Configuring the Cisco Broadband Troubleshooter

The following configuration procedures are required for using
Cisco Broadband Troubleshooter Release 3.4:

The following configuration procedures are optional for CBT 3.4:

Configuring the Cisco CMTS to Use CBT Spectrum Management Tools

The Cisco Broadband Troubleshooter Release 3.4 provides the spectrum management functionality, which is generated by the digital signal processor (DSP) in the Cisco uBR-MC16S, uBR-MC16U, uBR-MC16X, uBR-MC28U, uBR-MC28X, uBR10-MC5X20S/U/H, UBR-MC20X20V, and uBR-MC88V line cards on the Cisco CMTS.

Before using the spectrum management features in Cisco Broadband Troubleshooter, you must complete spectrum management configuration tasks on the Cisco CMTS. These configurations are outside the scope of Cisco Broadband Troubleshooter.

For more information, refer to the following document on Cisco.com:

- *Spectrum Management and Advanced Spectrum Management for the Cisco CMTS*

    http://www.cisco.com/en/US/docs/ios/cable/configuration/guide/cmts_spctrm_mgt.html

Configuring the Java Runtime Environment

This section describes Java Runtime Environment (JRE) requirements and procedures for JRE 5.0, but includes procedures for earlier JRE platforms also.

JRE 5 OS-Level Requirements

CBT 3.4 supports the latest JRE 5.0 platform. However, the network administrator must ensure that all OS-level patches are installed to avoid system problems with CBT 3.4. This section describes patch requirements according to platform.

The Sun JRE 5.0 is a plug-in that must be installed in the client browser. Cisco Broadband Troubleshooter detects if JRE 5.0 is installed in the browser. This section provides directions to install JRE 5.0 in the browsers supported by each platform.

Installing JRE 5.0 in Microsoft Internet Explorer on the Windows Platform

If JRE 5.0 is not installed in Internet Explorer on the Windows platform, the installation is automatic.

Installing JRE 5.0 in Netscape Navigator on the Windows Platform

If JRE 5.0 is not installed in Netscape Navigator on the Windows platform, refer to the following location:

http://java.sun.com/javase/downloads/index_jdk5.jsp

To install JRE 5.0 in Netscape Navigator on the Windows platform:

Step 1   From
https://sdlc5e.sun.com/ECom/EComActionServlet;jsessionid=A603027E34989B56B4909B018FB8F468, save jre-1_5_0_06-windows-i586-p.exe to a local directory.

Note   In these steps, *JRE5.0_07InstallationDirectory* represents the local directory you choose.

Step 2   To install JRE 5.0, choose:

Start > Run > *JRE5.0_07InstallationDirectory* \jre-1_5_0_06-windows-i586-p.exe

Step 3   Close Navigator.

Step 4   Reopen Navigator.

Installing JRE 5.0 in Netscape Navigator on the Solaris Platform

If JRE 5.0 is not installed in Netscape Navigator on the Solaris platform, refer to the following location:

http://java.sun.com/javase/downloads/index_jdk5.jsp

To install JRE 5.0 on the Solaris platform:

Step 1   From
https://sdlc5e.sun.com/ECom/EComActionServlet;jsessionid=A603027E34989B56B4909B018FB8F4
68, save jre-1_5_0_08-solaris-sparc.sh to a local directory.

> **Note**   In these steps, *JRE5.0InstallationDirectory* represents the local directory you choose and
> *Netscape7.0InstallationDirectory* represents directory where Netscape 7.0 is installed.

Step 2   To install JRE 5.0, enter:

    jre-1_5_0_08-solaris-sparc.sh

Step 3   Depending on the version of Netscape you are using, point to the Java plug-in by doing the following:

- **Netscape 4.7**—Set the environment variable NPX_PLUGIN_PATH to point to the Java plug-in by
  entering:

  setenv NPX_PLUGIN_PATH *JRE5.0InstallationDirectory***/plugin/sparc/ns4**

- **Netscape 7.0**—Create a softlink to point to the Java plug-in by entering:

  ln -s *JRE5.0InstallationDirectory*/plugin**/sparc/ns610/libjavaplugin_oji.so**
  *Netscape7.0InstallationDirectory***/plugins/libjavaplugin_oji.so**

Step 4   Close Navigator.

Step 5   Reopen Navigator.

Installing JRE 5.0 in Netscape Navigator on the Linux Platform

If JRE 5.0 is not installed in Netscape Navigator on the Linux platform, refer to the following location:

http://java.sun.com/javase/downloads/index_jdk5.jsp

To install JRE 5.0 in Netscape Navigator on the Linux platform:

Step 1   From
https://sdlc5e.sun.com/ECom/EComActionServlet;jsessionid=A603027E34989B56B4909B018FB8F4
68, save jre-1_5_0_08-linux-i586.bin to a local directory.

> **Note**   In these steps, *JRE5.0_07InstallationDirectory* represents the local directory you choose and
> *Netscape7.0InstallationDirectory* represents directory where Netscape 7.0 is installed.

Step 2   To install JRE 5.0, enter:

    jre-1_5_0_08-linux-i586.bin

Step 3   Depending on the version of Netscape you are using, point to the Java plug-in by doing the following:

- **Netscape 4.7**—Set the environment variable NPX_PLUGIN_PATH to point to the Java plug-in by
  entering:

  setenv NPX_PLUGIN_PATH *JRE5.0InstallationDirectory***/plugin/i386/ns4**

- **Netscape 7.0**—Create a softlink to point to the Java plug-in by entering:

```
ln -s JRE5.0_InstallationDirectory/plugin/i386/ns610/libjavaplugin_oji.so
Netscape7.0InstallationDirectory/plugins/libjavaplugin_oji.so
```

Step 4   Close Navigator.

Step 5   Reopen Navigator.

Configuring CiscoView (Optional)

CiscoView is a web-based device management application that provides dynamic status, monitoring, and configuration information for a range of Cisco internetworking products. CiscoView displays a physical view of a device chassis, with color-coding of modules and ports for at-a-glance status, and has two levels of capabilities:

- **Monitoring capabilities**—Displays performance and other statistics
- **Configuration capabilities**—Allows comprehensive changes to devices, if you have security privileges

For product information, refer to the following document on Cisco.com:

http://www.cisco.com/en/US/products/sw/cscowork/ps4565/index.html

You can launch CiscoView 5.*x* from CBT to monitor a device and get real-time information on it.

To configure and launch CiscoView from CBT:

Step 1   To identify the CiscoView server so that CBT can launch the application, from the **Configuration** menu, choose **CiscoView Server**.

Step 2   To identify the device that you want to monitor with CiscoView, from the **Hotline Tools** menu, choose **CiscoView**.

Step 3   For a complete description of each field in the CiscoView dialog boxes, click **Help**.

> **Note**   The Solaris installation package for CBT 3.4 includes the CiscoView installation package.

Using Subscriber Traffic Management with CBT 3.4 (Optional)

To use the Subscriber Traffic Management (STM) feature of CBT 3.4, the **cable qos enforce-rule** command on the Cisco CMTS must be used with a QoS profile that is not created by the cable modem. Any in-use QoS profile, such as one created by a cable modem, can be turned into a management profile.

> **Note**   STM is supported on the MC16U, MC16X, MC28U, MC28X, MC5X20S/U/H, MC20X20V, and MC88V line cards with CBT 3.4. STM data is enabled with CBT 3.4.

To create a management profile:

|	Command	Purpose
Step 1	Router# **show cable modem registered**	Finds the registered profiles on the Cisco CMTS. Finds a current registered profile that has the features you need.
Step 2	Router# **configure terminal**	Enters global configuration mode.
Step 3	Router (config)# **cable qos profile** *n*	Enters the QoS profile number of the registered profile that has the features you need.
Step 4	Router (config)# **exit**	Exits global configuration mode.

Reviewing the CBT Task Menu

This section describes the following components of the CBT Task Menu:

After you log on to CBT, the Task menu appears. See Figure 3-1:

Figure 3-1   *CBT Task Menu*
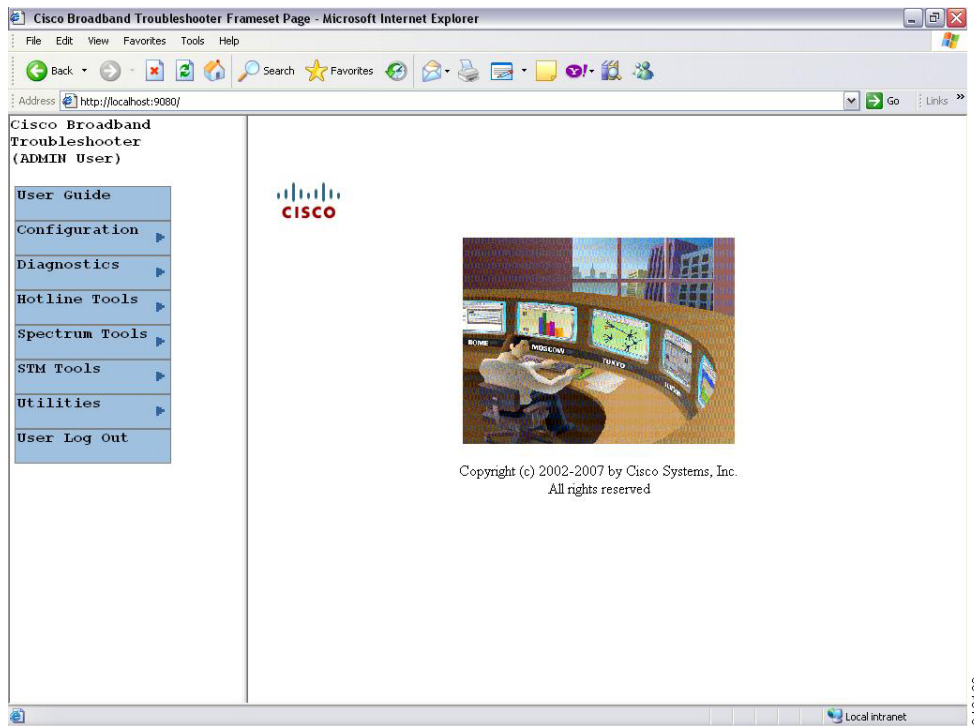
Above the menu, your user type is displayed. For more information on user types, see "User Types in CBT" section on page 3-9.

All tasks in CBT are divided into the following menus:

- User Guide
- Configuration
- Diagnostics
- Hotline Tools
- Spectrum Tools
- STM Tools
- Utilities
- User Log Out

The following sections describe the tasks within each menu.

User Guide

The User Guide menu links to the *Cisco Broadband Troubleshooter Release 3.4 User Guide*.

Configuration

The Configuration menu contains the following tasks:

- **User List**—Specify who can access the application and the level of access permissions.
- **CMTS List**—Specify the routers you want to manage by entering the information manually.
- **CMTS Group**—Organize CMTSs into groups, so that you can manage several CMTSs as a single unit.
- **Scheduler**—Schedule a time to capture data from one or more Cisco CMTSs:
  - **Flap List**—Set up the flap list configuration parameters.
  - **Spectrum Data**—Schedule time to capture spectrum data for the selected Cisco CMTS.
  - **STM Data**—Schedule time to capture STM data for the selected Cisco CMTS.
- **Flap List Parameters**—Specify configuration parameters for the flap list.
- **CiscoView Server**—Identify the CiscoView server so that you can launch CiscoView from CBT.
- **Message Log**—Filter errors and informational messages that the server logs.
- **System**—Modify system-level parameters that are saved to the CONFIGS.INI file.
- **External Interface**—Specify how and where to access subscriber and provisioning information.
- **Poller**—Schedule the polling frequency to procure provisioning information from the Cisco CMTSs.

Diagnostics

The Diagnostics menu contains the following tasks:

- **Flap List Analysis**—Analyze the results of data captured for the selected Cisco CMTSs.
- **Cable Monitor Tool**—Summarize information of Cisco cable modems.
- **Generic Query**—Poll the Cisco CMTS for individual MIB variables.

Hotline Tools

The Hotline Tools menu contains the following tasks:

- **Locate Modem**—Summarize information on one or more cable modems.
- **Modem Status**—Generate a real-time status report for a cable modem.
- **CMTS Dashboard**—Procure detailed information on one or more Cisco CMTSs.
- **Ping Test**—View if a device has connectivity.
- **CiscoView**—Identify the device that you want to monitor with CiscoView.

Spectrum Tools

The Spectrum Tools menu contains the following tasks:

- **Trace Window**—Monitor the power and noise levels for a selected cable modem or upstream port.

- **Spectrogram**—Monitor the power and noise levels *over time* for a selected cable modem or upstream port.

- **CNR Analysis**—Retrieve Carrier-to-Noise Ratio (CNR) for selected modems or upstream ports.

- **CNR Trending**—Retrieve CNR trending data for selected modems or upstream ports.

- **Data Playback**

    - **Trace Window**—Play back a saved Trace window.

    - **CNR Analysis**—Play back a saved CNR analysis.

    - **CNR Trending**—View the saved trending data and to monitor the CNR in the CNR trending chart.

- **Polling Status**

    - **Real Time**—Procure a list of each spectrum analysis that is in process on a client machine.

    - **Scheduled**—View the details of the scheduled spectrum polling events.

STM Tools

The Subscriber Traffic Management Tools menu contains the following tasks:

- **Enforce Rules**—View the STM enforce rules on a Cisco CMTS.

- **All Violators**—View the STM violator modems connected to a Cisco CMTS.

- **All Violators Real Time**—View the STM violator modems connected to a Cisco CMTS.

- **Locate Violator**—Find violator modems connected to a Cisco CMTS.

Utilities

The Utilities menu contains the following tasks:

- **Import**

    - **CMTS List**—Import an ASCII text file of subscriber data, such as name and phone number, into CBT.

    - **Subscriber Data**—Import an ASCII text file of all the managed Cisco CMTSs into CBT, so that you do not have to enter each Cisco CMTS manually.

- **Purge Saved Data**

    - **Flap List**—Remove a saved Flap List Analysis from the database.

    - **Spectrum Data**—Remove a saved Trace Window or CNR analysis from the database.

    - **STM Data**—Remove previously saved spectrum data from the database.

- **Message Log**—View error and information messages that the server logs by using filters to show the level of detail you want.

User Log Out

The User Log Out menu logs you out of the Cisco Broadband Troubleshooter.

User Types in CBT

The number of tasks you see in the CBT menu varies according to the type of user you are. There are two user types in CBT, each with access to different tasks:

- **ADMIN**—The administrator has access to all tasks in each menu.
- **RFTECH**—The RF technician has access to a subset of tasks in the following menus:
  - **Configuration menu**—Can access the **Flap List**, **Spectrum Data**, **STM Data** tasks under the **Scheduler** menu.
  - **Utilities menu**—Can access the **Purge Saved Data** and **Message Log** tasks only. Figure 3-3 shows the Utilities menu for each user type.

In each other menu, the RFTECH user has access to all tasks.

Figure 3-2   Configuration Menus for ADMIN and RFTECH Users
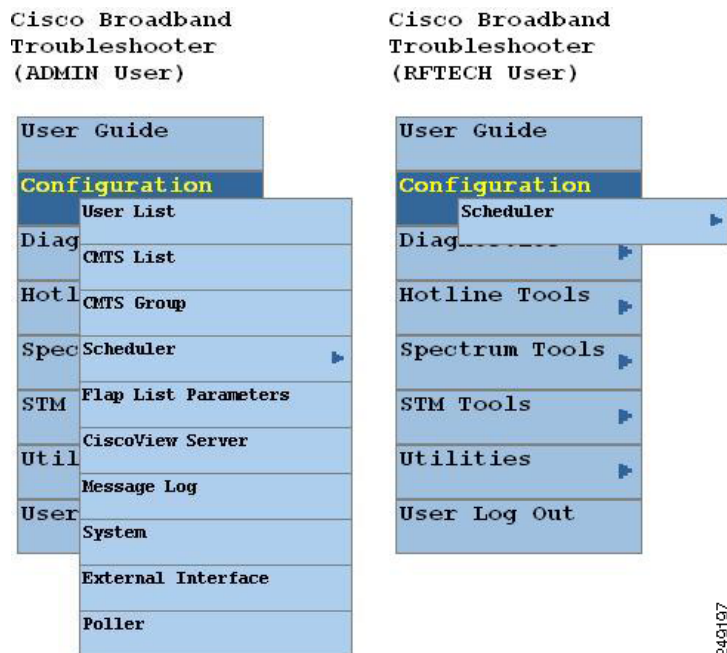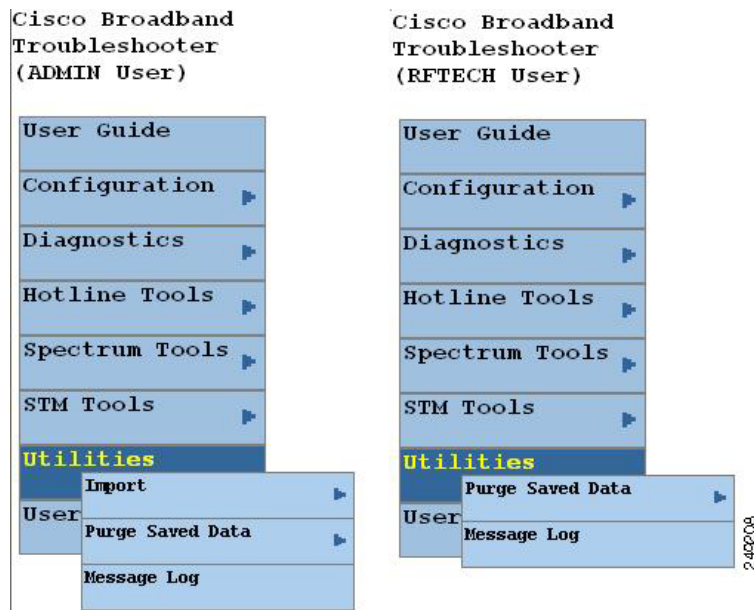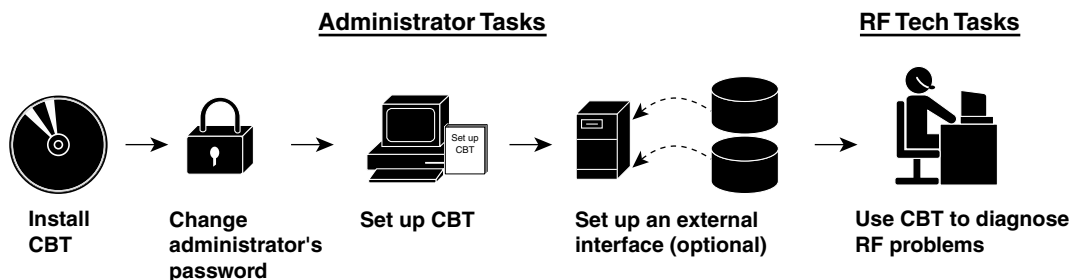
Figure 3-3   Utilities Menus for ADMIN and RFTECH Users

Workflow of Administrator and RF Technician Tasks

Figure 3-4 illustrates a high-level workflow of tasks that each type of user, the administrator and the RF technician, performs in CBT.

Figure 3-4   Administrator and RF Technician Tasks in CBT

Administrator Tasks

The first four tasks shown in Figure 3-4 are performed only by an administrator.

- **Install CBT**—The administrator installs CBT on one of the supported platforms: Linux, Solaris, or Windows.

- **Change administrator's password**—The administrator changes the default ADMIN password to ensure proper security.

- **Set up CBT**—The administrator performs the following setup tasks to configure CBT according to the site's needs:

- Add users, routers, and subscriber information

- Configure parameters in .INI files: CONFIGS.INI, GUNSLINGER.INI, POLLER.INI, and SPECTRUM.INI

- Set message log options to see errors logged by the server

- **Set up an external interface (optional)**—If CBT does not retrieve subscriber or provisioning data from its local database, which is the system default, the administrator sets up an external interface to retrieve the data by using one of the following methods:

  - **Subscriber information**—Can be accessed by script, HTTP, or Lightweight Directory Access Protocol (LDAP)

  - **Provisioning information**—Can be accessed by script, HTTP, LDAP, Cisco Broadband Provisioning Registrar (BPR), or Cisco Network Registrar (CNR)

> **Note** BPR is now called Cisco Broadband Access Center for Cable (BACC) and CNR is now called Cisco CNS Network Registrar (CNS-NR). You can see the new names on Cisco.com and in future releases. The CBT 3.4 GUI and documentation use the latest names and acronyms.

The remainder of this guide explains these tasks in greater detail.

RF Tech Tasks

The last task shown in Figure 3-4 is performed by the RF technician:

- **Use CBT to diagnose RF Problems**—The RF technician can diagnose a frequency problem in the cable plant by using any or all of the CBT troubleshooting capabilities:

  - **CMTS Dashboard**—To view summary information on a Cisco CMTS and the cable modems attached to it

  - **Flap List Analysis**—To analyze data from a Cisco CMTS and categorize problems into four groups: provisioning, reverse path noise, reverse path attenuation, and packet corruption

  - **Spectrum management tools**—To view performance data for an upstream port or cable modem

  - **Cable modem tools**—To ping, monitor, or query a cable modem to assess its status

Setting Up CBT

This section describes the following important setup tasks that only a CBT administrator can perform:

Changing the Administrator Password

For security reasons, we recommend that you change the default password for the administrator.

To change the administrator password:

Step 1   Open the browser and enter the URL for your CBT server:

    http://*CBT server IP address*:9080/

✎ **Note**   In the URL, *CBT server IP address* is the server on which you installed CBT.

The Login dialog box appears, as shown in Figure 3-5.

Step 2   Log in to CBT as **admin** with the default password **changeme**.

Step 3   To change the password, from the **Configuration** menu, choose the administrator from the **User List**, and proceed through dialogs that prompt you for the new password.

Disabling or Enabling Password Text Display

CBT enables you to display password text, or to disable password text display according to your needs. By default, this parameter is set to YES. If you set the corresponding parameter to NO, CBT does not display password text when the contents of the Password field is displayed.

To disable or enable password text display for one or more User Names:

Step 1   Open the GUNSLINGER.INI file available in the CBT server machine.

- For Solaris and Linux, the GUNSLINGER.INI file is under the directory /opt/CSCOcbt/httpServer/webapps/ROOT or <CBT_Install_Directory>/httpServer/webapps/ROOT.

- For Windows, the GUNSLINGER.INI file is under the directory C:\Program Files\Cisco Systems\Cisco Broadband Troubleshooter\httpServer\webapps\ROOT\ or <CBT_Install_Directory>\httpServer\webapps\ROOT\.

Step 2   Change the value of the ShowPasswordWhileEditing parameter to YES or NO as per your need.

- For YES, CBT 3.4 displays the password text when the password field is highlighted.

- For NO, CBT 3.4 does not display the password text when the password field is highlighted.

Step 3   Save the GUNSLINGER.INI file with your changes.

Step 4   Restart CBT 3.4.

Adding Users

You add users in CBT by specifying the following information for a user:

- **User Name**—Specifies the name the user enters in the Login dialog box.

- **Password**—Specifies the password the user enters in the Login dialog box.

- **User Type**—Determines the level of privileges the user has. The two choices are ADMIN and RFTECH.

To add users in CBT:

Step 1   Log in to CBT as **admin**. See Figure 3-5.

Step 2   From the Configuration menu, choose **User List**. The Manage Users dialog box appears.

Step 3   Select **Add User**, and proceed through dialog boxes that prompt you for the new user information. (See Figure 3-6.)

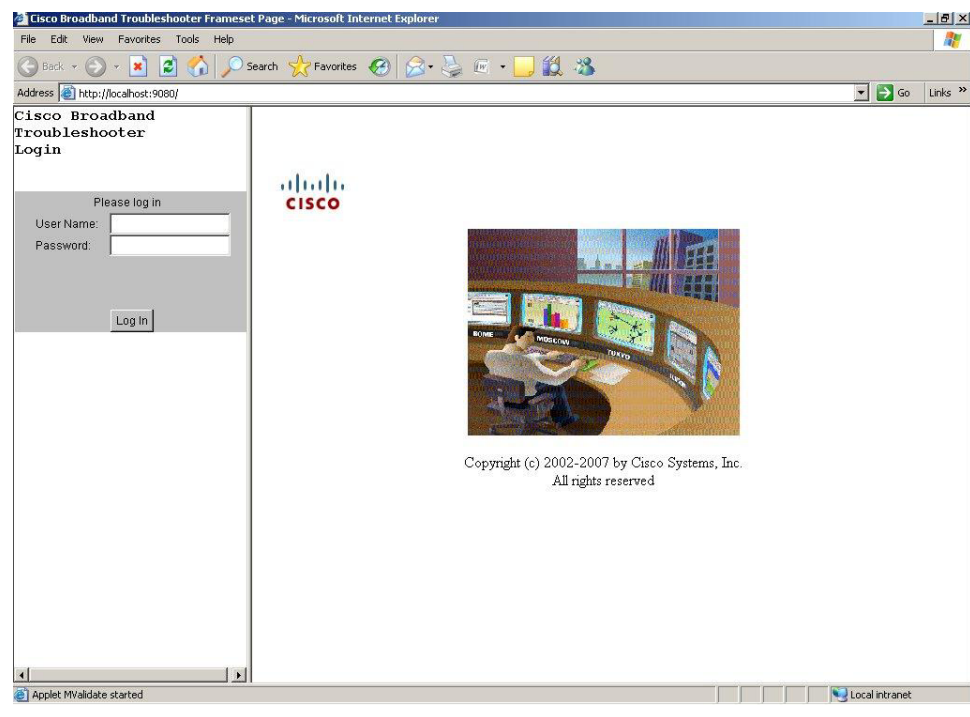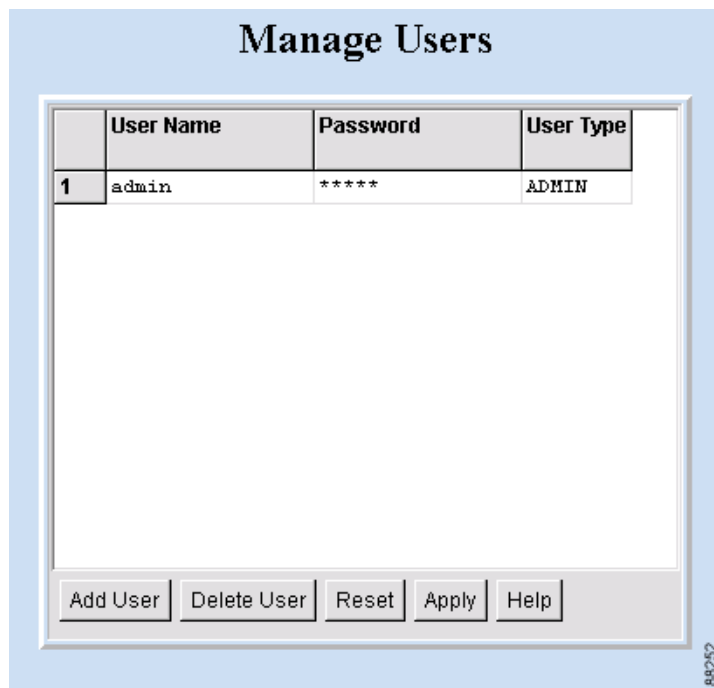*Figure 3-5*   *CBT Log In Window*

Figure 3-6   *Manage Users Dialog Box*

Adding Router Information

You can add router information in CBT by using either of the following methods in the CMTS List option of the Configuration menu:

- Enter information for a router by manually filling in fields for each router.
- Import an ASCII file that contains a list of managed Cisco CMTSs. A sample file is in the following locations:
  - **Linux and Solaris**—/opt/CSCOCBT/samples/showmap/cmts.txt
  - **Windows**—%CSCOCBT_ROOT%\samples\showmap\cmts.txt

If you import an ASCII file, the file must contain 13 fields for each CMTS:

- Fields 1 to 4—IP address, Community String (Read), Community String (Write), and CM Community String (Read).
- Fields 5 to 9—User Name, User Password, Line Password, Enable Password, and Telnet Enable.
- Field 10—Telnet port the router uses (the default is 23).
- Fields 11 and 12—AAA Username Prompt and AAA Password Prompt.
- Field 13—Setting to Ping CMTS. The options are YES or NO, and the default is YES.

Each field must be separated by a comma (,). If you leave a field blank, use a comma as a placeholder for it.

The following example shows the ASCII file format and data for a Cisco CMTS in this format:

```
172.21.73.10,public,private,public,jdoe,nAda,nAda,nAda,yes,23,UserName,Password,yes
```

To add information about the Cisco uBR7200 series, and Cisco uBR10012 universal broadband routers in CBT:

Step 1   Log in to CBT as **admin**.

Step 2   Choose a method to import router information:

- To add information for a router manually, from the Configuration menu, choose **CMTS List.**

- To add information by importing an ASCII file of router information, from the Utilities menu, choose **Import > CMTS List**. (See Figure 3-7.)

Step 3   Designate the location of the Cisco CMTS data file in the File Location field, and complete the remaining fields as required, click **Start** or **Reset**, or click **Status** to display current status.

Step 4   For a complete description of each field in the CMTS List dialog box, click **Help**.

Tip   To successfully manage routers, make sure that you enable SNMP on these routers. Verify that access lists, if configured in the router, allow for SNMP read access from your workstation.

Note   The Cisco CMTS name cannot contain a question mark (?).

Figure 3-7   Import a List of CMTSs Dialog Box

Adding Subscriber Information

To add subscriber information in CBT, you import an ASCII text file that contains the subscriber information. A sample file is in the following locations:

- **Linux and Solaris**—/opt/CSCOCBT/samples/showmap/subscriberinfo.txt

- **Windows**—%CSCOCBT_ROOT%\samples\showmap\subscriberinfo.txt

For each subscriber, the ASCII text file must contain 12 fields. The following fields are typical, although only the first one is required:

1. Cable modem MAC address

2. Account ID

3. Customer name

4. Phone number

5. Address

6. City

7. State

8. Zip

9. Country

10. Class of service

11. Fiber node

12. User-defined field

Each field, including blank ones, must be separated with the pipe symbol |.

The following example shows the ASCIII file format data for a subscriber in this format:

```
000216d5a0cf|ID987654|JohnDoe|4085551212|175 West Tasman|San
Jose|CA|95134|USA|Gold|FiberNode_SanJose|Paid
```

To add subscriber information to CBT:

Step 1   Log in to CBT as **admin**.

Step 2   From the Utilities menu, choose **Import > Subscriber Data**. (See Figure 3-8.)

Step 3   Designate a Data File Location, identify the import method, and click **Start** or **Reset**, according to your needs.

Step 4   For a complete description of each field, click **Help**.

Figure 3-8   *Import Subscriber Data Dialog Box*


Adding CMTS Group

To add a CMTS group:

Step 1   Log in to CBT as **admin**.

Step 2   From the Configuration menu, choose **CMTS Group**. The CMTS Group dialog box appears. (See Figure 3-9.)

Step 3   Enter a group name in the CMTS Group column for each CMTS in the list (the default group name is DEFAULT, which includes all CMTSs not assigned with a group name).

Step 4   To save the group name assignments, click **Apply**.

Step 5   For a complete description of each field, click **Help**.

Note   After you have grouped all the Cisco CMTSs into various groups, you can select the group rather than individual CMTSs.

Figure 3-9   CMTS Group Dialog Box
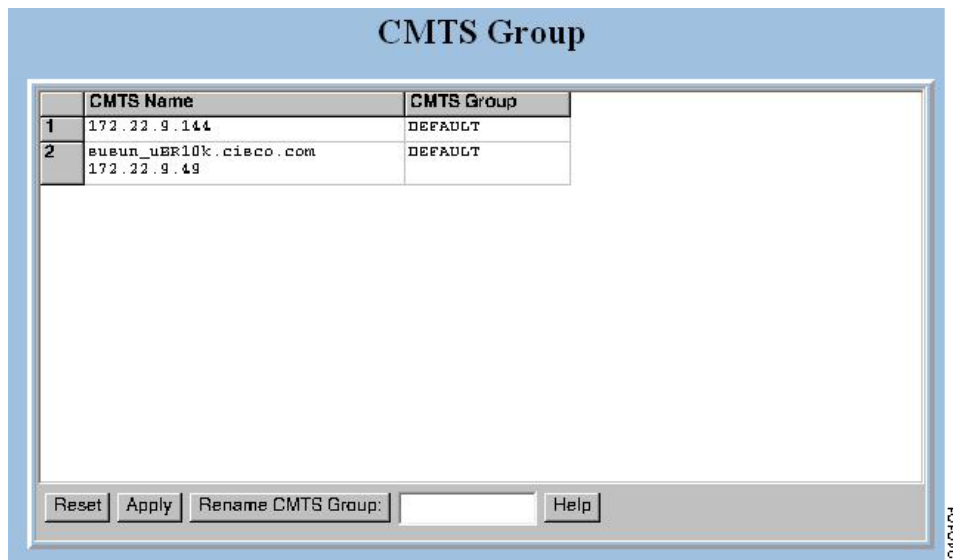
Setting Parameters in .INI Files

This section describes the parameters you set in three .INI files in CBT:

- CONFIGS.INI—Where you set certain system-level parameters
- POLLER.INI—Where you set parameters for the Poller, the separate Java application that polls Cisco CMTSs for provisioning data
- SPECTRUM.INI—Where you set parameters for the spectrum management tools
- GUNSLINGER.INI—Where you set parameters for password text display and hostnames.

Note   Cisco Broadband Troubleshooter and Cisco Cable Diagnostic Manager (CCDM) are companion network management software applications that share some functionality. CCDM is for the MSO customer service representative. In some instances, a parameter in an .INI file applies to one product but not to the other. Those parameters are identified in this section.

This section contains the following topics relating to setting parameters in .INI files for CBT 3.4.

Parameters in the CONFIGS.INI File

This section describes parameters that you configure in the CONFIGS.INI file, which is in the following locations:

- **Linux**—/opt/CSCOcbt/httpServer/webapps/ROOT/WEB-INF/classes
- **Solaris**—/opt/CSCOcbt/httpServer/webapps/ROOT/WEB-INF/classes
- **Windows**—C:\Program Files\Cisco Systems\Cisco Broadband Troubleshooter\httpServer\webapps\ROOT\WEB-INF\classes

Note When you configure parameters in CONFIGS.INI, you must restart the CBT server for the new settings to take effect.

In addition to specifying system-level parameters in the CONFIGS.INI file, you can also specify some of the parameters in the GUI.

Tip To specify configuration parameters in the GUI, from the Configuration menu, choose **System**.

Phone Number Format

The phoneLength parameter applies to Cisco Cable Diagnostic Manager only.

Modem Status Thresholds

When you view a status report for a cable modem, color-coding indicates the modem's status:

- **Green**—Indicates a normal condition. The modem is online and is within the thresholds that are specified to indicate proper performance.
- **Red**—Indicates that an error condition exists. The modem is under or over thresholds that are specified to indicate proper performance.

The following parameters set the thresholds that determine the boundaries for color-coding and must be configured in the CONFIGS.INI file:

- upstreamXmitPowerFloor
- upstreamXmitPowerCeiling
- downstreamSnrFloor
- downstreamReceivePowerFloor
- downstreamReceivePowerCeiling

upstreamXmitPowerFloor—This parameter determines the minimum upstream transmit power for a cable modem to show a functioning status. This measurement is expressed in decibels millivolt (dBmV). The default setting is 34, as shown below:

upstreamXmitPowerFloor=34

upstreamXmitPowerCeiling—This parameter determines the maximum upstream transmit power for a cable modem to show a functioning status. This measurement is expressed in decibels millivolt (dBmV). The default setting is 52, as shown below:

upstreamXmitPowerCeiling=52

downstreamSnrFloor—This parameter determines the minimum signal-to-noise (SNR) for a cable modem to show a functioning status. SNR is a measure of transmission quality, which is expressed by the ratio of good data (signal) to interference (noise) that is heard on a line. This ratio is measured in decibels (dB). A higher ratio indicates a better transmission quality. For example, 30 dB is better than 24 dB. The default setting is 30, as shown below:

    downstreamSnrFloor=30

downstreamReceivePowerFloor—This parameter determines the minimum downstream receive power for a cable modem to show a functioning status. This measurement is expressed in decibels millivolt (dBmV). The default setting is 15, as shown below:

    downstreamReceivePowerFloor=15

downstreamReceivePowerCeiling—This parameter determines the maximum downstream receive power for a cable modem to show a functioning status. This measurement is expressed in decibels millivolt (dBmV). The default setting is 5, as shown below:

    downstreamReceivePowerCeiling=5

Southbound Interface Settings

These parameters apply to Cisco Cable Diagnostic Manager only:

SouthBoundExtIntf

SouthBoundExtIntfTimeout

Modem State Settings

These parameters apply to Cisco Cable Diagnostic Manager only:

ModemStateMaxLife

ModemStateMaxHash

Query Timeout

The administrator specifies external interface parameters to access subscriber and provisioning information. Most of these parameters are in the Set External Interfaces dialog box. However, you must configure the following external interface parameters in the CONFIGS.INI file.

SubscriberExtIntfTimeout—This parameter determines the maximum wait time before CBT times out during a query for subscriber information. This measurement is expressed in milliseconds (msecs). The default setting is 5000, which is equal to 5 seconds, as shown below:

    SubscriberExtIntfTimeout=5000

ProvisionExtIntfTimeout—This parameter determines the maximum wait time before CBT times out during a query for provisioning information. This measurement is expressed in milliseconds (msecs). The default setting is 5000, which is equal to 5 seconds, as shown below:

    ProvisionExtIntfTimeout=5000

Parameters in the POLLER.INI File

This section describes parameters that you configure in the POLLER.INI file, which is in the following locations:

- **Linux and Solaris**—/opt/CSCOcbt/bin

- **Windows**—%CSCOCBT_ROOT%\bin

> **Note** For a detailed description of the Poller, see the "About the Poller" section on page 3-33.

The Poller accesses POLLER.INI to gather the following configurable parameters:

- maximumThread

- maximumDBConnection

- SnmpTimeout

- SnmpRetry

- Debug

- maximumAge

- PollerServerPort

maximumThread—This parameter determines the maximum number of different execution threads that can run simultaneously in the Poller. The valid range is 1 to 50. The default setting is 20, as shown below:

maximumThread=20

maximumDBConnection—This parameter determines the maximum number of CBT Sybase database connections the Poller uses to perform the polling operation. The valid range is 1 to 7. The default setting is 7, as shown below:

maximumDBConnection=7

SnmpTimeout—This parameter determines the number of seconds before the attempt to create the SNMP connection reaches a timeout or fail. The valid range is 1 to 3. The default setting is 2, as shown below:

SnmpTimeout=2

SnmpRetry—This parameter determines the number of times you want to try to create the SNMP connection. The valid range is 1 to 5. The default setting is 3, as shown below:

SnmpRetry=3

Debug—This parameter determines if debug messages are sent to the log file, which is in the following location:

/opt/CSCOcbt/logs/Poller.log

Valid values are true and false. The default setting is false, as shown below:

Debug=false

maximumAge—This parameter tells the Poller which outdated records to purge, based on the number of polling intervals that have occurred during which those records have not been updated. This measurement is expressed in polling intervals. A valid range is 1 to 7. The default setting is 2, as shown below:

maximumAge=2

PollerServerPort—This parameter sets the HTTP server port number where the Poll Manager listens to polling requests. The default setting is 8040:

PollerServerPort=8040

Note If a parameter in POLLER.INI is set out of the valid range, CBT resets the parameter to its default value.

Parameters in the SPECTRUM.INI File

This section describes parameters that you configure in the SPECTRUM.INI file, which is in the following locations:

- **Linux**—/opt/CSCOcbt/jakarta-tomcat-4.0.3/webapps/ROOT/WEB-INF/classes
- **Solaris**—/opt/CSCOcbt/httpServer/servlets
- **Windows**—C:\Program Files\Cisco Systems\Cisco Broadband Troubleshooter\httpServer\webapps\ROOT\WEB-INF\classes

---

Note When you configure parameters in SPECTRUM.INI, you must restart the CBT server for the new settings to take effect.

The parameters you specify in the SPECTRUM.INI file affect the following spectrum management tools:

- Trace Window
- Spectrogram
- CNR Analysis
- CNR Trending
- Data Playback
- Polling Status

The spectrum management tools access SPECTRUM.INI to gather the following configurable parameters:

- CNRFloor
- CNRCeiling
- CNRFloorColor
- CNRCeilingColor
- SpecDataMaxRequests
- SpecDataQueryInterval
- SpecDataMaxCPU
- CableModemCacheAge

CNRFloor—This parameter determines the lower threshold for the carrier-to-noise ratio that you see in the spectrum tools. CNR is a measure of transmission quality, which is expressed by the ratio of good data from the carrier to interference or noise that is heard on a line. A higher ratio indicates a better transmission quality. If the CNR is below this lower threshold, the value is highlighted in the color you

specify in the CNRFloorColor parameter. This measurement is expressed in decibels (dB). Acceptable values range from -20 to 60 dB. If an unacceptable value is entered, the system default is used. The default setting is 20, as shown below:

CNRFloor=20

CNRCeiling—This parameter determines the upper threshold for the carrier-to-noise ratio that you see in the spectrum tools. CNR is a measure of transmission quality, which is expressed by the ratio of good data from the carrier to interference or noise that is heard on a line. A higher ratio indicates a better transmission quality. If the CNR is below this upper threshold, the value is highlighted in the color you specify in the CNRCeilingColor parameter. This measurement is expressed in decibels (dB). Acceptable values range from -20 to 60 dB. If an unacceptable value is entered, the system default is used. The default setting is 30, as shown below:

CNRCeiling=30

CNRFloorColor—This parameter determines the color that is used to highlight a carrier-to-noise ratio that is below the lower threshold, which you specify in the CNRFloor parameter. Accepted colors are red, yellow, blue, cyan, green, magenta, orange, and pink. If an unacceptable color is entered, the system default is used. The default setting is red, as shown below:

CNRFloorColor=Red

CNRCeilingColor—This parameter determines the color that is used to highlight a carrier-to-noise ratio that is below the upper threshold, which you specify in the CNRCeiling parameter. Accepted colors are red, yellow, blue, cyan, green, magenta, orange, and pink. If an unacceptable color is entered, the system default is used. The default setting is yellow, as shown below:

CNRCeilingColor=Yellow

SpecDataMaxRequests—This parameter determines the maximum number of active rows of ccsSpectrumRequestTable in the CMTS SNMP agent. This setting is necessary to avoid overloading the CMTS, and CBT checks to ensure that the number is not exceeded. If the number of active rows in the associated CMTS has reached the specified value, new spectrum requests cannot be launched. The default setting is 10, as shown below:

SpecDataMaxRequests=10

SpecDataQueryInterval—This parameter determines the time required after a spectrum data response and before the next spectrum data query. This measurement is expressed in milliseconds and should not be edited. The default setting is 5000, as shown below:

SpecDataQueryInterval=5000

SpecDataMaxCPU—This parameter determines the CPU utilization in the CMTS SNMP agent. This setting is necessary to avoid overloading the CMTS, and CBT checks to ensure that the percentage is not exceeded. If the CPU utilization in the associated CMTS has reached the specified value, new spectrum requests cannot be launched. This measurement is expressed in percentage. The default setting is 80, as shown below:

SpecDataMaxCPU=80

CableModemCacheAge—This parameter determines the cable modem caching time for the spectrum management tools. If the value is set to 0, the CBT server generates an SNMP request and bypasses the cache, which slows down performance if there are many modems associated with the selected CMTS. This measurement is expressed in seconds. If a negative number is entered, the system default is used. The default setting is 3600, as shown below:

CableModemCacheAge=3600

Note   You can update the cache for a selected CMTS manually by using the GUI. From the Spectrum Tools menu, choose **Trace Window**, **Spectrogram**, **CNR Analysis**, **CNR Trending**, or **Polling Status**. Then click **Update CM Info**.

Several additional administrative parameters may be set in the SPECTRUM.INI file to support the latest CBT 3.4 Spectrum Analysis. Refer to the "Configuring Administrative Parameters for Spectrum Analysis" section on page 6-2 for a full list of such parameters, and instructions for changing related settings.

Parameters in the GUNSLINGER.INI File

The GUNSLINGER.INI file can be used to configure CBT 3.4 features for the following parameters:

- The value of the ShowPasswordWhileEditing parameter may be set to YES or NO to hide or to display password text, when the password is highlighted. Refer to the "Disabling or Enabling Password Text Display" section on page 3-12 for additional information.

- The UseHostName parameter may be set to to YES or NO to support hostname-based communications between Applet and Servlet on the network, in addition to sustaining IP-based communications, as with the prior CBT 3.3. Refer to the "Mapping Hostnames from Applet to Servlet" section on page 6-1 for additional information.

Retrieving Subscriber or Provisioning Data by Using an External Interface

With CBT you can set up an external interface to retrieve subscriber or provisioning data:

- **Subscriber information**—Data such as a customer's name and account number

- **Provisioning information**—Data such as the IP address for a customer's cable modem and the IP address for the Cisco CMTS on which the modem is located

You can use the following methods to set up an external interface:

- **Script**—Can be used for subscriber or provisioning information or both

- **Application on an HTTP server**—Can be used for subscriber or provisioning information or both

- **LDAP**—Can be used for subscriber or provisioning information or both

- **BPR**—Can be used for provisioning information only

- **CNR**—Can be used for provisioning information only

- **Local Database**—(Default) Can be used for subscriber or provisioning information or both

Note   If you set an external interface and CBT does not find subscriber or provisioning data there, CBT reverts to the local database.

Figure 3-10 shows the dialog box where you specify the method. The remainder of this section describes how to set up an external interface with each method, referring to Figure 3-10.

This section contains the following topics:

Figure 3-10   Set External Interfaces Dialog Box

Retrieving Data with a Script

You can implement an external data retrieval application by using a scripting language. To see a sample script that you can modify according to your needs, see "Shell Script for Retrieving Subscriber or Provisioning Information" section on page 8-1.

Note   You can also implement an external data retrieval application in programming languages such as PL/SQL, C/C++, and Java, as long as it is embedded in a shell script.

Script Parameters for MAC Address Information

The script must support the ability to search for a cable modem's MAC address by entering the customer's phone number or IP address. The input parameters for the script are:

* *subscriber-info-script-name* GET_MAC PHONE *phone-number*

* *provision-info-script-name* GET_MAC IP *ip-address*

For example, the following script invokes a search for the modem's MAC address by using the phone number 408-123-4567:

```
/opt/tools/subscriber-query.sh GET_MAC PHONE 4081234567
```

The next script invokes a search for the modem's MAC address by using the IP address 172.2.3.1:

```
/opt/tools/provision-query.sh GET_MAC IP 172.2.3.1
```

Note   A MAC address query by phone number invokes the subscriber information script. A MAC address query by IP address invokes the provisioning information script.

The output of the script must be in the following format:

OUT_DATA=MAC followed by one or more MAC addresses (non-dotted format) separated by ^

The following examples show the output for one and two MAC addresses:

```
OUT_DATA=MAC^001c64ff23ef^
OUT_DATA=MAC^001c64ff23ef^013e45ed1245^
```

Script Parameters for Subscriber Information

If you use a script to query subscriber information, it needs to support the ability to search for subscriber data, such as name and account number, by entering the MAC address of the subscriber's cable modem. The input parameters for the script are:

script-name GET_SUBSCRIBER MAC *non-dotted-modem-mac-address*

For example, the following script invokes a search for subscriber data by using the MAC address 001c.ab23.45fe in a non-dotted format:

```
/opt/tools/subscriber-query.sh GET_ SUBSCRIBER MAC 001cab2345fe
```

The output of the script must be in the following format, separated by ^:

OUT_DATA=SUBSCRIBER^*Field1=value1*^*Field2=value2*^*Field3=value3*^*Field4=value4*^*Field5=value5*^

The following example shows the output for a subscriber's data:

```
OUT_DATA=SUBSCRIBER^Account Number=123456^Name=Doe_John^Address=123 Tasman, San Jose,
CA 93443^Phone=4081234567^Class of Service=N/A^FiberNode=FIBER_1^Customer
Since=1999^Account Status=Paid
```

> **Note** In the Real-Time Modem Status Report, CBT displays subscriber information in the order in which the fields are returned from the script.

Script Parameters for Provisioning Information

If you use a script to query provisioning information, it needs to support the ability to search for provisioning data, such as CMTS and cable modem IP addresses, by entering the MAC address of a cable modem. The input parameters for the script are:

script-name GET_PROVISION MAC *non-dotted-modem-mac-address*

For example, the following script invokes a search for provisioning data by using the MAC address 001c.ab23.45fe:

/opt/tools/subscriber-query.sh GET_PROVISION MAC 001cab2345fe

The output of the script must be in the following format:

```
OUT_DATA=PROVISION^cmts-ip-address^cm-ip-address^
```

The following example shows the output for provisioning data:

```
OUT_DATA=PROVISION^127.23.45.1^127.23.127.5^
```

Error Handling for Script

If an error occurs within the script or the embedded application called by the script, the script should return the output in the following format:

OUT_DATA=ERROR^*error-message*^

The following example shows output for an error:

```
OUT_DATA=ERROR^Unable to query the subscriber database.^
```

In the graphical user interface (GUI), CBT displays the error message to the user in a message box.

Retrieving Data with a Script

To retrieve subscriber or provisioning information by using a script:

Step 1   Review the sample script and modify it according to your needs. See the "Sample Script Code" section on page 8-4.

Step 2   From the Configuration menu, choose **External Interface** to specify one or both of the following:

- In the Subscriber Information section, click **Script** and enter the **Script Location** of the file.
- In the Provisioning Information section, click **Script** and enter the **Script Location** of the file.

Step 3   For a complete description of each field in the External Interface dialog box, click **Help**.

Troubleshooting Script Problems

See the "Troubleshooting the Script" section on page 8-3.

Retrieving Data with an Application on an HTTP Server

You can implement an external data retrieval application by using an application running on an HTTP server. CBT sends the request to the HTTP server by using the POST method. To see a sample application file that you can modify according to your needs, see "Java Code for Retrieving Subscriber or Provisioning Information" section on page 8-4.

HTTP Parameters for MAC Address Information

The application running on an HTTP server must support the ability to search for a cable modem's MAC address by entering the customer's phone number or IP address. CBT sends the following parameters to the appropriate server:

- REQUEST=GET_MAC
- SEARCH_TYPE=*PHONE or IP*
- IN_PARAM=*phone* or *ip*

For example, the following parameters search for the modem's MAC address by using the phone number 408-123-4567:

```
REQUEST=GET_MAC
SEARCH_TYPE=PHONE
IN_PARAM=4081234567
```

The response from the server must be in the following format:

OUT_DATA=MAC followed by one or more MAC addresses separated by ^

The following examples show the output for one and two MAC addresses:

```
OUT_DATA=MAC^001c64ff23ef^
OUT_DATA=MAC^001c64ff23ef^013e45ed1245^
```

Note When the SEARCH_TYPE is PHONE, the subscriber information URL is used. When the SEARCH_TYPE is IP, the provisioning information URL is used.

HTTP Parameters for Subscriber Information

If you use an application running on an HTTP server to query subscriber information, it needs to support the ability to search for subscriber data, such as name and account number, by entering the MAC address of the subscriber's cable modem. CBT sends the following parameters to the server:

- REQUEST=GET_SUBSCRIBER
- SEARCH_TYPE=MAC
- IN_PARAM=*non-dotted-modem-mac-address*

For example, the following parameters search for subscriber data by using the MAC address 001cab2345fe:

```
REQUEST=GET_SUBSCRIBER
SEARCH_TYPE=MAC
IN_PARAM=001cab2345fe
```

The output of the script must be in the following format, separated by ^:

OUT_DATA=SUBSCRIBER^*Field1=value1^Field2=value2^Field3=value3^Field4=value4^Field5=value5^*

The following example shows the output for a subscriber's data:

```
OUT_DATA=SUBSCRIBER^Account Number=123456^Name=Doe_John^Address=123 Tasman, San Jose,
CA 93443^Phone=4081234567^Class of Service=N/A^FiberNode=FIBER_1^Customer
Since=1999^Account Status=Paid
```

Note In the Real-Time Modem Status Report, CBT displays subscriber information in the order in which the fields are returned from the script.

HTTP Parameters for Provisioning Information

If you use an application running on an HTTP server to query provisioning information, it needs to support the ability to search for provisioning data, such as CMTS and cable modem IP addresses, by entering the MAC address of the cable modem. CBT sends the following parameters to the server:

- REQUEST=GET_PROVISION
- SEARCH_TYPE=MAC
- IN_PARAM=*non-dotted-modem-mac-address*

For example, the following parameters search for provisioning data by using the MAC address 001cab2345fe:

```
REQUEST=GET_PROVISION
SEARCH_TYPE=MAC
IN_PARAM=001cab2345fe
```

The response from the server must be in the following format:

OUT_DATA=PROVISION^*cmts-ip-address^cm-ip-address^*

The following example shows the output for provisioning data:

```
OUT_DATA=PROVISION^127.23.45.1^127.23.127.5^
```

Error Handling for HTTP

If an error occurs within the application running on an HTTP server, the script should return the output in the following format:

OUT_DATA=ERROR^*error-message^*

The following example shows output for an error:

```
OUT_DATA=ERROR^Unable to query the subscriber database.^
```

In the GUI, CBT displays the error message to the user in a message box.

Retrieving Data with an HTTP Application

To retrieve subscriber or provisioning information with an application on an HTTP server:

Step 1 Review the sample application file and modify it according to your needs. See the "Sample Java Code" section on page 8-8.

Step 2 From the Configuration menu, choose **External Interface** to specify one or both of the following:

- In the Subscriber Information section, click **HTTP** and enter the **URL Location** of the file.
- In the Provisioning Information section, click **HTTP** and enter the **URL Location** of the file.

Step 3 For a complete description of each field in the External Interface dialog box, click **Help**.

Troubleshooting HTTP Problems

See "Troubleshooting the Sample HTTP Application" section on page 8-8.

Retrieving Data with LDAP

You can use Lightweight Directory Access Protocol (LDAP) to retrieve external subscriber or provisioning information. LDAP is a nonproprietary, standards-based protocol. If you use the LDAP method, see your LDAP server administrator to obtain the information about the LDAP server that CBT requires.

CBT 3.4 supports LDAP Version 2.0, which was tested with Netscape LDAP Server Version 4.0 and iPlanet Version 5.1.

To retrieve external subscriber or provisioning information by using LDAP:

Step 1 From the Configuration menu, choose **External Interface**.

Step 2 Depending on the type of information you want to retrieve, do one or both of the following:

- To retrieve subscriber information, in the Subscriber Information section select **LDAP** and click **LDAP Access Parameters** to open the LDAP Access Parameters dialog box.
- To retrieve provisioning information, in the Provisioning Information section select **LDAP** and click **LDAP Access Parameters** to open the LDAP Access Parameters dialog box.

Step 3 To fill in the LDAP Access Parameters dialog box, see your LDAP server administrator to obtain the required information and click **Help** for directions on how to fill in each of the LDAP fields that CBT requires.

Retrieving Data with BPR

You can retrieve provisioning information only by using Cisco Broadband Provisioning Registrar (BPR). BPR automates provisioning and configuration tasks. CBT supports BPR 2.0. For product information, refer to:

http://www.cisco.com/en/US/products/sw/netmgtsw/ps529/index.html

> **Note** BPR has recently been renamed as Cisco Broadband Access Center for Cable (BACC). You will see the new name on Cisco.com and in future releases. The CBT 3.4 GUI and documentation use the current name and acronym.

To retrieve provisioning information by using BPR:

Step 1   From the Configuration menu, choose **External Interface**.

Step 2   In the Provisioning Information section, click **BPR**. To interact with BPR, CBT requires the following information:

- RDU Server IP Address
- RDU Server Port Number
- Admin Password

Step 3   For information on each field, click **Help**.

Retrieving Data with CNR

You can retrieve provisioning information only by using Cisco Network Registrar (CNR). CNR is an application that provides scalable Domain Name System (DNS), Trivial File Transfer Protocol (TFTP), and Dynamic Host Configuration Protocol (DHCP) services. For product information, refer to:

http://www.cisco.com/en/US/products/sw/netmgtsw/ps1982/index.html

If you use CNR, the following caveats apply to the setup:

- Either the CNR GUI or server component must be installed on the CBT server.
- The CNR server component can be installed on the same server as CBT or on a different server. If it is installed on a separate server, the CBT server must know the location of that server.
- CBT currently works with one CNR at a time.
- CBT supports CNR 5.0.3 and 5.5.4.

> **Note**   CNR has recently been renamed to Cisco CNS Network Registrar (CNS-NR). You will see the new name on Cisco.com and in future releases. The CBT 3.4 GUI and documentation use the current name and acronym.

To retrieve provisioning information by using CNR:

Step 1   From the Configuration menu, choose **External Interface**.

Step 2   In the Provisioning Information section, click **CNR**. To interact with CNR, CBT requires the following information:

- Cluster Name/IP Address
- Admin User Name
- Admin Password
- Client Path

Step 3   For information on each field, click **Help**.

Retrieving Subscriber Data from the Local Database

CBT can retrieve subscriber data from its own local Sybase database after the data has been added in CBT. After installation, the local database is the default method for retrieving subscriber data.

To retrieve subscriber information from the local database:

Step 1   Add subscriber information by following the directions in the "Adding Subscriber Information" section on page 3-16.

Step 2   From the Configuration menu, choose **External Interface**.

Step 3   In the Subscriber Information section, click **Local Database**.

Step 4   (Optional) To update or replace the existing subscriber information, click **Import Subscriber** to open the Import Subscriber Data dialog box, as shown in Figure 3-11.

Step 5   In the dialog box, click **Help** for directions on how to import subscriber data.

Figure 3-11   Import Subscriber Data Dialog Box

Retrieving Provisioning Data from the Local Database

CBT can retrieve provisioning data from its own local Sybase database after the data has been added to it. After installation, the local database is the default method for retrieving provisioning data. To store provisioning information in its local database, CBT polls CMTSs using SNMP. CBT provides two ways to do this:

- **The Poller Scheduler dialog box**—Use this method if you prefer to work in the CBT GUI.

- **A separate Java poller application**—Use this method, referred to as the Poller, if you prefer to work with a command-line interface.

Tip   If you are using CBT on the Windows operating system, we recommend that you use the CBT GUI method.

About the Poller

When you install CBT, the default method for retrieving provisioning information is the local database. Because the Poller is part of the process for this method, it is on by default after installation. The default schedule for the Poller is to run at or about midnight and to repeat every 24 hours. You can change these settings according to your own needs.

To query Cisco CMTSs using the Poller, you specify two parameters:

- *delta-start-time*—When the Poller should start to poll the CMTSs. Expressed in hours, the delta is the difference between when you schedule the polling and when the polling begins.

- *poll-interval*—The interval, expressed in hours, between polling sessions.

The syntax to start the Poller on Linux or Solaris is:

/opt/CSCOcbt/bin/start_poller *delta-start-time poll-interval*

The following example shows a polling session that starts 8 hours after you schedule it and repeats every 24 hours:

/opt/CSCOcbt/bin/start_poller 8 24

The following example shows how to stop the Java Poller application on Linux or Solaris:

/opt/CSCOcbt/bin/stop_poller

Note   There is no impact to CBT if you turn the Poller off.

At each polling interval, the Poller accesses the CBT routers list file and performs SNMP queries to each CMTS using its SNMP read-only community string. The CBT routers list file is in the following locations:

- **Linux**—/opt/CSCOcbt/httpServer/webapps/ROOT/WEB-INF/classes/config

- **Solaris**—/opt/CSCOcbt/httpServer/webapps/ROOT/WEB-INF/classes/config

- **Windows**—C:\Program Files\Cisco Systems\Cisco Broadband Troubleshooter\httpServer\webapps\ROOT\WEB-INF\classes\config

In addition to the on-demand polling that you schedule, CBT submits a polling request when it detects that a change has been made to the list of routers that CBT manages. For example, CBT submits a polling request when it detects that a new chassis has been added to a router.

> **Note** The more frequent the polling interval, the more SNMP traffic that is generated to the CMTSs. This means that CPU utilization on the CMTS increases when polling is in progress. The impact on the CBT server side is minimal.

To retrieve provisioning information from the local database:

Step 1 Add provisioning data by following the directions in the "Adding Subscriber Information" section on page 3-16.

Step 2 From the Configuration menu, choose **External Interface.**

Step 3 In the Provisioning Information section, click **Local Database.**

Scheduling the Poller

To schedule when and how often the Poller populates the local database with provisioning information that it gathers from CMTSs, you can use the GUI or type a command.

To use the GUI, from the Configuration menu, choose **Poller**. The Schedule CMTS Polling dialog box appears, as shown in Figure 3-12. In this dialog box, click **Help** for directions on how to schedule the Poller.

To use a command, type the following command and specify the parameters in hours, as explained in the previous section:

```
/opt/CSCOcbt/bin/start_poller delta-start-time poll-interval
```

Figure 3-12   Schedule CMTS Polling Dialog Box

Getting Summary Information and a Detailed Real-Time Status Report for a Modem

To get summary information on a cable modem, you can locate the modem by entering the MAC address. If you retrieve subscriber or provisioning data from the local database, you can also locate the modem by using any of the following advanced search criteria:

- Phone number
- Account ID
- Name
- Street address
- Zip code

The CBT advanced search feature also allows you to use the asterisk (*) for wildcard searches. For example, if you enter 1234* for the account ID, you get a list of all cable modems for subscribers who have account numbers that begin with 1234.

> ✎
> **Note**   The CBT advanced search criteria applies to the local database only. If you set up an external interface for subscriber or provisioning data, you must locate a modem by entering its MAC address.

To get detailed information on a cable modem, you can get a real-time modem status report, as shown in Figure 3-13. The information for a cable modem comes from three sources:

- The CMTS, which is the router that directs network traffic.
- The cable modem itself.
- The provider's subscriber database, where each provider can specify the information that appears. Typical information would be the customer's name, phone number, and account number. However, the information is not limited to that.

Within the status report, the following colors are used in certain fields to indicate performance:

- **Green**—Indicates a value is within the allowed threshold.
- **Red**—Indicates a value is above or below the allowed threshold.

For more information on setting thresholds, see the "Modem Status Thresholds" section on page 3-19.

This section contains the following topics:

Figure 3-13   Real-Time Modem Status Report Data Display

CISCO SYSTEMS

Broadband Modem Real-Time Status   April 16, 2003
                                                   1:35 PM America/Los_Angeles

Dynamic Status for cable modem 0007.0e02.c2af

Help

Cable Modem Status   (From CMTS)

172.22.85.7 Ping -> Successful.		
CMTS CPU Usage	Five Seconds	5%
	One Minute	5%
	Five Minutes	6%
CM IP Address	172.22.127.10	
Upstream Channel	Cable3/0-upstream5	
Upstream Receive Power	-0.5	dBmV
Timing offset	4086	
Service Id	18	
Modem Status	online	
Times Online	7	
Minimum Online	0 days 0 hours	
Maximum Online	4 days 3 hours	
Average Online	0 days 23 hours	
Minimum Offline	0 days 0 hours	
Maximum Offline	0 days 0 hours	
Average Offline	0 days 0 hours	
CM Provision Mode	DOCSIS 1.1	
Current Number of Connected CPEs	0	

Cable Modem Status   (From CM)

172.22.127.10 Ping -> Successful.		
CM CPU Usage	Five Seconds	0 %
	One Minute	2 %
	Five Minutes	2 %
Description	<> IOS (tm) 925 Software (UBR925-K9O3SV9Y5-M), Experimental Version 12.2 Copyright (c) 1986-2003 by cisco Systems, Inc Compiled Mon 07-Apr-03 00:37 by	
Device Type	ciscoUBR925	
System Up Time	5 days 0 hours	
Downstream Channel Power	-12.3	dBmV
Upstream Transmit Power	30.0	dBmV
Resets	7	
Lost Syncs	15	
Downstream Signal to Noise Ratio	27.1	dB
CM Config File	docsis11.cfg	
DHCP	172.22.127.3	
TOD	172.22.127.3	
TFTP	172.22.127.3	

Misc Info (From Database)

Acct ID	ID123456
Name	Joe Cisco
Phone	408-123-4567
Address	325 West Tasman Drive San Jose, CA 95134 USA
Class Of Service	DataOnly
Fiber Node	SanJose_1

Modem's Service Flow   (From CMTS)

Service Flow Id	Direction	Curr State	Sid	Schedule Type	Priority	Maximum Sustainted Rate	Maximum Burst	Minimum Rerserved Rate	ThroughPut	Primary
37	upstream	act	18	bestEffort	0	0	3044	0	64	Yes
38	downstream	idle	0	undefined	0	0	3044	0	64	Yes
55	upstream	act	27	bestEffort	0	0	3044	0	64	No
56	downstream	idle	0	undefined	0	0	3044	0	64	No

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Getting Summary Information on a Modem

To get summary information on a modem:

Step 1   From the Hotline Tools menu, choose **Locate Modem**. The Locate Broadband Modems dialog box appears, as shown in Figure 3-14.

Step 2   Use one of the following methods to locate a modem:

- If you know the complete MAC address, enter one or more MAC addresses and click **Start**.

- If you are using the local database for subscriber or provisioning data and want to search by using other criteria, such as phone number or wildcard strings, click **Advanced Search**. The Locate A Broadband Modem dialog box appears, as shown in Figure 3-15.

Step 3   For a complete description of each field in these dialog boxes, click **Help**.

Figure 3-14   Locate Broadband Modems Dialog Box
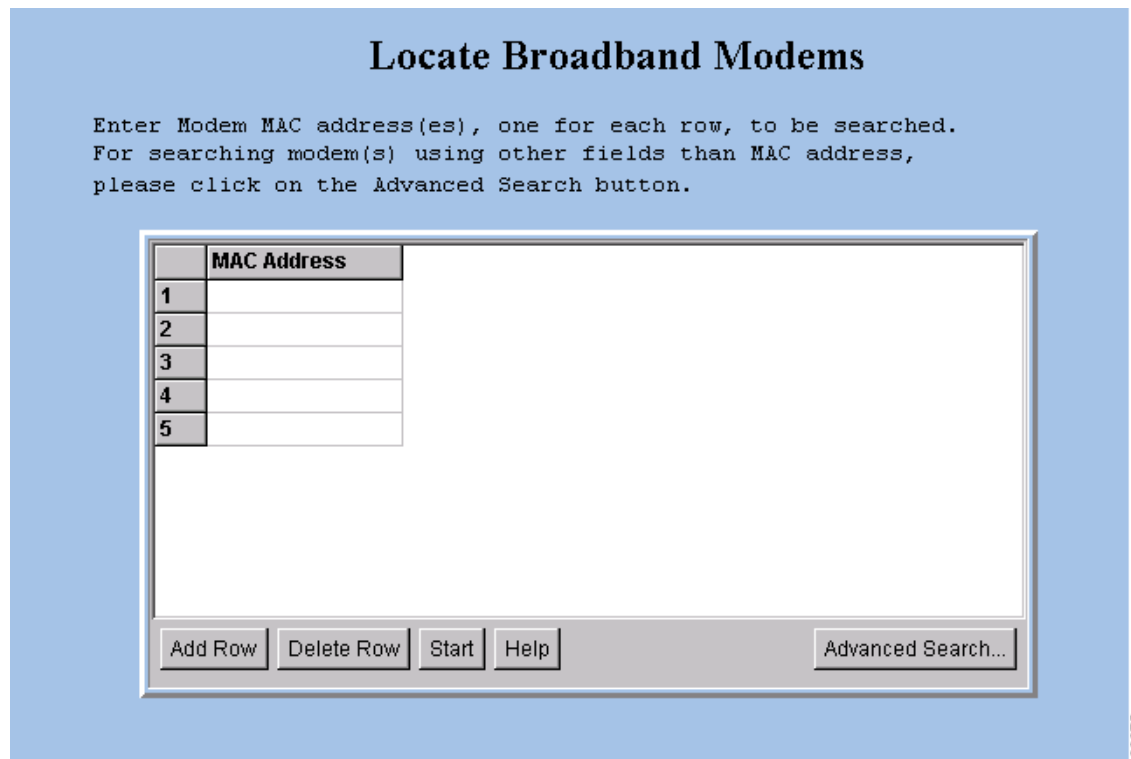
Figure 3-15   Locate A Broadband Modem Dialog Box

Getting a Detailed Real-Time Status Report for a Modem

To get a detailed status report for a cable modem:

Step 1   From the Hotline Tools menu, choose **Modem Status**. The Real Time Status of A Broadband Modem dialog box appears, as shown in Figure 3-16.

Step 2   Enter the MAC address for the cable modem for which you want to see a status report and click **Real Time Status**. The Real-Time Modem Status Report for that modem appears, as shown in Figure 3-13.

Step 3   For a complete description of each field in the dialog box and the Real-Time Modem Status Report, click **Help**.

Figure 3-16   Real Time Status of a Broadband Modem Dialog Box
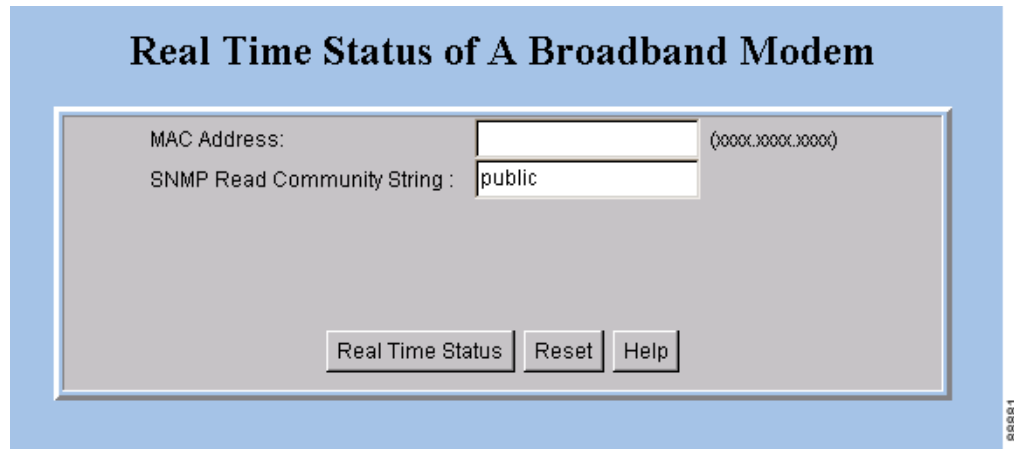
Reviewing the CMTS Dashboard

To get summary information on a Cisco CMTS, review the CMTS Dashboard dialog box.

For the CMTS that you select, the CMTS Dashboard provides the following information:

- Hostname
- IP address
- Interface/Upstream
- Counter reset time
- Signal-to-noise ratio (SNR)
- Minimum receive power level of all modems associated with that CMTS
- Maximum receive power level of all modems associated with that CMTS
- Percentage of time that the modem stays online
- Number of modems that are online
- Total number of modems that connect to the interface
- Router name

For printing or collaborative troubleshooting, you can generate an HTML version of the information.

To access the CMTS Dashboard:

Step 1   From the Hotline Tools menu, choose **CMTS Dashboard**.

Step 2   For a complete description of each field in the CMTS Dashboard dialog box, click **Help**.

Figure 3-17 shows the CMTS Dashboard.

Figure 3-17   CMTS Dashboard Dialog Box

Showing and Configuring the Flap List Analysis

To analyze the results of data captured from one or more Cisco CMTSs, review the Flap List Analysis Details display. The analysis shows the number of modems with the following problems:

- Provisioning—The issue could be at one of the provisioning servers.

- Reverse path noise—The issue could be from trouble in the cable plant.

- Reverse path attenuation—The issue could be from a power adjustment that the subscriber makes.

- Packet corruption—The issue could be from degradation on the network.

Note   You can not get a flap list analysis for a CMTS that is not from Cisco.

Showing the Flap List Analysis

To show a flap list for one or more CMTSs:

Step 1   From the Diagnostics menu, choose **Flap List Analysis**.

Step 2   Select one or more Cisco CMTSs to analyze and click **Analyze**.

Step 3   (Optional) To see a lower level of detail, click **Details**.

Step 4   For a complete description of each field in the Flap List Analysis dialog boxes, click **Help**.

Figure 3-18 shows the Flap List Analysis information display, which you can sort according to your needs by clicking a column heading. For example, to sort the provisioning problems by MAC address, click the MAC Address column heading.

Figure 3-18   Flap List Analysis Details Display

From the Flap List Analysis Details information display, you can see a lower level of detail that contains the following information:

- General status of each interface
- Total number of modems reported by the router and output for each one
- Number of flapping modems that are reported and output for each one

The detailed level of the Flap List Analysis detail display is shown in Figure 3-19.

Figure 3-19   Flap List Analysis Details Display

Scheduling the Flap List Analysis

To schedule a time to capture raw data from one or more Cisco CMTSs, use the Scheduler Configuration dialog box, which is shown in Figure 3-20.

Figure 3-20   Scheduler Configuration Dialog Box

To schedule a time to capture raw data from one or more Cisco CMTSs:

Step 1   From the Configuration menu, choose **Scheduler** > **Flap List**.

Step 2   Select one or more Cisco CMTSs from which you want to capture data and click **Schedule**.

Step 3   Click **OK** in the message box once Cisco CMTSs are added.

Step 4   For a complete description of each field in the Scheduler Configuration dialog box, click **Help**.
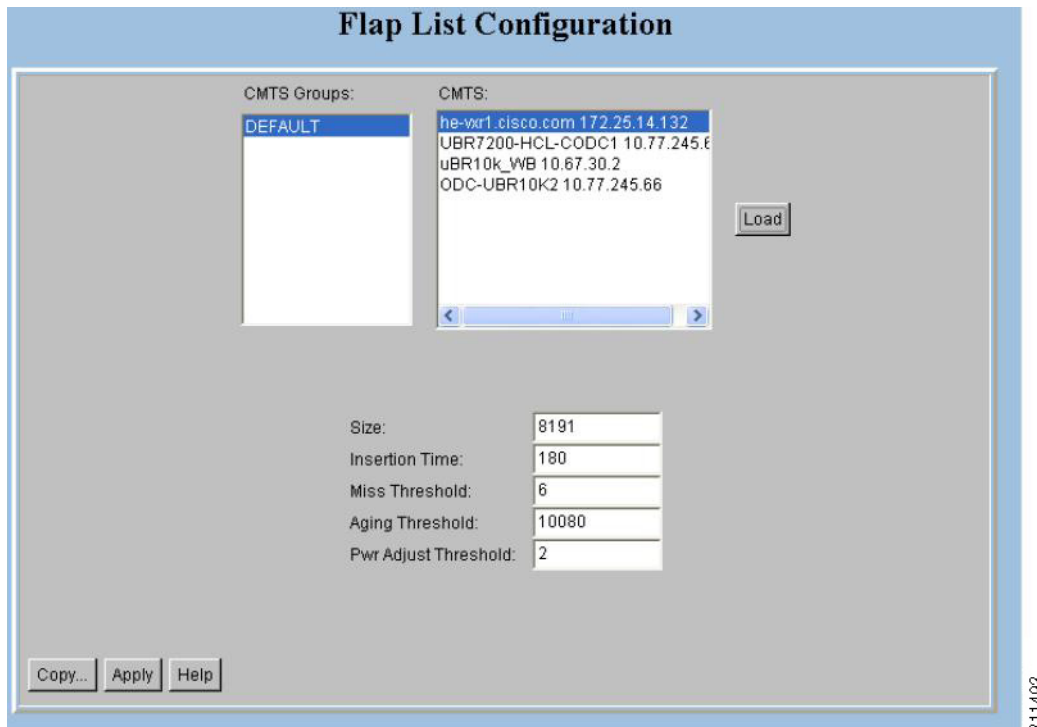
Setting Parameters for the Flap List

The administrator can set parameters for the flap list in the Flap List Configuration dialog box shown in Figure 3-21.

Note   The RFTECH user type does not have access to the Flap List Configuration dialog box.

Figure 3-21   Flap List Configuration Dialog Box

For a Cisco CMTS, the administrator can specify the following criteria for a flap list:

- Maximum number of rows that the flap list can have. Increase the default of 100 if you think you have more than 100 flapping modems.
- Insertion time, in seconds, at which a cable modem should be included in the flap list because it has not completed registration within that time.
- Miss threshold, which is the number of consecutive times a cable modem can fail to respond to a keepalive poll from the Cisco CMTS before it should be included in the flap list.
- Aging threshold, which is the number of minutes a cable modem is allowed between flaps before it should be included in the flap list.
- Power adjust threshold, in decibels, that a cable modem cannot exceed without being included in the flap list.

To set parameters for the flap list:

Step 1   From the Configuration menu, choose **Flap List Parameters**.

Step 2   Select the Cisco CMTS for which you want to set parameters and click **Load**.

Step 3   For a complete description of each field in the Flap List Configuration dialog box, click **Help**.

Purging the Flap List

When you want to delete a saved flap list file, use the Purge Flap List Data File dialog box, which is shown in Figure 3-22. Before you purge a flap list file, you can generate an HTML version of it.

Figure 3-22   *Purge Flap List Data File Dialog Box*
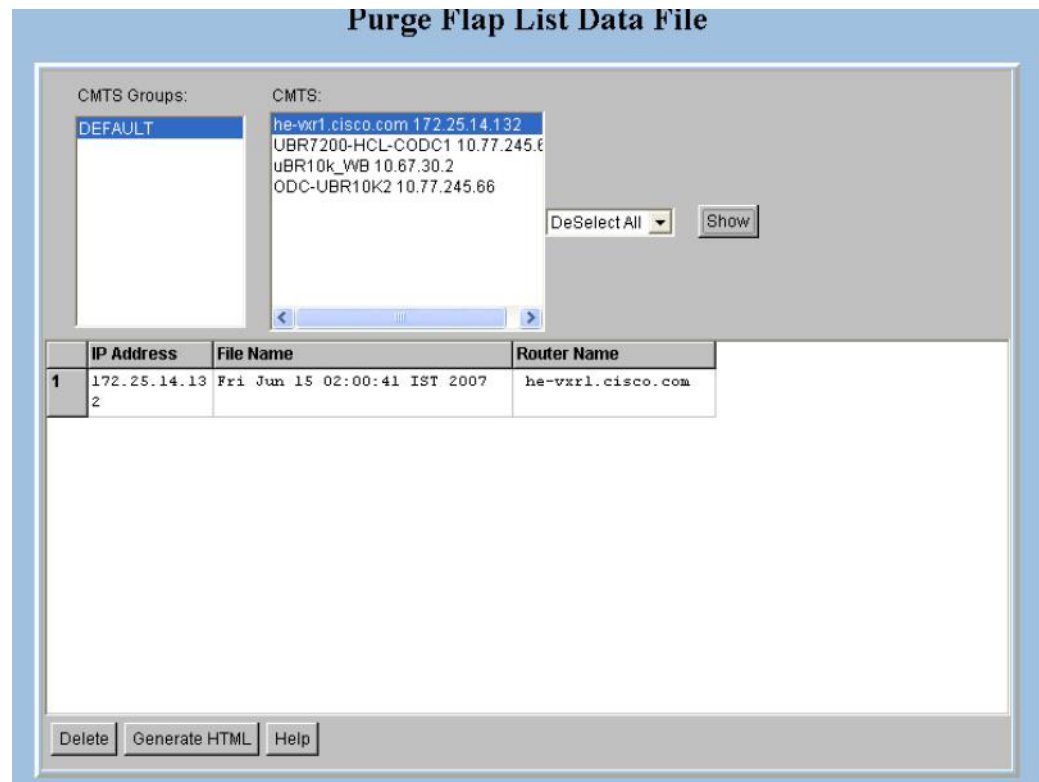
Perform these steps to purge a flap list file:

Step 1   From the Utilities menu, choose **Purge Saved Data > Flap List**.

Step 2   Select one or more Cisco CMTSs for which you want to show saved flap list files and click **Show**.

Step 3   For a complete description of each field in the Purge Flap List Data File dialog box, click **Help**.

Scheduling the Spectrum Data

To schedule a time to capture spectrum data from one or more Cisco CMTSs, use the Spectrum Data Scheduler dialog box, which is shown in Figure 3-23.

Figure 3-23   Spectrum Data Scheduler Dialog Box

To schedule a time to capture spectrum data from one or more Cisco CMTSs:

Step 1   From the Configuration menu, choose **Scheduler > Spectrum Data**. The Spectrum Data Schedule dialog box appears.

Step 2   Select one or more Cisco CMTSs from where you want to capture data and click **Schedule**.

Step 3   Click **OK** in the message box once Cisco CMTSs are added.

Step 4   For a complete description of each field in the Spectrum Data Scheduler dialog box, click **Help**.

Scheduling the STM Data

To schedule a time to capture STM data from one or more Cisco CMTSs, use the STM Data Scheduler dialog box, which is shown in Figure 3-24.

Figure 3-24   *STM Data Scheduler Dialog Box*

To schedule time to capture spectrum data from one or more Cisco CMTSs:

Step 1   From the Configuration menu, choose **Scheduler > STM Data**. The STM Data Scheduler dialog box appears.

Step 2   Select one or more Cisco CMTSs from which you want to capture data and click **Schedule**.

Step 3   Click **OK** in the message box once Cisco CMTSs are added.

Step 4   For a complete description of each field in the Scheduler Configuration dialog box, click **Help**.
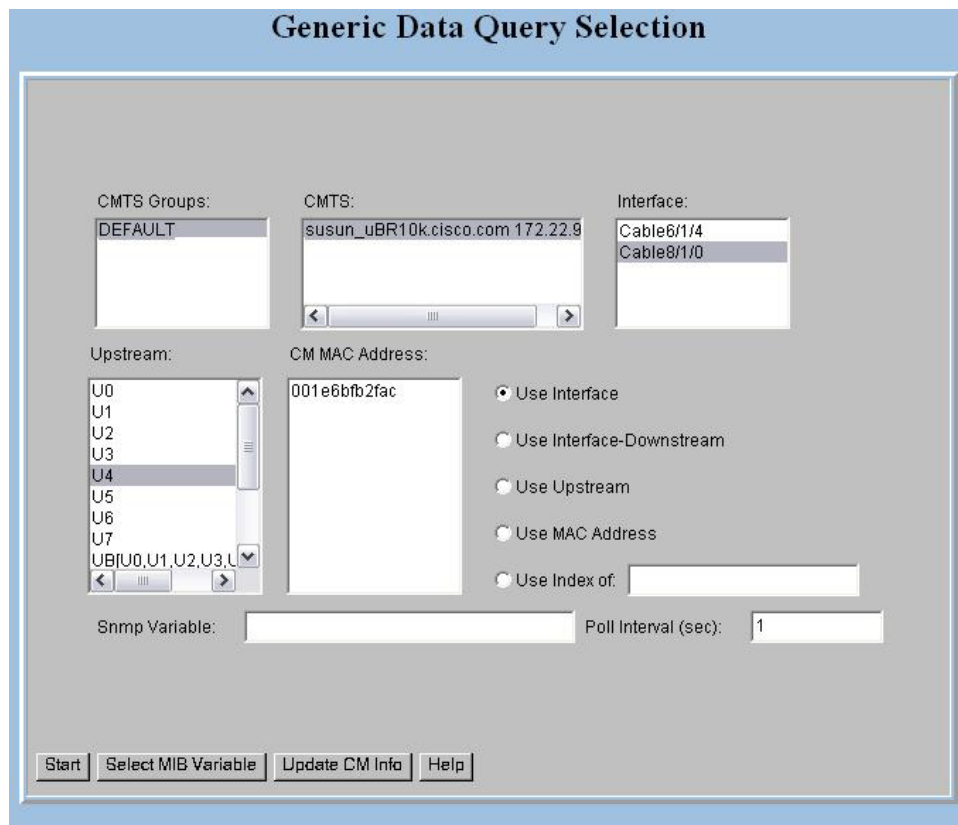
Generic Data Query

To poll the CMTS for individual MIB variables, use the Generic Query diagnostic tool, which is shown in Figure 3-25. You can choose MIB variables from the MIBs that are preloaded in the tool, or if the variable you need is not available, you can load a new MIB into the tool and then access the variable through the tool.

To query the MIB variables:

Step 1 Click **Update CM Info** to update the cable modem information on the selected CMTS instead of getting data from the cache.

Step 2 Select a CMTS.

Step 3 Enter a MIB variable in the SNMP Variable field and click **Start**.

Step 4 For a complete description of each field, click **Help**.

Figure 3-25   Generic Data Query Dialog Box