



## Using the Cable Monitor Tool

This appendix describes the Cisco uBR905 and Cisco uBR925 cable access routers' Cable Monitor tool. The Cable Monitor is part of the router's onboard software that provides a web-based diagnostic tool for easy access to configuration and status information about the router, without requiring access to the router's command line interface (CLI).

Technicians and subscribers can access the tool in the following ways:

- When the cable access router has established connectivity with the CMTS over the cable interface, a service technician and other users can use a web browser to remotely access the router and display the desired information.
- When the cable network is not operational and the cable access router is not online, the subscriber can access the tool with a PC connected to the router's Ethernet ports. On the Cisco uBR925 cable access router, the PC can also be connected to the USB port. Technicians can then prompt the user for the information they need to determine the source of the problem.

The Cable Monitor operates in two modes:

- **Basic Mode**—In basic mode, the Cable Monitor displays the router's current status, as well as the results of the router's initialization routines (power-on self-tests and registration with the CMTS). This provides a quick status check of the router and what stage of the initialization process is failing (if any).
- **Advanced Mode**—In advanced mode, the Cable Monitor also displays status and configuration information about the DOCSIS MAC layer, cable interface, and performance statistics. On the Cisco uBR925 cable access router, the advanced mode also displays the status of the two voice ports. Technicians with the proper login ID and password can also display advanced debug information that collects the output of the most commonly-used troubleshooting commands.



### Note

The Cable Monitor is a read-only tool—it cannot modify or reconfigure the cable access router. However, some of the information displayed in the advanced mode could be used to defeat the router's security. This information is available only to users who enter the enable password. Cisco recommends that an encrypted enable password be set on all routers deployed at subscriber sites. Passwords and SNMP community strings should be different for each router, using a nontrivial pattern. If an enable password is not being used at a subscriber's site, the Cable Monitor should be run only in the basic mode.

The following sections describe the cable access router's Cable Monitor:

- [Enabling the Cable Monitor, page B-2](#)
- [Disabling the Cable Monitor, page B-4](#)
- [Accessing the Cable Monitor, page B-5](#)

- [Sample Pages, page B-7](#)

## Enabling the Cable Monitor

By default, the Cable Monitor is disabled. To allow technicians and subscribers to access the Cable Monitor, it must be enabled using the **ip http** global configuration command as follows:

	Command	Purpose
Step 1	ubr9x5(config)# <b>ip http cable-monitor</b> { <b>basic</b>   <b>advance</b> } [ <i>URL-IP-address URL-mask</i> ]	Enables the Cable Monitor in either basic or advanced mode.  (Optional) Specifies the IP address and subnet mask for the Cable Monitor. These parameters also define the IP address pool used by the temporary DHCP server when the cable interface goes down.
Step 2	ubr9x5(config)# <b>ip http port</b> <i>http-port</i>	(Optional) Specifies the TCP port number to use for web server (HTTP) requests. The default is the well-known web server port of 80.



### Tip

If the router is operating in routing mode, and the cable interface is up, you can also access the Cable Monitor by entering the IP address for the Ethernet interface into your web browser.

When the Cable Monitor is enabled, it also automatically enables the Cisco web server (giving the equivalent of the **ip http server** command). However, while the Cable Monitor is active, it disables all other access to the Cisco web server, which prevents the user from accessing the CLI commands that are normally available when the Cisco web server is active. When the Cable Monitor is active, the Cisco web server can be used only for displaying the Cable Monitor pages.



### Note

If the Cable Monitor is not enabled on the cable access router, Cisco recommends that the Cisco web server be disabled, using the **no ip http server** configuration command.

## Configuration Modes

The **ip http cable-monitor basic** command enables the Cable Monitor and puts it in basic mode. In this mode, the Cable Monitor displays information only about the router's current status, whether it has successfully completed all of its initialization routines, and cable performance statistics.

The **ip http cable-monitor advance** command enables the Cable Monitor and puts it in advanced mode. In this mode, the Cable Monitor displays the router's current status, the status of its initialization routines, the router's basic configuration, and performance statistics. On the Cisco uBR925 cable access router, it also displays the status of the router's voice ports. If an enable password is set, users who can supply the enable password can also view detailed debugging and troubleshooting configuration information. If an enable password is not set, all users can view this information.

**Caution**

To ensure a secure system, the advanced mode should not be used unless a secure encrypted enabled password is configured on the cable access router.

By default, the Cable Monitor is configured with the IP address 192.168.100.1, which is a Class C address in the private IP address space reserved for private networks. If a device on the subscriber's private network is already using this IP address, use the *URL-IP-address* and *URL-mask* optional parameters to specify another IP address.

For example, to enable the Cable Monitor for advanced mode with the private IP address of 10.0.1.2 and the default HTTP port of 80, use the following command:

```
ip http cable-monitor advance 10.0.1.2 255.0.0.0
```

**Note**

This command can be included in the Cisco IOS configuration file that is downloaded to the router at power-on during the DOCSIS provisioning.

## Security Considerations

The Cable Monitor is a read-only tool that cannot be used to change the configuration of the cable access router. The debug page in advanced mode, however, does display information that could be used to defeat the router's security. This page is password-protected, requiring users to enter the enable password before displaying it. However, if an enable password has not been set, any user can display the debug page, which could reveal SNMP community strings and other configuration information.

For this reason, the following guidelines should be used when developing a security policy for the router:

- If the Cable Monitor is being used in advanced mode, an encrypted enable password must be set. Otherwise, all users can view the debug page, which displays the router's complete configuration, including SNMP community strings.
- If no enable password is set (to prevent remote configuration of the router using Telnet), then the Cable Monitor must be used only in basic mode.

**Note**

Because downloading a Cisco IOS configuration file during the provisioning process automatically disables the console port, all remote configuration of the cable access router using the CLI is disabled when an enable password is not set. In this situation, the only way to change the router's configuration is through SNMP or by resetting the router and uploading a new configuration file. The Cable Monitor, however, must not be run in advanced mode when no enable password has been set because this allows unauthorized users to view SNMP community strings and use SNMP to change the router's configuration.

# Disabling the Cable Monitor

To disable the Cable Monitor, use the **ip http** global configuration command as follows:

	Command	Purpose
Step 1	ubr9x5(config)# <b>no ip http cable-monitor</b>	Disables the Cable Monitor, preventing any web server access to its web pages. This command also automatically disables access to the Cisco web server (which is equivalent to giving the <b>no ip http server</b> command).



Note

The Cable Monitor is disabled by default, so the **no ip http cable-monitor** command does not need to be included in the Cisco IOS configuration file that is downloaded to the router at power-on during the DOCSIS provisioning. However, the Cisco web server is enabled by default; if this is not desirable, you should include the **no ip http server** command in the Cisco IOS configuration file that is downloaded to the cable access router.

When disabling the Cable Monitor, the console might display warning messages similar to the following:

```
% monitor-209.165.202.131 is not in the database.  
% monitor-192.168.100.1 is not in the database.  
% Range [209.165.202.131, 209.165.202.131] is not in the database.  
% Range [192.168.100.1, 192.168.100.1] is not in the database.
```

You can ignore these messages because they are simply confirming that the IP addresses used for the Cable Monitor are no longer being used for that purpose.



Note

The Cable Monitor can also be disabled by giving the **no ip http server** command, which disables all web server access. However, this is not recommended because it does not release the system resources that are specifically allocated to the Cable Monitor.

# Accessing the Cable Monitor

The Cable Monitor can be accessed either through the cable interface (typically by technicians at the headend or the service provider's network operations center) or through the Ethernet and USB interfaces (typically by subscribers when the cable interface has gone down). See the following sections for more information.

**Note**

You must use a web browser that supports frames to access the Cable Monitor pages.

## Through the Cable Interface when the Cable Interface Is Operational

During normal operations, when the cable access router is online and has connectivity with the CMTS through the cable interface, service technicians at the headend can access the Cable Monitor by doing the following:

- Step 1** Start a web browser on a PC or workstation at the headend that has TCP/IP connectivity with the cable access router.
- Step 2** Type in a URL with the IP address assigned to the cable interface on the cable access router. This is typically an address in the service provider's IP address space.

For example, if the service provider has assigned the cable access router the IP address of 209.165.202.131, a technician at the headend uses the following URL to access the Cable Monitor:

**`http://209.165.202.131`**

If a port number other than the default of 80 has been assigned to the Cable Monitor, that port number must be included as part of the URL. For example, if the service provider has assigned the cable access router the IP address of 209.165.202.131 and a port number of 8080, a technician at the headend uses the following URL to access the Cable Monitor:

**`http://209.165.202.131:8080`**

**Tip**

If the router is operating in routing mode, and the cable interface is up, you can also access the Cable Monitor by entering the IP address for the Ethernet interface into your web browser.

## Through the Ethernet or USB Interface when the Cable Interface Is Not Operational

When the cable access router loses connectivity with the CMTS at the headend and detects that its cable interface is not operational, the router automatically switches into a diagnostic mode and does the following:

- Activates a temporary DHCP server to assign IP addresses in the IP network that is defined by the IP address and subnet mask given with the **`ip http cable-monitor`** command (the default address pool is the Class C private network 192.168.100.0).

- Assigns an IP address and default gateway from this address space to any PC connected to the router's Ethernet ports when that PC makes a DHCP request. On the Cisco uBR925 cable access router, the PC can also be connected to the router's USB port. This allows the PC to communicate with the Cable Monitor on the router.

**Note**

The PC or workstation can be rebooted to force it to make a DHCP request. If using a Windows 95 or Windows 98 system, you can also use the **winipcfg** utility to send a DHCP release and renew request.

- When the router detects any web server requests, it automatically redirects them to the Cable Monitor.
- The router's DHCP server renews these IP addresses every 30 seconds as long as the cable interface is down.
- When the cable interface is back up, the router returns to normal operation, using the configuration that existed before it switched into diagnostics mode. (At this point, the PC or workstation that accessed the Cable Monitor can be rebooted to restore its configuration, or you can wait from 30 to 60 seconds for the PC to automatically issue a DHCP renew request. Windows 95 or Windows 98 users can also use the **winipcfg** utility.)

When the cable interface is down, users at the subscriber site can use the following procedure to access the Cable Monitor to aid in troubleshooting the problem with the cable network:

- Step 1** If necessary, connect a PC to one of the Ethernet ports on the cable access router. On the Cisco uBR925 cable access router, you can also connect a PC to the router's USB port.
- Step 2** If necessary, configure the PC so it obtains its IP address from a DHCP server. For example, on Windows 95 computers, display the Network Control Panel, click the TCP/IP component for the computer's Ethernet adapter, click the **IP Address** tab under Properties, and click **Obtain an IP address automatically**.

**Note**

Since most PCs are configured to use a DHCP server, this step is not usually necessary. However, if the PC is normally assigned a static IP address, you should copy down its IP address and default gateway address before reconfiguring it to use a DHCP server.

- Step 3** Reboot the PC so that it obtains an IP address from the cable access router. Alternatively, on Windows 95 and Windows 98 PCs, you can use the **winipcfg** utility to release and renew the IP address.
- Step 4** Start a web browser on the PC and enter any arbitrary URL, such as **http://anything**. The cable access router redirects the request to the Cable Monitor, which displays its home page.

**Note**

In the default configuration, the static IP address 192.168.100.1 is reserved for the Cable Monitor while in diagnostic mode. If desired, subscribers (or technicians who visit the subscriber's site) can enter **http://192.168.100.1** as a bookmark for the Cable Monitor. If a different IP address has been assigned to the Cable Monitor, users should enter that value as the bookmarked address.

- Step 5** When the cable interface resumes normal operations, reconfigure the PC (if necessary) to restore its previous TCP/IP configuration. Then wait from 30 to 60 seconds, or reboot the PC to restore normal operations.

# Sample Pages

Table B-1 lists each of the web pages displayed by the Cable Monitor, the modes in which the pages are displayed, and a short description of each page's information.

**Table B-1** Cable Monitor Pages

Cable Monitor Page	Modes Available	Description
<a href="#">Home</a>	Basic and Advanced	Displays current status and initialization information.
<a href="#">Initialization Information</a>	Advanced only	Displays more detailed initialization information.
<a href="#">Voice Ports Information</a>	Advanced Only	Displays status and configuration information for the router's voice ports (on the Cisco uBR925 cable access router only).
<a href="#">CPE State Information</a>	Advanced only	Displays the basic configuration for the router.
<a href="#">Cable Interface Information</a>	Advanced only	Displays the current status and configuration of the cable interface.
<a href="#">Performance Information</a>	Basic and Advanced	Displays performance statistics for the router.
<a href="#">Debug Information Page</a>	Advanced only (requires enable password)	Displays advanced configuration information.

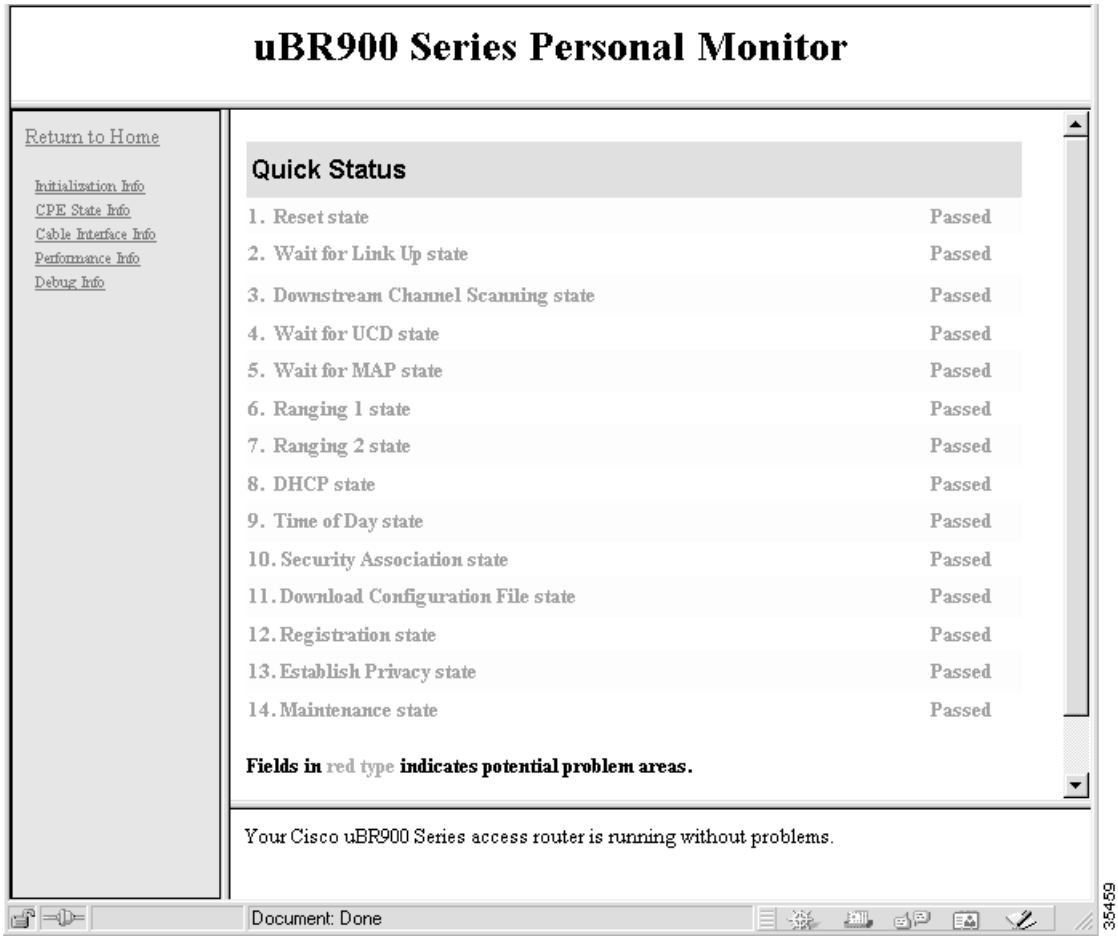
The following sections describe each page in more detail.

# Home

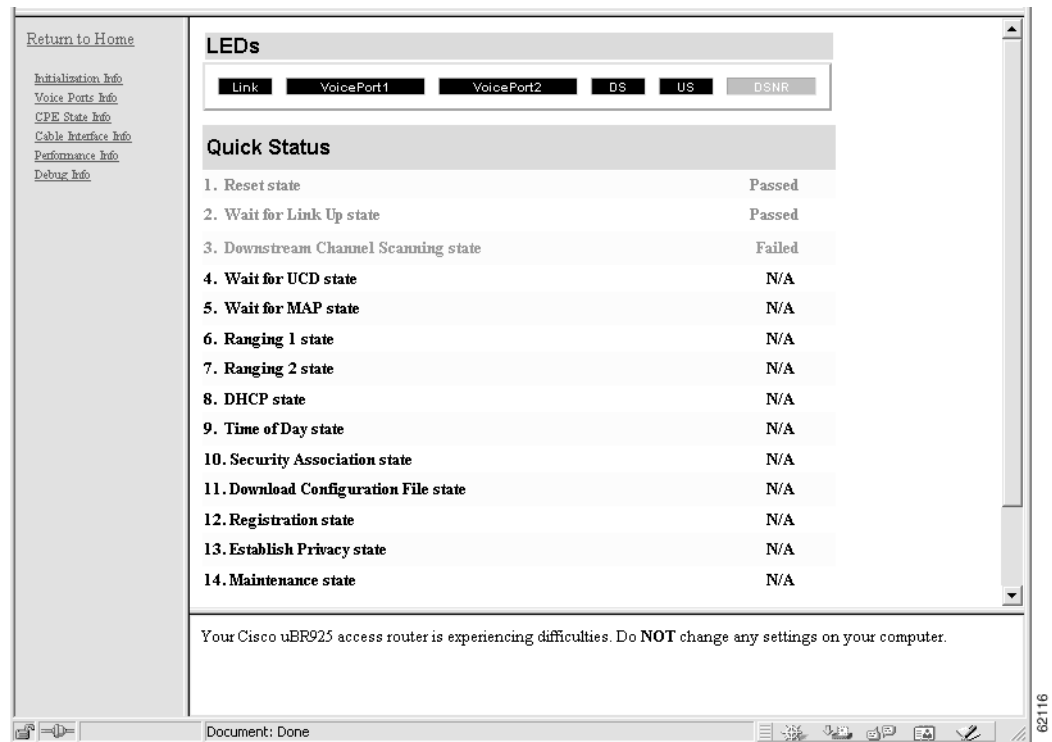
The Cable Monitor home page summarizes the status of the router’s registration process with the CMTS. On the Cisco uBR925 cable access router, the home page also displays the status of the cable and voice port LEDs on the front panel.

Figure B-1 shows a typical home page for the Cisco uBR905 cable access router when the Cable Monitor is configured for advanced mode. Figure B-2 shows a typical home page for the Cisco uBR925 cable access router.

Figure B-1 Cable Monitor Home Page (Cisco uBR905 Cable Access Router)





**Figure B-2 Cable Monitor Home Page (Cisco uBR925 Cable Access Router)****Note**

[Figure B-1](#) and [Figure B-2](#) show the home page when the Cable Monitor is configured for advanced mode; in this mode, the left side displays links for all available pages. When the Cable Monitor is configured for basic mode, the left side displays only the link for the Performance Information page.

The home page summarizes the information that is displayed on the [Initialization Information](#) page, which is described in the next section.

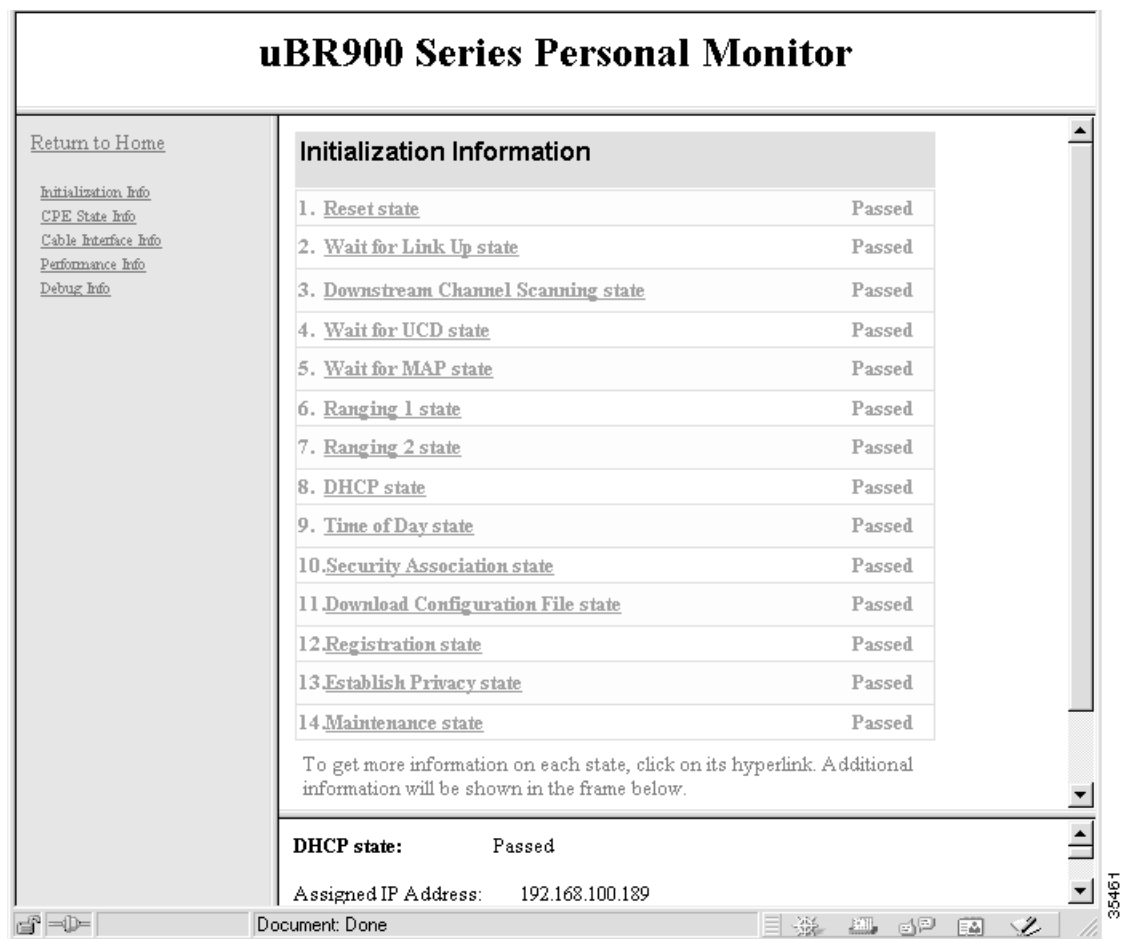
## Initialization Information

The Initialization Information page is available to advanced users only and displays the same information shown in the Quick Status section of the [Home](#) page. This information summarizes the router's power-on initialization and registration process using the following color codes:

- Green—Stages that passed.
- Red—Any stage that failed.
- Black—Stages that were not reached because of the failure of a previous stage.

Figure B-3 shows a display for a cable access router that has successfully registered and come online.

**Figure B-3** Initialization Information Page



This page provides detailed information on the state changes when the cable access router tries to establish communication and registration with the CMTS. All stages must show Passed before the router can come online.

Clicking on the name of the stage displays more information, if available, in the bottom half of the window. For example, clicking stage 11, “Download Configuration File state,” displays the name of the configuration file that was downloaded to the router and the configuration parameters it contained.

The following is the normal progression of states that is displayed when the cable access router registers successfully with the CMTS:

- **Reset state**—The router boots the Read-Only Memory (ROM) from its Flash memory, performs a self-test, initializes processor hardware, and boots the Cisco IOS release image stored in Flash memory.
- **Wait for link up state**—The router checks the cable interface and determines whether a DOCSIS-compliant signal exists.
- **Downstream frequency scanning state**—The router acquires a temporary downstream channel by matching the clock sync signal, which is regularly sent out by the CMTS in the downstream frequency range. If this stage passes, click this link to display the following information:
  - Downstream ID
  - Downstream Frequency
  - Downstream Symbol Rate
  - Downstream QAM Mode
  - Signal to Noise Ratio Estimate
  - Downstream Lock Threshold
  - Downstream Search
- **Wait for Upstream Channel Descriptor (UCD) state**—The router waits for a UCD message from the CMTS and configures itself for the upstream frequency specified in that message. If this stage passes, click this link to display the following information:
  - Upstream ID
  - Upstream Frequency
  - Mini-Slot Size
- **Wait for MAP state**—The router waits for the next upstream bandwidth allocation map message (MAP), which is regularly sent from the CMTS, to find the next available shared request timeslot.
- **Power ranging first state**—The router then uses the MAP timeslot to send a ranging request message to the CMTS, communicating the router's user ID (UID, which is its unique MAC address), using a temporary Service Identifier (SID) of 0 (zero) to indicate it has not yet been allocated an upstream channel. If this stage passes, click this link to display the following information:
  - Ranging Offset
  - Power Level
  - Ranging Response SID Assigned
  - Adjust Transmit Power
- **Power ranging second state**—In reply to the router's ranging request, the CMTS sends a ranging response containing a temporary SID to be used for the initial router configuration and bandwidth allocation. As needed, the router adjusts its transmit power levels using the power increment value given by the CMTS in its ranging response message.
- **DHCP state**—After the next MAP message broadcast, the router uses a shared require timeslot to invoke the Dynamic Host Configuration Protocol (DHCP) to establish IP connectivity with the TCP/IP network at the headend. The DHCP server sends a response with the following information:
  - Assigned IP Address
  - Network Mask
  - TFTP Server IP Address

- Time Server IP Address
- Time Zone Offset
- Configuration File Name
- Time of Day (ToD) state—The router configures itself for the specified IP address and gets the current date and time from the specified ToD server.
- Security Association state—Reserved for future use.
- Download Configuration File state—Using the TFTP protocol, the router downloads the specified DOCSIS configuration file and configures itself for the appropriate parameters. The DOCSIS configuration file contains the following parameters:
  - Configuration File
  - Network Access
  - Maximum CPEs
  - Class of Service information—Depending on the software image installed, up to four classes of service (CoS) are displayed. The following information is shown for each CoS:
    - Assigned SID
    - Max Downstream Rate
    - Max Upstream Rate
    - Upstream Priority
    - Min Upstream Rate
    - Max Upstream Burst
    - Privacy Enable

**Note**

For more information on these parameters, see the [“DOCSIS Configuration File” section on page 2-3](#).

- Registration state—The router sends another registration request to the CMTS that contains the CoS parameters given in the DOCSIS configuration file. The CMTS verifies that the router is using the appropriate CoS profile, and converts the temporary SID into a data SID with a service class index that points to the applicable CoS profile.
- Establish Privacy state—If BPI security has been enabled, the router negotiates the BPI parameters with the CMTS.
- Maintenance state—The router enters the maintenance state, passing traffic on the cable interface to and from the CMTS, and responding to periodic maintenance messages from the CMTS.

## Voice Ports Information

The Voice Ports Information page summarizes the current status of the two voice ports on the Cisco uBR925 cable access router. Figure B-4 shows a typical Voice Ports Information page.

Figure B-4 Voice Ports Page

uBR925 Personal Monitor		
<a href="#">Return to Home</a> <a href="#">Initialization Info</a> <a href="#">Voice Ports Info</a> <a href="#">CPE State Info</a> <a href="#">Cable Interface Info</a> <a href="#">Performance Info</a> <a href="#">Debug Info</a>	Voice Ports Information	
	<a href="#">Refresh Data</a>	
	Port 0	Port 1
	Transport Used	Analog
	Type	FXS
	Operation State	DORMANT
	Administrative State	UP
	Interface Down Failure	No
	Noise Regeneration	enabled
	Non Linear Processing	enabled
	Music on Hold Threshold	-38 dBm
	In Gain	-2 dBm
	Out Attenuation	0 dBm
	Echo Cancellation	enabled
	Echo Cancel Coverage	8 ms
	Connection Mode	normal
	Connection Number	Not Set
	Initial Time Out	10 s
	InterDigit Time Out	10 s
	Call Disconnect Time Out	60 s
	Region Tone	US



### Note

The Voice Ports Information page is displayed in advanced mode only on the Cisco uBR925 cable access router.

The Voice Ports Information page displays the same information that is shown using the **show voice port** command:

- Transport Used—The type of network being used to make calls on each voice port.
- Type—The type of voice port (always “FXS” for the Cisco uBR925 router).
- Operation State—The current functional status of the voice port:
  - UP—The port is online and currently making a call.
  - DOWN—The port is online but is not currently making a call.
  - TESTING—The port is in the middle of a test procedure, either its power-on self-test or a test manually initiated by a technician.
  - UNKNOWN—The port is an unknown state. This might indicate you are using an out-of-date software image.

- DORMANT—The port is not currently in use.
  - NOT PRESENT—The port is not present. Either the voice port hardware has failed or a software image with voice support has been loaded on a Cisco cable access router that does not support voice ports.
- Administrative State—The configuration of the voice port:
  - UP—The port is enabled and ready to accept and make calls.
  - DOWN—The port is disabled and cannot accept or make calls.
  - TESTING—The port has been put into test mode, typically by a technician who is manually testing the port.
- Interface Down Failure—Whether the voice port is currently experiencing an interface down failure.
- Noise Regeneration—Whether background noise should be played to fill silent gaps.
- Non Linear Processing—Whether nonlinear echo cancellation is enabled for this port.
- Music on Hold Threshold—The current music-on-hold threshold (–70 dB to –30 dB) for the port.
- In Gain—The amount of input gain (–6 dB to 14 dB) inserted at the receiver side of the port.
- Out Attenuation—The amount of output attenuation (0 dB to 14 dB) inserted at the transmit side of the port.
- Echo Cancellation—Whether echo cancellation is enabled for this port.
- Echo Cancel Coverage—The amount of time to be covered with echo cancellation (8, 16, 24, or 32 milliseconds)
- Connection Mode—The connection mode of the voice port.
- Connection Number—The full E.164 telephone number used to establish a connection.
- Initial Time Out—The maximum amount of time the port waits for an initial input digit after going off-hook (0 to 120 seconds).
- InterDigit Time Out—The maximum DTMF interdigit duration (0 to 120 seconds).
- Call Disconnect Time Out—The maximum amount of time the port waits to disconnect a call after the remote side hangs up (0 to 120 seconds).
- Region Tone—The type of ringing tone (cptone) generated by the port, as defined by locale (2-letter ISO-3166 country code).

## CPE State Information

This page summarizes how the cable access router has been configured at the MAC (physical) layer. [Figure B-5](#) shows a typical CPE State Information page.

**Figure B-5** CPE State Information Page

**uBR900 Series Personal Monitor**

[Return to Home](#)

[Initialization Info](#)  
[CPE State Info](#)  
[Cable Interface Info](#)  
[Performance Info](#)  
[Debug Info](#)

**CPE State Information** [Refresh Data](#)

Router Name	uBR910Router
IP Address	192.168.100.189
Net Mask	255.255.255.0
MAC State	maintenance_state
Ranging SID	3
Registered	True
Privacy Established	False
TFTP Server IP Address	192.168.100.20
Time Server IP Address	192.168.100.84
Time Zone Offset	1
<a href="#">Downstream Info</a>	
<a href="#">Upstream Info</a>	
<a href="#">Configuration File Info</a>	

**Configuration File Info**

Configuration File: docsis.cm  
Network Access: True  
Maximum CPEs: 3  
COS 1:  
Assigned SID: 3

Document: Done

35457

The following information is shown in the CPE State Information page:

- Router Name—Shows the hostname assigned to the router.
- IP Address—Shows the IP address assigned to the router's cable interface.
- Net Mask—Shows the subnet mask for the cable interface.
- MAC State—Indicates the current MAC layer state (during normal operation, this is "maintenance\_state"). The following are the possible MAC layer states; they correspond to the states shown in the [Initialization Information](#) page:
  - wait\_for\_link\_up\_state—Wait for Link Up state
  - ds\_channel\_scanning\_state—Downstream Channel Scanning state
  - wait\_ucd\_state—Wait for UCD state
  - wait\_map\_state—Wait for MAP state

- ranging\_1\_state—Ranging 1 state
- ranging\_2\_state—Ranging 2 state
- dhcp\_state—DHCP state
- establish\_tod\_state—Time of Day state
- security\_association\_state—Security Association state
- configuration\_file\_state—Download Configuration File state
- registration\_state—Registration state
- establish\_privacy\_state—Establish Privacy state
- maintenance\_state—Maintenance state
- Ranging SID—The SID assigned to the router by the CMTS.
- Registered—Indicates whether the router successfully registered with the CMTS.
- Privacy Established—Indicates whether the router established a BPI security session with the CMTS.
- TFTP Server IP Address—Shows the IP address for the TFTP server that downloaded the DOCSIS configuration file to the router.
- Time Server IP Address—Shows the IP address for the ToD server that provided the correct time-of-day to the router.
- Time Zone Offset—Shows the time zone that the router has been configured to use.
- Downstream Info—Click this link to display the following downstream characteristics:
  - DS ID—The Downstream ID assigned to the router.
  - DS Frequency—The frequency in MHz of the downstream assigned to the router.
  - DS Symbol Rate—The symbol rate currently used on the downstream.
  - DS QAM Mode—The bandwidth used on the downstream (64 QAM or 256 QAM).
  - Signal-to-Noise Ratio Estimate—The current SNR calculated for the downstream.
  - DS Lock Threshold—The minimum SNR signal that the router requires to maintain a lock on the downstream signal.
- Upstream Info—Click this link to display the following upstream characteristics:
  - US ID—The Upstream ID assigned to the router.
  - US Frequency—The frequency in MHz of the upstream assigned to the router.
  - US Power Level—The target power level that the router should be using on the upstream.
  - US Symbol Rate—The symbol rate currently used on the upstream.
  - Ranging Offset—The delay correction, in units of 6.25 microseconds, that the router must apply to the CMTS Upstream Frame Time to synchronize upstream transmissions.
  - Mini-Slot Size—The size of the DOCSIS mini-slots in units of 6.25 microseconds. Possible values are 2, 4, 8, 16, 32, 64, or 128.
  - Change Count—The DOCSIS configuration change count, which tracks how many times the UCD parameters for a router have changed.
- Configuration File Info—Click this link to display the contents of the DOCSIS configuration file that the router downloaded during its power-on provisioning.



## Cable Interface Information

The Cable Interface Information page provides information on the cable access router's cable interface and the quality of its signal. When the cable interface is not operational, the information provided is based on the live values last available.

Figure B-6 shows a typical Cable Interface page.

**Figure B-6** Cable Interface Information Page

uBR900 Series Personal Monitor	
<a href="#">Return to Home</a> <a href="#">Initialization Info</a> <a href="#">CPE State Info</a> <a href="#">Cable Interface Info</a> <a href="#">Performance Info</a> <a href="#">Debug Info</a>	<b>Cable Interface Information</b> <a href="#">Refresh Data</a>
	IP Address 192.168.100.189
	Network Mask 255.255.255.0
	MAC Address 00d0.ba45.4a07
	Signal Quality Acceptable
	Signal to Noise Ratio Estimate 32382
	Lock Threshold 26000
	Power Level 18.0 (dBmV)
	Mac Resets 0
	Sync Lost 0
	Invalid Maps 0
	Invalid UCDs 0
	Invalid Ranging Response 0
	Invalid Registration Response 0
	T1 Timeouts 0
	T2 Timeouts 0
	T3 Timeouts 0
	T4 Timeouts 0
	Range Aborts 0

The following information is displayed on the Cable Interface Information page:

- IP Address—The IP address assigned to the cable interface during DOCSIS provisioning.
- Network Mask—The subnet mask assigned to the cable interface during DOCSIS provisioning.
- MAC Address—The MAC (physical) layer address assigned to the router at the factory.
- Signal Quality—The signal quality interprets the signal-to-noise ratio (SNR) as follows:
  - Unreliable link (displayed in red)—SNR is 2,000 above the lock threshold; the link is likely to fail or go offline intermittently.
  - Poor link (displayed in yellow)—SNR is 4,000 above the lock threshold; the link may occasionally go offline intermittently.

- Acceptable link (displayed in green)—SNR is 6,000 above the lock threshold; the link is good.
- Signal-to-Noise Ratio Estimate—The current SNR value used to determine the Signal Quality.
- Lock Threshold—The lock threshold value used to determine the Signal Quality.
- Power Level—The current upstream power level that the router is using.

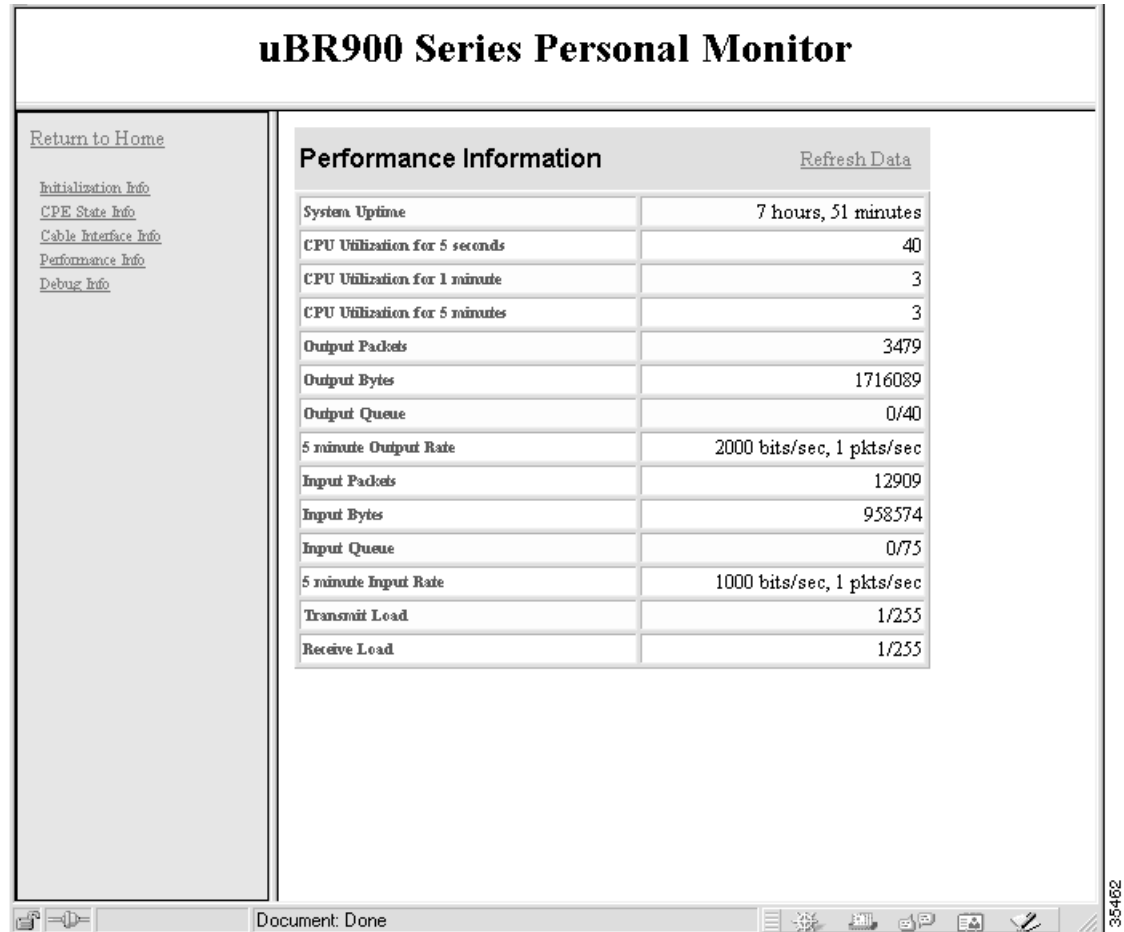
**The following are errors encountered by the router at the MAC layer:**

- Mac Resets—The number of times that the router has reset its MAC layer.
- Sync Lost—The number of times that the router has lost sync on the cable interface and the link has gone down.
- Invalid Maps—The number of invalid MAPs that the router has received from the CMTS.
- Invalid UCDs—The number of invalid UCDs that the router has received from the CMTS.
- Invalid Ranging Response—The number of invalid ranging responses that the router has received from the CMTS.
- Invalid Registration Response—The number of invalid registration responses that the router has received from the CMTS. Typically, an invalid registration response is due to either an authentication failure or a class of service failure.
- T1 Timeouts—The number of times that the router timed out waiting for a UCD message from the CMTS.
- T2 Timeouts—The number of times that the router timed out waiting for a broadcast ranging response from the CMTS.
- T3 Timeouts—The number of times that the router timed out waiting for a ranging response from the CMTS.
- T4 Timeouts—The number of times the router has reinitialized its MAC layer because it did not receive a Periodic Ranging opportunity from the CMTS.
- Range Aborts—The number of times that the CMTS has instructed the router to abort a ranging attempt, typically because of excessive ranging or excessive power levels.

## Performance Information

This page is available to all users and provides basic performance statistics for the cable access router. Figure B-7 shows a typical Performance Information page.

**Figure B-7 Performance Information Page**



The following information is displayed on the Performance Information page:

- System Uptime—The total time since the router was last reset or powered on.
- CPU Utilization for 5 seconds—The average CPU load (0 to 100%) for the past 5 seconds.
- CPU Utilization for 1 minute—The average CPU load (0 to 100%) for the past 1 minute.
- CPU Utilization for 5 minutes—The average CPU load (0 to 100%) for the past 5 minutes.
- Output Packets—The total number of MAC layer packets output on the upstream at the cable interface.
- Output Bytes—The total number of bytes output on the upstream at the cable interface.
- Output Queue—The current state of the output queue, shown as a ratio of the number of packets currently in the queue over the maximum size of the queue.

- 5 minute Output Rate—The average output rate over the past 5 minutes, in both bits per second and packets per second. For example, “10/40” shows that 10 packets are currently in the queue, which can hold 40 packets.
- Input Packets—The total number of MAC layer packets received on the downstream at the cable interface.
- Input Bytes—The total number of bytes output on the downstream at the cable interface.
- Input Queue—The current state of the input queue, shown as a ratio of the number of packets currently in the queue over the maximum size of the queue. For example, “13/75” shows that 13 packets are currently in the queue, which can hold 75 packets.
- 5 minute Input Rate—The average input rate over the past 5 minutes, in both bits per second and packets per second.
- Transmit Load—The current transmit load, shown as a ratio of the packets currently in the transmit buffer over the size of the buffer.
- Receive Load—The current receive load, shown as a ratio of the packets currently in the receive buffer over the size of the buffer.

## Debug Information Page

This page displays the output of the **show tech-support** command, which includes the output of the following CLI commands:

- **show version**—Displays the hardware configuration, software image names and version, register settings, and the boot image.
- **show running-config**—Displays the configuration the router is currently using.
- **show stacks**—Displays the stack usage of the router's processes and interrupt routines, including the reason for the last system reboot.
- **show interfaces**—Displays the status and configuration of the router's Ethernet and cable interfaces.
- **show controllers**—Displays the current state, configuration, and register information for each controller that the cable access router uses to move data between the cable and Ethernet interfaces.
- **show process memory**—Displays details about how tasks are using the router's memory.
- **show process cpu**—Displays details about how tasks are using the router's CPU.
- **show controller c0 mac state**—Displays the MAC layer configuration for the cable interface.
- **show voice port**—Displays the configuration of each voice port.
- **show dial-peer voice**—Displays the remote and local dial-peers that have been configured on the router.
- **show gateway**—Displays the gateway configuration (if any).
- **show call active voice**—Displays the contents of the active call table, which shows statistics for the voice calls currently in progress.
- **show call history voice**—Displays the call history table, which lists all voice calls connected through the router's voice ports.



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**Note** The information about the voice ports is displayed only for the Cisco uBR925 cable access router.

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- **show region**—Displays information about the memory regions in the router.
- **show buffers**—Displays the usage of the different memory buffers on the router.

If an enable password has been set, the user must enter the level 15 user ID and password to access this page. If no enable password has been set, this page is accessible to all users.



**Note**

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Cisco recommends that an encrypted enable password be set on all cable access routers that are deployed at subscriber sites. If an encrypted enable password is not being used at a subscriber's site, the Cable Monitor should not be enabled in advanced mode because the Debug Information page displays information, such as the SNMP community strings, that could be used to defeat the router's security.

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Figure B-8 and Figure B-9 show typical Debug Information pages for the Cisco uBR905 and Cisco uBR925 cable access routers.

Figure B-8 Debug Information Page (Cisco uBR905 Cable Access Router)

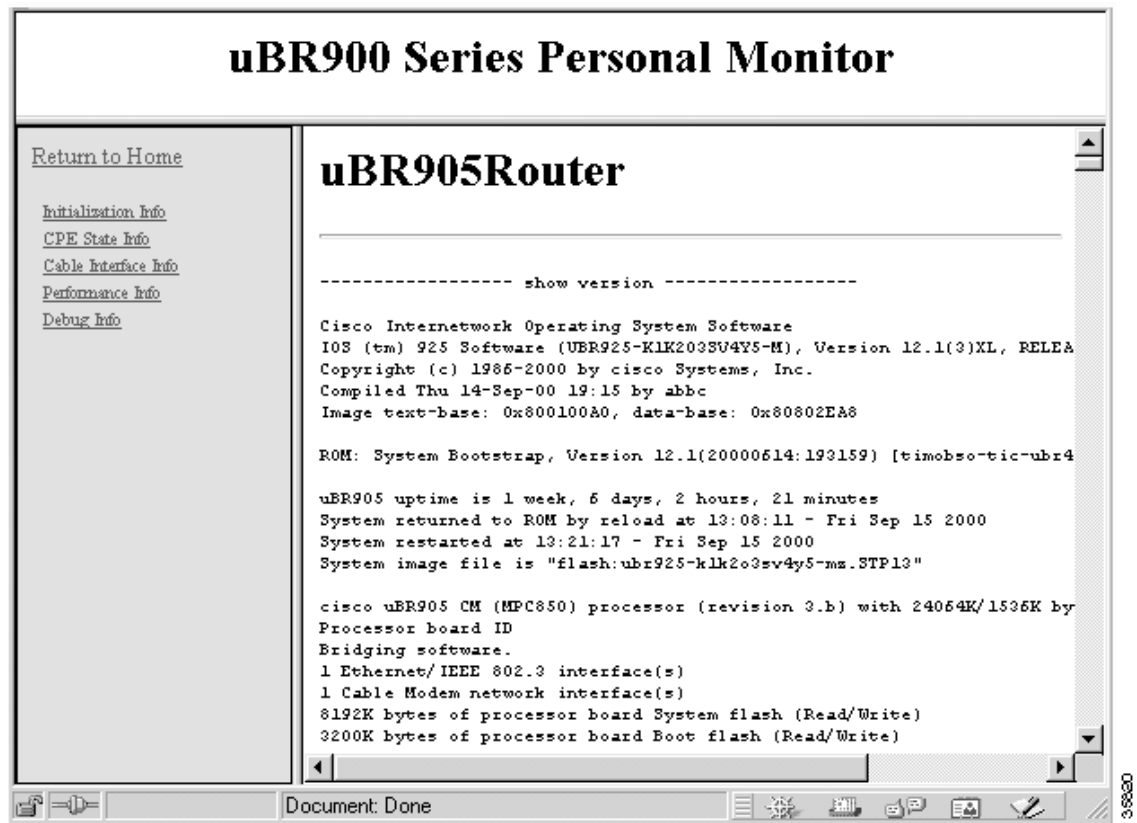


Figure B-9 Debug Information Page (Cisco uBR925 Cable Access Router)

