay oir command to check that a Wideband SPA is powered on.	<pre>Router# show hw-module bay 1/0/0 oir</pre> <table border="1"> <thead> <tr> <th>Module</th> <th>Model</th> <th>Operational Status</th> </tr> </thead> <tbody> <tr> <td>bay 1/0/0</td> <td>SPA-24XDS-SFP</td> <td>ok</td> </tr> </tbody> </table> <ul style="list-style-type: none"> • If the Operational Status is “ok”, the Wideband SPA is powered on and operational. • If the Operational Status is “admin down”, the Wideband SPA is not powered on. 	Module	Model	Operational Status	bay 1/0/0	SPA-24XDS-SFP	ok
Module	Model	Operational Status						
bay 1/0/0	SPA-24XDS-SFP	ok						
Step 4	Check that the Wideband SPA's STATUS LED is lighted green.	<ul style="list-style-type: none"> • If the STATUS LED is green, the SPA is ready and operational. • If the STATUS LED is amber, SPA power is on and good, and the SPA is being configured. • If the STATUS LED is off, SPA power is off. 						
Step 5	If cables are connected to one or both of the SPA's Gigabit Ethernet port SFPs and the links for these should be up, check that the Wideband SPA's two A/L (Active Loopback) LEDs are lighted green.	<ul style="list-style-type: none"> • If the A/L LED is green, the port is enabled and the link is up. • If the A/L LED is amber, the port is enabled and the link is down. • If the A/L LED is off, the port is not enabled. 						

Verifying That a Wideband SPA's Active Gigabit Ethernet Port Is Up

The Gigabit Ethernet ports on a Wideband SPA are not considered standard user-configurable interfaces and do not appear in the output of the **show interfaces** command. The Wideband SPA is a controller with one active and one redundant Gigabit Ethernet port. The **show controller modular-cable** command displays information about the SPA, its Gigabit Ethernet active port, installed Small Form-Factor Pluggable (SFP) modules, and so on.

The following example provides sample **show controller modular-cable** output for the Wideband SPA located in slot 1, subslot 0, bay 0 of a Cisco uBR10012 router.

```
Router# show controller modular-cable 1/0/0 brief

SPA 0 is present
status LED: [green]
Host 12V is enabled and is okay.
Power has been enabled to the SPA.
SPA reports power enabled and okay.
SPA reports it is okay and is NOT held in reset.

Gigabit Ethernet Port Selected : Port 1
Receive Interface      : In Reset
Receive Interface      : Disabled
Transmit Interface     : Out of Reset
Transmit Interface     : Enabled
Primary Receive Clock  : Disabled
Backup Receive Clock   : Disabled
SFP [Port 0] : 1000BASE-SX Present
  Tx Enabled , LOS Detected , TxFault Not Detected
  Link Status [Port 0] : DOWN

SFP [Port 1] : 1000BASE-T Present
  Tx Enabled , LOS Not Detected , TxFault Not Detected
  Link Status [Port 1] : UP
...
```

In the preceding output, notice the following:

- The Gigabit Ethernet Port Selected field indicates the active Gigabit Ethernet port.
- For the active Gigabit Ethernet port, the SFP [Port 1] field indicates the type of SFP that is present.
- For the active Gigabit Ethernet port, the Link Status [Port 1] field indicates whether the link is up.

The Cisco Wideband SPA transmits data in a unidirectional manner only and does not receive data from devices connected to its active Gigabit Ethernet port.

If the link for the active Gigabit Ethernet port is not up, check the following:

- Check that the SFP module is correctly installed and matches the SFP module in the connected device.
- Check that the cables to the Wideband SPA ports are correctly connected to a powered-on device.
- Check that the cables to the Wideband SPA ports are not bent or damaged.
- Check that a hardware failure has not occurred. For information, see the [“Performing Basic Troubleshooting on a Wideband SIP and Wideband SPA”](#) section on page 5-13.

Use the **show controller modular-cable** command with the **sfp** keyword to get more detailed information on the SFP modules installed in a Wideband SPA’s Gigabit Ethernet ports.

Verifying That a Wideband SPA Is Correctly Configured for SPA-to-EQAM Communications

If a Wideband SPA is unable to communicate with an edge QAM device, check that the RF channels configured with the **rf-channel** command match the values required by the edge QAM device. You can use the **show hw-module bay** command to see the values that have been configured for an RF channel. For example:

```
Router# show hw-module bay 1/0/0 config rf-channel 0 verbose

SPA                               : Wideband-Cable 1/0/0
RF channel number                 : 0
Frequency                         : 699000000 Hz
Modulation                       : 64qam
Annex                            : B
IP address of next hop           : 192.168.200.30
MAC address of EQAM              : 000c.3033.2cbf
UDP port number                   : 49152
EQAM headroom                    : 0
```

Check that the following values are correct and match what is configured on the edge QAM device:

- Frequency—The center frequency used for this RF channel.
- IP address of next hop—The IP address of the edge QAM device for this RF channel.
- MAC address—The MAC address of the next-hop or edge QAM device for this RF channel.
- UDP port—The UDP port number for the QAM output port for this RF channel.

If any of the above values do not match what is present on the edge QAM device, the Wideband SPA will not be able to successfully communicate with that device.

On the uBR10012 router, RF channels are configured with the **rf-channel** command. The values on the edge QAM are device-specific and are typically configured when setting up the edge QAM device.

Verifying That a Wideband SPA Is Able to Communicate with the Edge QAM Device

To verify that a Wideband SPA that has been correctly configured for wideband operations is communicating with the edge QAM device, use the **show hw-module bay** command with the **counters** and **rf-channel** keywords. In the following example, only RF channels 0 to 3 on the Wideband SPA are transmitting MPEG packets.

```
Router# show hw-module bay 1/0/0 counters rf-channel

SPA      RF channel  MPEG packets tx
1/0/0    0          3703146
1/0/0    1          3636531
1/0/0    2          3589760
1/0/0    3          3549859
1/0/0    4          0
1/0/0    5          0
1/0/0    6          0
1/0/0    7          0
1/0/0    8          0
1/0/0    9          0
1/0/0    10         0
1/0/0    11         0
1/0/0    12         0
1/0/0    13         0
1/0/0    14         0
1/0/0    15         0
1/0/0    16         0
1/0/0    17         0
```

```

1/0/0    18          0
1/0/0    19          0
1/0/0    20          0
1/0/0    21          0
1/0/0    22          0
1/0/0    23          0

```

Troubleshooting Wideband Channels

This section describes troubleshooting techniques for wideband channels. It includes the following sections:

- Verifying That a Wideband Channel is Up and Is Transmitting Packets
- Verifying That a Wideband Channel is Configured Correctly

For information on configuring wideband channels, see the *Cisco uBR10012 Universal Broadband Router SIP and SPA Software Configuration Guide*.

Verifying That a Wideband Channel is Up and Is Transmitting Packets

To verify that a wideband channel is up and transmitting packets, use the **show interface wideband-cable** command and examine the first line of output and the packets output field:

```

Router# show interface wideband-cable 1/0/0:1

Wideband-Cable1/0/0:1 is up, line protocol is up
  Hardware is Wideband CMTS Cable interface, address is 0012.001a.8897 (bia
0012.001a.8897)
  MTU 1500 bytes, BW 74730 Kbit, DLY 1000 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation MCNS, loopback not set
  Keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input never, output 00:00:09, 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)
  30 second input rate 0 bits/sec, 0 packets/sec
  30 second output rate 0 bits/sec, 0 packets/sec
    0 packets input, 0 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
  24224 packets output, 1222002 bytes, 0 underruns
    0 output errors, 0 collisions, 0 interface resets
    0 output buffer failures, 0 output buffers swapped out

```

For information on what criteria are used to determine whether a wideband channel and its associated line protocol are up, see the [“show interface wideband-cable” section on page 5-6](#).

Verifying That a Wideband Channel is Configured Correctly

To verify whether a wideband channel is configured correctly, use the **show hw-module bay** command with the **wideband-channel** keyword and the **association**, **config**, or **mapping** keywords. The following examples show the output for **association** keyword:

```
Router# show hw-module bay 1/0/0 association wideband-channel 0
```

WB channel	BG ID	Bundle num	NB channel	NB chan ID	Reserved CIR	Avail CIR
Wideband-Cable1/0/0:0	24	123	Cable5/0/1	120	0	0

In the preceding output, the Bundle num field indicates the virtual bundle interface to which the wideband channel belongs. For a description of each field in the preceding output, see the “[show hw-module bay](#)” section on page 5-7.

The wideband channel and the primary downstream channel (NB channel) must be members of the same virtual bundle interface. The CMTS running configuration file shows the virtual bundle (cable bundle) for the primary downstream channel (Cable5/0/1):

```
interface Cable5/0/1
  no ip address
  load-interval 30
  no cable packet-cache
  cable bundle 123
  cable downstream channel-id 120
  ...
```

The **downstream modular-cable rf-channel** command specifies the RF channels that are available for wideband channels on a fiber node. If a wideband channel attempts to use an RF channel that has not been made available for use on the fiber node, a misconfiguration error occurs. In this case, the **show hw-module bay** command displays the following error message:

```
Router# show hw-module bay 1/0/0 association wideband-channel
```

WB channel	BG ID	Bundle num	NB channel	NB chan ID	Reserved CIR	Avail CIR
Wideband-Cable1/0/0:0			RF channel mismatch with Fiber Node 1			

The following example shows the **show hw-module bay** output for the **config** keyword:

```
Router# show hw-module bay 1/0/0 config wideband-channel
```

WB channel	BG ID	Bundle num	WB Host Slot/Subslot	Primary BG
Wideband-Cable1/0/0:0	24	123	5/0	Yes
Wideband-Cable1/0/0:1	25	123	5/0	Yes
Wideband-Cable1/0/0:2	26	123	5/0	Yes
Wideband-Cable1/0/0:3	27	123	5/0	Yes
Wideband-Cable1/0/0:4	28	123	5/0	Yes
Wideband-Cable1/0/0:5	29	123	5/0	Yes
Wideband-Cable1/0/0:6	30	123	5/0	Yes
Wideband-Cable1/0/0:7	31	123	5/0	Yes
Wideband-Cable1/0/0:8	32	0	5/0	Yes
Wideband-Cable1/0/0:9	33	0	5/0	Yes
Wideband-Cable1/0/0:10	34	0	5/0	Yes
Wideband-Cable1/0/0:11	35	0	5/0	Yes

In the preceding output, each wideband channel that will be used should be configured as a member of a virtual bundle interface. Channels 8 through 11 are not members of a virtual bundle interface.

The following example shows the **show hw-module bay** output for the **mapping** keyword:

```
Router# show hw-module bay 1/0/0 mapping wideband-channel

SPA      WB      RF      BW %
        channel channel
1/0/0    0        0        100
          1        1        100
1/0/0    1        2        100
          3        3        100
1/0/0    2        4        100
          5        5        100
1/0/0    3        6        100
          7        7        100
1/0/0    4        8        100
          9        9        100
1/0/0    5        10       100
          11       11       100
1/0/0    6        12       100
          13       13       100
1/0/0    7        14       100
          15       15       100
1/0/0    8        16       100
          17       17       100
1/0/0    9        18       100
          19       19       100
1/0/0    10       20       100
          21       21       100
1/0/0    11       22       100
          23       23       100
```

A channel-bonded wideband channel is associated with at least two RF channels depending on the wideband channel's configuration. The **cable rf-channel** command associates an RF channel with a wideband channel. The bandwidth percent (BW %) of each RF channel used for the wideband channel is 100 percent by default but is configurable with the **cable rf-channel** command.

Troubleshooting Wideband Cable Modems

This section describes troubleshooting techniques for wideband cable modems. It includes the following sections:

- [Pinging a Wideband Cable Modem, page 5-19](#)
- [Verifying That a Wideband-Capable Cable Modem is Registered as a Wideband Modem, page 5-20](#)
- [Verifying Other Information for Wideband Cable Modems, page 5-21](#)

Pinging a Wideband Cable Modem

To determine whether a wideband cable modem or any DOCSIS cable CPE device is reachable from the CMTS at the DOCSIS MAC layer, use the **ping docsis** command with either a MAC address or IP address. For example:

```
Router# ping docsis 1.11.0.5

Queueing 5 MAC-layer station maintenance intervals, timeout is 25 msec:
!!!!
Success rate is 100 percent (5/5)
```

The **ping docsis** command uses 1/64—the bandwidth of IP ping—and works with cable modems that have not yet acquired an IP address. This allows cable operators to ping cable modems that are unable to complete registration, that have internal bugs, or that are unresponsive due to a crash.

The **ping docsis** command with the **verbose** keyword includes a real-time view and plot of requested power adjustments, frequency, timing offset adjustments, and a measure of optimal headend reception power.

```
Router# ping docsis 1.11.0.5 verbose
```

```
Queueing 5 MAC-layer station maintenance intervals, timeout is 25 msec:
Reply from 0014.bfbe.3e3c: 46 ms, tadj=1, padj=0, fadj=34
Reply from 0014.bfbe.3e3c: 46 ms, tadj=0, padj=0, fadj=26
Reply from 0014.bfbe.3e3c: 50 ms, tadj=0, padj=0, fadj=29
Reply from 0014.bfbe.3e3c: 50 ms, tadj=1, padj=0, fadj=29
Reply from 0014.bfbe.3e3c: 50 ms, tadj=-1, padj=0, fadj=39
```

```
Success rate is 100 percent (5/5)
```

For more information on the **ping docsis** command, see the [Cisco Broadband Cable Command Reference Guide](#).

Verifying That a Wideband-Capable Cable Modem is Registered as a Wideband Modem

To verify that a wideband-capable cable modem is registered as a wideband modem, use the **show cable modem** command. In the following example, the MAC address of the wideband cable modem is specified.

```
Router# show cable modem 0014.bfbe.3e70
```

MAC Address	IP Address	I/F	MAC State	Prim Sid	RxPwr (dBmv)	Timing Offset	Num CPE	BPI Enb
0014.bfbe.3e70	1.11.0.3	C5/0/1/U0	w-online(pt)	1	0.00	1231	0	Y

If a wideband-capable cable modem is registered as a wideband modem, the MAC State field will have one of the w-online values (wideband-online), such as w-online(pt) in the preceding example. For descriptions of the complete set of MAC state values, see the **show cable modem** command in the [Cisco Broadband Cable Command Reference Guide](#).

A wideband-capable modem may also register as a DOCSIS 2.0 modem (for example, if a wideband channel is not available). In this case, the MAC State field displayed by **show cable modem** will not have one of the w-online values.

To determine the set of wideband-capable cable modems that have registered as wideband modems on the CMTS, use the **show cable modem wideband** command.

```
Router# show cable modem wideband
```

MAC Address	IP Address	I/F	MAC State	Prim Sid	BG ID	DSID	MD-DS-SG
0014.bfbe.3e70	1.11.0.3	C5/0/1/U0	w-online(pt)	1	24	24	N/A
0014.bfbe.3e3c	1.11.0.4	C5/0/1/U0	w-online(pt)	2	24	24	N/A
0016.92fb.5742	1.11.0.6	C5/0/1/U0	w-online(pt)	3	24	256	1
0016.92fb.580e	1.11.0.7	C5/0/1/U0	w-online(pt)	4	24	264	1
0014.bfbe.3eaa	1.11.0.2	C6/0/1/U0	w-online(pt)	7	36	36	N/A
0016.92fb.57f8	1.11.0.5	C6/0/1/U0	w-online(pt)	8	36	298	1
0016.92fb.57f4	1.11.0.8	C6/0/1/U0	w-online(pt)	9	36	306	1

To determine the set of wideband-capable cable modems that have registered as DOCSIS 2.0 modems on the CMTS, use the **show cable modem wideband** command with the **registered-traditional-docsis** keyword.

Verifying Other Information for Wideband Cable Modems

To verify other information related to wideband cable modems, use the **show** commands that display information relevant to all cable modems:

- **show cable modem access-group**—Displays information about the access group for each CM.
- **show cable modem classifiers**—Displays information about the classifiers being used for each CM.
- **show cable modem cnr**—Displays carrier-to-noise ratio (CNR) information for CMs that are using cable interface line cards with hardware spectrum-management capabilities.
- **show cable modem connectivity**—Displays connectivity information for each CM.
- **show cable modem counters**—Displays traffic counters for each CM.
- **show cable modem cpe**—Displays information about the CPE devices using each CM.
show cable modem errors—Displays packet error information for each CM.
- **show cable modem flap**—Displays flap-list information for each CM.
- **show cable modem mac**—Displays MAC-layer information for each CM.
- **show cable modem offline**—Lists the offline CMs.
- **show cable modem maintenance**—Displays information about the Station Maintenance errors for each CM.
- **show cable modem offline**—Lists the offline CMs.
- **show cable modem phy**—Displays the PHY layer information for each CM.
- **show cable modem qos**—Displays the quality of service (QoS) information for each CM.
- **show cable modem registered**—Lists the registered CMs.
- **show cable modem remote-query**—Displays information collected by the remote-query feature.
- **show cable modem rogue**—Displays a list of cable modems that have been marked, locked, or rejected because they failed the dynamic shared-secret authentication checks.
- **show cable modem summary**—Displays summary information about the CMs on each cable interface.
- **show cable modem unregistered**—Lists the unregistered CMs.
- **show cable modem vendor**—Displays vendor names and identifies for each CM.

For information on the preceding commands, see the [Cisco Broadband Cable Command Reference Guide](#).

