Cornerstone

CMTS 1500 Command Line Interface Reference Guide

Release 4.3 Standard 1.0   September 2003

ARSVD00381

Cornerstone

CMTS 1500 Command Line Interface Reference Guide

Document number: ARSVD00756
Document release: Release 4.3 Standard 1.0
Date: September 2003

Publication history

August 2003

Release 4.2 Preliminary 2.0 version of this document.

May 2003

Release 4.2 Standard 1.0 version of this document.

Contents

Modem Command 4-1

CMTS 1500 software license 5-1

About this Document

This document is a reference guide to the Cornerstone® Cable Modem Termination System 1500 v. 4.2 Command Line Interface. It describes the structure and use of the CLI and includes a description of each command and its use in managing the CMTS 1500.

Audience

This document is intended for systems and operations personnel who have been trained and have knowledge on how to use the CMTS 1500.

CMTS 1500 Documents

The documentation suite for the CMTS 1500 includes the following:

- *Cornerstone CMTS 1500 Installation Guide* (ARSVD00379)
- *Cornerstone CMTS 1500 User Guide* (ARSVD00380)
- *Cornerstone CMTS 1500 Command Line Reference Guide* (ARSVD00756)
- *Cornerstone CMTS v. 4.2 Quick Reference* (ARSVD00542

Related Documents

- *Modular Redundant Chassis MRC 1.1 SW v 2.3 Installation and Operations Guide* (ARSVD00230)
- *DOCSIS LCn Provisioning Server* User Guide(ARSVD00081)
- *DOCSIS LCn Provisioning Server Release Notes* (304764)
- *Cornerstone Cable Provisioning System 2000 System Administrator's Guide* (309932-A Rev 01)
- *Cornerstone Cable Provisioning System 2000 User's Guide* (309931-A Rev 01)
- *Cornerstone Cable Provisioning System 2000* Installation Guide (309928-A Rev 01)
- *Cornerstone Cable Provisioning System 2000 Troubleshooting Guide* (309930-A Rev 01)

- *Cornerstone Cable Provisioning System 2000 Release Notes* (309929-A Rev 01)

Getting Help

Documentation, customer service, and support are available from your account representative.

About the CMTS 1500

The Cornerstone Cable Modem Termination System 1500 (CMTS) provides operators with a DOCSIS/EuroDOCSIS compliant, scalable, and interoperable headend cable access solution. New features allow operators to provide high-speed services such as telephony, high-speed Internet connections, and cable TV to their customers.

The CMTS 1500 has enhanced hardware and operates using 4.0+ software so that operators may employ new features including:

- DOCSIS 1.1-based Quality of Service
- Redundant Ethernet port with auto-switchover
- Redundant eighth upstream receiver
- Full ingress avoidance via spectrum analyzer
- SNMP v3 support
- Loss of communication alarms
- BPI+ support
- ARP spoofing protection

Upgrading your CMTS 1000

The CMTS 1000 can be upgraded to an CMTS 1100 which operates as a CMTS 1500. Upgrade information is available from your account representative.

General Information About the CLI

About the Command Line Interface

The Cornerstone CMTS Command Line Interface (CLI), described in this manual, is used to configure, manage and troubleshoot the CMTS and network devices such as cable modems and packet ports.

Also contained in this chapter is general information about the CLI. Detailed information about the commands are presented in the remaining chapters.

The Command Line Interface is a UNIX-like interface of text commands. Each command may be followed by one or more subcommands and/or parameters. Commands are entered by typing the command and any subcommands or parameters, then pressing the ↵ **<Enter> key**. A space must separate all elements of a command.

Commands are entered through:

- An alphanumeric terminal (or PC emulating an alphanumeric terminal) connected to the console port on the rear panel of the CMTS.
- A PC or workstation using Telnet or Secure Shell and connected via LAN (local area network) to one or both of the two Ethernet ports on the rear panel of the CMTS. Only one Ethernet port can be in use at any given time.

Note: A copy and paste function to input terminal or telnet program commands at the prompt is supported with hyperterm and telnet options only.

Symbols used in this document

Several symbols are used in this document as a short cut for a full command. Commands may be abbreviated to the shortest character string that uniquely identifies the command. For example, the **manage** command may be abbreviated "**man**".

↵   Press the **[Enter]** key

[s]   Type **show** and press ↵

[i]   Type **info** and press ↵

[?]   Type **?** and press ↵

<>   Enter a value for the parameter (example: replace <modem> with a specific MAC address or alias)

""   Enclose values in double quotes

The "prompt" or root level of a command

box#   The top-level manage-command prompt

<#>   Replace the # sign with a numeric value

Text Conventions

The following text conventions are used in this guide:

Table 1-1 Text Conventions

Text Convention	Description

angle brackets (<>)	Indicate that you choose the text to enter based on the description inside the brackets. **Do not type the brackets when entering the command.**
	 Example: If the command syntax is:
	 `ping <ip_address>, you enter:`
	 `ping 192.32.10.12`

bold text	Indicates an entered command. Example: [] console **dir** ↵
braces ({ })	Indicate the *required elements* in syntax descriptions where there is more than one option. You must choose *only one* of the options. **Do not type the braces when entering the command**. Example: `{MAC address	alias}`

brackets ([ ])	Indicate optional elements in syntax descriptions. **Do not type the brackets when entering the command.**
	 Example: If the command syntax is:
	 `show ip interfaces [-alerts],`
	 you can enter either:
	 `show ip interfaces` *or*
	 `show ip interfaces -alerts`

italic text	Indicates file and directory names, new terms, book titles and commands.
screen text	Indicates system output, for example, prompts and system messages. Example: `Set Trap Monitor Filters`
vertical line (|)	Separates choices for command keywords and arguments. Enter only one of the choices. Do not type the vertical line when entering the command. Example: If the command syntax is: `show ip {alerts	routes}`, you enter *either*:   `show ip alerts` *or* `show ip routes`, **but not both**.

Command Sequences

The command sequences display information, allow you to set values, or move you to the next level of the command structure. Commands may also be multi-layered, allowing you to view and set values for specific devices on the network.

Simple Commands

An example of a top-level command is the **cable** command, which allows you to remain at the default North American DOCSIS standard (**cable northamerica**) or choose the EuroDOCSIS standard (**cable europe**). Two choices are available. There are no other commands.

1   From the console prompt, type the **cable** command and press ↵.

```
[] console> cable ↵
```

The syntax for the command is displayed, showing values or choices available, and displays the console (or remote) prompt:

2   From the console prompt, type the **cable** command, replace the value or parameter given within the <> signs with your choice. For example, to select the europe choice (for EuroDOCSIS), enter:

```
[] console> cable europe ↵
```

Multi-layered Commands

An example of a multi-layered command is the **modem activity <modem> dhcp** command which is used to display DHCP activity for a particular cable modem on the network.

The syntax for the modem activity dhcp command is:

```
modem activity <modem> dhcp ↵
```

From the console prompt type the following, replacing the <modem> parameter with the MAC address or alias of the modem for which you want to see the DHCP activity:

```
[] console> modem activity 00:00:ca:14:13:3d dhcp ↵
```

Structure of the CLI

The Command Line Interface is organized into four groups of commands:

- Navigation and special control commands
- Console-level commands, which are used to display or perform specific actions
- Manage commands, which are organized into a "tree structure" also referred to as the "management tree". These commands can either display information (using the show command option), or set parameters (using the info command option).The ? symbol is used to display information about the current branch as well as any additional sub branches off of that level of commands (if any).
- Modem commands are a group of commands which display and set data items and parameters for the cable modems.

Navigation Commands

The CLI has a set of navigation and special commands, which are listed and briefly described in the table below. These commands are used at each level of the CLI, though the application of the command may differ among the CLI levels.

Table 1-2 Navigation Command Descriptions

Command	Function
? (from manage)	This command displays all settable parameters (without their values), and indicates whether read only items are available. The "?" also displays the next level of commands in the manage tree.
!!	This command is used from the console to repeat the last command you entered. The repeat command only applies to the show, info, or console-level commands (including those used with @ in the manage level.
@ (from manage)	This command allows you to use console-level commands while in the manage command. To ping a modem from the console: [ ] console> **ping <IP address>**↵ To ping a modem from the **manage command**: [ ] box#> **@ ping <IP address>**↵
box (from manage)	The **box** command moves you from any level in the manage command to the top level of the manage command known as the box prompt (box#). To return to the box prompt from a second-level command [ ]cm-vendor-list# **box** ↵ [ ]box#
back (from manage)	Moves **up** the tree one level toward the top
exit (from manage)	The exit command is used to leave the manage subsystem and return to the main console prompt. To return to the console prompt from the manage level (cm-vendor-list): [ ]box # **exit** ↵ leaving management subsystem... console>
exit (from console)	Ends a CLI session.
help	Displays information about console-level commands.
help tree (from manage)	Displays all commands in manage help tree. Certain commands are listed in their general form only.

Table 1-2 Navigation Command Descriptions (continued)

Command	Function
info (from manage)	The **info** command displays settable parameters (if any) and their current values for the current context. Commands with info items are followed by the abbreviation [i]. If there are no info items available, this message is displayed: No settable parameters at this tree level The "Info" cable-level command is used to display either read or write information respectively for a branch level given as a command.
pwc (from manage)	The **pwc** command "print working context" command displays the context for the location in which you are working in the manage command. The path you are on is expressed as a tree. For example: [ ]privileges-modify/1# **pwc** Current working context in configuration tree: box accounts privileges-modify/<index {1-10}
show (from manage)	The show command displays read-only values at the level of the manage command in which you are working. Commands with show items are followed by the abbreviation [s]. If there are no show items available, this message is displayed: **"No show values at this tree level"** Also, if show is typed prior to a command, you will go directly to that command from wherever you are in the in the tree The "Show" cable-level command is used to display either read or write information respectively for a branch level given as a command.
cursor up (up arrow)	Cycles to previous command (up to a history limit of 22.)
cursor down (down arrow)	Cycles to next command in history buffer
cursor right (right arrow)	No effect
cursor left (left arrow)	No effect
Ctrl-C (^C)	Terminates current line entered
backspace	Erases last character entered on current line.

Console-Level Commands

The top-level CLI commands are called Console-level commands. These can be simple or multi-layered. The most multi-layered console-level command is the Manage command, which is covered in detail in the Manage command section of this document. Refer toTable 1-4 on page 1-11.

Table 1-3 Console-level Commands

Command	Function
authentication	Sets a new authentication string
console-reset	Resets Console interface (Unavailable via console)
cable	Chooses applicable DOCSIS standard
dhcptrace	Turns dhcptrace on or off. Chooses long or short option.
dir	Displays information about the CMTS software
error-trace	Controls the internal CMTS error tracing function
exit	Ends the console or remote session
fpd	Shows front panel display options
get	Performs a snmpget on CMTS MIB database
getmng	Retrieves a configuration file that was previously stored using the put-mng command
help	Displays the console command menu
	Displays help for the console command you have chosen
	Displays an explanation of the console interface
llc-ping	Pings cable modems on the network via the MAC address
logout	Ends the console or remote session
manage	Enters the manage subtree
modem	Displays cable modem information
more	Chooses display options
next	Displays information about the next MIB you have chosen.
output	Enables or disables background output
passwd	Changes the current user password
ping	Pings an IP device

Table 1-3 Console-level Commands (continued)

Command	Function
port	Displays information about the Ethernet ports. Displays information about the cable interface.
purge-fdb	Deletes all dynamic non-cable modem entries in the forwarding database
putcfg	Uploads current configuration parameters in a text format
putmng	Uploads current configuration parameters in manage format
quit	Ends the console or remote session
reset	Restarts the CMTS
set	Sets a specified MIB object to a value
snmp-mode	Sets and displays the SNMP operation mode
ssh-keygen	Generates the host key for the CMTS and sets Secure Shell parameters
system	Displays CMTS characteristics
upstream-bandwidth	Calculates and displays upstream bandwidth statistics
upstream-failover	Manually switches an upstream receiver (1-7) to the spare receiver in the eighth position
v3passwd	Changes the password for an SNMPv3 user
who	Shows the active CLI sessions for the Console, remote Telnet, and Secure Shell ports
?	Displays message for more detailed help

Manage-Level Commands

The **manage** command and its many subcommands are the most commonly used set of commands. The **manage** command is multi-layered, allowing you to move down to a lower level of commands to set specific parameters. See Table 1-4 on page 1-11 for a list of the **manage** subcommands.

To access the **manage** command, (indicated by the "box#" prompt), type the following:

```
[] console> manage ↵
[] box# _
```

To access *read only* **system parameters**, type the following:

```
[] box# show ↵
```

To access *settable* **system parameters**, type the following:

```
[] box# info ↵
```

To view the **manage** subcommands, type the following:

```
[] box# ? ↵
```

Manage Command Tree (Subcommands)

Table 1-4 Manage Command Tree (Subcommands)

Subcommand Level 1	Subcommand Level 2	Description
sys-obj-resources • show [s]		Displays CMTS "system" resources for SNMP management.
admin • show [s] • info [i]	• cm-vendor-list [s] • cm-vendor-modify/<number> [i] • bootp-list [s] • bootp-modify/<index {1-10}> [s, i]	Displays and sets administrative data items and parameters for the CMTS and the cable modem network.
accounts • show [s] • info [i]	• user-list [s] • user-modify/<index {1-10}> [i] • privileges-list [s] • privileges-modify/<index {1-10}> [i]	Controls user accounts and user account privileges.
ethernet-level • show [s] • info [i]	• phy-level [i] • phy-list [s] • phy-specific/<index {1-2}> [s, i]	Controls the Ethernet interfaces on the CMTS.

Table 1-4 Manage Command Tree (Subcommands) (continued)

Subcommand Level 1	Subcommand Level 2	Description

cable-level
• show [s]
• info [i]
	• modu-iuc-list/<profile {1-10}> [s]
	• modulation/<profile {1-10}>/<iuc>
	• modulation/<profile {1-10}>/request [s, i]
	• modulation/<profile {1-10}>/ data-request [s, i]
	• modulation/<profile {1-10}>/ initial-ranging [s, i]
	• modulation/<profile {1-10}>/ periodic-ranging [s, i]
	• modulation/<profile {1-10}>/ short-data [s, i]
	• modulation/<profile {1-10}>/ long-data [s, i]
	• downstream [s, i]
	• frequency-split [i]
	• upstream-list [s]
	• upstream-specific/<channel {4-11}> [s, i]
	• upstream-test-port [i]
	• multi-us-list [s]
	• multi-us-config/<channel {4-11}> [i]
	• multi-usage-us [s, i]
	• ingress-avoidance-level [?]
	  • ingress-avoidance-us-config-list [s]
	  • ingress-avoidance-us-threshold-list [s]
	  • enable/<channel {4-11}> [i]
	  • freq-list/<carrier-path {1-8}> [s}
	  • freq-config/<carrier-path {1-8}>/<freq-index {1-10}> [i]
	  • change-pref/<channel {4-11}> [i]
	  • metric-threshold-config/<channel {4-11}> [i]
	  • profile-list/<ifIndex {4-11}> [s}
	  • profile-config/<ifIndex {4-11}>/<pref-index {1-3}> [i]
	  • tx-profile-list [s}
	  • tx-profile-config/<index {1-24}> [s, i]
	  • metric-config [i]
	  • metric2-config [i]
	  • freq-status-aging-config [i]
	  • freq-status-list/<carrier-path {1-8}> [s}
	  • health-list [s}
		Controls the cable (RF) interface on the CMTS. These cable-level commands give operators extensive monitoring and control capabilities for the downstream and upstream RF channels.

Table 1-4 Manage Command Tree (Subcommands) (continued)

Subcommand Level 1	Subcommand Level 2	Description

cable-level
• show [s]
• info [i]
	• modem-list [s]
	• modem-specific/<number> [s]
	• cpe-ip-list/<modem-number> [s]
	• cpe-ip-specific/<modem-number>/<index {1-1024}> [s]
	• cpe-control-list [s]
	• cm-filter-list [s]
	• modem-us-disable-list [s]
	• modem-us-disable-modify/<mac-addr> [i]
	• sid-list [s]
	• sid-specific/<said-num>[s]
	
	• qos-1.1-level [?]
	  • mac-sf-list [s]
	  • sf-per-mac-list/<mac-addr> [s]
	  • sf-list [s]
	  • sf-specific/<sfid> [s]
	  • sf-stats-list [s]
	  • sf-stats-specific/<sfid> [s]
	  • upstream-stats-list [s]
	  • upstream-stats-specific/<sid> [s]
	  • classifier-list [s]
	  • classifier-per-sf-list/<sfid> [s]
	  • classifier-specific/<sfid>/<class-id> [s]
	  • dynamic-service-stats [s]
	  • dynamic-service-specific/<direction> [s]
	  • sf-log-list [s]
	  • sf-log-specific/<index> [s, i]
	  • sfact-log-list [s]
	  • sfact-log-specific/<index> [s]
	  • qos-params-list [s]
	  • qos-params-per-sf-list/<sfid> [s]
	  • qos-params-specific/<sfid>/<type> [s, i]
	  • phs-list [s]
	  • phs-per-sf-list/<sfid> [s]
	  • phs-sf-specific/<sfid>/<cid> [s]
	• qos-1.0-list [s]
	• qos-1.0-specific/<qos-index> [s]	

Table 1-4 Manage Command Tree (Subcommands) (continued)

Subcommand Level 1	Subcommand Level 2	Description

forwarder
• show [s]
• info [i]
	• ethernet-port-fwd [s]
	• cable-port-fwd [s]
	• port-filter-list [s]
	• port-filter-modify/<mac-addr>/<port> [s]
	• port-filter-modify/<mac-addr>/ethernet [s, i]
	• port-filter-modify/<mac-addr>/cable [s, i]
	• tp-forwarding-data-base [s]
	• spanning-tree [s]
	  • ethernet-port-stp
	  • cable-port-stp
	• link-filter-list [s]
	• link-filter-modify/<index> [s]
	• ip-filter-list [s]
	• ip-filter-modify/<index> [s]
	• cpe-addr-filter-list [s]
	• cpe-filter-modify/<group {1-1024}>/<index {1-1024}> [s,i]
	• tcp-udp-filter-list [s]
	• tcp-udp-filter-modify/<group {1-1024}>/<index {1-1024}> [i]
		Controls the CMTS data packet forwarding functions, including bridging, forwarding and filtering capabilities.

ip-level • show [s] • info [i]	• route-list [s] • route-modify/<dest-ip-addr> [s, i] • icmp [s] • udp-stats [s] • udp-entry-list [s] • tcp-stats [s] • tcp-connection-list [s] • arp-list [s] • arp-modify/ethernet/<ip-addr> [i] • arp-modify/cable/<ip-addr> [i] • igmp-modify/ethernet [s, i] • igmp-modify/cable [s, i] • multicast-list [s] • multicast-modify/<ip-addr>/ <ethernet> [s, i] • multicast-modify/<ip-addr>/ <cable> [s, i] • scope-list [s] • scope-modify/ethernet/<ip-mask> [i] • scope-modify/cable/<ip-mask> [i] • dns-list [s] • dns-modify/<index {1-10}> [i]	Displays and controls the CMTS IP (Internet Protocol) functions. The IP-level commands report IP traffic statistics, handle multicast, manage the UDP and TCP functions, and control DNS settings.

Table 1-4 Manage Command Tree (Subcommands) (continued)

Subcommand Level 1	Subcommand Level 2	Description

snmp-mode
• show [s]
• info [i]
	• coex
	  • ver3 [s]
	    • v3user-list
	    • v3user-modify/username
	    • view-list
	    • view-modify/viewname/subtree
	    • group-list
	    • group-modify/sec-model/username
	    • v3access-list
	    • v3access-modify/group/context/sec-model/sec-level
	  • snmpcommunity-list
	  • snmpcommunity-specific/snmpcommunityindex
	  • snmptargetaddr-list
	  • snmptargetaddr-specific/snmptargetaddrname
	  • snmptargetaddrext-list
	  • snmptargetaddrext-specific/index {1-10}
	  • snmptargetparams-list
	  • snmptargetparams-specific/snmptargetparamsname
	  • snmpnotify-list
	  • snmpnotify-specific/snmpnotifyname
	  • snmpfilterprofile-list
	  • snmpfilterprofile-specific/snmptargetparamsname
	  • snmpfilter-list
	  • snmpfilter-specific/profilename/filtersubtree
	• traps [i]
	  • non-docs-traps
	  • docs-traps
	• nmaccess
	  • access-list [s]
	  • access-specific/\<index\> [i]
	  • community-list [s]
	  • alarms [s, i]
		Controls the CMTS SNMP functions, including access, traps and alarms, and SNMPv3.

Table 1-4 Manage Command Tree (Subcommands) (continued)

Subcommand Level 1	Subcommand Level 2	Description
baseline-privacy • show [s] • info [i]	• auth-list [s] • authorization/<mac-addr> [s, i] • said-bp-list [s] • said-bp-modify/<said-num> [s, i] • ip-mcast-list [s] • ip-mcast-modify/<said-num> [s, i] • mcast-auth-list [s] • mcast-auth-modify/<mcast-said-num>/<cm-mac-addr> [s, i] • prov-cm-cert-list [s] • prov-cm-cert-modify/<mac-addr> [s, i] • ca-cert-list [s] • ca-cert-modify/<index> [s, i]	Manages the base-line-privacy functions (both BPI and BPI+) in the CMTS. Baseline privacy used provides operator control through a certificate process that identifies devices and their trust levels.
event-level • show [s] • info [i] •	events-list [s]	Displays and manages the CMTS event logs.
serial-port • info [i]		Manages the CMTS serial port interface (used for the CLI console connection).

Modem-Level Commands

The **modem** commands are used to display information for all the cable modem (CM) devices on the network. The **modem** commands are located at the Console level of the CLI, but are listed as a separate group. The **modem** subcommands are defined by the sub-verb attached to the basic modem command, with qualifiers that further define the commands. The **modem help** command lists available sub-verbs and qualifiers.

To access the basic modem command, type the following:

```
[] console> modem ↵
```

To access modem sub-commands, type the following:

```
[] console> modem <subverb> <modem identifier> [qualifier] ↵
```

Table 1-5 Modem Command Sub-verbs and Qualifiers

Modem Sub-verb	Qualifiers	Description
modem	• <mac address> • <alias>	Lists modems attached to the CMTS.
modem activity	• initial_ranging • ranging_with_perm_sid • registration • authorization • dhcp • tftp • all • off	Displays modem activity on the cable network, as defined by the qualifier
modem alias	• * (wildcard selecting all modems) • <mac-address> • <name> • <mac-address><name>	Displays or associates an alias to the cable modem
modem connected		Displays modems with an active connection to the CMTS
modem history	• initial_ranging • ranging_with_perm_sid • registration • authorization • dhcp • tftp	Displays logged modem activity events, as defined by the qualifier

Table 1-5 Modem Command Sub-verbs and Qualifiers

Modem Sub-verb	Qualifiers	Description
modem restart	• <mac address> • <alias>	Restarts individual modems
modem state	• <mac address> • <alias-name>	Displays detailed cable modem state information (known to the CMTS)
modem total	• <all> • <group> • <channel>	Displays total number of active modems
modem unalias	• <alias> • mac-address> • * (wildcard selecting all modems)	Removes an alias assigned to a *specific* cable modem or *all* modems
modem worst	• crc-errors • hcs-errors • rangings-initial • invalid-rangings • registrations • bad-registrations • failed-registrations • t5-timeouts • uptimes-active • up-all-times	Displays list of cable modems with worst characteristics

CLI Log-in Process

Before commands can be entered, you must first establish a communications link with the CMTS, and enter the CLI program (through the log-in process).

Your first login to the CLI must be via the **Console** port. Succeeding logins may be via the console or remote. Simultaneous sessions may occur but are limited to one console and up to five remote sessions.

Refer to the Cornerstone CMTS 1500 User Guide for detailed procedures covering:

- Console port connection
- Logging into the CLI for the first time
- Logging into the CLI using Telnet or Secure Shell
- Creating and managing user accounts and many other management procedures accomplished via the CLI.

Logging Out

To end your CLI session, type the following:

> [] console> **logout** ↵

Note: "Exit" also ends a CLI session.

Console-Level Commands

Chapter Overview

The console-level CLI commands are explained in this chapter and are accessed through the Console port or at the top level of the remote prompt.

To display basic command information, type the following:

```
[] console> help console ↵
```

To display a list of console commands with a brief description of each, type the following:

```
[] console> show ↵
```

For a list of the Console-level commands, refer to the "Console Level Command Tree" command on page 4-3.

Console Level Command Tree

Navigation and Special Commands
```
?
!!
```

Console Level Commands
```
authentication
console-reset
cable
dhcptrace
dir
error-trace
exit
fpd
get
getmng
help
llc-ping
logout
manage
    manage command tree
modem
    modem command tree
mode
more
next
output
passwd
ping
port
purge-fdb
putcfg
putmng
quit
reset
set
snmp-mode
ssh-keygen
system
upstream-bandwidth
upstream-failover
v3passwd
who
```

authentication

Use the **authentication** command to enter a text/numeric value called the "authentication string". The authentication string is a secret key included in the .MD5 files that are shared between the CMTS and the cable modem. The secret key ensures the cable modem is receiving its configuration file from an authorized provisioning server. The authentication string is enclosed in double quote marks.

Default

There is no default key, therefore the default is **""** (null).

Note: The provisioning server and the CMTS must be configured with the same authentication key for cable modem provisioning to be successful. When entering a new authentication string, be sure to change it in both the provisioning server and the CMTS.

Command Path

```
[] console> authentication <"new authentication text string"> ↵
```

To set the authentication string to "test", enter the following:

```
[]console> authentication test ↵
```

```
New authentication string set to: "test"
```

To disable the authentication string, enter the following:

```
[]console> authentication "" ↵
```

An alert is displayed:

```
WARNING! Registration Authentication checking is now dis-
abled!
```

console-reset

Use the **console-reset** command to clear the CLI Console interface (through the serial port). The command resets the UART (Universal Asynchronous Receiver/Transmitter) port. You can use this command to resume CLI operations which may freeze during long output displays.

Note: This command MUST be performed from a local terminal connected directly to the CMTS via the serial connector.

Command Path

```
[] console> console-reset ↵
```

Syntax

```
console-reset
```

WARNING: This command will reset the CLI Console and disconnect CLI all users.

cable

Use the **cable** command to display cable standard parameters or change the cable standard for the CMTS. The available cable standards are:

*   **cable northamerica** selects North American Data Over Cable Service Interface Specification [DOCSIS]
*   **cable europe** selects European Data Over Cable Service Interface Specification [EuroDOCSIS].

When a cable standard is changed, the frequency-split is also changed. The CMTS checks the upstream channels. If it finds a conflict, the cable standard is not changed. When a cable command is used with no standard, the current cable settings are shown.

The cable command displays the following CMTS parameters:

Parameter	North America	Europe
Frequency Split	5-42 MHz/88-862 MHz	5/65 MHz upstream/100-862 MHz downstream
Forward Error Correction/FEC	Annex B	Annex A
D/S Channel Bandwidth	6 MHz	8 MHz
Interleave	Taps 8/increment 16	Taps 12/increment 17

Note: If the CMTS is set to cable northamerica while an upstream channel is operating above 42 MHz, the CMTS does not change the cable parameters.

Note: The cable europe command sets all four EuroDOCSIS parameters simultaneously, including the downstream bandwidth at 8 MHz. If you use an SNMP manager, you must set each individual parameter. It is possible to set the downstream bandwidth for EuroDOCSIS to 4 MHz; however, this is not a valid configuration and is not supported for the CMTS.

Default

cable northamerica (DOCSIS)

Syntax

```
cable <europe | northamerica>
```

Example

To set the downstream cable configuration to cable North America, enter the following:

```
[] console> cable northamerica ↵
success
```

To display cable parameters, enter the following:

```
[] console> cable ↵
current cable settings
  Frequency Split: 5-42/88-862 Mhz North America
  Fec: Annex B
  DS Bandwidth: 6MHz
  Interleave: 8taps 16 increments
```

dhcptrace

Use the **dhcptrace** command to choose if and how you would like to view dhcptrace output. Since the output tracks all DHCP activity in the network, you can use it to troubleshoot network problems.

Default

The default is OFF, since extensive output may interfere with your view of other CLI commands. To view long or short output, you must choose ON, followed by long or short.

Syntax

```
dhcptrace [ON | OFF]  [-l | -s]
```

Options or Qualifiers	Description
On	Sets the dhcptrace function to the ON position.
Off	Sets the dhcptrace function to the OFF position.
-l	Sets the dhcptrace output to the long format.
-s	Sets the dhcptrace output to the short format.

Example

To display current DHCP trace state, enter the following:

```
[] console> dhcptrace↵
```

```
DHCP Trace disabled
```

To turn on DHCP trace with the long form output, enter the following:

```
[] console> dhcptrace on -l ↵
```

```
DHCP Trace enabled long format
```

```
[] remote2>
```

```
ETHERNET: DA = 00:80:2d:62:39:84 SA = 00:00:ca:23:f4:a6
    SRC IP= 192.168.196.20 DST IP= 192.168.193.50
    DHCP Hdr : op=01 htype=01 hlen=06 hops=01 xid=50b46e3e
    sec=0005 flags=0000
    ciaddr = 0.0.0.0 yiaddr = 0.0.0.0
    siaddr = 0.0.0.0 giaddr = 192.168.196.20
    chaddr=0000ca171f2200000000000000000000
    sname =
    file =
<<DHCPDISCOVER>> 350101 3d 07 01 00 00 ca 17 1f 22 37 06 01 02 04 03 2a
07  ff
```

To turn on DHCP trace with the short form output, enter the following:

```
[] console> dhcptrace on -s ↵
```

dir

Use the **dir** command to display information about the two software albums or images loaded on the flash memory of the CMTS: Album A and Album B. The first album loaded will have a lower sequence number.

The album information displays the following parameters:

Parameter	Description
Sequence Number	Represents the sequence the album was loaded into the CMTS (e.g. 0.1, 1.2, 2.3)
Description	Software version or release
Timestamp	Creation time for the album
Album Filename	Filename assigned to the album for loading from TFTP server

Syntax

```
dir
```

Example

```
[] console> dir ↵


Installed software albums:
Album A:
sequence number: 11
description: Cornerstone 1500 CMTS - Ver: CMTS_4.0.0
timestamp: 11/13/00 22:29:59
album filename: /default_imagefrom_flash
```

The following table displays software information

```
Album B:
sequence number: 12
description: Cornerstone 1500 CMTS - Ver: CMTS_4.0.0
timestamp: 11/13/00 22:29:59
album filename: /default_imagefrom_flash
```

error-trace

Use the **error-trace** command to troubleshoot problems or check a software version prior to upgrading.

When error-trace is enabled, the CMTS maintains an internal log of its responses to hardware and software events that may play a part in causing a reset. Upon restart, output from the error-trace command displays the events that occurred prior to system failure in chronological order. Support personnel can use this information to help diagnose system problems.

Default

Since error-trace requires significant system resources, the default is OFF.

Syntax

```
error-trace [ ON | OFF ]
```

Example

To display the current setting:

```
[] console> error-trace ↵
```

```
Error tracing facility is OFF
```

To turn on the error-trace feature:

```
[] console> error-trace on ↵
```

```
Error tracing facility is now enabled [ON]
```

exit

Use the **exit** command to end a Console or remote session. The Console session will display the login prompt, while the remote session will terminate the connection.

The exit command is also used to exit anywhere in manage and return to the console prompt. The remote session remains open.

Syntax

```
exit
```

Example

To exit a CLI session, enter the following:

```
[] console> exit ↵
```

```
login: __
```

To leave the management subsystem, enter the following:

```
[] box# exit ↵
```

```
Leaving management subsystem. . .
```

```
[] remote1> __
```

fpd

Use the **fpd** command to set the CMTS front panel display timeout period.

Note: The result is displayed in seconds

Syntax

```
fpd lcd-timeout [<time-value>[<time-units>]]
```

Value	Description
time-value	Length of time prior to returning to default display. When this value is not present, the current value is returned. The value zero will not return the display to the default display.
time-units	Units of time applied to the time-value: s = seconds m = minutes h = hours

Example

To set the front panel display lead time out to five (5) minutes:

```
[] console> fpd led-timeout 5 m↵

led-timeout = 300 seconds
```

get

Use the **get** command to view a specified MIB value. You may view read-write, read-only, and/or read-create MIBs, depending on your level of privilege.

Note: The CLI get command corresponds to the SNMP manager get command.

Syntax

```
get <objectname> . <instance>
```

The get command includes:

Parameter	Description
<objectname>	The MIB object name
<instance>	The specified instance of that object

Example

To get the MIB object value that shows the administrative status for the CMTS channel four, enter the following:

```
[] console> get ifadminstatus.4 ↵

mib object ifadminstatus.4 1
```

Note: The value 1 means the administrative status for channel 4 is enabled.

getmng

Use the **getmng** command to provision a CMTS from a specified location using the configuration file exported using the **putmng** command. In order for the CMTS to access the configuration file, you must specify the file's location (IP address or DNS host) and the file name. The configuration file will be readable on your terminal with each output line being either a level identifier (preceded by a $) or a parameter followed by a value.

If you enter an invalid IP address, or if the TFTP server or the connection between the TFTP server and the CMTS is disabled, the CMTS will attempt to get the file for up to four minutes before timing out and generating an error message. During this period, the CMTS will not be able to perform other operations. The recommended practice is to open a separate remote session (Telnet or SSH) to run the getmng command.

Note: The TFTP Server automatically executes the **getmng** command twice. The *first* time it checks file size, and the *second* time it transfers the file. This two-step process is not apparent to the user.

Note: The **getmng** command will stop normal operations of the CMTS while it loads the configuration file. If the file is large, service may be disrupted for several minutes.

Syntax

```
getmng [ <a.b.c.d | host-name> <filename>]
```

Where	Description
<a.b.c.d.>	Ip address for the output file destination
<host-name>	DNS host name
<filename>	Output file created by the putmng command

Example

To place the MIB values from the file into a CMTS using TFTP:

```
[] console> getmng [IP address] [filename] ↵
```

help

Use the help command to display information about commands or options in several different forms.

Modes	Description
help	Shows the Console command list
help console	Displays an explanation of the Console interface
help <command name>	Shows useful help information about the specific command
help tree (in manage command)	Displays the entire manage command tree and indicates the current tree level

Syntax

```
help [ <command name> | console | tree ]
```

Example

To display the console Help menu, enter the following:

```
[] console> help ↵
```

To display Help information about any Console command, enter the following:

```
[] console> help <command name> ↵
```

To display an explanation of the Console interface, enter the following:

```
[] console> help console ↵
```

To display Help information for the **who** command, enter the following:

```
[] console> help who ↵
```

To display manage command tree, while inside "manage", enter the following:

```
[] box> help tree ↵
```

llc-ping

Use the **llc-ping** command to send a test packet to a device on the network to determine whether or not it is communicating at the physical layer with the CMTS.

The llc-ping command sends an LLC (Link Layer Control) packet, which checks for actual physical connectivity. Use the ping command to check for IP connectivity.

Syntax

```
llc-ping <mac | aliasname> [repeat-count | continuous]
[timeout in sec]
```

Syntax Qualifier	Description
mac	MAC address of the modem
aliasname	Aliasname of the modem
repeat-count	Number of times to test for physical connectivity
timeout	Duration of pinging. Integer hastening the timeout in seconds (the default is one second.)
continuous	Pings a modem every second forever

Examples

To llc-ping cable modem "AX482" for 100 times (with a two second timeout), enter the following:

```
[] console> llc-ping AX482 100 2 ↵
```

To ping a modem every second continuously, enter:

```
llc-ping 00:00:CA:00:05:09 continuous
```

Note: The time after a successful ping response is always one second.

logout

Use the **logout** command to end the CLI Console or remote session (Telnet or SSH). If you terminate a remote session, the connection must be re-established. The login name and password *must be* re-entered to establish a new CLI session.

Syntax

```
logout
```

Example

To logout of a CLI Console session, enter the following:

```
[] console> logout ↵
```

```
login: __
```

To logout of a CLI remote session, enter the following:

```
[] remote1> logout ↵
```

Telnet Connection to host lost.

manage

Use the **manage** command to access the Management sub-system command tree. The `box#` prompt indicates when you are at the top level of the Management sub-system (the "manage tree").

The manage tree has 11 major command groups to view or set data items for various CMTS operations. When you are inside the manage tree, the prompt changes to show you what level you are at in the command tree.

Use the **show** command with various manage tree options to display CMTS information. Use the **info** command with various manage tree options to configure the operation of the CMTS. Use the **?** command to query for the info items available at that manage tree level, or to see the next level of the manage tree.

manage command

Table 1: manage command

Display Operation CMTS (show [s] info [i])	
show [s]	Displays data items at the current level of the command tree.
info [i]	Displays settable data items at the current command level.
?	Displays available show, info and next level subcommands

For detailed information about the Manage Command, refer to the "Manage Commands" command on page 4-1.

modem

Use the **modem** command to display information about the cable modems in the net-work, or to configure cable modems (via the CMTS). The **modem** command has a sub-command tree structure that consists of subverbs and qualifiers.

For more detailed information about the Modem Command, refer to the "Modem Com-mand" command on page 4-1.

The CMTS adheres to DOCSIS specs and will inter-operate with DOCSIS-compatible cable modems.

more

Use the **more** command to control the screen display for viewing the CLI commands and output. You may turn scrolling on or off, and you may set the number of lines displayed per screen. Use the following keyboard commands for more display options.

Note: The **more** command may also be used within the **manage** command subsystem, using the "@" symbol.

Syntax

```
more <ON | OFF> [#of lines per screen]
```

Syntax	Description	Default
[on|off]	Defines scrolling action	on
[#of lines per screen]	10 to 200 lines	20

You can control the output display with the options listed below.

Keyboard Command	Description
<space>	Displays more lines per screen
<enter>	Displays the next line
Q	Quits
control C	Terminates the current command

Note: The **more** command may also be used within the **manage** command subsystem with the @ symbol.

Example

```
[] console> more on 24↵


More Mode: ON

Lines per screen: 24
```

next

Use the **next** command to display the next MIB object and its associated value. This command is used to find object values in the following cases when the instance:

- *is* known
- *is not* known but the instance count is known
- and instance count *are not* known

In the *first* case, when the instance *is* known (such as a **[0]** instance), enter the object name and the instance.

In the *second* case, when the instance *is not* known but the instance count *is* known, enter the object name, and the numerical number of the instance desired.

In the *third* case, when the instance and instance count *are not* known, enter the object-name, and all instances are displayed, along with current values.

The next command corresponds to the SNMP manager **get-next** command.

Note: You may find that the **next** command may produce unexpected results, based on the internal logic used by the CMTS that determines the next instance. For example, if an object has invalid or out-of-range value, the CMTS may interpret that value as less than 1, and therefore consider "1" to be the next instance of the object.

Syntax

```
next <objectname>.<instance>

next <objectname> <instance-component-count>

next <objectname>
```

Syntax Qualifier	Description
<objectname>.<instance>	If the instance is known
<objectname> <instance-component-count>	If the instance is NOT known but the instance count IS known
<objectname>	If the instance and instance count are NOT known

Example

To get the next instance of an access ipaddress:

```
[] console> next docsDevNmAccessIp.0 ↵
```

```
mib object docsdevnmaccessip.1 255.255.255.255
mib object docsdevnmaccessip. 2147483647 255.255.255.255
No next instance data for mib object docsdevnmaccessip
```

Note: 2147483647 is the default for the root sys-admin account.

output

Use the **output** command to turn background output ON or OFF from the **dhcptrace** and **modem activity** commands without having to change the settings of those two commands.

The **dhcptrace** and **modem activity** commands send output as events occur, so you may wish to turn this output ON or OFF, depending upon what you are trying to do.

For example:

- You may wish to turn output ON if you want to troubleshoot your system. You will then see all background output. Default is ON.
- You may wish to turn output OFF if you want to manage your system by entering several commands. You will then not be distracted by seeing all background output.

Note: Each console and remote session has its own output settings. You can use one session for management sessions while using a simultaneous session for troubleshooting and event logging.

Syntax

```
output [ON/OFF]
```

Example

```
[] console> output ON↵


Background output is ON
```

passwd

Use the **passwd** command to change the current login passwords. The passwd command has two functions:

- users can change their own passwords
- system administrators (account management privileges) can change other account passwords.

You must know the account name and current password. Case-sensitive names should be enclosed in double quotes "".

Note: It is strongly suggested that the default administrator password, "root", be changed as soon as the CMTS is activated.

Syntax

```
passwd

Old Password: <old password>

New password: <new password>

Re-enter: <new password>


passwd <different account name>
```

Syntax Qualifier	Description
<old password>	Existing user password
<new password>	New user password
<different account name>	User account different from system administrator account

Example

To change your own password:

```
[] console> passwd ↵


Old password: <old password> ↵

New password: <new password> ↵

Re-enter new password: <new password> ↵
```

As system administrator, to change the password for a different user account:

```
[] console> passwd <different user account name>↵


New password: <new password> ↵

Re-enter new password: <new password> ↵
```

ping

Use the **ping** command to send test packets to a device to determine if there is communication at the network layer. Use an IP address or a DNS host name to specify the device. The device may be located on either the CMTS cable or the ethernet interface. The ping command can not be used to ping aliases assigned to modems (via the modem alias command.)

You can stop pinging by pressing **<Ctrl C>**.

The ping command frequency or duration options are:

Ping	Duration
continuous	Pinging continues until stopped (Ctrl C command)
single ping	Sent when no count or time-out is specified

Once the cable modem is pinged, the results are displayed.

Syntax

```
ping <a.b.c.d | hostname> [repeat-count | continuous] [tim-
eout in secs]
```

<a.b.c.d.>	IP address of the host to ping
<host-name>	DNS host name
[repeat-count]	Specified number of ping packets sent (one per second)
[time-out]	Time-out period in seconds
<filename>	Output file created by the putmng command
DISPLAY	Selects screen display (Console or Telnet)
[time-out-in-seconds]	Time-out period in seconds

Example

```
[] console> ping 192.168.195.1 ↵


192.168.195.1 PING Statistics

1 packets transmitted, 0 packets received, 100% packet loss
```

port

Use the **port** command to display data packet traffic information about the cable, ethernet cable, upstream and downstream ports.

The following **port** command options are available:

Port Option	Description
ethernet	Displays the ethernet interface status
cable	Displays the overall cable interface status
downstream	Displays the downstream (forward path) cable status
upstream [N]	Displays the Nth (next) upstream channel for channels 1 through 8

Syntax

```
port [ethernet | cable | downstream | upstream {1-8}]
```

Example

```
[] console> port ethernet ↵

MAC address = 00:00:ca:28:d8:cd

Spanning Tree state: Forwarding

ifInOctets = 494846380

ifInUcastPkts = 292831

ifInNUcastPkts = 3264881

ifInDiscards = 136875

ifInErrors = 2

inInMulticastPkts = 1178494

ifInBroadcastPkts = 2086387

ifOutOctets = 739293

ifOutUcastPkts = 8825

ifOutNUcastPkts = 99

ifOutDiscards = 0

ifOutErrors = 0

ifOutMulticastPkts = 2

ifOutBroadcastPkts = 97

ifOutQueueDepth = 0


Ethernet Transmit Frames per seconds = 3

Ethernet Transmit Bits per seconds = 2416

Ethernet Receive Frames per seconds = 6

Ethernet Receive Bits per seconds = 4664
```

purge-fdb

Use the **purge-fdb** command to delete all ethernet and Customer Product Equipment (CPE) entries from the forwarding data base (FDB). This command purges all CPE devices with static IP addresses from the database.

Note: This command stops all CMTS packet processing until the purge is complete.

The purge-fdb command is used only when the forwarding data base capacity is exhausted. During normal operation, unused fdb entries are aged out after a specified period of time (typically 48 hours.)

The following warning message is displayed prior to executing the **purge-fdb** command:.

```
"This will cause all the non-cm dynamic entries in the FDB
to be deleted and influence traffic through the CMTS by
stopping all packet processing until the purge is complete.
Do you really want to perform the purge (y/n)?_"
```

Press **Y** to purge. If you press **N**, the following is displayed:

```
You have not deleted non-cms dynamic entries in fdb.
```

Syntax

```
purge-fdb
```

putcfg

Use the **putcfg** command to display or download the current CMTS configuration information that is stored in flash memory. The output from the **putcfg** command is in ASCII text format, and contains the MIB variables and the values that differ from the factory default configuration.

The putcfg command has two functions:
- Upload the CMTS configuration information (changed MIB values) to a file
- Display the CMTS configuration information on the terminal screen

Important Notes:
- Files created by the **putcfg** command must be sent to an ip address with a TFTP server running
- File/directories specified must be user-writable
- For some UNIX applications, the file must pre-exist
- Some UNIX applications are case sensitive
- You must have permission to write to the file and directory

Note: An error message such as "Error in configuration data transfer" may be generated if the CMTS is unable to communicate with the TFTP server and write the file. In other instances, the transfer will fail, but no error message will be displayed. The TFTP protocol does not support external alerts for internal TFTP server failure.

It is recommended that you open a separate remote session to run the putcfg command.

Syntax

```
putcfg [<a.b.c.d | hostname> <filename>] | DISPLAY ]
```

Where	Description
<a.b.c.d.>	Ip address for the output file destination
<host-name>	DNS host name
<filename>	Output file created by the putmng command
DISPLAY	Selects screen display (Console or Telnet)

Example

(This example only shows a sample of typical output.)

To display the current configuration information stored in flash memory on the terminal screen:

```
[] console> putcfg display ↵


1.3.6.1.2.1.10.127.1.1.1.1.2.3 Integer 681000000 // doc-
sifdownchannelfrequency.3

1.3.6.1.2.1.2.2.1.7.2 Integer 1 // ifadminstatus.2

1.3.6.1.3.83.1.2.1.7.2 Integer 6 // docsdevnmaccesssta-
tus.2

1.3.6.1.3.83.1.2.1.7.2 Integer 5 // docsdevnmaccesssta-
tus.2

1.3.6.1.3.83.1.2.1.2.2 IpAddress 255.255.255.255 // docs-
devnmaccessip.2


[] remote1> putcfg 192.185.200.123 testfile ↵


Configuration data transfer initiated, wait...

Configuration data transfer complete.
```

putmng

Use the **putmng** command to display or export a CMTS configuration file in the "mng" or "manage" format to a specified location.The "manage" format of the configuration file is readable, with each output line being either a level identifier (preceded by a $) or a parameter followed by a value.

The getmng command is used to load the exported file back into the CMTS.

The **putmng** command may produce unexpected results if the CMTS cannot find its file (incorrect IP address, for example). For more information, refer to the putcfg command description.

Important Notes:

- Files created by the **putmng** command must be sent to an ip address with a TFTP server.
- The directory/file specified must be user-writable, and the user must have file write permission.
- Some UNIX applications require that the file must pre-exist.
- Some UNIX applications are case sensitive.

Note: Putmng cannot be used to view or restore user accounts.

Syntax

```
putmng [ <a.b.c.d | host-name> <filename>] | [ DISPLAY ]
```

Where	Description
<a.b.c.d.>	Ip address for the output file destination
<host-name>	DNS host name
<filename>	Output file created by the putmng command
DISPLAY	Selects screen display (Console or Telnet)

To display the current configuration information stored in FLASH memory:

```
[] console> putmng display ↵
```

To output or place the MIB values from the CMTS into a file using TFTP:

```
[] console> putmng [IP address] [filename] ↵
```

Examples

To display the current configuration information stored in FLASH memory:

```
[] console> putmng display ↵


$  box
     contact                    "mr golden"
     name                       "mr golden"
$  admin
     sw-server-ip-addr          192.168.210.34
$  sw-filename
            "/view/main/vobs/cm/CMTS.album"
$  sw-admin status
                                ignore-provisioning-upgrade
$  downstream
     frequency                  687000000
     power                      610 cable
$  cable-level
     admin-status               up
$  admin
     bootp-relay-control        relay-tagging-enabled
$  bootp-modify/1
     server-ip-addr             192.168.211.5
     status                     active


[] console> __
```

To output or place the MIB values from the CMTS into a file using TFTP:

```
[] console> putmng [IP address] [filename] ↵
```

Note: The following alert is displayed if the MIB object is not recognized:

```
"MIB Name not found in Manage Parameters"
```

quit

Use the **quit** command to end the current CLI session:

- Console session terminates and the login prompt is displayed
- Remote session (Telnet or SSH) terminates and the connection to the CMTS is lost.

The **quit** command is available within the manage command tree by using the "@" command.

Syntax

```
quit
```

Example

To terminate the current Console (or Telnet) session, enter the following:

```
[] console> quit ↵
```

reset

Use the **reset** command to reset the CMTS. The reset command has two options:

- **reset** restores the CMTS to the current settings stored in Flash memory (NVRAM)

- **reset factory** restores the CMTS to the factory default settings.

Note: Choosing **reset factory** clears all configured information. All settings are lost.

WARNING: The reset command will terminate all CLI sessions (Console or remote) *immediately***! Connections to all modems will be reset.**

Syntax

```
reset [factory]
```

Value	Description
[factory]	Selects the reset factory version of the command

Examples

To reset the CMTS to current settings:

```
[] console> reset ↵
```

```
This resets the unit. Are you sure you want to do this?
(Y/N) Y ↵
```

```
**Shutting down immediately due to user 'Reset' command!
```

```
Shutdown in progress, please wait ...
```

To reset the CMTS to factory settings:

```
[] console> reset factory ↵
```

```
This resets the unit. Are you sure you want to do this?
(Y/N) Y ↵
```

```
Shutting down IMMEDIATELY due to user 'Reset' command!
Shutdown in progress, please wait ...
```

```
Nonvolatile storage returned to factory defaults.
```

```
NOTE: All Downstream and Upstream characteristics have been
reset.
```

```
        Downstream Center Frequency is now ZERO.
```

```
        Cable Admin Status is set to DOWN.
```

set

Use the **set** command to set SNMP MIB objects. Objects must be referred to by name and instance.

The CLI **set** command corresponds to the SNMP manager **set** command.

Syntax

```
set <objectname>.<instance> <value>
```

Values	Description
<object-name>	Read-write or read-create access
<instance>	Dotted decimal information that identifies an instance of an object.
<value>	valid object value

The object value types include:

Parameter	Description
ipaddr (IP address)	a.b.c.d or Dotted Decimal (e.g., 92.199.199.120)
integer	Decimal Number
enumerations	Double-quoted text
octet string	Decimal number

Example

To set the system name object to "My System", enter the following:

```
[] console> set sysName.0 "My System" ↵
```

snmp-mode

Use the **snmp-mode** command to display or set the current CMTS SNMP mode. The modes are coexistence, traps or nmaccess

Syntax

```
snmp-mode [coexistence | traps | nmaccess]
```

Table 2: mode command

Where	Description
[coexistence]	SNMPv1/V2 mode (Default
[traps]	Alarms, messages, status etc.
[nmaccess]	SNMPv3 mode

Examples

To display the current mode

```
[ ] console> snmp-mode ↵
```

```
The CMTS SNMP operation mode is currently set to coexist-
ence mode.
```

To set the mode to SNMPv3:

```
[ ] console> snmp-mode nmaccess ↵
```

ssh-keygen

Use the **ssh-keygen** command to generate a Secure Shell (**SSH**) host key and define the key size for both CMTS host keys and/or remote terminal session keys.

The **ssh-keygen** command qualifiers and options are:

Parameter	Description
[-hb]	Sets or changes the size (in bits) of the public Host Key
[-sb]	Sets or changes the size (in bits) of the public Session/Server Key
[-regen]	Regenerates the Host Key using current parameters
[-info]	Displays current Host Key and Server Key parameters

Syntax

```
ssh-keygen [-hb] value [-sb] value [-regen] [-info]
```

Examples:

To display the existing key parameters for both host and server keys.

```
[] console> ssh-keygen ↵
```

To regenerate the host key pair for a 1024--bit public key.

```
[] console> ssh-keygen -hb 1024 regen ↵
```

To set the session key pair public key size to 768 bits (DOES NOT regenerate the host key).

```
[] console> ssh-keygen -sb 768 ↵
```

To regenerate the host key pair for a 768-bit public key, and set the session key pair public key size to 512 bits.

```
[] console> ssh-keygen -hb 768 -sb 512 ↵
```

Note: Two keys must differ for at least 128 bits. A `ssh-keygen -regen` is required after any parameter change.

system

Use the **system** command to display current CMTS system parameter values. The following data items are displayed:

- software version
- hardware version
- system up-time
- system name
- IP address and mask
- default Gateway

The manage commands are used to modify system parameters.

Syntax

```
system
```

Example

```
[] console> system ↵

Software Version: 3.9.68

Hardware Version: 00

System up time: 7 days, 02:03:27

System name: nothing if name is not set

IP address 192.168.195.23 (mask 255.255.255.0)

default GATEWAY 192.168.195.2
```

upstream-bandwidth

Use the **upstream-bandwidth** command to display the upstream bandwidth statistics for all eight upstream channels. This command is also used to calculate upstream bandwidth statistics. Channels that are not active do not display statistics.

Note: The **upstream-bandwidth** command can be used to determine parameters for provisioning UGS upstream service flows.

Statistics	Measurement
Width	3200 KHz 51200000 bits/sec
Shortest Interval Scheduled	120 msec 614400 bits 76800 bytes
3 percent reserved	reserved
0 UGS flows	reserved

Approximate max available	Concurrent
	   603264 bits
	   75408 bytes

Syntax

```
upstream-bandwidth <display|calculate> [<grant size>
<grant interval> <channel id>]
```

Note: The default is display.

Values	Description
<display>	Displays upstream bandwidth for upstream channels
<calculate>	CMTS determines the maximum number of UGS flows that are possible for the specified grant parameters
<grant size>	Specified UGS grant size in bytes
<grant interval>	Specified UGS grant internal in 10 ms increments
<channel id>	Specifies upstream channel

Example

```
[] console> upstream-bandwidth calculate 100 10 7 ↵


Grant Size = 100 bytes, Grant Interval = 10 ms
Grant Interval Slots = 400 (0x190), Grant Size Slots = 9 (0x9)


44 Theoretical maximum UGS flows (no Initial Maintenance)

35 Theoretical maximum UGS flows (with Initial Maintenance 84 (0x54))


0 UGS flows currently active

35 Actual UGS flows that can be added based on current usage
```

upstream-failover

Use the **upstream-failover** command to manually switch the specified channel (1 through 7) to the spare (channel 8) upstream receiver. This switch takes down the eighth upstream receiver, by forcing the receive to a **testing** state with an administrative **down** status. The CLI displays a **success** message when the switch is complete. To cancel the failover action, specify **0** as the channel and the original upstream receiver is reinstated.

The upstream-failover command moves one upstream channel to the eighth upstream receiver. If you have already switched one channel to the eighth upstream receiver, you must cancel the switch before you can assign a different channel to the receiver.

Note: A manual upstream-failover immediately forces any modems connected to the eighth upstream receiver to de-register and drop out of the network.

Note: In the V4.0 software, two or more upstream receivers must be operational for automatic failover to occur.

Syntax

```
upstream-failover <channel 0-7>
```

Parameter	Description
<channel 0-7>	Selects channel (1 through 7) to switch upstream receiver 8. Zero (0) cancels switchover.

Example

To switch Channel 3 to Upstream 8 (spare upstream receiver), enter the following:

```
[] console> upstream-failover 3 ↵
```

To cancel the switch, enter the following:

```
[] console> upstream-failover 0 ↵
```

v3passwd

Use the **v3passwd** command to change user passwords for Simple Network Management Protocol version 3 (SNMPv3) accounts. The SNMPv3 protocol has enhanced security features, as compared to the default SNMPv1 used in the CMTS.

The **v3passwd** command has two functions:

- users can change their current login password
- account managers can change the password for user accounts

Case-sensitive passwords are enclosed in double quote marks (**""**); otherwise the CMTS accepts upper or lower case as valid. If a password change fails, a warning message is displayed.

Note: **v1** or **v3** is chosen via the **privileges-list subcommand** in the manage command tree.

Syntax

```
v3passwd [-p | -a] <username>:
```

Parameter	Description
-p	Changes the privacy password
-a	Changes the authorization password
<username>	Name of the SNMPv3 user

Example

To change the password:

```
[] console> v3passwd <user-name> ↵

Old password: <old password> ↵
New password: <new password> ↵
Re-enter new password: <new password> ↵
Authorization Key Change succeeded
```

To change the privacy password:

```
[] console> v3passwd -p <user-name> ↵

Old password: <old password> ↵

New password: <new password> ↵

Re-enter new password: <new password> ↵

Privacy Key Change succeeded
```

who

Use the who command to display information about current and remote CLI sessions for the Console and remote (Telnet or Secure Shell) ports.:

Parameter	Description
Session	Console, Telnet, or ssh
User Name	**root** is default
Location	IP address of local host (**127.0.0.1** is always used for the Console)
RemPort	Remote port number; none is for the Console
Intf	Interface type (UART for a serial connection, or Ethr for Ethernet)
Start	Shows when the session started

Syntax

```
who
```

Example:

```
[] console who ↵


Session  User name   Location    Rem Port  Intf  Start of Session
-------  ---------   ----------- --------  ----  -------------------
remote1  root        192.28.10.2 1026      Ethr  01/19/2001 16:07:10
```

Manage Commands

Chapter Overview

The manage-level CLI commands are accessed through the console port or at the top level of the remote prompt. The manage command opens the manage command tree.

Manage command tree

To display the manage command tree:

`[ ] box# `**`help tree`**` ↵`

The full configuration tree follows:

```
>>   box
        sys-obj-resources
        admin
           cm-vendor-list
           cm-vendor-modify/<number>
           bootp-list
           bootp-modify/<index {1-10}>
        accounts
           user-list
           user-modify/<index {1-10}>
           privileges-list
           privileges-modify/<index {1-10}>
        ethernet-level
           phy-level
           phy-list
           phy-specific/<index {1-2}>
        cable-level
           mod-iuc-list/<profile {1-10}>
           modulation/<profile {1-10}>/<iuc>
           downstream
              annex
           frequency-split
           upstream-list
           upstream-specific/<channel {4-11}>
           upstream-test-port
           multi-us-list
           multi-us-config/<channel {4-11}
           multi-usage-us
```

ingress-avoidance-level
   ingress-avoidance-us-config-list
   ingress-avoidance-us-threshold-list
   enable/<channel {4-11}>
   freq-list/<carrier-path {1-8}>
   freq-config/<carrier-path {1-8}>/<freq-index {1-10}>
   change-pref/<channel {4-11}>
   metric-threshold-config/<channel {4-11}>
   profile-list/<ifIndex {4-11}>
   profile-config/<ifIndex {4-11}>/<pref-index {1-3}>
   tx-profile-list
   tx-profile-config/<index {1-24}>
   metric-config
   metric2-config
   freq-status-aging-config
   freq-status-list/<carrier-path {1-8}>
   health-list
modem-list
modem-specific/<number>
cpe-ip-list/<modem-number>
cpe-ip-specific/<modem-number>/<index {1-1024}>
cpe-control-list
cm-filter-list
modem-us-disable-list
modem-us-disable-modify/<mac-addr>
sid-list
sid-specific/<sid-num>
qos-1.1-level
   mac-sf-list
   sf-per-mac-list/<mac-addr>
   sf-list
   sf-specific/<sfid>
   sf-stats-list
   sf-stats-specific/<sfid>
   upstream-stats-list
   upstream-stats-specific/<sid>
   classifier-list
   classifier-per-sf-list/<sfid>
   classifier-specific/<sfid>/<class-id>
   dynamic-service-stats
   dynamic-service-specific/<direction>
   sf-log-list
   sf-log-specific/<index>

        sfact-log-list
        sfact-log-specific/<index>
        qos-params-list
        qos-params-per-sf-list/<sfid>
        qos-params-specific/<sfid>/<type>
        phs-list
        phs-per-sf-list/<sfid>
        phs-sf-specific/<sfid>/<cid>
     qos-1.0-list
     qos-1.0-specific/<qos-index>
   forwarder
     ethernet-port-fwd
     cable-port-fwd
     port-filter-list
     port-filter-modify/<mac-addr>/<port>
     tp-forwarding-data-base
     spanning-tree
       ethernet-port-stp
       cable-port-stp
     link-filter-list
     link-filter-modify/<index>
     ip-filter-list
     ip-filter-modify/<index>
     cpe-addr-filter-list
     cpe-state-filter-list
     cpe-filter-modify/<group {1-1024}>/<index {1-1024}>
     tcp-udp-filter-list
     tcp-udp-filter-modify/<group {1-1024}>/<index {1-1024}>
   ip-level
     route-list
     route-modify/<dest-ip-addr>
     icmp
     udp-stats
     udp-entry-list
     tcp-stats
     tcp-connection-list
     arp-list
     arp-modify/<interface>/<ip-addr>
     igmp-modify/<interface>
     multicast-list
     multicast-modify/<ip-addr>/<interface>
     scope-list
     scope-modify/<interface>/<ip-addr>/<ip-mask>

        dns-list
        dns-modify/<index {1-10}>

     snmp
       coex
         ver3
           v3user-list
           v3user-modify/username
           view-list
           view-modify/viewname/subtree
           group-list
           group-modify/sec-model/username
           v3access-list
           v3access-modify/group/context/sec-model/sec-level
        snmpcommunity-list
        snmpcommunity-specific/snmpcommunityindex
        snmptargetaddr-list
        snmptargetaddr-specific/snmptargetaddrname
        snmptargetaddrext-list
        snmptargetaddrext-specific/index {1-10}
        snmptargetparams-list
        snmptargetparams-specific/snmptargetparamsname
        snmpnotify-list
        snmpnotify-specific/snmpnotifyname
        snmpfilterprofile-list
        snmpfilterprofile-specific/snmptargetparamsname
        snmpfilter-list
        snmpfilter-specific/profilename/filtersubtree
       traps
        non-docs-traps
        docs-traps
       nmaccess
        access-list
        access-specific/<index>
        community-list
        alarms
          active-list
          loc-list
          loc-provisioning/<mac-addr>
    baseline-privacy
      auth-list
      authorization/<mac-addr>
      said-bp-list

said-bp-modify/<said-num>
ip-mcast-list
ip-mcast-modify/<mcast-index>
mcast-auth-list
mcast-auth-modify/<mcast-said-num>/<cm-mac-addr>
prov-cm-cert-list
prov-cm-cert-modify/<mac-addr>
ca-cert-list
ca-cert-modify/<index>
event-level
events-list
serial-port

[ ] box#

manage

Use the **manage** command to access a series of subcommands used to operate, administer, maintain, and provision the CMTS.

The top level of the **manage** command is identified by the symbol **box #**, called the **box prompt**. Subcommands are entered from this prompt and include multi-layered **show [s], info [i]**, and **? (next-level)** commands.

manage [s] show

Use the **manage** "show" command to display CMTS system parameters.

Table 3: manage show data items

Data Item	Description	Range, Value, Example
description	CMTS type, H/W S/W version	Cornerstone DOCSIS CMTS, Hardware rev. 08, Software rev 4.2.0 (built 8/25/00 01:01:0000)
object-id	OID of CMTS in MIB tree	lancityMcnsProdIdCMTS
up-time	Time since last power-down or reset	—
serial-number	# assigned at factory. Stored in NVRAM.	Example: "SCHSRD351801"
current-temperature	Current internal temperature	37° C
front-fan-on	Front fan status	true
middle-fan-on	Middle fan status	true
back-fan-on	Back fan status	true
DOCSIS Version	CMTS DOCSIS Version	1.1

manage [i] info

Use the **manage** "info" command to set CMTS system parameters.

Table 4: manage info parameters

Parameter	Description or Values	Default	Range
contact	CMTS contact person (optional).	"" (null)	Text
name	Assigned CMTS name appearing in CLI prompt (optional).	"" (null)	Text

Table 4: manage info parameters

Parameter	Description or Values	Default	Range
location	Physical location of CMTS (optional).	"" (null)	Text
date-time	CMTS current time and date.	—	MM/DD/YYYY HH:MM:SS format
reset-now	CMTS software reset switch.	false	true = reset now false = no reset
restart-from-factory-defaults	Controls factory default software settings (stored in NVRAM).	false	True = reset from factory defaults False = reset from last image
high-temp-threshold	Sets CMTS high temperature warning threshold in degrees.	66	0 to 100 degrees C

manage [?] next level

Use the **manage** "? (next level)" command to view the next level of commands.

Table 5: manage next level commands

Next Level Command	Page #
sys-obj-resources [s]	page 3-10
admin [s, i]	page 3-11
accounts [i]	page 3-19
ethernet-level [s, i]	page 3-25
cable-level [s, i]	page 3-32
forwarder [s, i]]	page 3-149
ip-level [s,i]	page 3-183
snmp [s, i]	page 3-218
baseline-privacy [s, i]	page 3-278
event-level [s, i]	page 3-303
serial-port [i]	page 3-307

sys-obj-resources [s]

Use the **sys-obj-resources** "show" subtree command to display the SNMP object resource values associated with your CMTS. System object resources define the object identification, the capability statement, and the current up-time for the CMTS, as part of a larger network system.

Command Path

```
[] box# sys-obj-resources ↵
```

Syntax

```
show
```

sys-obj-resources [s] show

Table 6: sys-obj-resources show data items

Data item	Description	Typical Value or Range
object-resource-id	Object ID ("OID") identifying the CMTS.	1.3.6.1.4.1.482.60.9.1
object-resource-desc	Capability statement for the Cornerstone CMTS.	Capability statement for the Cornerstone CMTS
object-resource-uptime	CMTS up-time since last reset or power-on.	0

admin [s, i]

Use the **admin** "show and info" commands to configure and administer your CMTS 1500.

Command Path

```
[] box# admin ↵
```

Syntax

```
show
info
```

admin [s] show

Use the **admin** "show" command to display CMTS provisioning data.

Table 7: admin show data items

Data Item	Description	Typical Value or Range
sw-oper-status	CMTS software operational status. Indicates if software loaded success-fully from provisioning file or from NVRAM; also indicates failed software load. • complete-from-provisioning • complete-from-mgmt • failed	complete-from-provisioning or complete-from-mgmt
booted-album-filename	Filename of booted software album.	CMTS_album
booted-album-number	Sequence number of the current booted software album.	0 to 99
boot-state	Current boot state: • failed • operational	operational
dhcp-server-ip-addr	IP address of DHCP server. Default 0.0.0.0	Valid IP address (a.b.c.d format)
time-server-ip-addr	IP address of time server. Default 0.0.0.0	Valid IP address
tftp-server-ip-addr	IP address of TFTP server. Default 0.0.0.0	Valid IP address
config-file	CMTS Configuration file to be loaded from provisioning server.	"" (Null)

admin [i] info

Use the **admin** "info" command to set CMTS provisioning data and view the sub level commands.

Table 8: admin info parameters

Parameter	Description or Values	Default	Range
provisioning-control	Control for CMTS provisioning method	use-both-dhcp-and-tftp	• use-both-dhcp-and-tftp • use-dhcp • use-tftp • use-nvram
sw-server-ip-addr	IP address of provisioning server with CMTS configuration file software.	0.0.0.0 (use any server)	Valid IP address
sw-filename	Filename of CMTS software album.	"(unknown)"	Valid filename
config-tftp-ip-addr	IP address of TFTP server	0.0.0.0 (use any server)	Valid IP address
config-tftp-filename	CMTS configuration filename on TFTP server.	""	Valid filename
sw-admin-status	Administrative status of software upgrade: • upgrade-from-mgmt • allow-provisioning-upgrade • ignore-provisioning-upgrade	allow-provisioning-upgrade	• upgrade-from-mgmt • allow-provisioning-upgrade • ignore-provisioning-upgrade
dp-statistics-interval	Reporting period (in seconds) for DP (Data Path) statistics for CMTS.	10 seconds	Any positive integer
bootp-relay-control	CMTS control for allowing bootp relay requests from cable network:	relay-only-enabled disabled by default	• disabled • relay-only-enabled • relay-tagging-enabled
time-rfc868-addr	IP address for RFC868 time server	0.0.0.0 (any IP address)	Valid IP address
time-offset	CMTS time offset from time server (in seconds).	0 seconds	-43200 to 43200

Table 8: admin info parameters (continued)

Parameter	Description or Values	Default	Range
time-sntp-addr	IP address for SNTP time source.	0.0.0.0	Valid IP address
ssh-control	CMTS control for allowing SSH (Secure Shell) remote sessions on CLI. Stored in NVRAM through CMTS reset.	disabled	enabled disabled
ssh-host-key-bits	Size of SSH (Secure Shell) Host Key (in bits).	0 bits	512 to 2048 recommended size is 768 to 1021 bits
ssh-server-key-bits	Size of SSH (Secure Shell) Server Key (in bits).	0 bits	512 to 2048 recommended size is 512 to 640 bits
ssh-key-regen-mins	Interval (in minutes) between SSH key regeneration.	0 minutes	5 to 10080

admin (next level)

Table 9: admin next level commands

Next Level Command	Page #
cm-vendor-list [s]	page 3-14
cm-vendor-modify/<number> [i]	page 3-15
bootp-list [s]	page 3-16
bootp-modify/<index {1-10}> [s, i]	page 3-17

cm-vendor-list [s]

Use the **cm-vendor-list** "show" subtree command to display the list of cable modems organized by vendors recognized by the CMTS. The list is referenced by index number, which is used in the cm-vendor-modify command.

Command Path

```
[] box# admin ↵
[] admin# cm-vendor-list ↵
```

Syntax

```
show
```

cm-vendor-list [s] show

Table 10: cm-vendor-list show data items

Data Item	Description	Typical Value or Range
Index	Cable modem	Assigned by CMTS
Control	Controls status of vendor	Active Delete
Mac Address	MAC address of cable modem	Valid MAC address
Address Mask	Address Mask to filter cable modem MAC addresses	Default is 00:00:00:00:00:00:00 (no mask)

cm-vendor-modify/<number> [i]

Use the **cm-vendor-modify/<number>** command to view and set parameters for the specified cable modem vendor.

Command Path

```
[] box# admin ↵
[] admin# cm-vendor-modify/<number> ↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<number>	Index number shown in cm-vendor-list command.

cm-vendor-modify [i] info

Table 11: cm-vendor-modify info parameters

Parameter	Description or Values	Default	Range
control	Control action for selected cable modem. Delete will remove cable modem from active list.	active	active delete
mac-address	MAC address assigned to cable modem.	00:00:00:00:00:00 indicates any MAC address	Valid MAC address
address-mask	Mask used to separate particular vendors.	00:00:00:00:00:00 indicates no mask.	Valid mask to screen for selected vendor.

bootp-list [s]

Use the **bootp-list** "show" subtree command to display the bootp relay table, to show a list of servers that network devices can use for bootp functions.

Command Path

```
[] box# admin ↵
[] admin# bootp-list ↵
```

Syntax

```
show
```

bootp-list [s] show

Table 12: bootp-list show data items

Data Item	Description	Typical Value or Range
Index	Index value used by bootp-modify command to select server.	1 to 10; assigned by CMTS
Status	Action status for bootp Relay server.	active not-in-use
IP Address	IP address of bootp relay server. 255:255:255:255 indicates any IP address is valid.	Valid IP address.
Client Types	Clients accepted by this bootp relay server.	• cm • cpe • any-cm-or-cpe
Relay Count	Count of bootp relay server activity.	0 indicates no activity

bootp-modify/<index {1-10}> [s, i]

Use the **bootp-modify** "show and info" subtree commands to display and set the parameters for access to a specified bootp Server. Use the bootp-modify command to set up the bootp Relay servers for the client types: cable modems and attached customer equipment such as computers (CPE).

The CMTS supports up to ten different bootp Relay servers. Subscribers can be divided among different Relay servers to balance configuration loading by the cable modems.

Command Path

```
[] box#  admin ↵
[] admin#  bootp-modify/<index {1-10}> ↵
```

Syntax

```
show
info
```

Syntax Qualifier	Description
<index {1-10}>	Specifies index number shown in bootp-list command.

bootp-modify [s] show

Table 13: bootp-modify show data items

Data Item	Description	Typical Value or Range
number-of-relays	Count of bootp Relay server activity (for selected server). 0 indicates no bootp Relay activity	Varies

bootp-modify [i] info

Table 14: bootp-modify info parameters

Parameter	Description or Values	Default	Range
status	bootp Relay Server administrative status	not-in-service	active not-in-service
server-ip-address	IP Address for bootp Relay server. 255.255.255.255 indicates any valid IP address.	255.255.255.255	Valid IP address

Table 14: bootp-modify info parameters

Parameter	Description or Values	Default	Range
client-types-relayed	CMTS relays selected client types to specified bootp Relay server.	any-cm-or-cpe	cm-only cpe-only any-cm-or-cpe

accounts [i]

Note: Account management functions are performed by user accounts with read-write *AND* account management privileges (such as the "root" account).

Use the **accounts** "info" command to control security access to the CMTS. Security access can be controlled in the following ways:

- Limits number of remote sessions.
- Provides an inactivity timer for Telnet sessions.
- Restricts access to the CMTS by defining specific user accounts in the NmAccessTable MIB. Refer to the "coex [?]" command on page 3-220.
- Defines the user login and password entered at the start of a CLI session.
- Controls the access level of the user.

Most functions of the account "info" command are found at the next command level.

Command Path

```
[] box# accounts ↵
```

Syntax

```
info
```

accounts [i] info

Table 15: accounts info parameters

Parameter	Description or Values	Default	Range
number-telnet-sessions	Maximum number of remote sessions allowed.	5 sessions	0 to 5 (total of Telnet and Secure Shell) sessions
inactivity-timer	Inactivity period allowed for user before remote session is terminated. "0" indicates NO TIMEOUT period.	Default is 0 minutes	0 to 10080 minutes (7 days)

accounts (next level

Next Level Command	Page #
user-list [s]	page 3-21
user-modify/<index {1-10}> [i]	page 3-22
privileges-list [s]	page 3-23
privileges-modify/<index {1-10}>	page 3-24

user-list [s]

Use the **user-list** "show" subtree command to display a current list of user accounts with account parameters. All users with access to the CMTS are displayed.

Command Path

```
[] box# accounts ↵
[] accounts# user-list ↵
```

Syntax

```
show
```

user-list [s] show

Table 16: user-list show data items

Data Item	Description	Typical Value or Range
Index	Index number assigned by CMTS. Maximum of 10 user accounts allowed.	Default has "root" as 1. Ranges is 1 to 10.
User Name	User account name. Must be entered in double quotes ("").	"root" is default system administrator
Privileges index	Index into the privileges list (see privileges-list and privileges-modify commands).	N/A
Status	Current action status of this user. The system administrator can remove another account by setting status to "delete".	active delete

user-modify/<index {1-10}> [i]

Use the **user-modify <index {1-10}>** command to display a current list of user
accounts with account parameters. The **user-modify/<index {1-10}>** command dis-
plays all user accounts with access to the CMTS. You can also use this command to cre-
ate or remove users, or change privileges.

Command Path

```
[] box# accounts ↵
[] accounts# user-modify/<index {1-10}> ↵
```

Syntax

```
info user-modify/<index {1-10}>
```

Syntax Qualifier	Description
<index {1-10}>	Specifies index number shown in user-modify command.

user-modify [i] info

Table 17: user-modify info parameters

Parameter	Description or Values	Default	Range
user-name	User account name	root	—
privileges-index	Index to privileges-list. "0" indicates no privi-leges assigned.	1	0 to 10
status	Controls user account status	active	active delete

privileges-list [s]

Use the **privileges-list** "show" subtree command to display a list of privilege categories for user accounts. This account command allows you to see all privilege types defined on this CMTS.

Command Path

```
[] box# accounts ↵
[] accounts# privileges-list ↵
```

Syntax

```
show
```

privileges-list [s] show

Table 18: privileges-list show data items

Data Item	Description	Typical Value or Range
Index	Index number assigned by CMTS to privileges level. Maximum of 10 levels allowed.	Range is 1 to 10.
Level Name	Access privilege level name	Default is "" (Null)
Security Name	Password for account (in the NmAccess Table)	Default is "" (Null)
Status	Control status for user privilege level.	active delete

privileges-modify/<index {1-10}> [i]

Use the **privileges-modify/<index {1-10}>** command to set parameters for privilege levels. You can also use the privileges-modify/<index {1-10}> command to alter privileges assigned to user accounts. The privileges-modify/<index {1-10}>command creates a new privilege level if a specified level does not exist, and assigns default values to the new level.

Command Path

```
[] box# accounts ↵
[] accounts# privileges-modify/<index {1-10}> ↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<index {1-10}>	Specifies index number shown in privileges-modify command.

privileges-modify [i] info

Table 19: privileges-modify info parameters

Parameter	Description or Values	Default	Range
level-name	Privileges Level name	"" (Null)	-
method	Choose SNMP V1 or 3	SNMPv1	SNMPv1 SNMPv3
security-name	Security name (or community string for SNMPv1) associated with account. The security name is also found in the NmAccessTable. Must be entered in double quotes ("").	"" (Null)	-
status	Controls user privilege status. Select delete to remove privilege level.	active	active delete

ethernet-level [s, i]

Use the **ethernet-level** "show and info" commands to display the activity on the CMTS Ethernet port (main or aux), and set the parameters for this interface. The Ethernet port is the link to the "outside" world for the cable network. Ethernet features include Alternate Phy (alternate physical Ethernet port, or "aux"), and dual speed (10 or 100 mbits/sec).

Command Path

```
[] box# ethernet-level ↵
```

Syntax

```
show
info
```

ethernet-level [s] show

Table 20: ethernet-level show data items

Data Item	Description	Typical Value or Range
description	Name assigned to Ethernet interface.	ether0
mtu	Maximum transmission unit rate (in octets)	—
speed	Ethernet port speed can be 10 or 100 mbits/sec.	10000000 100000000
hi-speed	Maximum speed of Ethernet port: 10 or 100 mbits/sec.	10000000 100000000
physical-address	CMTS MAC address for Ethernet port	Assigned to CMTS in factory
operational-status	CMTS Ethernet port status	up down testing
last-change	Time since last change between main and aux Ethernet connections (in 100ths of seconds)	—
in-octets	Count of incoming octets since last CMTS reset	—
in-unicast-packets	Count of incoming unicast packets since last CMTS reset	—
in-non-unicast-packets	Count of incoming non-unicast packets since last CMTS reset	—
in-multicast-packets	Count of incoming multicast packets since last CMTS reset	—
in-broadcast-packets	Count of incoming broadcast packets since last CMTS reset	—
in-discards	Count of discarded incoming packets since last CMTS reset. One sign of traffic congestion is a high count value	—
in-errors	Count of errored incoming packets since last CMTS reset	—
out-octets	Count of outgoing octets	—
out-unicast-packets	Count of outgoing unicast packets since last CMTS reset	—
out-non-unicast-packets	Count of outgoing non-unicast packets since last CMTS reset	—

Table 20: ethernet-level show data items (continued)

Data Item	Description	Typical Value or Range
out-multicast-packets	Count of outgoing multicast packets since last CMTS reset	—
out-broadcast-packets	Count of outgoing broadcast packets since last CMTS reset	—
out-discards	Count of outgoing packets discarded since last CMTS reset	—
out-errors	Count of errored outgoing packets since last CMTS reset	—
tx-frame-rate	CMTS transmission rate (in frames/second)	—
rx-frame-rate	CMTS receiving rate (in frames/second)	—
tx-octet-rate	CMTS transmission rate (in octets)	—
rx-octet-rate	CMTS receiving rate (in octets)	—

ethernet-level [i] info

Table 21: ethernet-level info parameters

Parameter	Description or Values	Default	Range
admin-status	Administrative status of CMTS Ethernet port. The port will not be used for regular traffic if set to down or testing	up	up down testing
link-trap	Link-trap status (determines if link-traps are detected and forwarded on)	enabled	enabled disabled
alias	User assigned port nameG35	"null"	<string>

ethernet-level [?] (next level)

Next Level Command	Page #
phy-level	page 3-28
phy-list	page 3-30
phy-specific/<index{1-2}>	page 3-31

phy-level [i]

Use the **phy-level** "info" subtree command to set physical-level parameters for a CMTS Ethernet port. The CMTS auto-sensing capability detects Ethernet interface speed, and checks the interface to determine if the Ethernet link is active. You can force the CMTS to use one Ethernet connection (main or aux), or let it automatically select its own connection.

If you want to implement redundancy via the auto-poll feature, you must select a polling IP address that is accessible in the Ethernet LAN by both the main or aux connections.

Command Path

```
[] box# ethernet-level ↵
[] ethernet-level# phy-level ↵
```

Syntax

```
info
```

phy-level [i] info

Table 22: phy-level info parameters

Parameter	Description or Values	Default	Range
control	CMTS function for selecting Ethernet port. The CMTS uses the current port until it detects a problem, then switches if auto-detect is selected. When auto-poll is selected, the CMTS switches when polling fails. The main-only and aux-only settings force the CMTS to use the selected port.	auto-detect	auto-detect auto-poll main-only aux-only
poll-interval	Time interval used by CMTS for auto-poll (in 100ths of seconds)	200 (2 seconds)	Minimum 50 Maximum 360000
polling-ip-addr	Address used by CMTS to poll. "0.0.0.0". 0.0.0.0 causes the Gateway IP address to be used. If the Gateway IP address is not defined, the polling feature is disabled. Note: Numbers larger than 255 are not valid numbers. (Eg. 0.0.0.1 or multicast addresses 224.0.0.0 are valid.) When an invalid address is entered, the CMTS slows down significantly. Workaround: Verify the IP addess is correct.	0.0.0.0	Valid IP address

Table 22: phy-level info parameters

Parameter	Description or Values	Default	Range
send-tcn-message	CMTS sends TCN message (indicating a switch between Ethernet ports has occurred).	true	true false

phy-list [s]

Use the **phy-list** "show" subtree command to display the CMTS Ethernet Phy Connections list. This list has two rows (**Main** and **Aux**). The phy-list command displays actual and assigned data rate status for the CMTS.

Command Path

```
[] box# ethernet-level ↵
[] ethernet-level# phy-list ↵
```

Syntax

```
show
```

phy-list [s] show

Table 23: phy-list show data items

Data Item	Description	Typical Value or Range
Index	Index number for table (used with phy-specific command)	1, 2
Connector	CMTS physical connector.	Main Aux
Admin Status	CMTS administrative status for Ethernet phy connection. Default is auto.	• 10MbitHalfDuplex • 10MbitFullDuplex • 100MbitHalfDuplex • 100MbitFullDuplex • auto • disable
Operational Status	CMTS operational status for Ethernet phy connection. This status may be different from the Admin Status (assigned), because the CMTS can not transmit at the assigned rate.	• 10MbitHalfDuplex • 10MbitFullDuplex • 100MbitHalfDuplex • 100MbitFullDuplex • auto • disable • standby

phy-specific/<index {1-2}> [s, i]

Use the **phy-specific** "show and info" subtree commands to display CMTS Ethernet Phy operational status (with **show**), and to set the CMTS Ethernet Phy administrative status (with **info**). If you select **auto** for the administrative status, the CMTS operates at the highest possible level.

Command Path

```
[] box# ethernet-level ↵
[] ethernet-level# phy-specific/<index {1-2}> ↵
```

Syntax

```
show

info
```

Syntax Qualifier	Description
<index {1-2}>	Specifies index number shown in phy-specific command.

phy-specific [s] show

Table 24: phy-specific show data items

Data Item	Description	Typical Value or Range
phy-operational-status	Actual operational status for the CMTS Ethernet phy connection.	• 10MbitHalfDuplex • 10MbitFullDuplex • 100MbitHalfDuplex • 100MbitFullDuplex • auto • disable

phy-specific [i] info

Table 25: phy-specific info parameters

Parameter	Description or Values	Default	Range
phy-admin-status	CMTS administrative status for Ethernet phy connection.	auto	• standby • active • auto • disable

cable-level [s, i]

Use the **cable-level** "show and info" commands to display and set parameters for the CMTS cable interface ("RF" interface). Use the next level commands to display and set CM parameters.

Command Path

```
[] box# cable-level ↵
```

Syntax

```
show
info
?
```

cable-level [s] show

Table 26: cable-level show data items

Data Item	Description	Typical Value or Range
description	Name assigned to cable interface	cable0
mtu	Maximum Transmission Unit rate (in octets)	1500 octets
speed	Cable port speed (in mbits/sec) Note: Cable level relays information and control for all upstreams and downstreams	0
hi-speed	Maximum speed of cable port Note: Cable level relays information and control for all upstreams and downstreams	0
physical-address	CMTS MAC address for Cable port	Assigned to CMTS in factory
operational-status	CMTS Cable port status	• up • down • testing
last-change	Time since last change (in 100ths of seconds)	0
in-octets	Count of incoming octets since last CMTS reset	—
in-unicast-packets	Count of incoming unicast packets since last CMTS reset	—
in-non-unicast-packets	Count of incoming non-unicast packets since last CMTS reset	—
in-multicast-packets	Count of incoming multicast packets since last CMTS reset	—
in-broadcast-packets	Count of incoming broadcast packets since last CMTS reset	—
in-discards	Count of discarded incoming packets since last CMTS reset	—
in-errors	Count of errored incoming packets since last CMTS reset	—
out-octets	Count of outgoing octets	—
out-unicast-packets	Count of outgoing unicast packets since last CMTS reset	—

Table 26: cable-level show data items (continued)

Data Item	Description	Typical Value or Range
out-non-unicast-packets	Count of outgoing non-unicast packets since last CMTS reset	—
out-multicast-packets	Count of outgoing multicast packets since last CMTS reset	—
out-broadcast-packets	Count of outgoing broadcast packets since last CMTS reset	—
out-discards	Count of outgoing packets discarded since last CMTS reset	—
out-errors	Count of errored outgoing packets since last CMTS reset	—
capabilities	Transmission capabilities of cable interface	Transmission
invalid-range-reqs	Count of invalid ranging requests received by CMTS from CMs.	—
ranging-aborteds	Count of halted ranging requests received by CMTS from CMs.	—
invalid-reg-reqs	Count of invalid registration requests received by CMTS from CMs.	—
failed-reg-reqs	Count of failed registration requests received by CMTS from CMs.	—
invalid-data-reqs	Count of invalid data request messages received by CMTS from CMs.	—
t5-timeouts	Count of T-5 timeouts by CMTS (excess delay in receiving data from CMs).	—
tx-frame-rate	CMTS transmission rate (in frames/second)	—
rx-frame-rate	CMTS receiving rate (in frames/second)	—
tx-octet-rate	CMTS transmission rate (in octets)	—
rx-octet-rate	CMTS receiving rate (in octets)	—
admitted-cbr	Number of admitted CBR/UGS service flows	—
cbr-rejected	Number of CBR/UGS flows rejected	—

cable-level [i] info

Table 27: cable-level info parameters

Parameter	Description or Values	Default	Range
admin-status	CMTS administrative status for cable interface. The default is set to "down" so the operator can configure the cable interface before actual use. The testing value is for display only and cannot be set by user.	down	• up • down • testing
sync-interval	Interval between sync pulses from CMTS to cable modems (in milliseconds)	2	1 to 200
ucd-interval	Interval between Upstream Channel Descriptor (UCD) messages from CMTS to cable modems (in milliseconds). The UCD controls upstream transmission to the CMTS.	1000	1 to 2000
insert-interval	Interval between upstream transmission opportunities by cable modems. "0" means that modems can transmit at any interval.	0	0 to 200
invited-ranging-attempts	Number of ranging attempts allowed by CMTS before the cable modem must restart the registration process. During ranging, the cable modem tries to "lock" onto the upstream channel assigned by the CMTS.	10	0 to 1024
link-trap	CMTS generates link-traps for cable-level events.	enabled	enabled disabled
alias	User assigned interface name	"null"	
upstream-tolerance	Percentage of errored packets tolerated on upstream channels.	0	0 to 100
dnstream-tolerance	Percentage of errored packets tolerated on downstream channel.	0	0 to 100
max-cbr-flows	Maximum number of CBR (Constant Bit Rate) data flows supported by the CMTS.	1	1 to 400 1 = do not limit
max-cpe-default	Maximum number of cpe devices per modem	16	0 to 1024
cpe-active-default	Default status setting for CPE (Customer Premises Equipment) attached to CM.	disabled	enabled disabled
learn-ability-default	Default status setting for CMTS to learn forwarding database addresses of subscriber equipment.	enabled	enabled disabled

Table 27: cable-level info parameters (continued)

Parameter	Description or Values	Default	Range
sub-filter-downstream default	Default filter index value for subscriber downstream filter.	0	0 to 1024
sub-filter-upstream default	Default filter index value for subscriber upstream filter.	0	0 to 1024
cm-filter-downstream default	Default filter index value for CM downstream filter.	0	0 to 1024
cm-filter-upstream default	Default filter index value for CM upstream filter.	0	0 to 1024
upstream-tx-eq-enable	When enabled, the CM requests coefficients from the CMTS that are used by the CM to correct cable plant distortions.	disabled	ON/OFF
concatenation-control	Determines whether contenation should be turned on or off for cable modems that use a DOCSIS 1.0 configuration file and request concatenation. The CMTS supports concatenation for DOCSIS 1.1- and 2.0-compatible cable modems that use a DOCSIS 1.1 or 2.0 configuration file regardless of this setting.	enable	Enable Disable

cable-level [?] (next level)

Next Level Command	Page #
mod-iuc-list/<profile {1-10}> [s]	page 3-38
modulation/<profile {1-10}>/<request> [s,i]	page 3-42
modulation/<profile {1-10}>/<data-request> [s,i]	page 3-44
modulation/<profile {1-10}>/<initial-ranging> [s,i]	page 3-46
modulation/<profile {1-10}>/<periodic-ranging> [s, i]	page 3-48
modulation/<profile {1-10}>/<short-data> [s,i]	page 3-50
modulation/<profile {1-10}>/<long-data> [s,i]	page 3-52
downstream [s, i]	page 3-54
frequency-split [i]	page 3-59
upstream-list [s]]	page 3-60

Next Level Command	Page #
upstream-specific/<channel (4-11)> [s, i]	page 3-62
upstream-test-port [i]	page 3-67
multi-us-list [s]	page 3-68
multi-us-config/<channel {4-11}> [i]	page 3-69
multi-usage-us [s,i]	page 3-70
ingress-avoidance-level ?	page 3-72
modem-list [s]	page 3-93
modem-specific/<number> [s, i]	page 3-94
cpe-ip-list/<modem-number> [s]	page 3-96
cpe-ip-specific/<modem-number>/<index{1-1024}> [s]	page 3-97
cpe-control-list [s]	page 3-98
cm-filter-list [s]	page 3-99
modem-us-disable-list [s]	page 3-96
modem-us-disable-modify/<mac-addr> [i]	page 3-101
sid-list [s]	page 3-102
sid-specific/<sid-num> [s]	page 3-103
qos-1.1-level [?]	page 3-104
qos-1.0-list [s]	page 3-147
qos-1.0-specific/<qos-index> [s]	page 3-148

mod-iuc-list/<profile {1-10}> [s]

Use the **mod-iuc-list** "show" subtree command to display the Interval Usage Code (IUC) parameters for the CMTS. Values for each IUC type are shown in the Modulation list. You can have up to 10 different profiles for the six IUC types.

IUCs are part of the upstream bandwidth allocation map (MAP) generated by the CMTS and sent to the cable modems. The MAP tells the modem what and when to transmit. There are several types of IUCs, each has a different transmission "window". The modulation profiles can be *tuned* to optimize the network throughput; however, **this should only be done by experienced network operators**.

Command Path

```
[] box# cable-level ↵
[] cable-level# mod-iuc-list/<profile {1-10}> ↵
```

Syntax

```
show
```

Syntax Qualifier	Description
<profile {1-10}>	Specifies profile number for the modulation scheme shown in the mod-iuc-list command

mod-iuc-list [s] show

Table 28: mod-iuc-list show data items

Data Item	Description	Typical Value or Range
IUC	IUC type. Each IUC type has a specific set of parameters	• R (Request) • RD (Request/Data) • IR (Initial Ranging) • PR (Periodic Ranging • SD (Short Data Grant) • LD (Long Data Grant)
Control	CMTS administrative control status for this IUC profile	active off
Type	Modulation type used for the IUC	qpsk qam64 other
PreLn	Preamble Length (in bits) for the transmission packet	0 to 128

Table 28: mod-iuc-list show data items

Data Item	Description	Typical Value or Range
DfEnc	Differential encoding used (improves data integrity)	true false
F-EC	Forward Error Correction	0 to 10
F-CL	FEC codeword length	0 to 256
ScrOn	Scrambling on	true false
ScrSeed	Scrambler Seed size	338 is default
BstSz	Maximum burst size allowed (in mini-slots). "0" means no limit on burst size	0 to 255
GuardSz	Size of guardband between channels (in symbol times)	8 to 48
LastCW	Last codeword shortened	false true

mod-iuc-list/<profile {1-10}>/<iuc> [s]

Use the **mod-iuc-list <profile {1-10}>/<iuc>** "show" subtree command to display the Interval Usage Code (IUC) parameters for the CMTS. Values for each IUC type are shown in the Modulation list. You can have up to 10 different profiles for the six IUC types.

IUCs are part of the upstream bandwidth allocation map (MAP) generated by the CMTS and sent to the cable modems. The MAP tells the modem what and when to transmit. There are several types of IUCs, each has a different transmission "window". The modulation profiles can be *tuned* to optimize the network throughput; however, **this should only be done by experienced network operators**.

Command Path

```
[] box# cable-level ↵
[] cable-level# mod-iuc-list/<profile {1-10}>/<iuc> ↵
```

Syntax

```
show
```

Syntax Qualifier	Description
<profile {1-10}>	Specifies profile number for the modulation scheme shown in the mod-iuc-list command

mod-iuc-list [s] show

Table 29: mod-iuc-list show data items

Data Item	Description	Typical Value or Range
IUC	IUC type. Each IUC type has a specific set of parameters	• R (Request) • RD (Request/Data) • IR (Initial Ranging) • PR (Periodic Ranging) • SD (Short Data Grant) • LD (Long Data Grant)
Control	CMTS administrative control status for this IUC profile	active off
Type	Modulation type used for the IUC	qpsk qam64 other

Table 29: mod-iuc-list show data items

Data Item	Description	Typical Value or Range
PreLn	Preamble Length (in bits) for the transmission packet	0 to 128
DfEnc	Differential encoding used (improves data integrity)	true false
F-EC	Forward Error Correction	0 to 10
F-CL	FEC codeword length	0 to 256
ScrOn	Scrambling on	true false
ScrSeed	Scrambler Seed size	338 is default
BstSz	Maximum burst size allowed (in mini-slots). "0" means no limit on burst size	0 to 255
GuardSz	Size of guardband between channels (in symbol times)	8 to 48
LastCW	Last codeword shortened	false true

modulation/<profile {1-10}>/<request> [s,i]

Use the **modulation/<profile {1-10}>/<request>** "show and info" subtree commands to display and set the modulation profile for the Request IUC. The Request interval is only used for packets from the cable modem to the CMTS that contain control type of information.

Command Path

```
[] box# cable-level ↵
[] cable-level# modulation/<profile {1-10}>/<request> ↵
```

Syntax

```
show

info
```

Syntax Qualifier	Description
<profile {1-10}>	Specifies profile number for the modulation scheme shown in the request modulation profile command.

modulation/<profile {1-10}>/<request> [s] show

Table 30: modulation/<profile {1-10}>/<request> show data items

Data Item	Description	Typical Value or Range
Control	CMTS administrative control status for this request IUC profile.	active not-in-service
guard-time-size	Size of guardband between channels (in symbol times).	8 to 48 8 is typical

modulation/<profile {1-10}>/<request> [i] info

Table 31: modulation/<profile {1-10}>/<request> info parameters

Parameter	Description or Values	Default	Range
type	Modulation type	qpsk	qpsk qam16 other
preamble-len	Preamble length (in bits) in data packet	64	0 to 1024

Table 31: modulation/<profile {1-10}>/<request> info parameters

Parameter	Description or Values	Default	Range
differential-encoding	Differential encoding used in packet	false	true false
fec-error-correction	Number of bytes used for FEC (Forward Error Correction) used in packet	0	0 to 10
fec-codeword-length	FEC codeword length (in bytes).	0	0 to 255
scrambler-employed	Data scrambled using seed	true	true false
scrambler-seed	Scrambler seed size	338	0 to 32767
max-burst-size	Maximum data burst allowed (in mini-slots). "0" indicates no limit	0	0 to 255
last-codeword-shortened	Last FEC codeword shortened	false	true false

modulation/<profile {1-10}>/<data-request> [s,i]

Use the **modulation/<profile {1-10}>/<data-request>** "show and info" subtree com-
mands to display and set the modulation profile for the Data-Request IUC. The
Data-Request interval is used for packets from the cable modem to the CMTS that con-
tain control type or data type information.

Command Path

```
[] box# cable-level ↵
[] cable-level# modulation/<profile {1-10}>/<data-request> ↵
```

Syntax

```
show

info
```

Syntax Qualifier	Description
<profile {1-10}>	Specifies profile number for the modulation scheme shown in the data-request modulation profile command.

modulation/<profile {1-10}>/<data-request> [s] show

Table 32: modulation/<profile {1-10}>/<data-request> show data items

Data Item	Description	Typical Value or Range
Control	CMTS administrative control status for the data-request IUC profile	active not-in-service
guard-time-size	Size of guardband between channels (in symbol times).	8 to 48 8 is typical

modulation/<profile {1-10}>/<data-request> [i] info

Table 33: modulation/<profile {1-10}>/data-request info parameters

Parameter	Description or Values	* Default	Range
type	Modulation type	qpsk	qpsk qam16 other
preamble-len	Preamble length (in bits) in data packet	72	0 to 1024
differential-encoding	Differential encoding used in packet	false	true false
fec-error-correction	Number of bytes used for FEC (Forward Error Correction) used in packet	0	0 to 10
fec-codeword-length	FEC codeword length (in bytes)	75	0 to 255
scrambler-employed	Data scrambled using seed	true	true false
scrambler-seed	Scrambler seed size	338	0 to 32767
max-burst-size	Maximum data burst allowed (in mini-slots). "0" indicates no limit	0	0 to 255
last-codeword-shortened	Last FEC codeword shortened	false	true false
* Defauts are not defaulted to same value for all profiles			

modulation/<profile {1-10}>/<initial-ranging> [s,i]

Use the **modulation/<profile {1-10}>/<initial-ranging>** "show and info" subtree commands to display and set the modulation profile for the initial ranging process. The initial ranging process is used when the cable modem establishes the RF link with the CMTS.

Command Path

```
[] box# cable-level ↵
[] cable-level# modulation/<profile {1-10}>/<initial-ranging> ↵
```

Syntax

```
show

info
```

Syntax Qualifier	Description
<profile {1-10}>	Specifies profile number for the modulation scheme shown in the initial-ranging modulation profile command.

modulation/<profile {1-10}>/<initial-ranging> [s] show

Table 34: modulation/<profile {1-10}>/<initial-ranging> show data items

Data Item	Description	Typical Value or Range
Control	CMTS administrative control status for the initial ranging IUC profile	active not-in-service
guard-time-size	Size of guardband between channels (in symbol times).	8 to 48 48 is typical

modulation/<profile {1-10}>/<initial-ranging> [i] info

Table 35: modulation/<profile {1-10}>/<initial-ranging> info parameters

Parameter	Description or Values	Default	Range
type	Modulation type	qpsk	qpsk qam16 other
preamble-len	Preamble length (in bits) in data packet	128	0 to 1024
differential-encoding	Differential encoding used in packet	false	true false

Table 35: modulation/<profile {1-10}>/<initial-ranging> info parameters

Parameter	Description or Values	Default	Range
fec-error-correction	Number of bytes used for FEC (Forward Error Correction) used in packet	5	0 to 10
fec-codeword-length	FEC codeword length (in bytes)	34	0 to 255
scrambler-employed	Data scrambled using seed	true	true false
scrambler-seed	Scrambler seed size	338	0 to 32767
max-burst-size	Maximum data burst allowed (in mini-slots). "0" indicates no limit	0	0 to 255
last-codeword-shortened	Last FEC codeword shortened	false	true false

modulation/<profile {1-10}>/<periodic-ranging> [s, i]

Use the **modulation/<profile {1-10}>/<periodic-ranging>** "show and info" subtree commands to display and set the modulation profile for the periodic-ranging messages from the cable modem to the CMTS. This periodic-ranging messages monitor the on-going RF transmission settings to detect changes in ranging parameters.

Command Path

```
[] box# cable-level ↵
[] cable-level# modulation/<profile {1-10}>/<periodic-ranging> ↵
```

Syntax

```
show

info
```

Syntax Qualifier	Description
<profile {1-10}>	Specifies profile number for the modulation scheme shown in the periodic ranging modulation profile command.

modulation/<profile {1-10}>/<initial-ranging> [s] show

Table 36: modulation/<profile {1-10}>/<initial-ranging> show data items

Data Item	Description	Typical Value or Range
Control	CMTS administrative control status for this Request IUC profile	active not-in-service
guard-time-size	Size of guardband between channels (in symbol times)	8 to 48 48 is typical

modulation/<profile {1-10}>/<periodic-ranging> [i] info

Table 37: modulation/<profile {1-10}>/<periodic-ranging> info parameters

Parameter	Description or Values	* Default	Range
type	Modulation type	qpsk	qpsk qam16 other
preamble-len	Preamble length (in bits) in data packet	128	0 to 1024
differential-encoding	Differential encoding used in packet	false	true false
fec-error-correction	Number of bytes used for FEC (Forward Error Correction) used in packet	0	0 to 10
fec-codeword-length	FEC codeword length (in bytes).	34	0 to 255
scrambler-employed	Data scrambled using seed	true	true false
scrambler-seed	Scrambler seed size	338	0 to 32767
max-burst-size	Maximum data burst allowed (in mini-slots). "0" indicates no limit	0	0 to 255
last-codeword-shortened	Last FEC codeword shortened	false	true false
* Defaults are not the same value for all profiles.			

modulation/<profile {1-10}>/<short-data> [s,i]

Use the **modulation/<profile {1-10}>/<short-data>** "show and info" subtree commands to display and set the modulation profile for the short data packets sent from the cable modem to the CMTS.

Command Path

```
[] box# cable-level ↵
[] cable-level# modulation/<profile {1-10}>/<short-data> ↵
```

Syntax

```
show

info
```

Syntax Qualifier	Description
<profile {1-10}>	Specifies profile number for the modulation scheme shown in the short data modulation profile command.

modulation/<profile {1-10}>/<short-data> [s] show

Table 38: modulation/<profile {1-10}>/<short-data> show data items

Data Item	Description	Typical Value or Range
Control	CMTS administrative control status for the short data IUC profile	active not-in-service
guard-time-size	Size of guardband between channels (in symbol times)	8 to 48 8 is typical

modulation/<profile {1-10}>/<request> [i] info

Table 39: modulation/<profile {1-10}>/<request> info parameters

Parameter	Description or Values	* Default	Range
type	Modulation type	qpsk	qpsk qam16 other
preamble-len	Preamble length (in bits) in data packet	72	0 to 1024
differential-encoding	Differential encoding used in packet	false	true false
fec-error-correction	Number of bytes used for FEC (Forward Error Correction) used in packet	0	0 to 10
fec-codeword-length	FEC codeword length (in bytes)	76	0 to 255
scrambler-employed	Data scrambled using seed	true	true false
scrambler-seed	Scrambler seed size	338	0 to 32767
max-burst-size	Maximum data burst allowed (in mini-slots). "0" indicates no limit	12	0 to 255
last-codeword-shortened	Last FEC codeword shortened	true	true false
* Defaults are not the same value for all profiles.			

modulation/<profile {1-10}>/<long-data> [s,i]

Use the **modulation/<profile {1-10}>/<long-data?** "show and info" subtree commands to display and set the modulation profile for long data packets sent by the cable modem to the CMTS.

Command Path

```
[] box# cable-level ↵
[] cable-level# modulation/<profile {1-10}>/<long-data> ↵
```

Syntax

```
show

info
```

Syntax Qualifier	Description
<profile {1-10}>	Specifies profile number for the modulation scheme shown in the long data modulation profile command

modulation/<profile {1-10}>/<long-data> [s] show

Table 40: modulation/<profile {1-10}>/<long-data> show data items

Data Item	Description	Typical Value or Range
Control	CMTS administrative control status for the long data IUC profile	active not-in-service
guard-time-size	Size of guardband between channels (in symbol times)	8 to 48 8 is typical

modulation/<profile {1-10}>/<long-data> [i] info

Table 41: modulation/<profile {1-10}>/<long-data> info parameters

Parameter	Description or Values	Default	Range
type	Modulation type	qpsk	qpsk qam16 other
preamble-len	Preamble length (in bits) in data packet	80	0 to 1024
differential-encoding	Differential encoding used in packet	false	true false
fec-error-correction	Number of bytes used for FEC (Forward Error Correction) used in packet	0	0 to 10
fec-codeword-length	FEC codeword length (in bytes)	220	0 to 255
scrambler-employed	Data scrambled using seed	true	true false
scrambler-seed	Scrambler seed size	338	0 to 32767
max-burst-size	Maximum data burst allowed (in mini-slots) "0" indicates no limit	0	0 to 255
last-codeword-shortened	Last FEC codeword shortened	false	true false

downstream   [s, i]

Use the **downstream** "show and info" subtree commands to manage the downstream RF interface (from the CMTS to the cable modems). The command has show and info data items, and it also has a lower level of commands.

Command Path

```
[] box# cable-level ↵
[] cable-level# downstream ↵
```

Syntax

```
show

info
```

downstream [s] show

Table 42: downstream show data items

Data Item	Description	Typical Value or Range
description	Text description of channel, enclosed in double quotes	cabledown
mtu	Maximum Transmission Units (in octets)	1800
speed	Current downstream transmission speed (in megabits/sec)	32,000,000
hi-speed	Maximum speed of downstream interface (in bits/second)	30
operational-status	Current status of downstream channel	up down testing
last-change	Time interval since last change in downstream interface settings (in 100ths-of-seconds)	55
out-octets	Count of downstream traffic from CMTS to cable modems (in octets)	3,900,000,000
out-unicast-packets	Count of out-unitcast traffic from CMTS to cablel lmodems (in packets)	0
out-non-unicast-packets	Count of non-unicast traffic from CMTS to cable modems (in packets)	0
out-multicast-packets	Count of multicast traffic from CMTS to cable modems (in packets)	4,500,000,000
out-broadcast-packets	Count of broadcast packets from CMTS to cable modems (in packets)	28,000
out-discards	Count of discarded packets on downstream interface (in packets	0
out-errors	Count of errored packets on downstream interface (in packets	0
id	Identification number assigned to downstream channel (number)	4 through 11

downstream [i] info

Table 43: downstream info parameters

Parameter	Description or Values	Default	Range
admin-status	CMTS administrative status of downstream interface. Testing is for display only and cannot be set by user.	up	up down testing
frequency	Center frequency of downstream channel (in Hz)	0	88 to 859Mhz (DOCSIS) 104 to 858 MHz (EuroDOCSIS)
width	Nominal width of downstream channel (in Hz)	6000000 (DOCSIS) 8000000 (Euro-DOCSIS)	6000000 8000000 range value
modulation	Modulation type used for downstream channel	qam64	qam256
interleave	Interleave specification (for taps and increment) used for downstream channel	taps8/Increment16	Unknown other taps8/Increment16 taps16/Increment8 taps32/Increment4 taps64/Increment2 taps128/increment1 (EURO) taps12/Increment17 taps204/Increment1
power	Downstream transmission power level (at CMTS) (in tenths-of- dBmV)	510	500-610
link-trap	CMTS generates link-trap messages for downstream interface events	enabled	enabled disabled
alias	An Alias can be applied to an ethernet, cable, downstream and each upstream interface. If you assign an alias, the agent associates that alias with the same interface even if the ifIndex changes.	"Null"	

downstream [?] (next level)

Table 44: downstream [?] next level commands

Next Level Command	Page #
annex [i]	page 3-58

annex [i]

Use the **annex** command to set the annex mode used on the downstream interface. Annex type defines the signal formatting used for the downstream channel.

Command Path

```
[] box# cable-level ↵
[] cable-level# downstream ↵
[] downstream# annex ↵
```

Syntax

```
info
```

annex [i] info

Table 45: annex info parameters

Parameter	Description or Values	Default	Range
annex	Defines the signal formatting for the downstream channel	annex-b	annex-a (EuroDOCSIS) annex-b (DOCSIS)

frequency-split   [i]

Use the **frequency-split** command to set the "split" point between the downstream and upstream channels. The standard North American DOCSIS split is 5 to 42 MHz for upstream, and 65 to 860 MHz for downstream. The EuroDOCSIS split is 5 to 65 MHz upstream, and 100 to 862 MHz downstream.

The frequency-split is independant, but *must* match cable plant componants.

Command Path

```
[] box# cable-level ↵
[] cable-level# frequency-split ↵
```

Syntax

```
info
```

frequency-split [i] info

Table 46: frequency-split info parameters

Parameter	Description or Values	Default	Range
frequency-split	Defines the split point between the CMTS upstream and downstream RF channels	standard	standard (DOCSIS) euro (Euro-DOCSIS)

upstream-list [s]

Use the **upstream-list** "show" subtree command to show the Upstream list of parameters for the eight upstream cable (RF) channels.

Note: The upstream channels are shown as 4 through 11, which correspond to the following Upstream Receivers (in normal operation):

Interface 1 = Ethernet
Interface 2 = Cable (Both up and down)
Interface 3 = Cable Downstream
Interface 4 = Cable Upstream 1
Interface 5 = Cable Upstream 2
Interface 6 = Cable Upstream 3
Interface 7 = Cable upstream 4
Interface 8 = Cable upstream 5
Interface 9 = Cable upstream 6
Interface 10 = Cable upstream 7
Interface 11 = Cable upstream 8

Command Path

```
[] box# cable-level ↵
[] cable-level# upstream-list ↵
```

Syntax

```
show
```

upstream-list [s]

Table 47: upstream-list show data items

Data Item	Description	Typical Value or Range
Channel	Upstream channel interface	4 through 11
Status	Operational status of channel. Channels are "down" until set to "up". Testing is for display only and cannot be set.	up down testing
Speed	Nominal transmission speed (in Bits/Sec)	5,120,000
In Octets	Count of traffic received by the CMTS (for this channel) in octets	—
Mod Profile	Index number to Modulation Profile table	1 to 10
Frequency	Center frequency of upstream channel (in Hz)	5 to 42 MHz for DOC-SIS 5 to 65 MHz for Euro-DOCSIS
Power	Input power level for channel (in tenths-of-dBmV)	110
Window	Input power window used by CMTS to determine the tolerance of a cable modems transmit power level on given upstream channel (in tenths-of-dB)	Adjustable range: +/-2 dB to +/-15 dB Upper theoretical limit: +9 dB Default window: +/-6 dB

upstream-specific/<channel (4-11)> [s, i]

Use the **upstream-specific** "show and info" subtree commands to display and set the parameters for the specified upstream channel.

Command Path

```
[] box# cable-level ↵
[] cable-level# upstream-specific/<channel {4-11}> ↵
```

Syntax

```
show

info
```

Syntax Qualifier	Description
<channel {4-11}>	Specifies upstream channel number (channel 4 corresponds to upstream receiver 1)

upstream-specific [s] show

Table 48: upstream-specific show data items

Data Item	Description	Typical Value or Range
description	Text description of channel enclosed in double quotes	"cableup1"
mtu	Maximum Transmission Units (in octets)	1764 octets
speed	Current speed of upstream channel (in bits/second)	5,120,000
hi-speed	Maximum speed of upstream channel (in megabits/second)	5
operational-status	CMTS operational status of channel. All unused upstream channels should be set to "down" to improve throughput.	up down testing
last-change	Time interval since last change to channel parameters (in 100ths-of-seconds)	26,200,000
in-octets	Count of traffic received by CMTS on this upstream channel (in octets)	12,500,000
in-unicast-packets	Count of unicast traffic received by CMTS on this upstream channel (in packets)	240,000

Table 48: upstream-specific show data items (continued)

Data Item	Description	Typical Value or Range
in-non-unicast-packets	Count of non-unicast traffic received by CMTS on this upstream channel (in packets)	0
in-multicast-packets	Count of multicast traffic received by CMTS on this upstream channel (in packets)	0
in-broadcast-packets	Count of broadcast traffic received by CMTS on this upstream channel (in packets)	468
in-discards	Count of discarded packets received by CMTS on this channel (in packets)	0
in-errors	Count of errored packets received by CMTS on this channel (in packets)	0
id	Identification number assigned to this upstream channel	1 through 8
timing-offset	Timing offset in time-ticks (calculated) X (6.25 microsec/64)	586
includes-contention	Contention allowed for available bandwidth in this channel	true false
unerroreds	Count of FEC codewords with no errors (codewords)	578
correcteds	Count of FEC codewords with corrections (codewords)	0
uncorrectables	Count of FEC codewords that could not be corrected (codewords)	0
signal-noise	Signal-to-noise ratio (SNR) at the CMTS for RF on an upstream channel. The SNR ratio describes the ratio between the average signal amplitude and the noise amplitude of an upstream channel (in multiples of 1/10 dB).	300 (s/n ratio)
microreflections	Detected decibel level of micro reflection on RF channel (in dBc)	0 dBc
equalization-data	Equalization values used by cable modems on this channel (calculated by CMTS)	—
publication-delay	Delay in packet re-transmission (in microseconds)	1918

Table 48: upstream-specific show data items (continued)

Data Item	Description	Typical Value or Range
nflow-controlled-maps	Number of flow-controlled-maps (PDUs) used by CMTS for this channel. Flow controlled maps manage the data transmissions of cable modems on this channel. (map PDUS)	—
non-flow-controlled-maps	Number of non-flow-controlled maps (PDUs) used by CMTS for this channel (map PDUS	82,140,324
admitted-cbr	Number of admitted CBR service flows	—
cbr-rejected	Number of CBR service flows rejected	—

upstream-specific [i] info

Table 49: upstream-specific info parameters

Parameter	Description or Values	Default	Range
admin-status	CMTS administrative status for specified upstream channel. Testing is used to display only, it cannot be set.	up	up down testing
frequency	Center frequency of channel (in Hz)	27500000 (differs per upstream)	5-42 MHz (DOCSIS) 5-65 MHz (Euro-DOCSIS)
width	Width of upstream channel (in Hz)	3200000	200000 400000 800000 1600000 3200000
power	Input power level (in tenths-of-dB)	—	+/- 20 to +/- 150
input-power-window	Size of power-input window (in tenths-of-dB). The input power level at the CMTS corresponds to the output level at the cable modem, less any cable plant loss and signal attentuation. Adjustable in tenths-of-dB steps.	60	+/- 20 to +/- 150
modulation-profile	Index number of modulation profile used	1	1 to 10
slot-size	Upstream transmission mini-slot size (in timeticks of 6.25 microseconds)	4	Any number
start-ranging-backoff	Starting interval for ranging-backoff (2 raised to the power of this number). The value of 16 is reserved as special value.	2	0 to 16
end-ranging-backoff	Ending interval for ranging-backoff (2 raised to the power of this number). The value of 16 is reserved.	5	0 to 16

Table 49: upstream-specific info parameters (continued)

Parameter	Description or Values	Default	Range
start-tx-backoff	Starting interval for transmission backoff (2 raised to this power). The value of 16 is reserved.	3	0 to 16
end-tx-backoff	Ending interval for transmission backoff (2 raised to this power). The value of 16 is reserved.	10	0 to 16
minimum-map-size	Minimum MAP size (cable modem transmit opportunities) in mini-slots for this upstream channel.	32	any number
maximum-map-size	Maximum MAP size (in mini-slots) for upstream channel	2048	any number
contention-per-map	In Min-slots	32	—
request-data-allowed	CMTS allows request-data packets on this upstream channel	disallowed	allowed disallowed adaptive
max-data-in-contention	Maximum size of data transmission during contention (in mini-slots)	80	any number
initial-ranging-interval	Length of interval for initial ranging by cable modems on upstream channel	2000	any number
high-priority-threshold	Number of high-priority data streams allowed on channel	75	0 to 100
guaranteed-threshold	Percentage of threshold reserved for high-priority traffic	100	0 to 100
link-trap	CMTS generates link-trap messages for events on upstream channel	enabled	enabled disabled
max-cbr-flows	Maximum number of simultaneous CBR (Constant Bit Rate) flows allowed on channel	-1	-1 no limit

upstream-test-port [i]

Use the **upstream-test-port** command to select the Upstream Receiver RF port (corresponding to the Upstream Receiver number) that is routed to the CMTS test port (located on the front of the unit).

Command Path

```
[] box# cable-level ↵
[] cable-level# upstream-test-port ↵
```

Syntax

```
info
```

upstream-test-port [i] info

Table 50: upstream-test-port info parameters

Parameter	Description or Values	Default	Range
upstream	Upstream Receiver RF port routed to the CMTS test port	1	1 through 8

Note: The CMTS may report back "0" if upstream 8 is being used for spectrum analysis or redundancy. However, the upstream can only be set to a value of "1" to "8", not "0".

multi-us-list [s]

Use the **multi-us-list** "show" subtree command to display the Upstream channel list. Use this command to look at the carrier path and channel group assigned for each upstream channel.

The carrier path corresponds to the physical cable plant connection between the cable modems and the CMTS. Upstream channels on the same carrier path must have different frequency ranges. The channel group path corresponds to the frequency range, modulation profile, and bandwidth. Upstream channels can have the same channel group path number if they are located on different carrier paths.

Command Path

```
[] box# cable-level ↵
[] cable-level# multi-us-list ↵
```

Syntax

```
show
```

multi-us-list [s] show

Table 51: multi-us-list show data items

Data Item	Description	Typical Value or Range
Channel	Upstream IPIndex number	4 through 11
Carrier Path	Physical cable path on which an upstream channel resides	1 through 8
Channel Group	Logical channel group number assigned to upstream channel. "0" indicates no channel group is assigned.	0 through 8

multi-us-config/<channel {4-11}> [i]

Use the **multi-us-config/<channel {4-11}**command to set the carrier path and channel group parameters for the specified upstream channel.

Command Path

```
[] box#  cable-level ↵
[] cable-level#  multi-us-config/<channel {4-11}> ↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<channel {4-11}>	Specifies upstream ifIndex number (channel 4 corresponds to upstream receiver 1)

multi-us-config [i] info

Table 52: multi-us-config info parameters

Parameter	Description or Values	Default	Range
carrier-path	Carrier path assigned to specified upstream channel	1	1 to 8
channel-group	Channel group assigned to specified upstream channel. "0" indicates no assigned channel group.	0	0 to 8

multi-usage-us [s,i]

Use the **multi-usage-us** "show and info" subtree commands to display and set the operational usage of the Eighth Upstream Receiver (Upstream Port 8). The eighth upstream receiver can be programmed to one of these options:

- **standard**—Upstream Receiver 8 updates as a normal upstream.
- **spec-analysis-only**—Upstream Receiver 8 is assigned to spectrum analyzer function, and takes readings on each carrier path.
- **redundant-upstream-only**—Upstream Receiver 8 can be used as redundant for Upstream Receivers 1 through 7.
- **spec-analysis-and-redundant-only**—Upstream Receiver 8 is used as spectrum analyzer with primary function of redundant receiver for channels 1 through 7.
- **spec-analysis-debug-only**—Upstream Receiver 8 is used for spectrum analysis for special debugging mode.

The internal RF Switch can be used for:

- the 8th receiver module as a spectrum analyzer
- the 8th receiver module as a spare for any other receiver module
- any receiver module input to copy to the front-side upstream test port

Command Path

```
[] box# cable-level ↵
[] cable-level# multi-usage-us ↵
```

Syntax

```
show
info
```

Note: The CLI parameter, spec-analysis-and-redundant is equivalent to the MIB object IngressAvoidanceAndRedundant.

multi-usage-us [s] show

Table 53: multi-usage-us show data items

Data Item	Description	Typical Value or Range
Operstatus	Operational status of the upstream channel port	• standard • spec-analysis • redundant-upstream • spec-analysis-debug-only • front panel redirect

multi-usage-us [i] info

Table 54: multi-usage-us info parameters

Parameter	Description or Values	Default	Range
admin	CMTS administrative status of the upstream port	standard	• standard • spec-analysis- only • redundant- upstream-only • spec-analysis- and-redundant • spec-analysis- debug-only
upstream	CMTS upstream port assignment for failover	none	none 1 through 7

Note: When the admin parameter is set to spec-analysis-debug-only, or spec-analysis-only, or spec-analysis-and-redundant and a channel is directed to the front panel test port, debug spectral analysis is temporarily disabled (for about 5 minutes). Any spectrum analysis admin state will have the same effect. Temporary spectral analysis blocking of the front panel test port CANNOT be over-ridden by manually selecting spectral analysis.

ingress-avoidance-level ?

The **ingress-avoidance-level** "? (next level)" command has no **show** and no **info** data, but does have a set of next-level commands. Use the ingress-avoidance feature to select RF signal parameters that minimizes ingress noise in the upstream path. Ingress Avoidance relies on channel group/carrier group path that links groups of upstream channels together on the same or different RF path information.

Ingress avoidance allows you to configure each upstream channel with options to compensate for or avoid noise. The options include moving to a different frequency range, adjusting bandwidth, or changing the modulation type.

Command Path

```
[] box# cable-level ↵
[] cable-level# ingress-avoidance-level ↵
```

Syntax

```
?
```

ingress-avoidance-level [?] (next level) commands

Next Level Command	Page #
ingress-avoidance-us-config-list [s]	page 3-74
ingress-avoidance-us-threshold-list [s]	page 3-75
enable/<channel {4-11}> [i]	page 3-76
freq-list/<carrier-path {1-8}> [s]	page 3-77
freq-config/<carrier-path {1-8}>/<freq-index {1-10}> [i]	page 3-78
change-pref/<channel {4-11}> [i]	page 3-79
metric-threshold-config/<channel {4-11}> [i]	page 3-80
profile-list/<ifIndex {4-11}> [s]	page 3-82
profile-config/<ifIndex {4-11}>/<pref-index {1-3}> [i]	page 3-83
tx-profile-list [s]	page 3-84
tx-profile-config/<index {1-24}> [s, i]	page 3-85
metric-config [i]	page 3-87
metric2-config [i]	page 3-88
freq-status-aging-config [i]	page 3-89
freq-status-list/<carrier-path {1-8}> [s]	page 3-90
health-list [s]	page 3-92

ingress-avoidance-us-config-list [s]

Use the **ingress-avoidance-us-config-list** "show" subtree command to display a list of configured ingress avoidance (IA) parameters for upstream channels. To enable Metric1, Metric2 or both, use the ingress-avoidance-us-config-list metric enable parameters in the following table.

Enable Parameters	Metric1 ON	Metric2 ON	Metric1 & 2 ON
Enable	ON	ON	ON
Metric 1	ON	OFF	ON
Metric 2	OFF	ON	ON

Command Path

```
[] box# cable-level ↵
[] cable-level# ingress-avoidance-level ↵
[] ingress-avoidance-level# ingress-avoidance-us-config-list ↵
```

Syntax

```
show
```

ingress-avoidance-us-config-list [s] show

Table 1: ingress-avoidance-us-config-list show data items

Data Item	Description	Typical Value or Range
Channel	CMTS upstream ifIndex	4 through 11
Enabled	Master control for CMTS ingress avoidance feature	on off
Metric1 Enabled	Turns on Ingress Avoidance metric1 (using as performance characteristics)	on off
Metric2 Enabled	Turns on Ingress Avoidance metric2 (using loss of modems)	on off
ChangePref	Preferred method of selecting next hop to reduce ingress noise. Profile changes the modulation profile used. Frequency changes the channel frequency used.	Profile Frequency

ingress-avoidance-us-threshold-list [s]

Use the **ingress-avoidance-us-threshold-list** to view a list of threshold values used for the Metric1 and Metric2. Each metric has two thresholds:

- GtoY (*Green to Yellow*) alerts that the channel has potential RF noise problems.
- YtoR (*Yellow to Red*) warns that the channel has RF noise problems, and will initiate action if Ingress Avoidance feature is enabled.

Command Path

```
[] box# cable-level ↵
[] cable-level# ingress-avoidance-level ↵
[] ingress-avoidance-level# ingress-avoidance-us-threshold-list ↵
```

Syntax

```
show
```

ingress-avoidance-us-threshold-list [s] show

Table 2: ingress-avoidance-us-threshold-list show data items

Data Item	Description	Typical Value or Range
Channel	CMTS upstream ifIndex	4 through 11
Metric 1 GtoY	Threshold for Metric 1 Yellow (alert)	50000 (default)
Metric 1 YtoR	Threshold for Metric 1 Red (action)	5000 (default)
Metric 2 GtoY	Threshold for Metric 2 Yellow (alert)	25 (default)
Metric 2 YtoR	Threshold for Metric 2 Red (action)	75 (default)

enable/<channel {4-11}> [i]

Use the **enable/<channel {4-11}>** command to activate the ingress avoidance feature, Metric 1 and Metric 2.

Note: Each ingress avoidance parameter must be enabled in order for the ingress avoidance feature to operate.

Command Path

```
[] box# cable-level ↵
[] cable-level# ingress-avoidance-level ↵
[] ingress-avoidance-level# enable/<channel {4-11}> ↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<channel {4-11}>	Specifies upstream ifIndex channel number (channel 4 corresponds to upstream receiver 1)

enable /<channel {4-11}> [i] info

Table 3: enable /<channel {4-11}> info parameters

Parameter	Description or Values	Default	Range
avoidance-enable	Master control for ingress avoidance (on specified channel)	off	off on
metric1-enable	Metric 1 control	off	off on
metric2-enable	Metric 2 control	off	off on

freq-list/<carrier-path {1-8}>   [s]

Use the **freq-list/<carrier-path {1-8}>** "show" subtree command to display a list of frequencies available for the selected carrier path. The maximum number of frequency ranges is ten, with each band having a starting and ending frequency.

Command Path

```
[] box# cable-level ↵
[] cable-level# ingress-avoidance-level ↵
[] ingress-avoidance-level# freq-list/<carrier-path {1-8}> ↵
```

Syntax

```
show
```

Syntax Qualifier	Description
<carrier-path {1-8}>	Specifies carrier path (physical path) for defining a frequency range. Individual upstreams are assigned to a carrier path via the multi-us-config change command

freq-list [s] show

Table 4: freq-list [s] show data items

Data Item	Description	Typical Value or Range
Index	Index number for list	1 to 10
Available	Frequency band is available on carrier path	true false
Start Frequency	Lower edge of frequency band used for ingress avoidance hop. Note: Starting frequency *must be lower* than stop frequency.	DOCSIS: 5000000 to 42000000 EuroDOCSIS: 5000000 to 65000000
Stop Frequency	Upper edge of frequency band used for ingress avoidance hop	DOCSIS: 5000000 to 42000000 EuroDOCSIS: 5000000 to 65000000

freq-config/<carrier-path {1-8}>/<freq-index {1-10}>   [i]

Use the **freq-config/<carrier-path>/<freq-index>** command to set the frequency availability and frequency band (start and stop frequencies) for the specified carrier path/frequency index. You can have a total of 80 combinations (8 carrier paths x 10 frequency indexes) available for ingress avoidance, with each of the 80 combinations having three settable parameters.

The command can be used to define the available frequency bandwidth. For example, you can block out a specific frequency range that has excessive noise so that no carrier paths or frequency selections will use that range. The CMTS only looks at bandwidth that is defined as available ("turned on"); the remaining bandwidth is ignored.

Command Path

```
[] box# cable-level ⊘
[] cable-level# ingress-avoidance-level ⊘
[] ingress-avoidance-level# freq-config/<carrier-path{1-8}>/|<freq-index{1-10}>⊘
```

Syntax

```
info
```

Syntax Qualifier	Description
<carrier-path {1-8}>	Specifies carrier path (physical path) used for upstream channel (1 through 8)
<freq-index {1-10}>	Specifies frequency band selected (1 through 10)

freq-config/<carrier-path>/<freq-index>[i] info

Table 5: freq-config/<carrier-path>/<freq-index> info parameters

Parameter	Description or Values	Default	Range
freq-available	Frequency bandwidth is available for ingress avoidance	no	no yes
start-frequency	Lower edge of frequency band (in Hz)	0 Hz	• Standard DOCSIS: 5000000 to 45000000 • EuroDOCSIS: 5000000 to 65000000
stop-frequency	Upper edge of frequency band (in Hz)	0 Hz	• Standard DOCSIS: 5000000 to 45000000 • EuroDOCSIS: 5000000 to 65000000

change-pref/<channel {4-11}>   [i]

Use the **change-pref/<channel {4-11}>** command to select the change preference used for the ingress avoidance change:
- profile
- frequency

Profile change modifies either the bandwidth and/or modulation profile first, while frequency change modifies the frequency first. Once the desired change preference is exhausted, the other change preference is used.

For example, if three profiles are configured, and profile is the preference, Ingress Avoidance will try all three profiles, and then attempt to change the frequency.

Command Path

```
[] box# cable-level ↵
[] cable-level# ingress-avoidance-level ↵
[] ingress-avoidance-level# change-pref/<channel {4-11}> ↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<channel {4-11}>	Specifies upstream channel (4 through 11)

change-pref/<channel {4-11}> [i] info

Table 6: change-pref/<channel {4-11}> info parameters

Parameter	Description or Values	Default	Range
change-preference	Preference for ingress avoidance action. Profile changes either the bandwidth and/or the modulation profile, while frequency alters the frequency range.	profile	profile frequency

metric-threshold-config/<channel {4-11}> [i]

Use the **metric-threshold/config/<channel {4-11}>** command to set the metric threshold parameters for the specified channel. These threshold parameters trigger alerts or actions if the ingress avoidance feature is enabled.

The **metric1-threshold** option sets the two threshold levels which divide the green, yellow, and red system states for the packet error rate (Metric 1). The following states reflect the overall "health" of each upstream channel:

Condition	Description
green	When the amount of packet loss is acceptable, the green light is on.Green also indicates a low percentage of modems that have de registered ("flapping").
yellow	Alerts you when there is an increase in the amount of packet loss and when there is an increase in the percentage of modems de registering.
red	Warns you when the amount of packet loss is unacceptable, and an excessive percentage of cable modems have de registered, Ingress avoidance (if configured and enabled) will be triggered when the red light is on
green-to-yellow	Default threshold is set at 1 error per 50,000 packets
yellow-to-red	Default threshold is set at 1 error per 5,000 packets
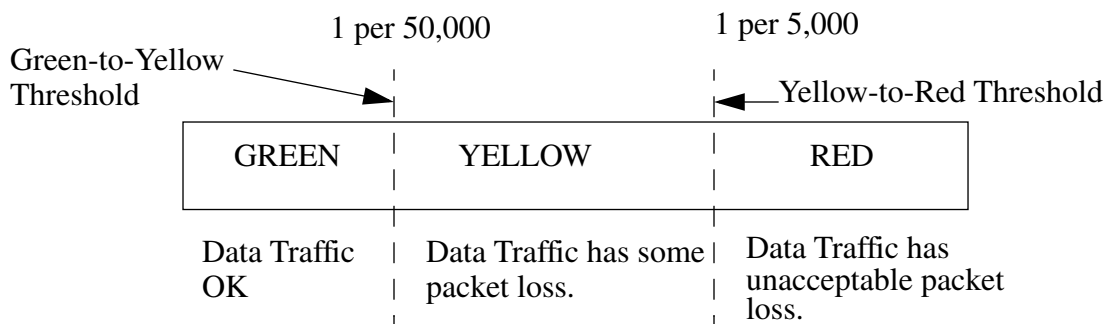
The **metric2 threshold** option sets the two thresholds that divide the green, yellow, and red system states for the "flapping modem" rate (Metric 2). These states will alert you when there are increases in the number of cable modems that are de registering caused by problems on the upstream channel.

Command Path

```
[] box# cable-level ↵
[] cable-level# ingress-avoidance-level ↵
[] ingress-avoidance-level# metric-threshold-config/<channel {4-11}> ↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<channel {4-11}>	Specifies the upstream channel (4 through 11)

metric-threshold-config/<channel>[i] info

Table 7: metric-threshold-config/<channel> info parameters

Parameter	Description or Values	Default	Range
metric1-green-to-yellow	Alert threshold for good-to-bad-packet ratio	50000	Any number greater than Metric 1 Yellow to Red Value
metric1-yellow-to-red	Action threshold for good-to-bad-packet ratio	5000	Any number
metric2-green-to-yellow	Alert threshold for flapping modem ratio (number of modems on channel that have de-registered)	25 percent	Any number lower than Metric 2 Yellow to Red Value and between 1 to 100
metric2-yellow-to-red	Action threshold for flapping modem ratio	75 percent	1 to 100

profile-list/<ifIndex {4-11}> [s]

Use the **profile-list/<ifIndex {4-11}>** "show" subtree command to display the three preference choices for the selected IfIndex value (which corresponds to the upstream channel). The table displayed is indexed in turn to the Transmission Profile (Tx Profile) table.

Command Path

```
[] box# cable-level ↵
[] cable-level# ingress-avoidance-level ↵
[] ingress-avoidance-level# profile-list/<ifIndex {4-11}> ↵
```

Syntax

```
show
```

Syntax Qualifier	Description
<ifIndex {4-11}>	Specifies index value in the Tx Profile table

profile-list/<ifIndex> [s] show

Table 8: profile-list/<ifIndex> show data items

Data Item	Description	Typical Value or Range
Preference	Index for preference (in order)	1 to 3
Available	Activates profile for use	on off
Tx Profile Index	Index to Transmission Profile Table (1 is the default)	1-24

profile-config/<ifIndex {4-11}>/<pref-index {1-3}> [i]

Use the **profile-config/<ifIndex {4-11}>/<pref-index {1-3}>** command to set the status of the specified channel/preference and link the status to the transmission profile index.

Command Path

```
[] box# cable-level ↵
[] cable-level# ingress-avoidance-level ↵
[] ingress-avoidance-level# profile-config/<ifIndex {4-11}>/pref-index
{1-3}> ↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<ifIndex {4-11}>	Specifies ifindex of the upstream interface
<pref-index {1-3}>	Specifies ifindex for the preference order

profile-config/<ifIndex {4-11}>/pref-index {1-3}> [i]

Table 9: profile-config/<ifIndex {4-11}>/pref-index {1-3}> info parameters

Parameter	Description or Values	Default	Range
status	Enables profile configuration for a specified channel/preference combination	off	off on
transmission-profile-index	Indexes the transmission profile table (8 channels x 3 preferences = maximum of 24 entries)	1	1 to 24

tx-profile-list [s]

Use the **tx-profile-list** "show" subtree command to display an indexed list of upstream transmission profiles that include bandwidth and calculated efficiency.

Command Path

```
[] box# cable-level ↵
[] cable-level# ingress-avoidance-level ↵
[] ingress-avoidance-level# tx-profile-list ↵
```

Syntax

```
show
```

tx-profile-list [s] show

Table 10: tx-profile-list show data items

Data Item	Description	Typical Value or Range
Index	Index to Transmission Profile Table	1 to 24
Burst Profile Index	Index to DOCSIS Burst Profile Table	1 to 10
Bandwidth	Frequency bandwidth (in Hz)	• 200000 • 400000 • 800000 • 1600000 • 3200000
Efficiency	Calculated efficiency (based on transmission profile and bandwidth). Higher values indicate greater efficiency. (E.g. less overhead data is transmitted.)	565000 (default value)

tx-profile-config/<index {1-24}> [s,i]

Use the **tx-profile-config/<index>** "show and info" subtree commands to display the indexed list of upstream transmission profiles with bandwidth and calculated efficiency.

Command Path

```
[] box# cable-level ↵
[] cable-level# ingress-avoidance-level ↵
[] ingress-avoidance-level# tx-profile-config/ <index {1-24}> ↵
```

Syntax

```
show

info
```

Syntax Qualifier	Description
<index {1-24}>	Specifies transmission profile by index value

tx-profile-config/<index> [s] show

Table 11: tx-profile-config/<index> show data items

Data Item	Description	Typical Value or Range
coding-efficiency	Calculated coding efficiency. This number represents information bytes/second for the given settings. This calculation in based on short and long data grants and a minimum and maximum packet size transmitted for each type of grant.	565000 (default value)

tx-profile-config/<index> [i] info

Table 12: tx-profile-config/<index> info parameters

Parameter	Description or Values	Default	Range
modulation-profile-index	Index value for modulation profile	1	1 to 10

Table 12: tx-profile-config/<index> info parameters

Parameter	Description or Values	Default	Range
bandwidth	Bandwidth (in Hz)	3200000	• 200000 • 400000 • 800000 • 1600000 • 3200000

metric-config [i]

Use the **metric-config** "info" subtree command to configure metric1 parameters. The metric-config command sets: minimum sample size which is needed to make a valid calculation; how often the metric1 calculation is performed; and a weighting factor to bias the decision toward the current calculation for voice traffic, or on the overall operation data traffic.

The CMTS uses sample size, weight-factor, and a calculation timer to determine when the metric1 threshold has been reached, so it knows when to trigger ingress avoidance (if activated).

Command Path

```
[] box# cable-level ↵
[] cable-level# ingress-avoidance-level ↵
[] ingress-avoidance-level# metric-config ↵
```

Syntax

```
info
```

metric-config [i] info

Table 13: metric-config info parameters

Parameter	Description or Values	Default	Range
min-packets-per-sample	Minimum number of packets used to calculate the metric	10	1 to 10000000
weight-factor	Weighting-factor applied to the sample. Smaller values bias decision on latest statistics.	99 percent	0 to 99
calculation-timer	Timer for sample (in milliseconds)	2000 ms	100 to 100000000 (1/10 to 10,000 seconds)

Note: The calculation-timer parameter has a very high upper limit boundary (up to 50 days). For normal operating conditions, calculation timers are set to much lower values (2000 milliseconds equal to two seconds.)

Note: If the timer is set to a very large value, the CMTS waits the full period before it performs a new calculation.

metric2-config [i]

Use the **metric2-config** "info" subtree command to set the parameters for metric 2. Metric 2 is based on the occurrence of de registered modems ("flapping" modems). The command sets the number of modems required before metric2 is activated, and the associated interval timer used for the calculation.

Statistics are checked at this interval. If at the time the statistics exceed the yellow-red threshold, Ingress Avoidance then makes a change to the upstream settings.

Command Path

```
[] box# cable-level ↵
[] cable-level# ingress-avoidance-level ↵
[] ingress-avoidance-level# metric2-config ↵
```

Syntax

```
info
```

metric2-config [i] info

Table 14: metric2-config info parameters

Parameter	Description or Values	Default	Range
flapping-Min-CMs	Minimum number of registered cable modems (cable modems) to trigger metric	20	1 to 1000
flapping-calculation-timer	Timer for sample (in seconds)	600 seconds	1 to 4294967

Note: The calculation-timer parameter has a very high upper limit boundary (up to 50 days). For normal operating conditions, calculation timers are set to much lower values (2000 milliseconds equal to two seconds.)

Note: If the timer is set to a very large value, the CMTS waits the full period before it performs a new calculation.

freq-status-aging-config   [i]

Use the **freq-status-aging-config** "info" subtree command to define the aging parameter for aging frequencies marked bad.

Note: The aging parameter is determined by two factors: the *aging-multiplier* and the *calculation-timer*. The aging-multiplier is the percent of the aging number that is retained after the aging period. The calculation-timer sets the aging period in milliseconds. (E.g. If the aging-multiplier is set to 10%, and the calculation-timer is set to 10000ms, the CMTS reduces the aging parameter by 90% every 10 seconds.

Command Path

```
[] box# cable-level ↵
[] cable-level# ingress-avoidance-level ↵
[] ingress-avoidance-level# freq-status-aging-config ↵
```

Syntax

```
info
```

freq-status-aging-config [i] info

Table 15: freq-status-aging-config info parameters

Parameter	Description or Values	Default	Range
aging-multiplier	Percentage of metric aged out per calculation period	100 percent	1-100
calculation-timer	Duration of aging period (in microseconds)	120000 ms	50 to 10000000

Note: The calculation-timer parameter has a very high upper limit boundary (up to 50 days). For normal operating conditions, calculation timers are set to much lower values (2000 milliseconds equal to two seconds.)

Note: If the timer is set to a very large value, the CMTS waits the full period before it performs a new calculation.

freq-status-list/<carrier-path {1-8}> [s]

Use the **freq-status-list/<carrier-path {1-8}>** "show" subtree command to display the frequency characteristics of the available frequency range for the selected carrier path, in 200000 Hz increments. This table shows which frequencies have been used, and which frequencies are currently being used. It can also contain spectrum analysis data.

Command Path

```
[] box# cable-level ↵
[] cable-level# ingress-avoidance-level ↵
[] ingress-avoidance-level# freq-status-list/<carrier-path {1-8}> ↵
```

Syntax

```
show
```

Syntax Qualifier	Description
<carrier-path {1-8}>	Specifies carrier path {1-8}

tx-profile-config/<index> [s] show

Table 16: tx-profile-config/<index> show data items

Data Item	Description	Typical Value or Range
Frequency	Frequency (lower band edge)	5000000 to 42000000 Hz
Fc	Center Frequency	no yes
Available	Frequency available for ingress avoidance action. **No** = frequency is not available for ingress avoidance. **Yes** = frequency is not being used and is available for ingress avoidance. **Inuse** = frequency is actively being used by an upstream path. **Reserved** = frequency is reserved by an upstream channel which is currently down.	• no • yes • inuse • reserved
Status	Quality of frequency band. Unknown or zero = good frequency to try. A large integer indicates the channel is extremely bad.	—
TimeSinceUsed	Duration (in seconds) since last used by CMTS	—

Table 16: tx-profile-config/<index> show data items

Data Item	Description	Typical Value or Range
UpTime	Up-time (in seconds) for the last time the frequency was used, or the current amount of time on the frequency, if in use	—
NoiseFloor	Noise level in channel in tenths-of-dB	—

health-list [s]

Use the **health-list** "show" subtree command to display "health" statistics for all upstream channels, including uptime and metric values.

Command Path

```
[] box# cable-level ↵
[] cable-level# ingress-avoidance-level ↵
[] ingress-avoidance-level# health-list ↵
```

Syntax

```
show
```

health-list [s] show

Table 17: health-list show data items

Data Item	Description	Typical Value or Range
Channel	Carrier path channel	4 to 11
Profile	Profile index number	0-3
Fc	Center frequency of channel	5-42 MHz or 5-65 MHz for Euro
Uptime	Up-time for channel in seconds	—
Metric1 Status	Threshold status of metric 1	• green • yellow • red
Metric1 Value	Value of metric 1	—
Metric2 Status	Threshold status of metric 2	• green • yellow • red
Metric2 Value	Value of metric 2	0 to 100

modem-list [s]

Use the **modem-list** "show" subtree command to display a list of modems recognized by the CMTS.

Command Path

```
[] box# cable-level ↵
[] cable-level# modem-list ↵
```

Syntax

```
show
```

modem-list [s] show

Table 18: modem-list show data items

Data Item	Description	Typical Value or Range
Modem	Index number for table	—
Mac Address	MAC address of cable modem	Valid MAC address
Ip Address	IP address of cable modem	Valid IP address
DnCh	Downstream channel	3
UpCh	Upstream channel used by modem	4-11
RxPwr	Receive power of cable modem (in dBmV)	--
Status	Current modem status	• rng • regstr-complete • rng-aborted • range-complete

modem-specific/<number> [s, i]

Use the **modem-specific/<number> show** "show and info" subtree commands to display parameters for the specified cable modem on the network. If no such modem number exists, the standard error message "SNMP Error: No Such Name" is displayed.

Command Path

```
[] box# cable-level ↵
[] cable-level# modem-specific/<number> ↵
```

Syntax

```
show
```

Syntax Qualifier	Description
<number>	Index number from modem-list table

modem-specific/<number> [s] show

Table 19: modem-specific/<number> show data items

Data Item	Description	Typical Value or Range
modem-number	Index number for modem	—
mac-address	MAC address of cable modem	Valid MAC address
ip-address	IP address of cable modem	Valid IP address
down-channel-number	Downstream channel	3
up-channel-number	Upstream channel used by modem	4-11
rx-power	Receive power of cable modem (in dBmV)	—
timing-offset	Timing offset (in microticks) for the most distant cable modem	—
equalization-data	Equalization values used by cable modem	—-
status	current modem status	registration-complete ranging-abort range-complete
unerrords	Count of unerrored codewords received from cable modem	—

Table 19: modem-specific/<number> show data items

Data Item	Description	Typical Value or Range
correcteds	Count of corrected data packets received from cable modem	—
uncorrectables	Count of uncorrected errored packets received from cable modem	—
signal-noise	Ratio of signal-to-noise	—
microreflections	Microreflection value (in dBc)	—
DOCSIS version	DOCSIS version in cable modem	1.0 or 1.1

cpe-ip-list/<modem-number> [s]

Use the **cpe-ip-list** "show" subtree "show" subtree command to display the list of cpe ip addresses associated with a specific modem.

Command Path

```
[] box# cable-level ↵
[] cable-level# cpe-ip-list/<modem-number>↵
```

Syntax

```
show
```

Syntax Qualifier	Description
<modem-number>	Specifies a modem by number

cpe-ip-list/<modem number> [s]

Table 20: cpe-ip-list/<modem number> show data items

Data Item	Description	Typical Value or Range
Modem Index	Modem index value from Modem-list table.	—
cpe ip addr	IP address assigned to CPE (subscriber unit).	a.b.c.d
CPE index	Index to CPE list.	—
Learned	*true* - If cpe ip addr learned by source address gleaning *false* - if configured via provisioning	true or false

cpe-ip-specific/<modem-number>/<index{1-1024}> [s]

Use the **cpe-ip-specific** "show" subtree "show" subtree command to display the index table list for each CPE (by IP address) and cable modem.

Command Path

```
[] box# cable-level ↵
[] cable-level# cpe-ip-specific/<modem-number>/<Index{1-1024}>↵
```

Syntax

```
show
```

Syntax Qualifier	Description
<modem-number>	Specifies a modem by number
<index {1-1024}>	Index value for CPE IP address/CM association.

cpe-ip-specific<modem-number>/<index{1-1024}> [s]

Table 21: cpe-ip-specific/<modem-number>/<index{1-1024}>

Data Item	Description	Typical Value or Range
ip address	IP address of CPE device	a.b.c.d
learned	Indication of how the IP address was entered into the table	true or false

cpe-control-list [s]

Use the **cpe-control-list** "show" subtree "show" subtree command to display the CPE control status, listed by CM. When the CPE control is enabled, the CMTS can remotely control the CPE and learn its IP address.

Command Path

```
[] box# cable-level ↵
[] cable-level# cpe-control-list↵
```

Syntax

```
show
```

cpe-control-list [s]

Table 22: cpe-control-list show data items

Data Item	Description	Typical Value or Range
modem #	Index number for CM.	—
CPE Active	CPE control status	enabled disabled (default)
Learnable	CMTS ability to learn CPE IP addresses.	enabled (default) disabled
Max CPE	Maximum number of CPE devices allowed per CM.	0 to 1024 (default is 16)

cm-filter-list [s]

Use the **cm-filter-list** "show" subtree command to list the upstream and downstream filter index values for the CM and CPE (subscriber) equipment.

Command Path

```
[] box# cable-level ↵
[] cable-level# cm-filter-list↵
```

Syntax

```
show
```

cm-filter-list [s]

Table 23: cm-filter-list show data items

Data Item	Description	Typical Value or Range
modem IP Addr	IP address for CM	a.b.c.d
CM Down Index	Index value for CM downstream filter. 0 is no filter)	0 to 1024 (default is 0)
CM Up Index	Index value for CM upstream filter. 0 is no filter.	0 to 1024 (default is 0)
Sub Down Index	Index value for subscriber equipment downstream filter. 0 is no filter.	0 to 1024 (default is 0)
Sub Up Index	Index value for subscriber equipment upstream filter. 0 is no filter.	0 to 1024 (default is 0)

Note: The column values in the cm-filter-list do not align properly with their respective column headings.

modem-us-disable-list [s]

Use the **modem-us-disable-list** "show" subtree command to show the MAC address operational status for each CM recognized by the CMTS.

Command Path

```
[] box# cable-level ↵
[] cable-level# modem-us-disable-list↵
```

Syntax

```
show
```

Table 24: modem-us-disable-list show data items

Data Item	Description	Typical Value or Range
Mac Address	MAC address of modem	Valid MAC Address
Row Status	Modem status	• active • not-in-service • not-ready • delete
Timeout	timeout in ms	• Any integer

modem-us-disable-modify/<mac-addr> [i]

Use the **modem-us-disable-modify/<mac-addr>** "info" subtree command to set the operational status for the modem specified by MAC address.

Command Path

```
[] box# cable-level ↵
[] cable-level# modem-us-disable-modify/<mac-addr>↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<mac-address>	Valid MAC address of cable modem

Table 25: modem-us-disable-modify/<mac-addr> info parameters

Parameter	Description	Typical Value or Range
row-status	Current status of specified modem	• active • not-in-service • not-ready • delete

sid-list [s]

Use the **sid-list** "show" subtree command to display the Service Identification Num-ber(s) (SIDs) associated with each cable modem. Statistics are also displayed for each SID.

Note: SIDs are for Upstream Service Flows only.

Command Path

```
[] box# cable-level ↵
[] cable-level# sid-list ↵
```

Syntax

```
show
```

sid-list [s] show

Table 26: sid-list [s] show data items

Data Item	Description	Typical Value or Range
SID	Service Identification number (SID) assigned to cable modem	—
Modem	Index number for modem	—
Admin Sts	CMTS administrative status for modem	enabled disabled
Qos Indx	Qos (Quality of Service) index number for DOCSIS 1.0 modems. This index can be used in the QoS-1.0-specific command to look up the parameters associated with the index. It is "0" for DOCSIS 1.1 modems.	• 0 for DOCSIS 1.1 modems. • Valid index number for DOCSIS 1.0 modems.
Create Time	Interval since SID creation (in seconds)	—
In Octets	Count of data received from cable modem (in octets) on this SID	—
In Packets	Count of data received from cable modem (in packets) on this SID	—

sid-specific/<sid-num> [s]

Use the **sid-specific/<sid number>** "show" subtree command to display statistics for the specific SID (Service Identification Number) information.

Command Path

```
[] box# cable-level ↵
[] cable-level# sid-specific/<sid-num> ↵
```

Syntax

```
show
```

Syntax Qualifier	Description
<sid-num>	Index number identifying SID (from sid-list table)

sid-specific/<sid-num> [s] show

Table 27: sid-specific/<sid-num> show data items

Data Item	Description	Typical Value or Range
service-id	Service Identification number (SID) assigned (by cable modem.)	—
modem-number	Index number for modem	—
admin-status	CMTS administrative status for modem	enabled disabled
qos-profile	QoS (Quality of Service) profile index number for DOCSIS 1.0 modems. This index can be used in the QoS-1.0-specific command to look up the parameters associated with the index. It is "0" for DOCSIS 1.1 modems.	• 0 for DOCSIS 1.1 modems. • Valid index number for DOCSIS 1.0 modems.
create-time	Interval since SID creation	—
in-octets	Count of data received from cable modem on a particular upstream service flow (SID) (in octets)	—
in-packets	Count of data received from cable modem on a particular upstream service flow (SID) (in packets)	—

qos-1.1-level [?]

Use the **qos-1.1-level** "?" subtree command to view the next level of CMTS DOCSIS QoS 1.1 data items and parameters or delete a log entry from the CLI. The **qos-1.1-level** command has no **show** and no **info** data, but it does have a set of next-level commands.

Command Path

```
[] box# cable-level ↵
[] cable-level# qos-1.1-level ↵
```

Syntax

```
?
```

qos-1.1-level [?] (next level)

Table 28: qos-1.1-level next level commands

Next Level Command	Page #
mac-sf-list [s]	page 3-106
sf-per-mac-list/<mac-addr> [s]	page 3-107
sf-list [s]	page 3-108
sf-specific/<sfid> [s]	page 3-109
sf-stats-list [s]	page 3-110
sf-stats-specific/<sfid> [s]	page 3-111
upstream-stats-list [s]	page 3-112
upstream-stats-specific/<sid> [s]	page 3-113
classifier-list [s]	page 3-114
classifier-per-sf-list/<sfid> [s]	page 3-115
classifier-specific/<sfid>/<class-id> [s]	page 3-116
dynamic-service-stats [s]	page 3-121
dynamic-service-specific/downstream [s]	page 3-122
dynamic-service-specific/upstream [s]	page 3-124
sf-log-list [s]	page 3-126
sf-log-specific/index> [s, i]	page 3-127
sfact-log-list [s]	page 3-129

Table 28: qos-1.1-level next level commands (continued)

sfact-log-specific/<index> [s,i]	page 3-130
qos-params-list [s]	page 3-132
qos-params-per-sf-list/<sfid> [s]	page 3-133
qos-params-specific/<sfid>/active [s,i]	page 3-135
qos-params-specific/<sfid>/admitted [s,i	page 3-138
qos-params-specific/<sfid>/provisioned [s,i	page 3-141
phs-list [s]	page 3-144
phs-per-sf-list/<sfid> [s]	page 3-133
phs-sf-specific/<sfid>/<phsi> [s]	page 3-146

mac-sf-list   [s]

Use the **mac-sf-list** "show" subtree command to show the mapping of Service Flows to cable MAC addresses. A Service Flow is a MAC-layer transport service that provides unidirectional transport of packets either to upstream packets transmitted by the cable modem, or to downstream packets transmitted by the CMTS. A Service Flow is charac-terized by a set of QoS (Quality of Service) parameters.

Command Path

```
[] box# cable-level ↵
[] cable-level# qos-1.1-level ↵
[] qos-1.1-level# mac-sf-list ↵
```

Syntax

```
show
```

mac-sf-list [s] show

Table 29: mac-sf-list show data items

Data Item	Description	Typical Value or Range
CM MAC	Cable modem MAC address	valid MAC address
Service Flow Id	Service Flow ID (SFID) assigned by CMTS	valid SFID number

sf-per-mac-list/<mac-addr> [s]

Use the **sf-per-mac-list/<mac-addr>** "show" subtree command to display the Service Flows for a specific cable MAC address <mac-addr>.

Command Path

```
[] box# cable-level ↵
[] cable-level# qos-1.1-level ↵
[] qos-1.1-level# sf-per-mac-list/<mac-addr> ↵
```

Syntax

```
show
```

Syntax Qualifier	Description
<mac-addr>	MAC address of cable modem

sf-per-mac-list/<mac-addr> [s] show

Table 30: sf-per-mac-list/<mac-addr> show data items

Data Item	Description	Typical Value or Range
Service Flow Id	Service Flow ID (SFID) assigned by the CMTS	valid SFID number

sf-list [s]

Use the **sf-list** "show" subtree command to list all service flows administered by the CMTS.

Note: In version 4.0, service flows must be provisioned because they cannot be dynamically created.

Command Path

```
[] box# cable-level ↵
[] cable-level# qos-1.1-level ↵
[] qos-1.1-level# sf-list ↵
```

Syntax

```
show
```

sf-list [s] show

Table 31: sf-list show data items

Data Item	Description	Typical Value or Range
SFID	Service Flow ID assigned by CMTS	—
Direction	Direction of service flow: upstream or down-stream	upstream downstream
Primary	Defines whether the flow is primary or second-ary	true false
SID	Service ID number. Set to 0 if SID does not exist or the entry is for a downstream service flow. The SID only exists for admitted or active *upstream* service flows.	**nnnn** where **n** is single digit

sf-specific/<sfid>   [s]

Use the **sf-specific/<sfid>** "show" subtree command to display information for the service flow specified by <sfid> (Service Flow ID).

Command Path

```
[] box# cable-level ↵
[] cable-level# qos-1.1-level ↵
[] qos-1.1-level# sf-specific/<sfid> ↵
```

Syntax

```
show
```

Syntax Qualifier	Description
<sfid>	Specifies SFID (Service Flow ID) number from sf-list table

sf-specific/<sfid> [s] show

Table 32: sf-specific/<sfid> show data items

Data Item	Description	Typical Value or Range
Direction	Direction of service flow	upstream downstream
Primary	Primary service flow for cable modem	true false
SID	Service ID number. Set to 0 if no SID exists or it is a downstream service flow.	—

sf-stats-list   [s]

Use the **sf-stats-list** "show" subtree command to display a list of service flow statistics. This list is indexed by Service Flow ID number.

Command Path

```
[] box# cable-level ↵
[] cable-level# qos-1.1-level ↵
[] qos-1.1-level# sf-stats-list ↵
```

Syntax

```
show
```

sf-stats-list [s] show

Table 33: sf-stats-list show data items

Data Item	Description	Typical Value or Range
SFID	Service Flow ID (SFID) assigned by CMTS	valid SFID number
Packets	Number of packets counted on this service flow	Integer
Octets	Number of octets counted on this service flow	Integer
PHSUnkn	Number of packets with unknown payload header suppression index	Integer
Drop	Number of packets dropped by flow due to policing	Integer
Delay	Number of packets delayed by flow due to policing	Integer
Active	Number of seconds flow has been active	—

sf-stats-specific/<sfid>   [s]

The **sf-stats-specific/<sfid>** "show" subtree command displays statistics for the speci-
fied service flow (<SFID>).

Command Path

```
[] box# cable-level ↵
[] cable-level# qos-1.1-level ↵
[] qos-1.1-level# sf-stats-specific/<sfid> ↵
```

Syntax

```
show
```

Syntax Qualifier	Description
<sfid>	Specifies SFID (Service Flow ID) number from sf-list table

sf-stats-specific/<sfid> [s] show

Table 34: sf-stats-specific/<sfid> show data items

Data Item	Description	Typical Value or Range
SFID	Service Flow ID number	—
Packets	Number of packets counted on the service flow	—
Octets	Number of octets counted on the service flow	—
PHS unknown	Number of packets with unknown payload header suppression index	—
Dropped packets	Number of dropped packets counted on the service flow	—
Delayed packets	Number of delayed packets counted on the service flow	—
Flow Active	Number of seconds flow has been active	—
Flow Created	Time since service flow was created (100ths-of-seconds). The value of sysUpTime when that flow was created.	—

upstream-stats-list   [s]

Use the **upstream-stats-list** "show" subtree command to display summary upstream statistical information for all SIDs.

Command Path

```
[] box# cable-level ↵
[] cable-level# qos-1.1-level ↵
[] qos-1.1-level# upstream-stats-list ↵
```

Syntax

```
show
```

upstream-stats-list [s] show

Table 35: upstream-stats-list show data items

Data Item	Description	Typical Value or Range
SID	SID number for an admitted or an active service flow	valid SID number
Fragmented	Number of fragmented packets counted on a flow	—
Fragments Discarded	Number of discarded fragments counted on a flow	—
Concat Bursts	Number of concatenated burst packets counted on a flow	—

upstream-stats-specific/<sid> [s]

Use the **upstream-stats-specific/<sid>** "show" subtree command to display statistics for the upstream service flow specified by <sid>.

Command Path

```
[] box# cable-level ↵
[] cable-level# qos-1.1-level ↵
[] qos-1.1-level# upstream-stats-specific/<sid> ↵
```

Syntax

```
show
```

Syntax Qualifier	Description
<sid>	Specifies SID index number (from upstream-stats-list table)

upstream-stats-specific/<sid> [s] show

Table 36: upstream-stats-specific/<sid> show data items

Data Item	Description	Typical Value or Range
SID	SID number for an admitted or active service flow	valid SID number
Fragmented	Number of fragmented packets counted on a flow	—
Fragments Discarded	Number of discarded fragments counted on a flow	—
Concat Bursts	Number of concatenated burst packets counted on a flow	—

classifier-list   [s]

Use the **classifier-list** "show" subtree command to display a summary of all classifiers currently configured on the CMTS. A classifier is a set of matching criteria applied to each packet entering the cable network. These criteria act as rules to determine how the packet is handled.

Command Path

```
[] box# cable-level ↵
[] cable-level# qos-1.1-level ↵
[] qos-1.1-level# classifier-list ↵
```

Syntax

```
show
```

classifier-list [s] show

Table 37: classifier-list show data items

Data Item	Description	Typical Value or Range
SFID	Service Flow ID assigned by CMTS to the classifier. Several classifiers may refer to the same service flow.	valid SFID number
CID	Index assigned to classifier entry, unique per service flow	valid CID number
Direction	Indicates direction of flow in which classifier is applied	upstream downstream
Priority	Classifier priority. Defines order of classifiers evaluation. Highest priority classifiers are applied first to packets.	0 to255
State	Defines whether the classifier currently classifies packets	active inactive
Packets	Number of packets classified by this entry	—

classifier-per-sf-list/<sfid>   [s]

Use the **classifier-per-sf-list/<sfid>** "show" subtree command to display a summary of all classifiers for a specific service flow selected by <sfid>.

Command Path

```
[] box# cable-level ↵
[] cable-level# qos-1.1-level ↵
[] qos-1.1-level# classifier-per-sf-list/<sfid> ↵
```

Syntax

```
show
```

Syntax Qualifier	Description
<sfid>	Service Flow ID number used as reference value

classifier-per-sf-list/<sfid> [s] show

Table 38: classifier-per-sf-list/<sfid> show data items

Data Item	Description	Typical Value or Range
CID	Index assigned to classifier entry by CMTS, unique per service flow	valid CID number (1 to 65535)
Direction	Indicates direction in which classifier is applied	• up • down
Priority	Classifier priority. Defines order of classifiers evaluation. Highest priority classifiers are applied first to packets.	• 0 to 255 • 0 is default value for provisioned classifiers by default for dynamic classifiers
State	Defines whether the classifier currently classifies packets	• active • inactive
Packets	Number of packets classified by this entry	—

classifier-specific/<sfid>/<class-id>   [s]

Use the **classifier--specific/<sfid>/<class-id>** "show" subtree command to display statistics for a specific classifier selected by <sfid> and <class-id>.

Command Path

```
[] box# cable-level ↵
[] cable-level# qos-1.1-level ↵
[] qos-1.1-level# classifier-specific/<sfid>/<class-id> ↵
```

Syntax

```
show
```

Syntax Qualifier	Description
<sfid>	Service Flow ID number used as index value
<class-id>	Index value for the classifier ID

classifier-specific/<sfid>/<class-id> [s] show

Table 39: classifier-specific/<sfid>/<class-id> show data items

Data Item	Description	Typical Value or Range
Direction	Direction in which classifier is applied	upstream downstream
Priority	Classifier priority; defines order of classifier evaluation	• 0 to 255 • 0 is default for provisioned classifiers by default for dynamic classifiers.
State	Defines if classifier currently classifies packets	active inactive
IP TOS Low	Low value of a range of TOS byte values	IP TOS byte low value
IP TOS High	High value of a range of TOS byte values	IP TOS byte high value

Table 39: classifier-specific/<sfid>/<class-id> show data items (continued)

Data Item	Description	Typical Value or Range
IP TOS Mask	Is ANDed with the value in the TOS byte of the IP packet and compared to the IP TOS low and the IP TOS high value ranges to determine if the packet matches the classifier.	• IP TOS Mask • 0 means IP TOS Mask not used
IP Protocol	Defines IP protocol field value	• 0 to 257 • 256 matches any IP protocol. 257 matches both TCP and UDP
IP Src Addr	Defines IP source Address	• Valid IP address • 0.0.0.0 means IP source address not used.
IP Src Mask	Specifies which bits of source address are compared to match this rule	• Valid IP mask • 0.0.0.0 means IP source address not used
IP Dest Addr	Defines IP destination address. Value of 0.0.0.0 means IP destination address is not used for classification.	• Valid IP address • 0.0.0.0 means IP destination address not used.
IP Dest Mask	Specifies which bits of destination address are compared to match this rule.	• Valid IP mask • 0.0.0.0 means IP destination address not used.
Src Port Start	Defines for TCP/UDP packets the low end of source port numbers to which a packet is compared.	• 0 to 65535
Src Port End	Defines for TCP/UDP packets the high end of source port numbers to which a packet is compared.	• 0 to 65535 for TCP/UDP source port numbers. • Not used for nonTCP/UDP IP packets.

Table 39: classifier-specific/<sfid>/<class-id> show data items (continued)

Data Item	Description	Typical Value or Range
Dest Port Start	Defines for TCP/UDP packets the low end of destination port numbers to which a packet is compared.	• 0 to 65535
Dest Port End	Defines for TCP/UDP packets the high end of destination port numbers to which a packet is compared.	• 0 to 65535
Dest MAC Addr	Used to match Ethernet destination MAC addresses.	—
Dest MAC Mask	Used to select bits in the destination MAC address.	• 0 means destination MAC address bits not used.
Src MAC Addr	Used to match Ethernet source MAC addresses.	• FF:FF:FF:FF:FF:FF means source MAC address bits not used.
Enet Type	Indicates format of Layer 3 protocol ID in the Ethernet packet.	• 0 means rule does not use Layer 3 protocol type as matching criteria. • 1 means rule applies only to frames containing an EtherType value. • 2 means rule applies to frames using IEEE 802.3 format with DSAP other than 0xAA (which is reserved for SNMAP). • If the Ethernet frame contains an 802.1 P/Q tag header (0x8100), this object applies to the embedded Ethertype field.

Table 39: classifier-specific/<sfid>/<class-id> show data items (continued)

Data Item	Description	Typical Value or Range
Enet Protocol	Used to select Ethernet protocol.	• 0 to 65535 • 0 means this object is not used for matching. • If the EnetType is 1, this object gives the 16-bit value of the EtherType that the packet must match to meet rule. • If the EnetType is 2 (DSAP), the lower 8 bits of this object must meet the DSAP byte of the packet to match the rule. • If the EnetType has an 802.1 P/Q tag, this object applies to the embedded Etype field. Version 4.2 CMTS does not support 802.1 P/Q packet classification. If type=3, the rule applies only to MAC management messages. Version 4.2 CMTS does not support type 3. If type=4, the rule is considered a "catch-all" rule that matches all data PDU packets. The rule does not match MAC mgt messages.
User Pri Low	Used to select low user priority.	• 0 to 7 • Applies only to Ethernet frames using 802.1 P/Q tag header with 3-bit priority field. • 4.2 CMTS does not support IEEE 802.1 P/Q classification.
User Pri High	Used to select high user priority	• 0 to 7 • Applies only to Ethernet frames using 802.1 P/Q/ tag header. • 4.2 CMTS does not support IEEE 802.1 P/Q classification.
VLanId	IEEE 802.1 P/Q Classifier based on Virtual LAN ID.	• 0 to 4095. • 0 means VLAN ID not used for packet matching. • If non-zero, tagged packets must have VLAN ID that matches value in order to meet rule. • 4.2 CMTS does not support IEEE 802.1 P/Q classification.
Packets	Count of packets classified by this entry.	• Integer value

Table 39: classifier-specific/<sfid>/<class-id> show data items (continued)

Data Item	Description	Typical Value or Range
Signal Bit Map	Indicates which parameter encodings were originally specified when the classifier was created or replaced, as apposed to the parameter not being specified explicitly but rather filled in with a default value.	—

dynamic-service-stats [s]

Use the **dynamic-service-stats** "show" subtree command to display a table that lists the Dynamic Service Flow statistics.

Command Path

```
[] box# cable-level ↵
[] cable-level# qos-1.1-level ↵
[] qos-1.1-level# dynamic-service-stats ↵

If dynamic service events of that type have not occured, then 0 is
shown
```

Syntax

```
show
```

dynamic-service-stats [s] show

Table 40: dynamic-service-stats show data items

Data Item	Description	Typical Value or Range
Direction	Defines the direction of the interface. Two rows are displayed (upstream and down-stream)	• up • down
Adds	Number of successful dynamic service adds	—
DSA fails	Number of dynamic service additions failed	—
Changes	Number of successful dynamic service changes	—
DSC Fails	Number of dynamic service changes failed	—
Deletes	Number of successful dynamic service deletes	—

dynamic-service-specific/downstream [s]

Use the **dynamic-service-specific/downstream** "show" subtree command to display a table that lists the Dynamic Service Flow downstream statistics.

Command Path

```
[] box# cable-level ↵
[] cable-level# qos-1.1-level ↵
[] qos-1.1-level# dynamic-service-specific/downstream ↵

If dynamic service events of that type have not occured, then 0 is
shown
```

Syntax

```
show
```

dynamic-service-specific/downstream [s] show

Table 41: dynamic-service-specific/downstream show data items

Data Item	Description
DSA Reqs	Count of Dynamic Service Addition requests on downstream channel.
DSA Rsps	Count of Dynamic Service Addition responses on downstream channel.
DSA Acks	Count of Dynamic Service Addition acknowledgements on downstream channel.
DSC Reqs	Count of Dynamic Service Change requests on downstream channel.
DSC Rsps	Count of Dynamic Service Change requests on downstream channel.
DSC Acks	Count of Dynamic Service Change acknowledgements on downstream channel.
DSD Reqs	Count of Dynamic Service Deletion requests on downstream channel.
DSD Rsps	Count of Dynamic Service Deletion responses on downstream channel.
Adds	Count of successful adds on downstream channel. (Adds can be SF's, Classifiers, or PHS rules or combinations of all.)
Add Fails	Count of failed adds on downstream channel.
Changes	Count of successful changes on downstream channel.
Change Fails	Count of failed changes on downstream channel.
Deletes	Count of successful deletions on downstream channel.
Delete Fails	Count of failed deletions on downstream channel.
DCC Reqs	Count of Dynamic Channel Change requests on downstream channel.
DCC Rsps	Count of Dynamic Channel Change responses on downstream channel.
DCC Acks	Count of Dynamic Channel Change acknowledgements on downstream channel.
DCCs	Count of Dynamic Channel Changes on downstream channel.
DCC Fails	Count of failed Dynamic Channel Changes on downstream channel.

dynamic-service-specific/upstream [s]

Use the **dynamic-service-specific/upstream** "show" subtree command to display a table that lists the Dynamic Service Flow upstream statistics.

Command Path

```
[] box# cable-level ↵
[] cable-level# qos-1.1-level ↵
[] qos-1.1-level# dynamic-service-specific/upstream ↵

If dynamic service events of that type have not occured, then 0 is
shown
```

Syntax

```
show
```

dynamic-service-specific/upstream [s] show

Table 42: dynamic-service-specific/upstream show data items

Data Item	Description
DSA Reqs	Count of Dynamic Service Addition requests on upstream channel.
DSA Rsps	Count of Dynamic Service Addition responses on upstream channel.
DSA Acks	Count of Dynamic Service Addition acknowledgements on upstream channel.
DSC Reqs	Count of Dynamic Service Change requests on upstream channel.
DSC Rsps	Count of Dynamic Service Change requests on upstream channel.
DSC Acks	Count of Dynamic Service Change acknowledgements on upstream channel.
DSD Reqs	Count of Dynamic Service Deletion requests on upstream channel.
DSD Rsps	Count of Dynamic Service Deletion responses on upstream channel.
Adds	Count of successful adds on downstream channel. (Adds can be SF's, Classifiers, or PHS rules or combinations of all.)
Add Fails	Count of failed adds on downstream channel.
Changes	Count of successful changes on downstream channel.
Change Fails	Count of failed changes on downstream channel.
Deletes	Count of successful deletions on downstream channel.
Delete Fails	Count of failed deletions on downstream channel.
DCC Reqs	Count of Dynamic Channel Change requests on downstream channel.
DCC Rsps	Count of Dynamic Channel Change responses on downstream channel.
DCC Acks	Count of Dynamic Channel Change acknowledgements on downstream channel.
DCCs	Count of Dynamic Channel Changes on downstream channel.
DCC Fails	Count of failed Dynamic Channel Changes on downstream channel.

sf-log-list [s]

Use the **sf-log-list** "show" subtree command to display a list of the service flows that have been deleted along with statistics for the service flow. An entry is automatically created when the modem's service flows are deleted by poweroff, reset, or a DSD.

Command Path

```
[] box# cable-level ↵
[] cable-level# qos-1.1-level ↵
[] qos-1.1-level# sf-log-list ↵
```

Syntax

```
show
```

Table 43: sf-log-list show data items

Data Item	Description	Typical Value or Range
Index	Unique index for a logged service flow	—
SFID	ID assigned to the service flow by the CMTS	—
CM MAC	MAC address of the modem associated with the service flow	valid MAC address
Packets	Number of packets counted on the service flow	—
Octets	Number of octets counted on the service flow	—
Created	Specifies the SysUpTime the service flow was in existence.	—

sf-log-specific/<index> [s, i]

Use the **sf-log-specific/<index>** "show and info" subtree commands to display the service flow log list statistics.

Command Path

```
[] box# cable-level ↵
[] cable-level# qos-1.1-level ↵
[] qos-1.1-level# sf-log-specific/<index> ↵
```

Syntax

```
show

info
```

Syntax Qualifier	Description
<index>	Index to entries in the Service Flow log.

Table 44: sf-log-specific/<index> show data items

Data Item	Description	Typical Value or Range
SFID	ID assigned to service flow by the CMTS	VALID SFID Number
CM MAC	MAC address the cable modem associates with the service flow	VALID MAC Address
Packets	Number of packets counted on the service flow	integer
Octets	Number of octets counted on the service flow	integer
Created	Specifies the SysUpTime when the service flow was created.	100ths-of-seconds
Deleted	Specifies the SysUpTime when the service flow was deleted	100ths-of-seconds
Active	Time (in seconds) the service flow was active	seconds
Direction	Defines the service flow as upstream or downstream	upstream downstream
Primary	Indicates primary service flow	true false
Service Class Name	Indicates service class name	text string
Policed Drop Packets	Counts dropped packets in service flow	integer
Policed Delay Packets	Counts delayed packets in service flow	integer

Table 45: sf-log-specific/<index> info parameters

Parameters	Description	Typical Value or Range
status	status of an index entry	Active Inactive

sfact-log-list [s]

Use the **sfact-log-list** "show" subtree command to display the service flow active log statistics. This table displays service flows whose state has changed from an "Active" to "non-active" state. The service flow is active if it is currently using the active QoS parameter set.

Command Path

```
[] box# cable-level ↵
[] cable-level# qos-1.1-level ↵
[] qos-1.1-level# sf-log-list ↵
```

Syntax

```
show
```

Table 46: sfact-log-list show data items

Data Item	Description	Typical Value or Range
Index	Unique index for a logged service flow	integer
SFID	ID assigned to the service flow by the CMTS	integer
CM MAC	MAC address of the modem associated with the service flow	valid MAC address
Packets	Number of packets counted on the service flow	integer
Octets	Number of octets counted on the service flow	integer
Active	Defines the time (in seconds) the service flow was active	integer

sfact-log-specific/<index> [s, i]

Use the **sfact-log-specific/<index>** "show and info" subtree commands to display the service flow log entries for a specific index in the table.

Command Path
```
[] box# cable-level ↵
[] cable-level# qos-1.1-level ↵
[] qos-1.1-level# sfact-log-list ↵
```

Syntax

```
show

info
```

Syntax Qualifier	Description
<index>	Unique index to identify service flow log

Table 47: sfact-log-specific/<index> show data items

Data Item	Description	Typical Value or Range
Index	Unique index for a logged service flow	integer
SFID	ID assigned to the service flow by the CMTS	integer
CMMAC	MAC address of the modem associated with the service flow	MAC address
Packets	Number of packets counted on the service flow	integer
Octets	Number of octets counted on the service flow	integer
Created	Specifies the SysUpTime when the service flow was created	100ths-of-seconds
Last Inactivated	Specifies the SysUpTime when the service flow was inactivated	100ths-of-seconds
Deleted	Specifies the SysUpTime when the service flow was deleted	—
Active	Defines the time (in seconds) the service flow was active	—
Direction	Defines whether the service flow is upstream or downstream	upstream downstream

Table 47: sfact-log-specific/<index> show data items

Data Item	Description	Typical Value or Range
Primary	Defines whether the service flow is primary	true false
Service Class Name	Service Class Name associated with the flow	text string
Policed Drop Pkts	Packets dropped due to traffic policing	integer
Policed Delay Packets	Packets delayed due to traffice policing	integer

Table 48: sfact-log-specific/<index> info parameters

Parameters	Description	Typical Value or Range
Status	Controls the entry in the table. Reading the object returns an active value. To remove an entry, the value is set to destroy.	active destroy

qos-params-list [s]

Use the **qos-params-list** "show" subtree command to display the summary of all QoS parameter sets on the CMTS.

Command Path
```
[] box# cable-level ↵
[] cable-level# qos-1.1-level ↵
[] qos-1.1-level# qos-params-list ↵
```

Syntax

```
show
```

qos-params-list [s] show

Table 49: qos-params-list show data items

Data Item	Description	Typical Value or Range
SFID	Unique index assigned by the CMTS to each QOS parameter set type	1 to 4294967295
Type	Defines the type of parameter set (provisioned active or admitted)	• provisioned • active • admitted
Priority	Relative priority of service flow. Priority only used to differentiate service flows with identical parameter sets.	0 to 7
Class Name	Service Class name for the parameter set. SFs may display the name as a label if a service class name (SCN) was assigned.	Display string for Service Class Name. Null (zero-length) string is displayed if service class name not used.

qos-params-per-sf-list/<sfid>   [s]

Use the **qos-params-per-sf-list/<sfid>** "show" subtree command to display all param sets used by a specific SFID.

Command Path

```
[] box# cable-level ↵
[] cable-level# qos-1.1-level ↵
[] qos-1.1-level# qos-params-per-sf-list/<sfid> ↵
```

Syntax

```
show
```

Syntax Qualifier	Description
<sfid>	Service Flow Identifier value.

qos-params-per-sf-list/<sfid> [s] show

Table 50: qos-params-per-sf-list/<sfid> show data items

Data Item	Description	Typical Value or Range
SFID	Service Flow identifier	Valid service flow identifier.
Set type	Type of QoS parameter set.	• provisioned • active • admitted
Priority	Relative priority of service flow.	0 to 7
Class Name	Service Class Name associated with the SFID for the parameter set.	Display string for Service Class Name.

qos-params-specific/<sfid>/<type> [s]

Use the **qos-params-specific/<sfid>/<type>** "show" subtree command to view the QoS parameters for a specified active, admitted or provisioned service flow.

Command Path

```
[] box# cable-level ↵
[] cable-level# qos-1.1-level ↵
[] qos-1.1-level# qos-params-specific/<sfid>/<type>↵
```

Syntax

```
show
```

Syntax Qualifier	Description
<sfid>	Service Flow Identifier value.
<type>	Active, admitted or provisional

qos-params-specific/<sfid>/<active> [s]

Use the **qos-params-specific/<sfid>/<active>** "show" subtree command to view or change the QoS parameters for a specified active service flow.

Command Path

```
[] box# cable-level ↵
[] cable-level# qos-1.1-level ↵
[] qos-1.1-level# qos-params-specific/<sfid>/<active>↵
```

Syntax

```
show
```

qos-params-specific/<sfid>/<active> [s] show

Syntax Qualifier	Description
<sfid>	Service Flow Identifier value.

Table 51: qos-params-specific/<sfid>/<active> show data items

Data Item	Description	Typical Value or Range
Class Name	Service Class Name	text string
Priority	Relative priority of service flow.	0 to 7. Default value is 0.
Max Traffic Rate	Maximum sustained traffic flow allowed for this service flow in bits/sec.	Default value is 0. Typical value is 1000000.
Max Traffic Burst	Token bucket size in bytes for this parameter set.	Default value is 1522.
Min Reserved Rate	Guaranteed minimum rate in bits/sec for this parameter set.	Default value is 0.
Min Reserved Pkt	Assumed minimum packet size in bytes.	0 to 65535. Typical value is 64.
Active Timeout	Maximum duration in seconds that resources remain unused on an active service flow before the CMTS signals that both active and admitted parameters set are null.	0 to 65535. Default value is 0 (no timeout).
Admitted Timeout	Maximum duration in seconds that resources remain in admitted state before resources must be released.	0 to 65535. Default value is 200.

Table 51: qos-params-specific/<sfid>/<active> show data items (continued)

Data Item	Description	Typical Value or Range
Max Concat Burst	Maximum concatenated burst in bytes which an upstream service flow is allowed.	0 to 65535. Default value is 0 (no maximum burst).
Scheduling Type	Upstream scheduling service used for upstream service flow.	• undefined (1) • bestEffort (2) • nonRealTimePollingService (3) • RealTimePollingService • unsolicitedGrantService-WithAD (5) • unsolicitedGrantService(6) • notApplicable (256)
Nom Poll Interval	Nominal interval in microseconds between successive unicast request opportunities on an upstream service flow.	Default value is 0.
Tol Poll Jitter	Maximum amount of time in microseconds that the unicast request interval may be delayed from the nominal periodic schedule on an upstream service flow.	Default value is 0.
Unsolicit Grant Size	Unsolicited grant size in bytes.	0 to 65535. Default value is 0
Nom Grant Interval	Nominal interval in microseconds between successive data grant opportunities on an upstream service flow.	Default value is 0.
Tol Grant Jitter	Maximum amount of time in microseconds that the transmission opportunities may be delayed from the nominal periodic schedule.	Default value is 0.
Grants Per Interval	Number of data grants per nominal grant interval.	0 to 127 Default value is 0.
TOS AND Mask	The AND mask for IP TOS byte for overwriting IP packet TOS value.	Octet string Default value is "FF" hex (255).
TOS OR Mask	The OR mask for the IP TOS byte.	Octet string Default value is "00" hex (0).
Max Latency	The maximum latency between receiving a packet on the NSI and forwarding the packet to the RF interface	—

Table 51: qos-params-specific/<sfid>/<active> show data items (continued)

Data Item	Description	Typical Value or Range
Request Policy	The transmit interval opportunities the CM omits for upstream packet	—
Bit Map	The set of QoS parameters signaled in the CM registration file	—

qos-params-specific/<sfid>/<admitted> [s]

Use the **qos-params-specific/<sfid>/<admitted>** "show" subtree command to view the QoS parameters for a specified admitted service flow.

Command Path

```
[] box# cable-level ↵
[] cable-level# qos-1.1-level ↵
[] qos-1.1-level# qos-params-specific/<sfid>/<admitted>↵
```

Syntax

```
show
```

Syntax Qualifier	Description
<sfid>	Service Flow Identifier value.

qos-params-specific/<sfid>/<admitted> [s] show

Table 52: qos-params-specific/<sfid>/<admitted> show data items

Data Item	Description	Typical Value or Range
Priority	Relative priority of service flow.	0 to 7. Default value is 0.
Max Traffic Rate	Maximum sustained traffic flow allowed for this service flow in bits/sec.	Default value is 0. Typical value is 1000000.
Max Traffic Burst	Token bucket size in bytes for this parameter set.	Default value is 1522.
Min Reserved Rate	Guaranteed minimum rate in bits/sec for this parameter set.	Default value is 0.
Min Reserved Pkt	Assumed minimum packet size in bytes.	0 to 65535. Typical value is 64.
Active Timeout	Maximum duration in seconds that resources remain unused on an active service flow before the CMTS signals that both active and admitted parameters set are null.	0 to 65535. Default value is 0 (no timeout).
Admitted Timeout	Maximum duration in seconds that resources remain in admitted state before resources must be released.	0 to 65535. Default value is 200.
Max Concat Burst	Maximum concatenated burst in bytes which an upstream service flow is allowed.	0 to 65535. Default value is 0 (no maximum burst).

Table 52: qos-params-specific/<sfid>/<admitted> show data items (continued)

Data Item	Description	Typical Value or Range
Scheduling Type	Upstream scheduling service used for upstream service flow. Typically set to bestEffort (2) for data flows.	• undefined (1) • bestEffort (2) • nonRealTimePollingService (3) • RealTimePollingService () • unsolicitedGrantServiceWithAD (5) • unsolicitedGrantService(6) • notApplicable (256)
Nom Poll Interval	Nominal interval in microseconds between successive unicast request opportunities on an upstream service flow.	Default value is 0.
Tol Poll Jitter	Maximum amount of time in microseconds that the unicast request interval may be delayed from the nominal periodic schedule on an upstream service flow.	Default value is 0.
Unsolicit Grant Size	Unsolicited grant size in bytes.	0 to 65535. Default value is 0
Nom Grant Interval	Nominal interval in microseconds between successive data grant opportunities on an upstream service flow.	Default value is 0.
Tol Grant Jitter	Maximum amount of time in microseconds that the transmission opportunities may be delayed from the nominal periodic schedule.	Default value is 0.
Grants Per Interval	Number of data grants per nominal grant interval.	0 to 127 Default value is 0.
TOS AND Mask	The AND mask for IP TOS byte for overwriting IP packet TOS value.	Octet string Default value is "FF" hex (255).
TOS OR Mask	The OR mask for the IP TOS byte.	Octet string Default value is "00" hex (0).
Max Latency	The maximum latency between receiving a packet on the NSI and forwarding the packet to the RF interface	—
Request Policy	The transmit interval opportunities the CM omits for upstream packet	—

Table 52: qos-params-specific/<sfid>/<admitted> show data items (continued)

Data Item	Description	Typical Value or Range
Bit Map	The set of QoS parameters signaled in the CM registration file	—

qos-params-specific/<sfid>/<provisioned> [s]

Use the **qos-params-specific/<sfid>/<provisioned>** "show" subtree command to view or change the QoS parameters for a specified provisioned service flow.

Command Path

```
[] box# cable-level ↵
[] cable-level# qos-1.1-level ↵
[] qos-1.1-level# qos-params-specific/<sfid>/<provisioned>↵
```

Syntax

```
show
```

Syntax Qualifier	Description
<sfid>	Service Flow Identifier value.

qos-params-specific/<sfid>/<provisioned> [s] show

Table 53: qos-params-specific/<sfid>/<provisioned> show data items

Data Item	Description	Typical Value or Range
Priority	Relative priority of service flow.	0 to 7. Default value is 0.
Max Traffic Rate	Maximum sustained traffic flow allowed for this service flow in bits/sec.	Default value is 0. Typical value is 1000000.
Max Traffic Burst	Token bucket size in bytes for this parameter set.	Default value is 1522.
Min Reserved Rate	Guaranteed minimum rate in bits/sec for this parameter set.	Default value is 0.
Min Reserved Pkt	Assumed minimum packet size in bytes.	0 to 65535. Typical value is 64.
Active Timeout	Maximum duration in seconds that resources remain unused on an active service flow before the CMTS signals that both active and admitted parameters set are null.	0 to 65535. Default value is 0 (no timeout).
Admitted Timeout	Maximum duration in seconds that resources remain in admitted state before resources must be released.	0 to 65535. Default value is 200.
Max Concat Burst	Maximum concatenated burst in bytes which an upstream service flow is allowed.	0 to 65535. Default value is 0 (no maximum burst).

Table 53: qos-params-specific/<sfid>/<provisioned> show data items (continued)

Data Item	Description	Typical Value or Range
Scheduling Type	Upstream scheduling service used for upstream service flow. Typically set to bestEffort (2) for data flows.	• undefined (1) • bestEffort (2) • nonRealTimePollingService (3) • RealTimePollingService () • unsolicitedGrantServiceWithAD (5) • unsolicitedGrantService(6) • notApplicable (256)
Nom Poll Interval	Nominal interval in microseconds between successive unicast request opportunities on an upstream service flow.	Default value is 0.
Tol Poll Jitter	Maximum amount of time in microseconds that the unicast request interval may be delayed from the nominal periodic schedule on an upstream service flow.	Default value is 0.
Unsolicit Grant Size	Unsolicited grant size in bytes.	0 to 65535. Default value is 0
Nom Grant Interval	Nominal interval in microseconds between successive data grant opportunities on an upstream service flow.	Default value is 0.
Tol Grant Jitter	Maximum amount of time in microseconds that the transmission opportunities may be delayed from the nominal periodic schedule.	Default value is 0.
Grants Per Interval	Number of data grants per nominal grant interval.	0 to 127 Default value is 0.
TOS AND Mask	The AND mask for IP TOS byte for overwriting IP packet TOS value.	Octet string Default value is "FF" hex (255).
TOS OR Mask	The OR mask for the IP TOS byte.	Octet string Default value is "00" hex (0).
Max Latency	The maximum latency between receiving a packet on the NSI and forwarding the packet to the RF interface	—
Request Policy	The transmit interval opportunities the CM omits for upstream packet	—

Table 53: qos-params-specific/<sfid>/<provisioned> show data items (continued)

Data Item	Description	Typical Value or Range
Bit Map	The set of QoS parameters signaled in the CM registration file	—

phs-list [s]

Use the **phs-list** "show" subtree command to display a list of PHS (Payload Header Suppression) parameters. PHS requires that three objects be created: Service Flow (referenced by SFID), Classifier (referenced by CID), and PHS Rule (referenced by PHS Index).

Command Path

```
[] Box # cable-level ↵
[] cable-level# qos-1.1-level ↵
[] qos-1.1-level# phs-list ↵
```

Syntax

```
show
```

Table 54: phs-list show data items

Data Item	Description	Typical Value or Range
SFID	Service Flow ID. A 32-bit unsigned integer assigned by the CMTS to each Service Flow.	—
CID	Classifier ID. An integer assigned by the CMTS to the Classifier.	—
PHS Index	Index value which identifies the PHS Rule.	—

phs-per-sf-list/<sfid> [s]

Use the **phs-per-sf-list/<sfid>** "show" subtree command to display the PHS information associated with a specific SFID.

Command Path

```
[] box# cable-level ↵
[] cable-level# qos-1.1-level ↵
[] qos-1.1-level# phs-per-sf-list/<sfid> ↵
```

Syntax

```
show
```

Syntax Qualifier	Description
<sfid>	Specifies the Service Flow ID number

Table 55: phs-per-sf-list/<sfid> show data items

Data Item	Description	Typical Value or Range
CID	Classifier ID	Assigned by CMTS
PHSI	Payload Header Suppression (PHS) Index value	Assigned by CMTS

phs-sf-specific/<sfid>/<cid> [s]

Use the **phs-sf-specific/<sfid>/<cid>** "show" subtree command to display a list of PHS rules per Service Flow, as specified by the SFID and CID indexes.

Command Path

```
[] box# cable-level ↵
[] cable-level# qos-1.1-level ↵
[] qos-1.1-level# phs-sf-specific/<sfid>/<cid> ↵
```

Syntax

```
show
```

Syntax Qualifier	Description
<sfid>	Specifies the Service Flow ID index to the PHS-list table
<cid>	Specifies the Classifier ID value

Table 56: phs-per-sf-list/<cid> show data items

Data Item	Description	Typical Value or Range
PHS Field	Defines byte values in payload header to suppress/restore	—
PHS Mask	Defines which bytes to suppress/restore	—
PHS Size	Defines the field size	—
PHS Verify	Defines verification of packet values before suppressing	true false

qos-1.0-list [s]

Use the **qos-1.0-list** "show" subtree command to display a list of the different Quality of Service classes offered on a network for DOCSIS 1.0 devices. The parameters for the QoS list are displayed below.

Note: These parameters are designed for QoS standards for DOCSIS 1.0.

Command Path

```
[] box# cable-level ↵
[] cable-level# qos-1.0-list ↵
```

Syntax

```
show
```

qos-1.0-list [s] show

Table 57: qos-params-list show data items

Data Item	Description	Typical Value or Range
Index	Index value which uniquely identifies entry in the docsIfQosProfileTable	Integer
Pri	Priority assigned to this service when allocating bandwidth	0 to 7 0 indicates lowest priority
Max Up Bw	Maximum upstream bandwidth (in bits per second) allowed for a service within this service class	0 to 10000000 0 indicates no restriction
Guar UpBw	Minimum guaranteed upstream bandwidth (in bits per second) allowed for a service in this service class	0 to 10000000
Max Dn Bw	Maximum downstream bandwidth (in bits per second) allowed for a service in this service class	0 to 10000000
MaxTxBst	Maximum transmit burst (in bytes) allowed for a single upstream transmission	0 to 65535 0 indicates no limit
BpEnb	Indicates if Baseline Privacy is enabled for this service class	true false
Status	QoS status	active delete

qos-1.0-specific/<qos-index>   [s]

Use the **qos-specific/<qos-index>** "show" subtree command to display a Quality of Service class identified by the qos-index number (from the qos-1.0-list table).

Command Path

```
[] box# cable-level ↵
[] cable-level# qos-1.0-specific/<qos-index> ↵
```

Syntax

```
show
```

Syntax Qualifier	Description
<qos-index>	Index to the qos-1.0-list table

qos-1.0-specific/<qos-index> [s] show

Table 58: qos-1.0-specific/<qos-index> show data items

Data Item	Description	Typical Value or Range
Index	Index value which uniquely identifies entry in the docsIfQosProfileTable	Integer
Pri	Priority assigned to this service when allocating bandwidth	0 to 7 0 indicates lowest priority
Max Up Bw	Maximum upstream bandwidth (in bits per second) allowed for a service within this service class	0 to 10000000 0 indicates no restriction
Guar UpBw	Minimum guaranteed upstream bandwidth (in bits per second) allowed for a service in this service class	0 to 10000000
Max Dn Bw	Maximum downstream bandwidth (in bits per second) allowed for a service in this service class	0 to 10000000
MaxTxBst	Maximum transmit burst (in bytes) allowed for a single upstream transmission	0 to 65535 0 indicates no limit
BpEnb	Indicates if Baseline Privacy is enabled for this service class	true false
Status	QoS status	active delete

forwarder [s, i]

Use the **forwarder** "show" and "info" command to control packet forwarding through the CMTS and to control data traffic over the cable modem network.

The forwarder command controls the following functions:
- forwarding mode (transparent bridge or learning)
- filtering
- proxy-arping
- multicast forwarding

The forwarder command also prevents and detects subscriber-side attempts to compromise network security.

Command Path

```
[] box# forwarder ↵
```

Syntax

```
show
info
```

forwarder [s] show

Table 59: forwarder show data items

Data Item	Description	Typical Value or Range
bridge-address	Factory-supplied MAC address of CMTS (not changeable by user)	Fixed MAC address
num-ports	Number of ports controlled by this bridging entity	2
type	Indicates type of bridging performed by this bridge. If a bridge is bridging, this is indicated by entries in the port table for a given type.	• unknown • transparent-only • source-route-only • srt
learned-entry-discards	Count of FDB (Forwarding Data Base) discards	()

forwarder [i] info

Table 60: forwarder info parameters

Parameter	Description	Default	Range
forwarding-mode	CMTS forwarding mode: Mode A = none (transparent learning bridge) Mode B = dhcp-arp	none	none dhcp-arp
dot1d-aging-time	Time to age out entries in the Forwarding Data Base (in seconds)	1000000	10 to 100000
stpcontrol	Determines Spanning Tree Protocol (STP) type.	Default is no-st-filter-bpdu BPDU (Bridge Protocol Data Unit)	st-enabled no-st-filter-bpdu no-st-pass-bpdu
llc-filter-default	LLC (Logical Link Control) default filter setting	accept	accept discard
ip-filter-default	IP default filter setting	accept	accept discard
send-du-when-ip-filter	Sends Data Unit (DU) message during filtering action	off	on off

Table 60: forwarder info parameters

Parameter	Description	Default	Range
icmp-type9-filter	Sets action for icmp-type9-filter	forward	forward filter
proxy-arp	Controls the CMTS Proxy ARP in transparent mode. Enable CMTS responds to an ARP received from the cable if the IP address is known, and responds to ARP from the Ethernet when the IP address is known to be on the cable. Disable CMTS does not respond to ARP requests.	disable	enable disable
timeout-proxy-arp	Timeout (in seconds) for the Proxy ARP cache enable	900	any number
arp-spoofing-protection	Controls whether arp spoofing protection is enabled or disabled	disable	disable enable
multicast-forwarding	Controls CMTS handling of IP IGMP multicast packets. The router(s) between the IGMP source and the CMTS must be configured to allow IGMP packets to pass. Some cable modems have a separate IGMP control.	pass	• pass • discard • igmp • trap
funnel-mode	Monitors traffic flow to allow customer to comply with law enforcement agency requests and other traffic monitoring	disable	disable enable
deregistered-cm-aging-time	Defines the number of seconds that is used as the aging interval for an FDB entry with a CM that has de-registered.	172000	30-43200
ranged-only-cm-aging-time	Defines the number of seconds that is used as the aging interval for an FDB entry with a CM that has ranged but has not yet completed the registration process	120	30-43200
use-dot1d-aging	Controls whether aging of entries in forwarding database is enabled or disabled	disable	disable enable

forwarder (next level)

Table 61: forward next level commands

Next Level Command	Page #
ethernet-port-fwd [s]	page 3-153
cable-port-fwd [s]]	page 3-154
port-filter-list [s]	page 3-155
port-filter-modify/<mac-addr>/<both ports> [s, i]	page 3-156
port-filter-modify/<mac-addr>/<ethernet> [s,i]	page 3-158
port-filter-modify/<mac-addr>/<cable> [s, i]	page 3-160
tp-forwarding-data-base [s]	page 3-162
spanning-tree [s,i]	page 3-163
link-filter-list [s]	page 3-170
link-filter-modify/<index> [s,i]	page 3-171
ip-filter-list [s]	page 3-173
ip-filter-modify/<index> [s, i]	page 3-174
cpe-addr-filter-list [s]	page 3-176
cpe-state-filter-list [s]	page 3-177
cpe-filter-modify/<group {1 to 1024}>/<index{1 to 1024}> [s, i]	page 3-178
tcp-udp-filter-list [s]	page 3-180
tcp-udp-filter-modify/<group{1 to 1024}>/<index{1 to 1024}> [i]	page 3-181

ethernet-port-fwd [s]

Use the **ethernet-port-fwd** "show" subtree command to view statistics on traffic for-warded on the CMTS Ethernet port.

Command Path

```
[] box# forwarder ↵
[] forwarder# ethernet-port-fwd ↵
```

Syntax

```
show
```

ethernet-port-fwd [s] show

Table 62: ethernet-port-fwd show data items

Data Item	Description	Typical Value or Range
delay-exceeded-discards	Count of discarded frames (exceeded delay time)	—
mtu-exceeded-discards	Count of discarded frames exceeding MTU (Maximum Transmission Unit) size	—
max-info	Maximum packet size (in octets)	Example: 1500 octets
in-frames	Count of incoming frames on Ethernet inter-face	—
out-frames	Count of frames sent out on Ethernet interface	—
in-discards	Count of discarded incoming frames on Ether-net interface	—

cable-port-fwd [s]

Use the **cable-port-fwd** "show" subtree command to view statistics on traffic forwarded on the CMTS Ethernet port.

Command Path

```
[] box# forwarder ↵
[] forwarder# cable-port-fwd ↵
```

Syntax

```
show
```

cable-port-fwd [s] show

Table 63: cable-port-fwd show data items

Data Item	Description	Typical Value or Range
delay-exceeded-discards	Count of discarded frames (exceeded delay time)	—
mtu-exceeded-discards	Count of discarded frames (exceeded MTU size)	—
max-info	Maximum packet size (in octets)	1500 octets
in-frames	Count of incoming frames on Ethernet interface	—
out-frames	Count of frames sent out on Ethernet interface	—
in-discards	Count of discarded incoming frames on Ethernet interface	—

port-filter-list [s]

Use the **port-fwd** "show" subtree command to view the list of configured port filters, corresponding MAC addresses, and connectivity.

Command Path

```
[] box# forwarder ↵
[] forwarder# port-filter-list ↵
```

Syntax

```
show
```

port-filter-list [s] show

Table 64: port-filter-list show data items

Data Item	Description	Typical Value or Range
Mac Address	MAC address of CMTS receive port	valid MAC address
Receive Port	Current receive port mode	- none (default) - blocked - ethernet - cable - both
Allowed-To-Go-To Port	Port interfaces allowing packets to pass (connectivity)	- none - ethernet - cable - both
Status	Receive port filter setting	- other - delete-now - permanent - delete-on-reset - delete-on-timeout

port-filter-modify/<mac-addr>/<both ports> [s, i]

Use the **port-filter-modify/<mac-addr>/<both ports>** "show" and "info" subtree commands to view and configure the CMTS port filter statistics for both ports (ethernet and cable) by specified MAC address.

Command Path

```
[] box# forwarder ↵
[] forwarder# port-filter-modify/<mac-addr>/<both ports> ↵
```

Syntax

```
show
info
```

Syntax Qualifier	Description
<mac-addr>	Selects specific port filter to view or modify, by MAC address

port-filter-modify/<mac addr>/<both-ports> [s] show

Table 65: port-filter-modify/<mac addr><both-ports> show data items

Data Item	Description	Value
mac-address	modem MAC address	valid MAC address
receive-port	Sets CMTS receive and send port connectivity	• none • ethernet • cable • ethernet & cable

port-filter-modify/<mac addr>/<both-ports> [i] info

Table 66: port-filter-modify/<mac addr>/<both-ports> info data items

Parameter	Description or Values	Default	Range
allowed-to-go-to-port	Sets CMTS receiver port connectivity	both	• none • ethernet • cable • ethernet & cable

Table 66: port-filter-modify/<mac addr>/<both-ports> info data items

Parameter	Description or Values	Default	Range
status	CMTS receive port status	other	• other • delete-now • permanent • delete-on-reset • delete-on-time-out

port-filter-modify/<mac-addr>/<ethernet> [s,i]

Use the **port-filter-modify/<mac-addr>/<ethernet>** "show" and "info" subtree commands to view port statistics and configure the CMTS Ethernet port filter by specified MAC address.

Command Path

```
[] box# forwarder ↵
[] forwarder# port-filter-modify/<mac-addr>/<ethernet> ↵
```

Syntax

```
show
info
```

Syntax Qualifier	Description
<mac-addr>	Selects specific port filter to view or modify, by MAC address

port-filter-modify/<mac addr>/<ethernet> [s] show

Table 67: port-filter-modify/<mac addr>/<ethernet> show data items

Data Item	Description	Typical Value or Range
mac-address	MAC address of CMTS receive port	valid MAC address
receive-port	Sets CMTS receive port connectivity: • none blocks all connectivity • ethernet allows ethernet connectivity • cable allows cable connectivity • both allows cable and ethernet connectivity	• none • ethernet • cable • both

port-filter-modify/<mac addr>/<ethernet> [i] info

Table 68: port-filter-modify/<mac addr>/<etherne>t info parameters

Parameter	Description or Values	Default	Range
allowed-to-go-to-port	Sets CMTS receive port connectivity	none	• none • ethernet • cable • ethernet & cable
status	CMTS receive port status	other	• other • delete-now • permanent • delete-on-reset • delete-on-time-out

port-filter-modify/<mac-addr>/<cable> [s, i]

Use the **port-filter-modify/<mac-addr>/cable** "show"and "info" subtree commands to view and configure the CMTS cable port filter statistics by specified MAC address.

Command Path

```
[] box# forwarder ↵
[] forwarder# port-filter-modify/<mac-addr>/<cable> ↵
```

Syntax

```
show
info
```

Syntax Qualifier	Description
<mac-addr>	Selects specific port filter to view or modify, by MAC address

port-filter-modify/<mac addr>/<cable> [s] show

Table 69: port-filter-modify/<mac addr>/<cable> show data item

Data Item	Description	Typical Value or Range
mac-address	MAC address of CMTS receive port	valid MAC address
receive-port	Sets CMTS receive port connectivity: • none blocks all connectivity • ethernet allows ethernet connectivity • cable allows cable connectivity • both allows cable and ethernet connectivity	• none • ethernet • cable • ethernet & cable

port-filter-modify/<mac addr>/<cable> [i] info

Table 70: port-filter-modify/<mac addr>/<cable> info parameters

Parameter	Description or Values	Default	Range
allowed-to-go-to-port	Sets CMTS receiver port connectivity	both	• none • ethernet • cable • ethernet & cable
status	CMTS receive port status	other	• other • delete-now • permanent • delete-on-reset • delete-on-time-out

tp-forwarding-data-base [s]

Use the **tp-forwarding-data-base** "show" subtree command to view the transparent bridge forwarding data base connections. The forwarding data base is connected to the CMTS Ethernet and cable ports, and is built by checking traffic through the ports.

Command Path

```
[] box# forwarder ↵
[] forwarder# tp-forwarding-data-base ↵
```

Syntax

```
show
```

tp-forwarding-data-base [s] show

Table 71: tp-forwarding-data-base show data items

Data Item	Description	Typical Value or Range
mac-address	Unicast MAC address for which the bridge has forwarding and/or filtering information	valid MAC address
port	Port type	• unspecified • ethernet • cable
status	Status of the entry indicates how the port number was learned. Modems are typically shown as learned by mgmt.	• other (1) • invalid (2) • learned (3) • self (4) • mgmt (5)

spanning-tree [s,i]

Use the **spanning-tree** "show" and "info" subtree commands to view and configure the CMTS spanning-tree forwarding operation.

Spanning-tree refers to an algorithm used to select a single data path between any two ports located at different locations in a network. The CMTS uses the spanning-tree method to determine the best path to forward data. A "cost" is calculated for various paths, and the lowest-cost path is selected as "best".

Command Path

```
[] box# forwarder ↵
[] forwarder# spanning-tree ↵
```

Syntax

```
show
info
```

spanning-tree [s] show

Table 72: spanning-tree show data items

Data Item	Description	Typical Value or Range
protocol-specification	Shows which version of the Spanning Tree Protocol is used by CMTS	unknown (1) decLb100 (2) ieee8021d(3)
time-since-topology-change	Duration since last change in spanning-tree topology (100ths-of-seconds)	—
topology-changes	Count of topology changes. TCN (Topology Change Notices) typically are not transmitted or processed.	—
designated-root	Designated root priority as a number with its MAC address: <priority>, <MAC ID> CMTS units operating as bridges must participate in this protocol and must be assigned higher priorities than cable modems. The NSI interface on the CMTS should be assigned a port cost equivalent to a link speed of at least 100 Mbps.	default is 0, 00.00.00.00.00.00
path-to-root-cost	Calculated root-path cost. cable modems: The modulation type (QPSK or 16QAM) for the Long Data Grant IUC is multiplied by the raw symbol rate to determine the nominal path cost. CMTS: The downstream symbol rate is multiplied by the data rate.	0 if root not designated
root-path-port	Port number of port which offers the lowest cost path from this bridge to the root bridge	—
max-age	Maximum allowed age of STP information learned from the network on any port before it is discarded (in 100ths-of-seconds)	—
hello-time	Duration for configuration bridge PDUs by this node on any port when it is root or trying to become root (in 100ths-of-seconds)	—

Table 72: spanning-tree show data items (continued)

Data Item	Description	Typical Value or Range
hold-time	Determines interval length during which no more than two configuration bridge PDUs will be transmitted by this node (in 100ths-of-seconds)	100 is default
forward-delay	Controls how fast a port changes it spanning stand when moving to the Forwarding state (in 100ths-of-seconds). This value is also used to age all dynamic entries in the Forwarding Database when a topology change is detected.	—

spanning-tree [i] info

Table 73: spanning-tree info parameters

Parameter	Description or Values	Default	Range
priority	Assigned priority value; higher numbers indicate higher priority	32768	0 to 65535
bridge-max-age	Maximum age allowed for all bridges (in seconds)	2000	600 to 4000 Must be whole number of seconds
bridge-hello-time	Value used by all bridges for hello time when this bridge acts as root (in seconds)	200	100 to 1000
bridge-forward-delay	Value used by all bridges for forwarding delay time when this bridge acts as root (in seconds)	1500	400 to 3000

spanning-tree (next level)

Table 74: spanning-tree next level commands

Next Level Command	Page #
ethernet-port-stp [s,i]	page 3-166
cable-port-stp [s,i]	page 3-168

ethernet-port-stp [s, i]

Use the **ethernet-port-stp** "show" and "info" subtree commands to view and control the spanning-tree function for the CMTS ethernet port.

Command Path

```
[] box# forwarder ↵
[] forwarder# spanning-tree ↵
[] spanning-tree# ethernet-port-stp ↵
```

Syntax

```
show
info
```

ethernet-port-stp [s] show

Table 75: ethernet-port-stp show data items

Data Item	Description	Typical Value or Range
state	Operational state of cable bridge	• disabled (1) • blocking (2) • listening (3) • learning (4) • forwarding (5) • broken (6)
designated-root	Unique bridge identifier of bridge in the form: <priority>, <MAC ID>	0, 00:00:00:00:00:00
designated-path-cost	Path cost of designated port of segment connected to this port	—
designated-bridge	Unique bridge identifier of designated bridge for this port's segment: <priority>, <MAC ID>	0, 00:00:00:00:00:00
designated-port	Port identifier of the port on the designated bridge for this port's segment.	Default value is 0 0 <id>.
forward-transitions	Number of times this port has transitioned from Learning state to Forwarding state	—

ethernet-port-stp [i] info

Table 76: ethernet-port-stp info parameters

Parameter	Description or Values	Default	Range
priority	Priority value assigned to port	128	0 to 255
enable	Port operation status	enable	• enable • disable
path-cost	Calculated path cost	100	1 to 65535

cable-port-stp [s, i]

Use the **cable-port-stp** "show" and "info" subtree commands to view and control the spanning-tree function for the CMTS cable port.

Command Path

```
[] box# forwarder ↵
[] forwarder# spanning-tree ↵
[] spanning-tree# cable-port-stp ↵
```

Syntax

```
show

info
```

cable-port-stp [s] show

Table 77: cable-port-stp show data items

Data Item	Description	Typical Value or Range
state	Operational state for cable port	• disabled (1) • blocking (2) • listening (3) • learning (4) • forwarding (5) • broken (6)
designated-root	Unique bridge identifier of bridge in the form: <priority>, <MAC ID>	Default is 0, 00:00:00:00:00:00
designated-path-cost	Path cost of designated port of segment connected to this port	1 to 65535 Default is 0
designated-bridge	Unique bridge identifier of designated bridge for this port's segment: <priority>, <MAC ID>	Default is 0, 00:00:00:00:00:00
designated-port	Port identifier of the port on the designated bridge for this port's segment: 0 0 <id>	Octet string
forward-transitions	Number of times this port has transitioned from Learning state to Forwarding state	—

cable-port-stp [i] info

Table 78: cable-port-stp info parameters

Parameter	Description or Values	Default	Range
priority	Priority value assigned to port	128	0 to 255
enable	Port operation status	enable	• enable • disable
path-cost	Calculated path cost	100	1 to 65535

link-filter-list [s]

Use the **link-filter-list** "show" subtree command to view the list of configured link filters. Link filters control LLC (Link Level Control) traffic at the MAC layer. These filters are placed at the CMTS ethernet or cable ports.

Command Path

```
[] box# forwarder ↵
[] forwarder# link-filter-list ↵
```

Syntax

```
show
```

link-filter-list [s] show

Table 79: link-filter-list show data items

Data Item	Description	Typical Value or Range
Index	Index to Link Filter Table entries	1 to 2147483647
Status	Controls and reflects status of rows in table	• active • not-in-service • delete
Interfaces	Value corresponds to ifIndex for either a CATV MAC or another network interface. If value is zero, filter applies to all interfaces. In CMTS systems, this object has to be specified to create a row in this table.	0 or interface index value
Prtcl Type	Indicates format: either a two-byte Ethernet Ethertype, or a one-byte 802.2 SAP value. EtherType also applies to SNAP-encapsulated frames. DSAP = Destination Service Access Point.	• ethertype (1) • dsap (2) Default value is ethertype
L3 Protocol	Layer 3 network protocol assigned to each link filter, depending on Protocol Type. For SNAP frames, ethertype filtering is performed rather than DSAP = 0xAA.	0 to 65535 Default value is 0
Matches	Counts number of times this filter was matched	—

link-filter-modify/<index> [s,i]

Use the **link-filter-modify/<index>** "show" and "info" subtree commands to view and configure entries in the ip-filter-list, referenced by <index>.

Command Path

```
[] box# forwarder ↵
[] forwarder# link-filter-modify/<index> ↵
```

Syntax

```
show

info
```

Syntax Qualifier	Description
<index>	Index to select specific link filter to view or modify, from link-filter-list table

link-filter-modify/<index> [s] show

Table 80: link-filter-modify/<index> show data items

Data Item	Description	Typical Value or Range
matches	Number of matches the filter made	—

link-filter-modify/<index> [i] info

Table 81: link-filter-modify/<index> info parameters

Parameter	Description or Values	Default	Range
status	Controls and reflects status of rows in table	not-in-service	• active • not-in-service • delete
interface	Specifies CMTS interface this filter is applied to	ethernet	• ethernet • cable • ether-and-cable
type-of-protocol	Specifies LLC protocol type	ethertype	• ethertype • dsap
layer-3-protocol	Specifies Layer 3 protocol number used for filtering	0	0 to 65535

ip-filter-list [s]

Use the **ip-filter-modify/<index>** "show" subtree command to view and configure
entries in the ip-filter-list, referenced by <index>.

Command Path

```
[] box# forwarder ↵
[] forwarder# ip-filter-list ↵
```

Syntax

```
show
```

ip-filter-list [s] show

Table 82: ip-filter-list show data items

Data Item	Description	Typical Value or Range
Index	Index used to order the application of filters. The filter with the lowest index is always applied first.	1 to 2147483647
Status	Controls and reflects status of rows in this table	• active • not-in-service • deleted
Control	Default IP filtering action performed on matching packets. If set to discard, all packets matching this filter will be discarded and scanning remainder of filter list will be halted. If set to accept, all packets matching this filter will be accepted for further processing.	• discard (1) • accept (2) • Default is discard
Interfaces	Interfaces to which this filter applies. For CMTS, this object has to be specified to create a row in this table. The value corresponds to the ifIndex for either a cable or ethernet interface, or both.	• none • ethernet • cable • ethernet & cable
Direction	Determines direction filter is applied	• inbound • outbound • both
Matches	If traffic is broadcast, the condition is true. If not broadcast, then condition is false.	• true • false

ip-filter-modify/<index> [s, i]

Use the **ip-filter-modify/<index>** "show and info" subtree commands to view and configure entries in the ip-filter-list, referenced by <index>.

Command Path

```
[] box# forwarder ↵
[] forwarder# ip-filter-modify/<index> ↵
```

Syntax

```
show

info
```

Syntax Qualifier	Description
<index>	Index to select specific link filter to view or modify, from ip-filter-list table

ip-filter-modify/<index> [s] show

Table 83: ip-filter-modify/<index> show data items

Data Item	Description	Typical Value or Range
matches	Displays matches with this IP filter	—

ip-filter-modify/<index> [i] info

Table 84: ip-filter-modify/<index> info parameters

Parameter	Description or Values	Default	Range
status	Controls and reflects status of rows in this table	not-in-service	• active • not-in-service • delete
control	Defines default filtering action performed on matching packet	discard	• accept • discard
interface	Interfaces to which this filter applies. For CMTS, this object has to be specified to create a row in this table. The value corresponds to the ifIndex for either a cable or ethernet interface, or both.	ethernet	• none • ethernet • cable • ether-and-cable

Table 84: ip-filter-modify/<index> info parameters (continued)

Parameter	Description or Values	Default	Range
direction	Direction of filtering action	inbound	• inbound • outbound • both
broadcast	If set to false, filter applies to all traffic. If set to true, filter applies to broadcast packets only.	false	• true • false
source-ip-address	Source IP address, or part of IP address, used for filtering	0.0.0.0	any valid IP address
source-ip-mask	Mask used for source IP address filtering. 1's bits must be left most and contiguous.	0.0.0.0 (no masking)	any valid mask
dest-ip-address	Destination IP address, or part of IP address, used for filtering	0.0.0.0	any valid IP address
dest-ip-mask	Mask used for destination IP address filtering	0.0.0.0 (no masking)	any valid mask
protocol	IP protocol value to be matched. If protocol type is UDP or TCP, then the upper or lower ranges can also be specified (low-source-port, high-source-port, low-destination-port, high-destination-port)	256	0 to 256
low-source-port	Threshold value for filtering packets based on low source port value	0	0 to 65535
high-source-port	Threshold value for filtering packets based on high source port value	65535	0 to 65535
low-dest-port	Threshold value for filtering packets based on low destination port value	0	0 to 65535
high-dest-port	Threshold value for filtering packets based on high destination port value	65535	0 to 65535

cpe-addr-filter-list [s]

Use the **cpe-addr-filter-list** "show" subtree command to display a list of customer premise equipment filter addresses.

Command Path

```
[] box# forwarder ↵
[] forwarder# cpe-addr-filter-list ↵
```

Syntax

```
show
```

cpe-addr-filter-list [s] show

Table 85: cpe-addr-filter-list show data items

Data Item	Description	Typical Value or Range
Group	CPE filter group number.	Unsigned Integer, starting at 1-1024.
Index	CPE filter index number.	Unsigned integer, starting at 1-1024.
SrcIpAddr	CPE filter for source IP address.	valid IP address. Default value is 0.0.0.0.
SrcIpMask	CPE filter for Source IP mask.	valid IP mask. Default value is 0.0.0.0.
DstIpAddr	CPE filter for Destination IP address	valid IP address Default value is 0.0.0.0.
DstIpMask	CPE filter for Destination IP mask.	valid IP mask Default value is 0.0.0.0.

cpe-state-filter-list [s]

Use the **cpe-addr-filter-list** "show" subtree command to display a list of customer premise equipmentfilters.

Command Path

```
[] box# forwarder ↵
[] forwarder# cpe-state-filter-list ↵
```

Syntax

```
show
```

cpe-state-filter-list [s] show

Table 86: cpe-state-filter-list show data items

Data Item	Description	Typical Value or Range
Group	CPE filter group number.	Unsigned Integer, starting at 1-1024.
Index	CPE filter index number.	Unsigned integer, starting at 1-1024.
ULP	CPE filter for source ULP address.	valid IP address. Default value is 0.0.0.0.
TOS Value	CPE filter for source TOS value	—
TOS Mask	CPE filter for source TOS mask.	valid IP mask. Default value is 0.0.0.0.
Action	Action filter takes when condition is met	• forward • discard
Matches	Number of times conditions of the filter has been met	—
Status	Current status of filter	• create and go • active • not in service • destroy

cpe-filter-modify/<group {1 to 1024}>/<index{1 to 1024}> [s, i]

Use the **cpe-filter-modify/<group {1 to 1024}>/<index{1 to 1024}>** "show and info" subtree commands to display a count of customer premise equipment filter matches.

Command Path

```
[] box# forwarder ↵
[] forwarder# spanning-tree ↵
[] spanning-tree# cpe-filter-modify/<group {1 to 1024}>/<index{1 to
1024}>↵
```

Syntax

```
show

info
```

Syntax Qualifier	Description
<group>{1 to 1024}	CPE filter group number (1 to 1024)
<index>{1 to 1024}	CPE filter index number (1 to 1024)

cpe-filter-modify/<group {1 to 1024}>/<index{1to1024} >[s] show

Table 87: cpe-filter-modify/<group {1 to 1024}>/<index{1to1024} >show data items

Data Item	Description	Typical Value or Range
matches	Count of CPE filter matches for the specified entry (Group/Index)	—

cpe-filter-modify/<group{1 to 1024}>/<index{1to1024}> [i] info

Table 88: cpe-filter-modify/<group{1 to 1024}>/<index{1to1024}> info parameters

Parameter	Description or Values	Default	Value
source-addr	CPE filter for source IP address	0.0.0.0	valid IP Addr
source-mask	CPE filter for source IP mask	0.0.0.0	valid IP Mask
dest-addr	CPE filter for destination IP address	0.0.0.0	valid IP Addr
dest-mask	CPE filter for destination iP mask	0.0.0.0	valid IP Mask
upper-level-pro-tocol	CPE filter for Upper Level Protocol (ULP) type	256	0 to 256
tos-value	CPE filter for TOS byte value Note: Help message should display "one integer" not a "series of integers"	0	valid TOS byte value
tos-mask	CPE filter for TOS mask Note: Help message should display "one integer" not a "series of integers"	0	valid TOS mask
filter-action	CPE filter action.	Forward	• Forward • Discard
status	CPE filter status.	Active	• Active • Not-in-service • Delete

tcp-udp-filter-list [s]

Use the **tcp-udp-filter-list** "show" subtree command to filter group and index numbers, source port and destination port filters, flag mask values and filter status.

Command Path

```
[] box# forwarder ↵
[] forwarder# tcp-udp-filter-list↵
```

Syntax

```
show
```

tcp-udp-filter-list [s] show

Table 89: tcp-udp-filter-list show data items

Data Item	Description	Typical Value or Range
Group	TCP-UDP filter group number	Integer starting at 1-1024.
Index	TCP-UDP filter index number	Integer starting at 1-1024.
Src Port	TCP/UDP source port filter.	0 to 65536 Default value is 65536.
Dst Port	TCP/UDP destination port filter.	0 to 65536 Default value is 65336.
Flag Value	TCP/UDP flag filter value. Multiple values allowed: <name1> + <name2> *Note: This value can only be modified in SNMPc and will not show up in "info" in the CLI. "Putcfg display" shows the correct value entered in SNMPc.*	Default value is 0.
Flag Mask	TCP/UDP flag mask value *Note: This value can only be modified in SNMPc and will not show up in "info" in the CLI. "Putcfg display" shows the correct value entered in SNMPc.*	Default value is 0 (no mask)
Status	TCP/UDP filter status	• active • delete • not-in-service

tcp-udp-filter-modify/<group{1 to 1024}>/<index{1 to 1024}> [i]

Use the **tcp-udp-filter-modify/<group{1 to 1024}>/<index{1 to 1024}>** "info" subtree command to display an index of TCP/UD filter group and index number.

Command Path

```
[] box# forwarder ↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<group>{1 to 1024}	TCP/UDP filter group number
<index>{1 to 1024}	TCP/UDP filter index number

tcp-udp-filter-modify/<group{1 to 1024}>/<index{1to1024}> [i] info

Table 90: tpc-udp-filter-modify/<group{1 to 1024}>/<index{1to1024}> info parameters

Parameter	Description or Values	Default	Value
source-port	TCP/UDP filter for source port	65536	0 to 65536
dest-port	TCP/UDP filter for destination port	65536	0 to 65536
flag-value (Can only be modified in SNMPc)	Type of flag generated by TCP/UDP filter match.	none	- none - urgent - ack - push - reset - sgn - fin
flag-mask	Type of destination flag mask generated by TCP/UDP filter match.	none	- none - urgent - ack - push - reset - sgn - fin
status	Current status of TCP/UDP filter.	Active	- Active - Not-in-service - Delete

Note: Flag-value must be a subset of flag-mask value and can be multiple entries.

ip-level [s,i]

Use the **ip-level** "show and info" commands to view statistics for IP-level packet processing by the CMTS, and to configure the CMTS IP-level interface and packet processing functions.

Command Path

```
[] box# ip-level ↵
```

Syntax

```
show

info
```

ip-level [s] show

Table 91: ip-level show data items

Data Item	Description	Typical Value or Range
in-receives	Count of incoming IP packets	—
in-hdr-errors	Count of incoming IP packets with header errors	—
in-addr-errors	Count of incoming packets with IP address errors	—
forw-datagrams	Count of forwarding datagram packets received	—
in-unknown-protos	Count of incoming packets with unknown protocol type	—
in-discards	Count of incoming packets discarded	—
in-delivers	Count of incoming packets delivered	—
out-requests	Count of outgoing requests	—
out-discards	Count of outgoing packets discarded	—
out-no-routes	Count of outgoing packets with no assigned route	—
reasm-timeout	Maximum time allowed for reassembly (in seconds)	—
reasm-reqds	Count of reassembly requests	—
reasm-oks	Count of packets successfully reassembled	—
reasm-fails	Count of packets not successfully reassembled	—
frag-oks	Count of packets successfully fragmented	—
frag-fails	Count of packets not successfully fragmented	—
frag-creates	Count of number of fragmented packets created	—
routing-discards	Count of routed packets discarded by the CMTS	—
dns-service-type	DNS (Domain Name Server) type	—

Table 91: ip-level show data items

Data Item	Description	Typical Value or Range
dns-enabled-servers	Number of dns-enabled-servers networked to the CMTS	—

ip-level [i] info

Table 92: ip-level info parameters

Parameter	Description or Values	Default	Range
config-ip-address	IP address of CMTS	0.0.0.0	valid IP address
config-ip-subnet	IP subnet mask for CMTS	0.0.0.0	valid IP mask.
config-ip-gateway	Network IP Gateway address	0.0.0.0	valid IP address
default-ttl	Default time-to-live (TTL) value	255	integer
dns-control	CMTS control of DNS servers	disabled	enabled disabled
dns-domain-name	DNS domain name assigned to CMTS	""	Fully qualified domain name path

ip-level [?] (next level)

Table 93: ip-level next level commands

Next Level Command	Page #
route-list [s]	page 3-187
route-modify/<dest-ip-addr> [s, i]	page 3-188
icmp [s]	page 3-190
udp-stats [s]	page 3-192
udp-entry-list [s]	page 3-193
tcp-stats [s]	page 3-194
tcp-connection-list [s]	page 3-196
arp-list [s]	page 3-198
arp-modify/<interface>/<ip-addr> [i]	page 3-200
arp-modify/<cable>/<ip-addr> [i]	page 3-201
arp-modify/<interface>/<ip-addr> [i]	page 3-199
igmp-modify/<ethernet> [s, i]	page 3-202
igmp-modify/<cable> [s, i]	page 3-204
multicast-list [s]	page 3-206
multicast-modify/<ip-addr>/<ethernet> [s,i]	page 3-208
multicast-modify/<ip-addr>/<cable> [s,i]	page 3-208
scope-list [s]	page 3-210
scope-modify/ethernet/<ip-addr>/<ip-mask> [i]	page 3-214
scope-modify/cable/<ip-addr>/<ip-mask> [i]	page 3-215
dns-list [s]	page 3-216
dns-modify/<index {1-10}> [i]	page 3-217

route-list [s]

Use the **route-list** "show" subtree command to display the IP routing information known to the CMTS.

Command Path

```
[] box#      ip-level ↵
[] ip-level# route-list ↵
```

Syntax

```
show
```

route-list [s] show

Table 94: route-list show items

Data Item	Description	Typical Value or Range
Dest IP Addr	Destination IP Address in route. "0.0.0.0" indicates the default route	0.0.0.0 any valid IP address
Port	Destination routing port for CMTS	ethernet cable ether-and-cable none
Mtr1	Routing metric1 value used to compute distance	—
Next Hop Address	IP address for next hop	any valid IP address
Protocol	Routing protocol used by CMTS	local other
Ip Mask	IP subnet mask used for each destination IP address	any valid subnet mask (e.g. 255.255.255.0)

route-modify/<dest-ip-addr> [s, i]

Use the **route-modify/<dest-ip-addr>** "show and info" subtree commands to view routing information for a specified IP address, and configure routing to that IP address.

Command Path

```
[] box# ip-level ↵
[] ip-level# route-modify/<dest-ip-addr> ↵
```

Syntax

```
show

info
```

Syntax Qualifier	Description
<dest-ip-addr>	Specifies destination IP address

route-modify/<dest-ip-addr> [s] show

Table 95: route-modify/<dest-ip-addr> show data items

Data Item	Description	Typical Value or Range
route-protocol	Routing protocol used to reach destination IP address	local
route-info	Routing parameters used to reach destination IP address	0.0 (zero.zero)

route-modify/<dest-ip-addr> [i] info

Table 96: route-modify/<dest-ip-addr> info parameters

Parameter	Description or Values	Default	Range
dest-ip-addr	Destination IP address of this route	0.0.0.0	valid IP address
interface	Index value which identifies the local interface through which the next hop of the route should be reached. This interface is the same as identified by the ifIndex value.	—	—
metric1	Primary routing metric for this route. If this metric is not used, its value should be set to -1.	—	integer
metric2	Alternate routing metric. If this metric is note used, its value should be set to -1.	-1	integer
metric3	Alternate routing metric. If this metric is note used, its value should be set to -1.	-1	integer
metric4	Alternate routing metric. If this metric is note used, its value should be set to -1.	-1	integer
metric5	Alternate routing metric. If this metric is note used, its value should be set to -1.	-1	integer
next-hop-ip-addr	IP address of next hop (or gateway)	—	valid IP address
route-type	Route type used by CMTS: • other = none of the following • invalid = an invalidated route • direct = route to directly con-nected (sub-) network • indirect = route to a non-local host/network/sub-network	direct	• other • invalid • direct • indirect
route-age	Number of seconds since route was last updated or determined to be cor-rect	—	age in seconds
route-ip-mask	Routing subnet mask	0.0.0.0	valid IP mask

icmp [s]

Use the **icmp** "show" subtree command to display statistics for ICMP (Internet Control Message Protocol) routing messages. The ICMP protocol serves as an extension to the Internet Protocol (IP) which allows for the generation of error messages, test packets, and informational messages related to IP.

Command Path

```
[] box# ip-level ↵
[] ip-level# icmp ↵
```

Syntax

```
show
```

icmp [s] show

Table 97: icmp show parameters

Data Item	Description	Typical Value or Range
in-msgs	Total number of ICMP messages received by the CMTS	—
in-errors	Number of ICMP messages received by the CMTS with ICMP-specific errors (bad ICMP checksums, bad length, etc.)	—
in-dest-unreachs	Number of ICMP Destination Unreachable messages received by the CMTS	—
in-time-excds	Number of ICMP Time Exceeded messages received by the CMTS	—
in-parm-problems	Number of ICMP Parameter Problem messages received by the CMTS	—
in-src-quenchs	Number of ICMP Source Quench messages received by the CMTS	—
in-redirects	Number of ICMP Redirect messages received by the CMTS	—
in-echos	Number of ICMP Echo (request) messages received by the CMTS	—
in-echo-replies	Number of ICMP Echo Reply messages received by the CMTS	—

Table 97: icmp show parameters (continued)

Data Item	Description	Typical Value or Range
in-timestamps	Number of ICMP Timestamp (request) messages received by the CMTS	—
in-timestamp-replies	Number of ICMP Timestamp Reply messages received by the CMTS	—
in-addr-masks	Number of ICMP Address Mask Request messages received by the CMTS	—
in-addr-mask-replies	Number of ICMP Address Mask Reply messages received by the CMTS	—
out-msgs	Total number of ICMP messages received by the CMTS, including out-errors	—
out-errors	Number of ICMP messages NOT sent by CMTS due to problems discovered within ICMP	—
out-dest-unreachs	Number of ICMP Destination Unreachable messages sent by the CMTS	—
out-time-excds	Number of ICMP Time Exceeded messages sent by the CMTS	—
out-parm-problems	Number of ICMP Parameter Problem messages sent by the CMTS	—
out-src-quenchs	Number of ICMP Source Quency messages sent by the CMTS	—
out-redirects	Number of ICMP Redirect messages sent by the CMTS	Should be 0 for a host
out-echos	Number of ICMP Echo (request) messages sent by the CMTS	—
out-echo-replies	Number of ICMP Echo Reply messages sent by the CMTS	—
out-timestamps	Number of ICMP Timestamp (request) messages sent by the CMTS	—
out-timestamp-replies	Number of ICMP Timestamp Reply messages sent by the CMTS	—
out-addr-masks	Number of ICMP Address Mask Request messages sent by the CMTS	—
out-addr-mask-replies	Number of ICMP Address Mask Reply messages sent by the CMTS	—

udp-stats [s]

Use the **udp-stats** "show" subtree command to display statistics for UDP (User Datagram Protocol) traffic. The UDP protocol describes how messages reach application programs within a destination system.

Command Path

```
[] box# ip-level ↵
[] ip-level# udp-stats ↵
```

Syntax

```
show
```

udp-stats [s] show

Table 98: udp-stats show data items

Data Item	Description	Typical Value or Range
in-datagrams	Total number of incoming datagram packets	—
no-ports	Number of received UDP datagrams for which there was no application at the CMTS destination port	—
in-errors	Number of received UDP datagrams that could not be delivered other than for no application at the destination port	—
out-datagrams	Total number of UDP datagrams sent from the CMTS	—

udp-entry-list [s]

Use the **udp-entry-list** "show" subtree command to display the table of UDP entries. Each row shows the local IP address and its corresponding Local UDP Port as known to the CMTS.

Command Path

```
[] box# ip-level ↵
[] ip-level# udp-entry-list ↵
```

Syntax

```
show
```

udp-entry-list [s] show

Table 99: udp-entry-list show data items

Data Item	Description	Typical Value or Range
Local IP Address	CMTS local IP address designated to receive UDP entries (listen)	0.0.0.0 is used to accept datagrams for any IP interface
Local UDP Port	Local UDP port number used for the local IP address	0 to 65535

tcp-stats   [s]

Use the **tcp-stats** "show" subtree command to display TCP (Transmission Control Protocol) statistics for the CMTS. TCP is both an OSI transport layer 4 protocol that regulates source-to-destination communication over virtual circuits and the portion of the TCP/IP protocol suite that governs the exchange of sequential data.

Command Path

```
[] box# ip-level ↵
[] ip-level# tcp-stats ↵
```

Syntax

```
show
```

tcp-stats [s] show

Table 100: tcp-stats show data items

Data Item	Description	Typical Value or Range
timeout-algorithm	Timeout algorithm used for retransmitting unacknowledged octets	vanj (Van Jacobson's algorithm)
min-retransmit-timeout	Minimum timeout for retransmission (in milli-seconds)	—
max-retransmit-timeout	Maximum timeout for retransmission (in milli-seconds)	—
max-connections	Limit on total number of TCP connections supported by the CMTS. Where the maximum number of connections is dynamic, this object should be -1.	16
active-opens	Number of times TCP connections have made a direct transition to SYN-SENT from CLOSED state	—
passive-opens	Number of times TCP connections have made a direct transition to SYN-RCVD from LISTEN state	—
attempt-fails	Number of times TCP connections have made a direct transition to CLOSED state from SYN-SENT or SYN-RCVD state, or to LISTEN state from SYN-RCVD state	—
established-resets	Number of times TCP connections have made a direct transition to CLOSED state from either ESTABLISHED or CLOSE-WAIT states	—
established-connections	Total number of connections that have been established	—
segments-received	Total number of segments received	—
segments-sent	Total number of segments sent	—
segments-retransmitted	Total number of segments retransmitted	—
segment-receive-errors	Total number of segments received with errors	—
RST-segments-sent	Number of TCP segments containing the RST (reset) flag sent by the CMTS	—

tcp-connection-list [s]

Use the **tcp-connection-list** "show" subtree command to view the active Telnet session users connected to the CMTS. This command will show all remote CLI connections to the CMTS. The internal CMTS tcp connection state is "listen" at address 0.0.0.0.

Command Path

```
[] box# ip-level ↵
[] ip-level# tcp-connection-list ↵
```

Syntax

```
show
```

tcp-connection list [s] show

Table 101: tcp-connection list show data items

Data Item	Description	Typical Value or Range
Connx State	TCP connection state for the CMTS	• closed (1) • listen (2) • synSent (3) • synReceived (4) • established (5) • finWait1 (6) • finWait2 (7) • closeWait (8) • lastAck (9) • closing (10) • timeWait (11) • delteTCB (12)
Local Ip Address	CMTS local IP address for this connection	0.0.0.0 indicates connections will be accepted for any IP interface associated with the node any valid IP address
Local Port	Local port for this connection	0 to 65535
Remote IP Address	Remote IP address for this connection	0 to 65535
Remote Port	Remote port for this connection	0 to 65535 0 (CMTS port) 1031 and higher

arp-list [s]

Use the **arp-list** "show" subtree command to display ARP (Address Request Protocol) information for the CMTS.

Command Path

```
[] box# ip-level ↵
[] ip-level# arp-list ↵
```

Syntax

```
show
```

arp-list [s] show

Table 102: arp-list show data items

Data Item	Description	Typical Value or Range
Interface	CMTS system interface used to receive ARP messages	ethernet cable
Ip Address	IP address entry	valid IP address
Mac Address	MAC address which binds with current rows IP address	valid MAC address
Media Type	Interface media type	other invalid dynamic static

arp-modify/<interface>/<ip-addr> [i]

Use the **arp-modify/<interface>/<ip-addr>** "info" subtree command to configure the ethernet or cable interfaces used for ARP requests, specified by IP address.

Command Path

```
[] box# ip-level ↵
[] ip-level# arp-modify/<interface>/<ip-addr> ↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<ip-addr>	Specifies Ethernet IP address to configure

arp-modify/<ethernet>/<ip-addr> [i]

Use the **arp-modify/<ethernet>/<ip-addr>** "info" subtree command to configure the ethernet interface used for ARP requests, specified by IP address.

Command Path

```
[] box#  ip-level ↵
[] ip-level#  arp-modify/<ethernet>/<ip-addr> ↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<ip-addr>	Specifies Ethernet IP address to configure

arp-modify/<ethernet>/<ip-addr> [i] info

Table 103: arp-modify/<ethernet>/<ip-addr> info parameters

Parameter	Description or Values	Default	Range
interface	CMTS interface type	ethernet	ethernet cable
ip-address	IP address that receives ARP requests	—	valid IP address
mac-address	MAC address associated with IP address that receives ARP requests	—	valid MAC address
media-type	Interface media type	dynamic	other invalid dynamic static

arp-modify/<cable>/<ip-addr> [i]

Use the **arp-modify/<cable>/<ip-addr>** "info" subtree command to configure the cable interface used for ARP requests, specified by IP address.

Command Path

```
[] box# ip-level ↵
[] ip-level# arp-modify/<cable>/<ip-addr> ↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<ip-addr>	Specifies cable IP address to configure

arp-modify/<cable>t/<ip-addr> [i] info

Table 104: arp-modify/<cable>/<ip-addr> info parameters

Parameter	Description or Values	Default	Range
interface	CMTS interface type	ethernet	ethernet cable
ip-address	IP address that receives ARP requests	—	valid IP address
mac-address	MAC address associated with IP address that receives ARP requests	—	valid MAC address
media-type	Interface media type	dynamic	other invalid dynamic static

igmp-modify/<ethernet> [s, i]

Use the **igmp-modify/<ethernet>** "show and info" subtree commands to configure the ethernet interface used for IGMP multicasting.

Command Path

```
[] box# ip-level ↵
[] ip-level# igmp-modify/<ethernet> ↵
```

Syntax

```
show
info
```

igmp-modify/<ethernet> show

Table 105: igmp-modify/<ethernet> show data items

Data Item	Description	Typical Value or Range
querier	The IP address used by the CMTS when querying hosts	valid IP address
version-1-query-timer	Time-to-live for version 1 queries (in 100ths-of-seconds)	—
wrong-version-count	Number of wrong-version messages received by CMTS	—
count-of-joins	Number of joins to multicast	Integer
number-multicast-groups	Number of multicast groups known to CMTS	Integer
querier-up-time	Current up-time for querier (in 100ths-of-seconds)	—
querier-time-to-live	Maximum timer value for querier (in 100ths-of-seconds)	0

igmp-modify/<ethernet> info

Table 106: igmp-modify/<ethernet> info parameters

Parameter	Description or Values	Default	Range
query-interval	Interval between general queries sent by the querier	125 seconds	any number
admin-state	Administrative state of host	active	active not-in-service delete
version	IGMP version	2	1 or 2
max-query-time	Maximum time (in 10ths-of-seconds) allowed between queries	100	1 to 255
robustness	Used to tune for expected packet loss on a subnet	2	any number must not be 0; should not be 1
last-member-query-interval	Amount of time between Group-Specific query messages. Can be tuned to modify the "leave latency" of the network to detect los of last member of a group.	10 (1 second)	1 to 255
proxy-if-index	Identifies the CMTS NSI-Side interface ifIndex that is providing proxy host services	0	positive integer

igmp-modify/<cable> [s, i]

Use the **igmp-modify/<cable>** "show and info" subtree commands to configure the cable interface used for IGMP multicasting.

Command Path

```
[] box# ip-level ↵
[] ip-level# igmp-modify/<cable> ↵
```

Syntax

```
show
info
```

igmp-modify/<cable> show

Table 107: igmp-modify/<cable> show data items

Data Item	Description	Typical Value or Range
querier	The IP address of the querier	valid IP address
version-1-query-timer	Time-to-live for version 1 queries (in 100ths-of-seconds)	—
wrong-version-count	Number of wrong-version messages received by CMTS	—
count-of-joins	Number of joins to multicast	Integer
number-multicast-groups	Number of multicast groups known to CMTS	Integer
querier-up-time	Current up-time for querier (in 100ths-of-seconds)	—
querier-time-to-live	Maximum timer value for querier (in 100ths-of-seconds)	0

igmp-modify/cable info

Table 108: igmp-modify/<cable> info

Parameter	Description or Values	Default	Range
query-interval	Interval between general queries sent by the querier	125 seconds	any number
admin-state	Administrative state of host	active	active not-in-service delete
version	IGMP version	2	1 or 2
max-query-time	Maximum time (in 10ths-of-seconds) allowed between queries	100	1 to 255
robustness	Used to tune for expected packet loss on a subnet	2	any number must not be 0; should not be 1
last-member-query-interval	Amount of time between Group-Specific query messages. Can be tuned to modify the "leave latency" of the network to detect los of last member of a group.	10 (1 second)	1 to 255
proxy-if-index	Identifies the CMTS NSI-Side interface ifIndex that is providing proxy host services	0	positive integer

multicast-list [s]

Use the **multicast-list** "show" subtree command to display the list of multicast IP addresses known to the CMTS.

Command Path

```
[] box# ip-level ↵
[] ip-level# multicast-list ↵
```

Syntax

```
show
```

multicast-list [s] show

Table 109: multicast-list show data items

Data Item	Description	Typical Value or Range
Multicast Ip Addr	Multicast IP address for this entry	value between 224.0.0.0 and 239.255.255.255
Admin State	CMTS administrative state for the multicast interface	active not-in-service
Up-Time	Duration of multicast (in hundreths-of-seconds)	—
Expiration Time	Timeout of multicast (in hundreths-of-seconds)	—
Last Reporter	IP address of last reporting multicast host	valid IP address

multicast-modify/<ip-addr>/<interface> [s]

Use the **multicast-modify/<ip-addr>/<interface>** "show" subtree command to display and configure the multicast list entry specified by IP address, on the CMTS ethernet interface.

Command Path

```
[] box# ip-level ↵
[] ip-level# multicast-modify/<ip-addr>/<interface> ↵
```

Syntax

```
show
```

multicast-modify/<ip-addr>/<ethernet> [s,i]

Use the **multicast-modify/<ip-addr>/<ethernet>** "show and info" subtree commands to display and configure the multicast list entry specified by IP address, on the CMTS ethernet interface.

Command Path

```
[] box# ip-level ↵
[] ip-level# multicast-modify/<ip-addr>/<ethernet> ↵
```

Syntax

```
show
info
```

Syntax Qualifier	Description
<ip-addr>	Specifies multicast IP address to configure

multicast-modify/<ip-addr>/ethernet [s]

Table 110: multicast-modify/<ip-addr>/<ethernet> show data items

Data Item	Description	Typical Value or Range
Up Time	Duration of multicast (in hundreths-of-seconds)	—
Time To Live	Expiration timer value for multicast	—
Last Reporter	IP address of last reporting cable modem or CPE	valid IP address
Version 1 Host Timer	Host timer value	—

multicast-modify/<ip-addr>/<ethernet> [i]

Table 111: multicast-modify/<ip-addr>/ethernet info parameters

Parameter	Description or Values	Default	Range
admin-state	CMTS administrative state for the multicast IP address	active	active not-in-service delete
self	Self-reporting action	false	true false

multicast-modify/<ip-addr>/<cable> [s,i]

Use the **multicast-modify/<ip-addr>/<ethernet> cable** "show and info" subtree commands to display and configure the multicast list entry specified by IP address, on the CMTS cable interface.

Command Path

```
[] box# ip-level ↵
[] ip-level# multicast-modify/<ip-addr>/<cable> ↵
```

Syntax

```
show

info
```

Syntax Qualifier	Description
<ip-addr>	Specifies multicast IP address to configure

multicast-modify/<ip-addr>/<cable> [s] show

Table 112: multicast-modify/<ip-addr>/<cable> show data items

Data Item	Description	Typical Value or Range
Multicast Ip Addr	Corresponds to the IP Multicast Group	valid IP address
Up Time	Duration of multicast (in hundreths-of-seconds)	—
Time To Live	Expiration timer value for multicast	—
Last Reporter	IP address of last reporting cable modem or CPE	valid IP address
Version 1 Host Timer	Host timer value	—

multicast-modify/<ip-addr>/<cable> [i] info

Table 113: multicast-modify/<ip-addr>/<cable> info parameters

Parameter	Description or Values	Default	Range
admin-state	CMTS administrative state for the multicast IP address	active	• active • not-in-service • delete
self	Self-reporting action	false	• true • false

scope-list [s]

Use the **scope-list** "show" subtree command to view the administratively scoped IP addresses. The administratively-scoped IPv4 multicast space is in a range 239.0.0.0 to 239.255.255.255. An administratively scope IP multicast region is a topological region in which there are one or more boundary routers with common boundary location.

Command Path

```
[] box# ip-level ↵
[] ip-level# scope-list ↵
```

Syntax

```
show
```

scope-list [s]

Table 114: scope-list show data items

Data Item	Description	Typical Value or Range
Multicast Ip Addr	Multicast IP source address	range from 239.0.0.0 to 239.255.255.255
IP Mask	Multicast IP mask	valid IP mask
State	Current state of entry	• active • not-in-service

scope-modify/<interface>/<ip-addr>/<ip-mask> [i]

Use the **scope-modify/<interface>/<ip-addr>/<ip-mask>** "info" subtree command to configure the multicast entry specified by IP address and IP Mask, on the CMTS ethernet interface.

Command Path

```
[] box# ip-level ↵
[] ip-level# scope-modify/<interface>/<ip-addr>/<ip-mask> ↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<interface>	Specifies ethernet or cable
<ip-addr>	Specifies multicast IP address, in range 239.0.0.0 through 239.255.255.255
<ip-mask>	Specifies IP mask

scope-modify/ethernet/<ip-addr>/<ip-mask> [i]

Use the **scope-modify/ethernet/<ip-addr>/<ip-mask>** "info" subtree command to configure the multicast entry specified by IP address and IP Mask, on the CMTS ethernet interface.

Command Path

```
[] box# ip-level ↵
[] ip-level# scope-modify/ethernet/<ip-addr>/<ip-mask> ↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<ip-addr>	Specifies multicast IP address, in range 239.0.0.0 through 239.255.255.255
<ip-mask>	Specifies IP mask

scope-modify/ethernet/<ip-addr>/<ip-mask> [i] info

Table 115: scope-modify/ethernet/<ip-addr>/<ip-mask> info parameter

Parameter	Description or Values	Default	Range
admin-state	State of entry	active	• active • not-in-service • delete

scope-modify/cable/<ip-addr>/<ip-mask> [i]

Use the **scope-modify/cable/<ip-addr>/<ip-mask>** "info" subtree command to configure the multicast entry specified by IP address and IP Mask, on the CMTS cable interface.

Command Path

```
[] box# ip-level ↵
[] ip-level# scope-modify/cable/<ip-addr>/<ip-mask> ↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<ip-addr>	Specifies multicast IP address in range 239.0.0.0. through 239.255.255.255
<ip-mask>	Specifies IP mask index

scope-modify/cable/<ip-addr>/<ip-mask> [i] info

Table 116: scope-modify/cable/<ip-addr>/<ip-mask> info parameter

Parameter	Description or Values	Default	Range
admin-state	State of entry	active	• active • not-in-service • delete

dns-list [s]

Use the **dns-list** "show" subtree command to view the list of DNS (Domain Name Server) servers connected to the CMTS. The CMTS will support up to 10 DNS servers. DNS servers use an addressing system that translates the domain name into an IP address.

Command Path

```
[] box# ip-level ↵
[] ip-level# dns-list ↵
```

Syntax

```
show
```

dns-list [s]

Table 117: dns-list [s] show data items

Data Item	Description	Typical Value or Range
Index	Index to dns-list table	1 to 10
Status	CMTS administrative status for DNS server	• not-in-service • active
IP Address	IP address of the DNS server	0.0.0.0 any valid IP address
Pri	Priority assigned to DNS server for resolving IP addressing	1 is default Typically 1 through 10.
Name	DNS Server name, enclosed in double quotes	Text entry "" (Null) is default

dns-modify/<index {1-10}> [i]

Use the **dns-modify** "info" subtree command to configure entries in the DNS table.

Command Path

```
[] box# ip-level ↵
[] ip-level# dns-modify/<index {1-10}> ↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<index {1-10}>	Index to dns-list table entry (1-10)

dns-modify/<index {1-10}> [i] info

Table 118: dns-modify/<index {1-10}> info parameters

Parameter	Description or Values	Default	Range
status	DNS Server status	not-in-service	active not-in-service
server-ip-addr	DNS Server IP address	0.0.0.0	any valid IP address
priority	DNS Server priority	1	1 to 10
name	Name assigned to DNS Server Enter new name in double quotes.	""	Text string

snmp [s, i]

Use the **snmp** "show" subtree command to *view SNMP statistical data*. Use the **snmp** **"**info"subtree command to *configure various snmp functions*. Use the **snmp** "?" command to *display the next level of SNMP commands*. The CMTS supports SNMPv1 or SNMPv3, in an SNMP co-existence mode.

Command Path

```
[] box# snmp ↵
```

Syntax

```
show

info

?
```

snmp [s] show

Table 119: snmp show data items

Data Item	Description	Typical Value or Range
in-pkts	Count of incoming SNMP message packets	—
in-bad-versions	Count of wrong SNMP version messages received by CMTS	—
in-bad-community-names	Count of incoming bad community strings received by CMTS	—
in-bad-community-users	Count of incoming bad community users received by CMTS	—
in-asnparse-errs	Count of SNMP parsing errors detected by CMTS	—
silent-drops	Count of CMTS silent drops of SNMP messages	—
proxy-drops	Count of CMTS proxy drops of SNMP messages	—

snmp [i] info

Table 120: snmp info parameters

Parameter	Description or Values	Default	Range
enable-authen-traps	CMTS generates authentication trap messages	enabled	enabled disabled

snmp [?] (next level)

Table 121: snmp next level commands

Next Level Command	Page #
coex [?]	page 3-220
traps [?]	page 3-264
nmaccess [?]	page 3-268

coex [?]

Use the **coex** (coexistence) "? (next level)" subtree command to view SNMPv1, SNMPV2c statistical data concurrently.

Note: The ver3 "? (next level) subtree command is used for SNMPv3 management. (Refer to "ver3 [s] ?" command on page 3-221 for more information on SNMPv3.)

Command Path

```
[] box# snmp ↵
[] snmp# coex↵
```

Syntax

```
?
```

coex [?] (next level)

Table 122: coex [?] next level commands

Next Level Command	Page #
ver3 [s] ?	page 3-221
snmpcommunity-list [s]	page 3-247
snmpcommunity-specific/<snmpcommunityindex> [i]	page 3-248
snmptargetaddr-list [s]	page 3-250
snmptargetaddr-specific/<snmptargetaddrname> [i]	page 3-251
snmptargetaddrext-list [s]	page 3-253
snmptargetaddrext-specific/<index {1-10}> [i]	page 3-254
snmptargetparams-list [s]	page 3-255
snmptargetparams-specific/<snmptargetparamsname> [i]	page 3-256
snmpnotify-list [s]	page 3-258
snmpnotify-specific/<snmpnotifyname> [i]	page 3-259
snmpfilterprofile-list [s]	page 3-260
snmpfilterprofile-specific/<snmptargetparamsname> [i]	page 3-261
snmpfilter-list [s]	page 3-262
snmpfilter-specific/<profilename>/<filtersubtree> [i]	page 3-263

ver3 [s] ?

Use the **ver3** "show" and "? (next level) commands to view SNMP version 3 ("SNMPv3") statistical data.

SNMPv3 support is a requirement for DOCSIS 1.1. It provides much more flexible and secure authentication than SNMPv1.

SNMPv3 uses the User-based Security Model (USM) to control access to MIBs and network devices. The USM consists of four major parts:

- Users -- individual login accounts. In some instances, the user ID is referred to as a "security name."
- Groups -- defines access rights for one or more users.
- Access Table -- specifies the views used for read access, write access, and access to SNMPv3 notifications.
- Views -- specifies which MIB objects are (or are not) available to a user.

You can provision access to cable data network objects by both SNMPv1, SNMPv2. and SNMPv3 clients.

Use the ver3 "? (next level)" command for SNMPv3 management.

Command Path

```
[] box#  snmp ↵
[] snmp# coex ↵
[] coex# ver3 ↵
```

Syntax

```
show

?
```

ver3 [s] show

Table 123: ver3 show data items

Data Item	Description	Typical Value or Range
snmp-engine-id	Unique identification number assigned to CMTS SNMPv3 engine	Example: "0000001e2 0000ca28 d8cf000 "
snmp-engine-boot	Number of times SNMP engine has been reset since the snmp-engine-id was assigned	1 to 2147483647
snmp-engine-time	Duration since last SNMP engine reboot (in seconds)	0 to 2147483647
max-message-size	Maximum SNMP message size allowed (in octets)	484 to 2147483647
unknown-sec-models	Total number of packets received by SNMP engine which were dropped because they referenced a security model not known or not supported by the SNMP engine	—
invalid-messages	Total number of packets received by SNMP engine which were dropped because they contained invalid or inconsistent components in the SNMP message	—
unsupported-sec-levels	Total number of packets received by SNMP engine which contained unsupported USM level components	—
not-in-time-windows	Total number of packets received by SNMP engine which were outside the time window	—
*unknown-user-names	Total number of packets received by SNMP engine from unknown user names	—
* wrong-digests	Total number of packets received by SNMP engine with wrong message digest	—
* decryption-errors	Total number of packets received by SNMP engine with decryption errors	—
* unknown-engine-ids	Total number of packets received by SNMP engine with unknown SNMP engine IDs	—
* These entries may indicate attempted security breaches and should be further investigated		

ver3 [?] (next level)

Table 124: ver3 next level commands

Next Level Command	Page #
v3user-list [s]	page 3-224
v3user-modify/<username> [i]]	page 3-226
view-list [s]	page 3-229
view-modify/<viewname>/<subtree> [i]	page 3-230
group-list [s]	page 3-231
group-modify/<SNMPv1>/<username> [i]	page 3-232
group-modify/<SNMPv2>/<username> [i]	page 3-233
group-modify/<USM>/<username> [i]	page 3-234
v3access-list [s]	page 3-235
v3access-modify/<group>/<context>/<sec-model>/<sec-level> [i]	page 3-237
v3access-modify/<group>/<context>/<SNMPv1>/<noAuthNoPriv> [i] infoi	page 3-235
v3access-modify/<group>/<context>/<SNMPv1>/<authNoPriv> [i]	page 3-239
v3access-modify/<group>/<context>/<SNMPv1>/<authPriv> [i]	page 3-240
v3access-modify/<group>/<context>/<SNMPv2>/<noAuthNoPriv> [i]	page 3-241
v3access-modify/<group>/<context>/<SNMPv2>/<authNoPriv> [i]	page 3-242
v3access-modify/<group>/<context>/<SNMPv2>/<authPriv> [i]	page 3-243
v3access-modify/<group>/<context>/<USM>/<noAuthNoPriv> [i]	page 3-244
v3access-modify/<group>/<context>/<USM>/<authNoPriv> [i]	page 3-245
v3access-modify/<group>/<context>/<USM>/<authPriv> [i]	page 3-246

v3user-list [s]

Use the **v3user-list** "show" subtree command to display the list of SNMPv3 user accounts. There are four default accounts, which can be used as templates for creating additional accounts (with other v3 commands):

- initial
- dhKickstart
- template MD5
- templateSHA

The Authorization Protocol indicates the authorization method used. The two main methods are MD5 and SHA.

Command Path

```
[] box#  snmp ↵
[] snmp#  coex ↵
[] coex#  ver3 ↵
[] ver3#  v3user-list ↵
```

Syntax

```
show
```

v3user-list [s] show

Table 125: v3user-list show parameters

Data Item	Description	Typical Value or Range
User Name	SNMPv3 user account name. Four default account names should be present	Four default account names should be present: • initial • dhKickstart • templateMD5 • templateSHA
Auth Protocol	Registration point for standards-track authorization protocols used in the SNMP management	• None • MD5 Auth • SHA Auth
Priv Protocol	Registration point for standards-track privacy protocols used in the SNMP management	• None • DES Priv
Status	SNMPv3 engine status	• active • not-ready • not-in-service

v3user-modify/<username> [i]

Use the **v3user-modify/<username>** "info" subtree command to create new SNMPv3 accounts or modify existing accounts. Use a new <username> to create a new account, or use an existing <username> to modify that count.

Command Path

```
[] box#  snmp ↵
[] snmp#  coex ↵
[] coex#  ver3 ↵
[] ver3#  v3user-modify/<username> ↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<username>	Specifies user name.

v3user-modify/<username> [i] info

Table 126: v3user-modify/<username> info parameters

Parameter	Description or Values	Default	Range
security-name	Readable string representing the user in Security Model independent format	""	Characters in double quotes
clone-from-user	Points to another row entry in this table. The user in this other row is called the clone-from user. The privacy and authentication parameters of the new user are cloned from its clone-from user.	0.0 (zero dot zero)	OID pointing to a conceptual row in this table
authorization-protocol	Indicates if messages sent on behalf of this user to or from the SNMP engine can be authenticated, and if so, which type of privacy protocol is used	usmNoAuth-Protocol	• usmNoAuthProtocol • usmHMACMD5AuthProtocol • usmHMACSHAAuthProtocol
privacy-protocol	Indicates if messages sent on behalf of this user to or from the SNMP engine can be protected from disclosure, and if so, which type of privacy protocol is used	usmNoPrivProtocol	• usmNoPrivProtocol • usmDESPrivProtocol

Table 126: v3user-modify/<username> info parameters (continued)

Parameter	Description or Values	Default	Range
status	Displays status of the row entry. Until instances of all corresponding columns are appropriately configured, the value is not-ready.	not-ready	• active • not-in-service • not-ready • delete

view-list [s]

Use the **view-list** "show" subtree command to display the view tables for the three primary views (plus others if they exist):
- internet
- restricted
- dhKickRestricted

The views show the OID subtree (in decimal dot format), the Mask, Type and Status.

Command Path

```
[] box#   snmp ↵
[] snmp#  coex ↵
[] coex#  ver3 ↵
[] ver3#  view-list ↵
```

Syntax

```
show
```

view-list [s] show

Table 127: view-list show data items

Data Item	Description	Typical Value or Range
View Name	Name assigned to this view	• internet • restricted • dhKickRestricted (defaults)
Subtree	Subtree location in zero-dot-zero format (OID)	Examples: 1 3 6 1 1 3 6 1 2 1 1
Mask	Mask used with subtree	Default value is None
Type	Defines view type: included means that matching entries are included; excluded means matching entries are excluded	• Included (Default) • Excluded
Status	Status of the view entry	• active • not-in-service • delete

view-modify/<viewname>/<subtree> [i]

Use the **view-modify/<viewname>/subtree** "info" subtree command to change views of the accessible nodes in the MIB object tree for SNMPv3 users.

Command Path

```
[] box#  snmp ↵
[] snmp#  coex ↵
[] coex#  ver3 ↵
[] ver3#  view-modify/<viewname>/<subtree> ↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<viewname>	Name assigned to view
<subtree>	Accessible node or subtree address in dotted decimal notation (OID)

view-modify/<viewname>/<subtree> [i] info

Table 128: view-modify/<viewname>/<subtree> [i] info

Parameter	Description or Values	Default	Range
mask	Mask	—	Valid mask
type	Defines view type: Included means that matching entries are included Excluded means matching entries are excluded	Included	• Included • Excluded
status	View status	active	• active • not-in-service • delete

group-list [s]

Use the **group-list** "show" subtree command to view the list of group names and associated user names.

Command Path

```
[] box#  snmp ↵
[] snmp#  coex ↵
[] coex#  ver3 ↵
[] ver3#  group-list ↵
```

Syntax

```
show
```

group-list [s] show

Table 129: group-list show data items

Data Item	Description	Typical Value or Range
GroupName	SNMPv3 group name (4 default entries)	• coex-v1 • coex-v1 • initial • dhKickStart
UserName	SNMPv3 user names (6 default entries)	• coex-v1 • coex-v1 • initial • dhKickstart • templateMD5 • templatteSHA
Model	SNMPv1, SNMPv2c and SNMPv3 security model used	• SNMPv1 (1) • SNMPv2c (2) • USM (3)
Status	Current status of row entry in list	• active • not-in-service • not-ready • Delete

group-modify/<SNMPv1>/<username> [i]

Use the **group-modify/<SNMPv1>/<username>** "info" subtree command to create or modify SNMPv1 users associated with groups.

Command Path

```
[] box#  snmp ↵
[] snmp#  coex ↵
[] coex#  ver3 ↵
[] ver3#  group-modify/<SNMPv1>/<username> ↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<username>	Specifies username (from view-list table)

group-modify/<SNMPv1>/<username> [i] info

Table 130: group-modify/<SNMPv1>/<username> info parameters

Parameter	Description or Values	Default	Range
group-name	SNMPv1, SNMPv2 and USM group names	coex-v1 coex-v2 initial dhKickstart	Characters enclosed in double quotes
status	Current user-name status	active	• active • not-in-service • not-ready • delete

group-modify/<SNMPv2>/<username> [i]

Use the **group-modify/<SNMPv2>/<username>** "info" subtree command to create or modify SNMPv2 users associated with groups.

Command Path

```
[] box#  snmp ↵
[] snmp#  coex ↵
[] coex#  ver3 ↵
[] ver3#  group-modify/<SNMPv2>/<username> ↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<username>	Specifies username (from view-list table)

group-modify/SNMPv2/<username> [i] info

Table 131: group-modify/<SNMPv2>/<username> info parameters

Parameter	Description or Values	Default	Range
group-name	SNMPv1, SNMPv2 and USM group names	coex-v1 coex-v2 initial dhKickstart	Characters enclosed in double quotes
status	Current user-name status	active	• active • not-in-service • not-ready • delete

group-modify/<USM>/<username> [i]

Use the **group-modify/<USM>/<username>** "info" subtree command to create or modify SNMPv3 users associated with groups.

Command Path

```
[] box#  snmp ↵
[] snmp#  coex ↵
[] coex#  ver3 ↵
[] ver3#  group-modify/<USM>/<username> ↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<username>	Specifies username (from view-list table)

group-modify/<USM>/<username> [i] info

Table 132: group-modify/<USM>/<username> info parameters

Parameter	Description or Values	Default	Range
group-name	SNMPv1, SNMPv2 and USM group names	coex-v1 coex-v2 initial dhKickstart	Characters enclosed in double quotes
status	Current user-name status	active	• active • not-in-service • not-ready • delete

v3access-list [s]

Use the v3access-list "show" subtree command to display the SNMPv3 access list segmented by Group and Entry. You will see a set of default access names in the list, plus any new additions.

Command Path

```
[] box#   snmp ↵
[] snmp#   coex ↵
[] coex#   ver3 ↵
[] ver3#   v3access-list ↵
```

Syntax

```
show
```

v3access-list [s] show

Table 133: v3access-list show data items

Data Item	Description	Typical Value or Range
Group	Group name which defines an access control policy (security model and security name) for a group of principals	• coex-v1 • coex-v2 • initial • dhKickstart • (user-entered names)
Entry	Maps the combination of security model and security name into a group name	0, integer
read-view-name	Identifies the MIB view to which this row entry has read access	• restricted • internet • dhKickRestricted
write-view-name	Identifies the MIB view to which this row entry has write access	internet
notify-view-name	Identifies the read view to which this row entry has access for notifications	• restricted • internet • dhKickRestricted
prefix name	Name assigned to prefix	—

Table 133: v3access-list show data items

Data Item	Description	Typical Value or Range
match	Match to mask required	• exact • prefix
model	SNMPv1, SNMPv2, and USM security model	• SNMPv1 (1) • SNMPv2c (2) • USM (3)
level	Security level at which SNMP messages can be sent or processed: • noAuthNoPriv = without authentication and without privacy • authNoPriv = with authentication but without privacy • authPriv = with authentication and with privacy	• noAuthNoPriv • authNoPriv • authPriv
Status	current user name status	• active • not-in-service • not-ready • delete

v3access-modify/<group>/<context>/<sec-model>/<sec-level> [i]

Use the **v3access-modify/<group>/<context>/<sec-model>/<sec-level>** "info" sub-tree command to view SNMPv1, SNMPv2c and USM event messages for the specified group name, context, security model and security level (no authorization/no privacy, authorization/no privacy, or authorization with privacy.)

Command Path

```
[] box#  snmp ↵
[] snmp#  coex ↵
[] coex#  ver3 ↵
[] ver3#  v3access-modify/<group>/<context>/<sec-model>/<sec-level> ↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<group>	Specifies usergroup (from view-list table)
<context>	

<sec-model>	Specifies a group-name with:
	  - SNMPv1
	  - SNMPv2c
	  - USM

<sec-level>	Security level at which SNMP messages can be sent or processed:
	  - no authorization/no privacy
	  - authorization/no privacy
	  - authorization with privacy

v3access-modify/<group>/<context>/<SNMPv1>/<noAuthNoPriv > [i]

Use the **v3access-modify/<group>/<context>/<SNMPv1>/<noAuthNoPriv>** "info" subtree command to view SNMP event messages for the specified group-name, with no authorization and no privacy.

Command Path

```
[] box#  snmp ↵
[] snmp#  coex ↵
[] coex#  ver3
[] ver3#  v3access-modify/<group>/<context>/<SNMPv1>/<noAuthNoPriv>↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<group>	Specifies usergroup (from view-list table)

v3access-modify/<group>/<context>/<SNMPv1>/<noAuthNoPriv> [i] infoi

Table 134: v3access-modify/<group>/<context>/<SNMPv1>/<noAuthNoPriv> info parameters

Parameter	Description or Values	Default	Range
context-match	Match to mask required	exact	exact prefix
read-view-name	Identifies the MIB view to which this row entry has read access	""	characters in double quotes
write-view-name	Identifies the MIB view to which this row entry has write access	""	characters in double quotes
notify-view-name	Identifies the read view to which this row entry has access for notifications	""	characters in double quotes
status	Status of row entry	active	• active • not-in-service • create-and-go • create-and-wait • delete

---

v3access-modify/<group>/<context>/<SNMPv1>/<authNoPriv> [i]

Use the **v3access-modify/<group>/<context>/<SNMPv1>/<authNoPriv>** "info" sub-tree command to view SNMPv1 event messages for the specified group, context, with authorization and no privacy.

Command Path

```
[] box# snmp ↵
[] snmp# coex ↵
[] coex# ver3
[] ver3# v3access-modify/<group>/<context>/<SNMPv1>/<authNoPriv> ↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<group>	Specifies usergroup (from view-list table)

v3access-modify/<group>/<context>/<SNMPv1>/<authNoPriv> [i] info

Table 135: v3access-modify/<group>/<context>/<SNMPv1>/<authNoPriv> info parameters

Parameter	Description or Values	Default	Range
context-match	Match to mask required	exact	• exact • prefix
read-view-name	Identifies the MIB view to which this row entry has read access	""	characters in double quotes
write-view-name	Identifies the MIB view to which this row entry has write access	""	characters in double quotes
notify-view-name	Identifies the read view to which this row entry has access for notifications	""	characters in double quotes
status	Status of row entry	active	• active • not-in-service • delete

v3access-modify/<group>/<context>/<SNMPv1>/<authPriv> [i]

Use the **v3access-modify/<group>/<context>/<SNMPv1>/<authPriv>** "info" subtree command to view SNMPv1 event messages for the specified group, context with authorization and privacy.

Command Path

```
[] box# snmp ↵
[] snmp# coex ↵
[] coex# ver3
[] ver3# v3access-modify/<group>/<context>/<SNMPv1>/<authPriv> ↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<group>	Specifies usergroup (from view-list table)

v3access-modify/<group-name>/<context>/<SNMPv1>/<authPriv> [i] info

Table 136: v3access-modify/<group-name>/<context-prefix>/<authPriv> info parameters

Parameter	Description or Values	Default	Range
context-match	Match to mask required	exact	exact prefix
read-view-name	Identifies the MIB view to which this row entry has read access	""	characters in double quotes
write-view-name	Identifies the MIB view to which this row entry has write access	""	characters in double quotes
notify-view-name	Identifies the read view to which this row entry has access for notifications	""	characters in double quotes
status	Status of row entry	active	• active • not-in-service • delete

v3access-modify/<group>/<context>/<SNMPv2>/<noAuthNoPriv> [i]

Use the **v3access-modify/<group>/<context>/<SNMPv2>/<noAuthNoPriv>** "info" subtree command to view SNMP event messages for the specified group-name, with no authorization and no privacy.

Command Path

```
[] box#  snmp ↵
[] snmp#  coex ↵
[] coex#  ver3
[] ver3#  v3access-modify/<group>/<context>/<SNMPv2>/<noAuthNoPriv>↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<group>	Specifies usergroup (from view-list table)

v3access-modify/<group>/<context>/<SNMPv2>/<noAuthNoPriv> [i] infoi

Table 137: v3access-modify/<group>/<context>/<SNMPv2>/<noAuthNoPriv> info parameters

Parameter	Description or Values	Default	Range
context-match	Match to mask required	exact	exact prefix
read-view-name	Identifies the MIB view to which this row entry has read access	""	characters in double quotes
write-view-name	Identifies the MIB view to which this row entry has write access	""	characters in double quotes
notify-view-name	Identifies the read view to which this row entry has access for notifications	""	characters in double quotes
status	Status of row entry	active	• active • not-in-service • delete

v3access-modify/<group>/<context>/<SNMPv2>/<authNoPriv> [i]

Use the **v3access-modify/<group>/<context>/<SNMPv2>/<authNoPriv>** "info" sub-tree command to view SNMPv1 event messages for the specified group, context, with authorization and no privacy.

Command Path

```
[] box#    snmp ↵
[] snmp#   coex ↵
[] coex#   ver3
[] ver3#   v3access-modify/<group>/<context>/S<NMPv2>/<authNoPriv> ↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<group>	Specifies usergroup (from view-list table)

v3access-modify/<group>/<context>/<SNMPv2>/<authNoPriv> [i] info

Table 138: v3access-modify/<group>/<context>/<SNMPv2>/<authNoPriv> info parameters

Parameter	Description or Values	Default	Range
context-match	Match to mask required	exact	• exact • prefix
read-view-name	Identifies the MIB view to which this row entry has read access	""	characters in double quotes
write-view-name	Identifies the MIB view to which this row entry has write access	""	characters in double quotes
notify-view-name	Identifies the read view to which this row entry has access for notifications	""	characters in double quotes
status	Status of row entry	active	• active • not-in-service • delete

v3access-modify/<group>/<context>/<SNMPv2>/<authPriv> [i]

Use the **v3access-modify/<group>/<context>/<SNMPv2>/<authPriv>** "info" subtree command to view SNMPv2 event messages for the specified group, context with authorization and privacy.

Command Path

```
[] box# snmp ↵
[] snmp# coex ↵
[] coex# ver3
[] ver3# v3access-modify/<group>/<context>/<SNMPv2>/<authPriv> ↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<group>	Specifies usergroup (from view-list table)

v3access-modify/<group>/<context>/<SNMPv2>/<authPriv> [i] info

Table 139: v3access-modify/<group>/<context>/<SNMPv2>/<authPriv> info parameters

Parameter	Description or Values	Default	Range
context-match	Match to mask required	exact	exact prefix
read-view-name	Identifies the MIB view to which this row entry has read access	""	characters in double quotes
write-view-name	Identifies the MIB view to which this row entry has write access	""	characters in double quotes
notify-view-name	Identifies the read view to which this row entry has access for notifications	""	characters in double quotes
status	Status of row entry	active	• active • not-in-service • delete

v3access-modify/<group>/<context>/<USM>/<noAuthNoPriv> [i]

Use the **v3access-modify/<group>/<context>/<USM>/<noAuthNoPriv>** "info" sub-tree command to view SNMP event messages for the specified group-name, with no authorization and no privacy.

Command Path

```
[]  box#  snmp  ↵
[]  snmp#  coex  ↵
[]  coex#  ver3
[]  ver3#  v3access-modify/<group>/<context>/<USM>/<noAuthNoPriv>↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<group>	Specifies usergroup (from view-list table)

v3access-modify</group>/<context>/<USM>/<noAuthNoPriv> [i] infoi

Table 140: v3access-modify/<group>/<context>/<USM>/<noAuthNoPriv> info parameters

Parameter	Description or Values	Default	Range
context-match	Match to mask required	exact	exact prefix
read-view-name	Identifies the MIB view to which this row entry has read access	""	characters in double quotes
write-view-name	Identifies the MIB view to which this row entry has write access	""	characters in double quotes
notify-view-name	Identifies the read view to which this row entry has access for notifications	""	characters in double quotes
status	Status of row entry	active	• active • not-in-service • delete

v3access-modify/<group>/<context>/<USM>/<authNoPriv> [i]

Use the **v3access-modify/<group>/<context>/<USM>/<authNoPriv>** "info" subtree command to view SNMPv3 event messages for the specified group, context, with authorization and no privacy.

Command Path

```
[] box#  snmp  ↵
[] snmp#  coex  ↵
[] coex#  ver3
[] ver3#  v3access-modify/<group>/<context>/<USM>/<authNoPriv>  ↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<group>	Specifies usergroup (from view-list table)

v3access-modify/<group>/<context>/<USM>/<authNoPriv> [i] info

Table 141: v3access-modify/<group>/<context>/<USM>/<authNoPriv> info parameters

Parameter	Description or Values	Default	Range
context-match	Match to mask required	exact	• exact • prefix
read-view-name	Identifies the MIB view to which this row entry has read access	""	characters in double quotes
write-view-name	Identifies the MIB view to which this row entry has write access	""	characters in double quotes
notify-view-name	Identifies the read view to which this row entry has access for notifications	""	characters in double quotes
status	Status of row entry	active	• active • not-in-service • delete

v3access-modify/<group>/<context>/<USM>/<authPriv> [i]

Use the **v3access-modify/<group>/<context>/<USM>/<authPriv>** "info" subtree command to view SNMPv3 event messages for the specified group, context with authorization and privacy.

Command Path

```
[] box#  snmp ↵
[] snmp#  coex ↵
[] coex#  ver3
[] ver3#  v3access-modify/<group>/<context>/<USM>/<authPriv> ↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<group>	Specifies usergroup (from view-list table)

v3access-modify/<group>/<context>/<USM>/<authPriv> [i] info

Table 142: v3access-modify/<group>/<context>/<USM>/<authPriv> info parameters

Parameter	Description or Values	Default	Range
context-match	Match to mask required	exact	exact prefix
read-view-name	Identifies the MIB view to which this row entry has read access	""	characters in double quotes
write-view-name	Identifies the MIB view to which this row entry has write access	""	characters in double quotes
notify-view-name	Identifies the read view to which this row entry has access for notifications	""	characters in double quotes
status	Status of row entry	active	• active • not-in-service • delete

snmpcommunity-list [s]

Use the **snmpcommunity-list** "show" subtree command to view a list of the snmp data items.

Command Path

```
[] box#  snmp ↵
[] snmp#  coex ↵
[] coex#  snmpcommunity-list↵
```

Syntax

```
show
```

snmpcommunity-list [s] show

Table 143: snmpcommunity-list show data items

Data Item	Description	Typical Value or Range
CommunityIndex	Unique index value of entry	Text string
Status	Status of this row entry	• active • not-in-service • not ready • delete
Community Name	Community string	Text string
Transport Tag	Transport identifier.	Text string

snmpcommunity-specific/<snmpcommunityindex> [i]

Use the **snmpcommunity-specific/<snmpcommunityindex>** "info" subtree command to define the parameters for the specified (by index number) SNMP community string.

Command Path

```
[] box#  snmp ↵
[] snmp#  coex ↵
[] coex#  --fill in --↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<snmpcommunity index>	The unique value of an entry

snmpcommunity-specific/<snmpcommunityindex> [i] info

Table 144: snmpcommunity-specific/<snmpcommunityindex> info parameters

Parameter	Description or Values	Default	Range
Community-Name	SNMP community name shown as administrative display text.	public	Display text
Security-Name	Identifies principal on whose behalf SNMP messages will be generated.	public	Display text
Engine-ID	SNMP Engine ID. Unique identifier for the SNMP "engine".	Engine ID	12 octets long May not be all zeros or all "ff"H or the empty (zero length) string. Refer to SNMPv3 MIB for details.
Context-Name	Identifies SNMP context name for this entry.	" "	Display text
Transport-Tags	Identifies SNMP transport mechanism	" "	Display text
Storage-Types	Storage mechanism for this entry.	Non-Volatile	Non-Volatile

Table 144: snmpcommunity-specific/<snmpcommunityindex> info parameters

Parameter	Description or Values	Default	Range
Status	The status of this row entry	Not-Ready	• Active • Not-in-Service • Not-ready • Destroy

snmptargetaddr-list [s]

Use the **snmptargetaddr-list** "show" subtree command to display the list of SNMP target addresses.

Command Path

```
[] box#  snmp ↵
[] snmp#  coex ↵
[] coex#  snmptargetaddr-list↵
```

Syntax

```
show
```

snmptargetaddr-list [s] show

Table 145: snmptargetaddr-list show data items

Data Item	Description	Typical Value or Range
TargetName	Name used to identify SNMP target entry.	Display text (1 to 32 characters)
Status	Status of this row entry.	• active • not-in-service • not-ready
Target Domain	Indicates transport type for the SNMP target. (Only SNMP and PDU are supported.)	Display text
Target Address	Indicates target transport address.	Display text

snmptargetaddr-specific/<snmptargetaddrname> [i]

Use the **snmptargetaddr-specific/<snmptargetaddrname>** "info" subtree command to define data items for the specified SNMP transport address.

Command Path

```
[] box# snmp ↵
[] snmp# coex ↵
[] coex# snmptargetaddr-specific/<snmptargetaddrname> ↵
```

Syntax

```
show
```

Syntax Qualifier	Description
<snmptargetaddrname>	The locally arbitrary, but unique identifier associated with this snmpTargetAddrEntry

snmptargetaddr-specific/<snmptargetaddrname> [i] info

Table 146: snmptargetaddr-specific/<snmptargetaddrname> info parameters

Parameter	Description or Values	Default	Range
AddrTdomain	Indicates transport type of the address contained in the SNMP target address name.	1.3.6.1.6.1.1	TDomain
Targetaddress	Transport address based on the value of the AddrTdomain object.	255.255.255.255 (Default 162)	Taddress
Timeout	Expected maximum round-trip time for communicating with the transport address defined by this object (in 100ths-of-seconds)	1500	0 to 2147483647

Table 146: snmptargetaddr-specific/<snmptargetaddrname> info parameters

Parameter	Description or Values	Default	Range
Retrycount	Default number of retries to be attempted when a response is not received for a gener-ated message.	3	0 to 255
Taglist	List of tag values which are used to select target addresses for a par-ticular operation	" " (null)	SnmpTagList
Parameters	Identifies an entry in the snmpTarget-ParamsTable. The identified entry con-tains SNMP parame-ters to be used when generating mes-sages to be sent to this transport address.	"public"	Administrative Text String (1 to 32 char-acters)
Storage-Types	Storage type for the row	NonVolatile	NonVolatile
Status	Controls status of table entries. To create a table entry, this object must be set to either cre-ateAndGo or create-AndWait. Until all columns are config-ured, the instance is notReady. Certain objects may not be modified while this object is active.	Not-Ready	• Active • Not-In-Service • Not-ready • Delete

snmptargetaddrext-list [s]

Use the **snmptargetaddrext-list** "show" subtree command to view a list of the SNMP target parameters.

Command Path

```
[] box#  snmp ↵
[] snmp#  coex ↵
[] coex#  snmptargetaddrext-list↵
```

Syntax

```
show
```

snmptargetaddrext-list [s] show

Table 147: snmptargetaddrext-list show data items

Data Item	Description	Typical Value or Range
entry	The locally arbitrary, but unique identifier associated with this entry.	Administrative Display Text (1 to 10 characters)
Status	Status of this row entry.	• Active • Not-ready
MaxMessageSize	The maximum length, in octets, of an SNMP message sent, received and processed	• Integer
TargetAddrTMask	The mask value associated with an entry in the snmpTargetAddrTable.	• Octet String

snmptargetaddrext-specific/<index {1-10}> [i]

Use the **snmptargetaddrext-specific/<index {1-10}>** "info" subtree command to con-figure the SNMP target address for the specified SNMP address.

Command Path

```
[] box#   snmp ↵
[] snmp#  coex ↵
[] coex#  snmptargetaddrext-specific/<index {1-10}>↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<snmptargetaddrext>	The message value associated with an entry in the snmpTargetAddrTable

snmptargetaddrext-specific/<index {1-10}> [i] info

Table 148: snmptargetaddrext-specific/<index {1-10}> info parameters

Parameter	Description or Values
ext-tmask	The mask value associated with an entry in the snmpTargetAddrTable
message-size	0

snmptargetparams-list [s]

Use the **snmptargetparams-list** "show" subtree command to view a list of the SNMP target parameters.

Command Path

```
[] box#  snmp ↵
[] snmp# coex ↵
[] coex# snmptargetparams-list↵
```

Syntax

```
show
```

snmptargetparams-list [s] show

Table 149: snmptargetparams-list show data items

Data Item	Description	Typical Value or Range
TargetParamsName	The locally arbitrary, but unique identifier associated with this entry.	Administrative Display Text (1 to 32 characters)
Status	Control status for this table row entry.	• active • not-in-service • not-ready • destroy
MPModel	The Message Processing Model to be used when generating SNMP messages using this entry.	• SNMPv1 (0) • SNMPv2c (1) • SNMPv3 (3)
Security Model	The Security Model to be used when generating SNMP messages using this entry. Refer to the SNMPv3 MIB for detailed information.	1 to 2147483647 • SNMPv1 (0) • SNMPv2C (1) • SNMPv3 (3)
Security Level	Level of Security to be used when generating SNMP messages using this entry.	• noAuthNoPriv (1) • authNoPriv (2) • authPriv (3)

snmptargetparams-specific/<snmptargetparamsname> [i]

Use the **snmptargetparams-specific/<snmptargetparamsname>** "info" subtree command to configure the SNMP target parameters for the specified SNMP target.

Command Path

```
[] box# snmp ↵
[] snmp# coex ↵
[] coex# snmptargetparams-specific/<snmptargetparamsname>↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<snmptargetparamsname>	Specifies target parameter name.

snmptargetparams-specific/<snmptargetparamsname> [i] info

Table 150: snmptargetparams-specific/<snmptargetparamsname> info parameters

Parameter	Description or Values	Default	Range
MP-Model	The Message Processing Model to be used when generating SNMP messages using this entry.	SNMPv1	• SNMPv1 (0) • SNMPv2c (1) • SNMPv3 (3)
Security-Model	Security Model to be used when generating SNMP messages using this entry. Refer to the SNMPv3 MIB for more information.	SNMPv1	1 to 2147483647 • SNMPv1 • SNMPv2c • USM
Security-Name	The locally arbitrary, but unique identifier associated with this entry.	"public"	Display text (1 to 32 characters)
Security-Level	Level of Security to be used when generating SNMP messages using this entry.	noAuth/NoPriv	• noAuthNoPriv • authNoPriv • authPriv
Storage-Type	Indicates method of storing SNMP security parameters.	non-Volatile	• nonVolatile

Table 150: snmptargetparams-specific/<snmptargetparamsname> info parameters

Parameter	Description or Values	Default	Range
Row Status	Status of row	not-ready	• active • not-in-service • not-ready • destroy

snmpnotify-list [s]

Use the **snmpnotify-list** "show" subtree command to view an SNMP notify list.

Command Path

```
[]  box#  snmp ↵
[]  snmp#  coex ↵
[]  coex#  snmpnotify-list↵
```

Syntax

```
show
```

snmpnotify-list [s] show

Table 151: snmpnotify-list show data items

Data Item	Description	Typical Value or Range
Notify Name	Identifies management target which should receive notifications.	Display text (1 to 32 characters)
Status	Control status of the row entry.	• Active • Not-In-Service • notReady
Notify Tag	A single tag value which is used to select entries in the SNMP Target Address table.	SNMP Tag Value
Notify Type	Type of notification to be generated for entries in the SNMP Target Address table.	• notification • Inform

snmpnotify-specific/<snmpnotifyname> [i]

Use the **snmpnotify-specific/<snmpnotifyname>** "info" subtree command to display the SNMPv3 access notification list by Group and Entry.

Command Path

```
[] box#  snmp ↵
[] snmp#  coex ↵
[] coex#  snmpnotify-specific/<snmpnotifyname>↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<snmpntofiyname>	Unique local identifier specifying SNMP trap or notification target.

snmpnotify-specific/<snmpnotifyname> [i] info

Table 152: snmpnotify-specific/<snmpnotifyname> info parameters

Parameter	Description or Values	Default	Range
Notify-tag	A single tag value which is used to select entries in the SNMP Target Address table.	" " (null)	SNMP Tag Value
Notify-type	Determines type of notification to be generated for entries in the SNMP Target Address table.	notification	• notification • inform
Storage-type	Storage type for the SNMPv3 parameters.	non-Volatile	Non-Volatile
Row-Status	Control status of the row entry.	not-Ready	• Active • Not-In-Service • notReady • Destroy

snmpfilterprofile-list [s]

Use the **snmpfilterprofile-list** "show" subtree command to view a list of the SNMP filter profiles.

Command Path

```
[] box#  snmp ↵
[] snmp#  coex ↵
[] coex#  snmpfilterprofile-list↵
```

Syntax

```
show
```

snmpfilterprofile-list [s] show

Table 153: snmpfilterprorfile-list show data items

Data Item	Description	Typical Value or Range
snmpTargetParamsName	The locally arbitrary, but unique identifier associated with this entry	Administrative Display Text (1 to 32 characters)
Status	Status of this row entry	• Active • Not-In-Service • notReady
ProfileName	The SNMP filter name associated with this target parameter name	• SNMPv1 (0) • SNMPv3 (3)

snmpfilterprofile-specific/<snmptargetparamsname> [i]

Use the **snmpfilterprofile-specific/<snmptargetparamsname>** "info" subtree command to configure the SNMP filter profile parameters for the specified SNMP target.

Command Path

```
[] box#  snmp ↵
[] snmp#  coex ↵
[] coex#  snmpfilterprofile-specific/<snmptargetparamsname>↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<snmpfilterprofilename>	Specifies filter profile target parameter name.

snmpfilterprofile-specific/<snmptargetparamsname> [i] info

Table 154: snmpfilterprofile-specific/<snmptargetparamsname> info parameters

Parameter	Description or Values	Default	Range
profile-name	Indicates filter profile name	"public"	—
Storage-Type	Indicates method of storing SNMP security parameters.	non-Volatile	• nonVolatile
Status	Status of this ow entry.	not-ready	• active • not-in-service • not-ready • destroy

snmpfilter-list [s]

Use the **snmpfilter-list** "show" subtree command to view an SNMP filter list.

Command Path

```
[] box#  snmp ↵
[] snmp#  coex ↵
[] coex#  snmpfilter-list↵
```

Syntax

```
show
```

snmpfilter-list [s] show

Table 155: snmpfilter-list show data items

Data Item	Description	Typical Value or Range
Profile Name	Identifies management target which should receive notifications.	Display text (1 to 32 characters)
FilterSubtree		•
Status	Status of this row entry.	• Active • Not-In-Service • notReady
Filtertype	Type of filter - either include or exclude	• include • exclude)

snmpfilter-specific/<profilename>/<filtersubtree> [i]

Use the **snmpfilter-specific/<profilename>/<filtersubtree>** "info" subtree command to display the SNMPv3 access filter list by Group and Entry.

Command Path

```
[] box#  snmp ↵
[] snmp#  coex ↵
[] coex#  snmpfilter-specific/<profilename>/f<iltersubtree>↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<snmpfiltername>	Unique local identifier specifying SNMP trap or filter target.

snmpfilter-specific/<profilename>/<filtersubtree> [i] info

Table 156: snmpfilter-specific/<profilename>/<filtersubtree> info parameters

Parameter	Description or Values
filter-mask	—
filter-type	Included
storage-type	Non volatile
status	not-ready

traps [?]

Use the **traps "? (next level)"** command to configure SNMP traps.

Command Path

```
[] box# snmp ↵
[] snmp# traps ↵
```

Syntax

```
?

There are no show or info items. The next level of traps
are:

non-docs-trap [i]
docs-trap [i]
```

Table 157: traps next level commands

Next Level Command	Page #
non-docs-traps [i]	page 3-265
docs-traps [i]]	page 3-267

non-docs-traps [i]

Use the **non-docs-traps** "info" subtree command to configure SNMP traps for non-DOCSIS 1.1 compliant cable devices.

Command Path

```
[] box#  snmp ↵
[] snmp#  traps ↵
[] traps#  non-docs-traps ↵
```

Syntax

```
info
```

non-docs-traps [i] info

Table 158: non-docs-traps info parameters

Parameter	Description or Values	Default	Range
coldstart	Generated when CMTS does a complete system reset	send-notification	• send-v1 trap • send-notification • send-inform • no-trap
warmstart	Generated when the CMTS does an internal software restart	send-notification	• send-v1 trap • send-notification • send-inform • no-trap
link-up	Generated when the CMTS establishes an LLC interface link	send-notification	• send-v1 trap • send-notification • send-inform • no-trap
link-down	Generated when the CMTS loses an LLC interface link	send-notification	• send-v1 trap • send-notification • send-inform • no-trap
auth-failure	Generated when a CMTS authentication failure occurs	send-notification	• send-v1 trap • send-notification • send-inform • no-trap

Table 158: non-docs-traps info parameters

Parameter	Description or Values	Default	Range
lc-deregistration	Generated when a given number of cable modems deregister	send-notification	• send-v1 trap • send-notification • send-inform • no-trap
lc-redundancy	Generated when a redundancy is invoked	send-notification	• send-v1 trap • send-notification • send-inform • no-trap
lc-lceventhandler	Trap generated for vendor events	send-notification	• send-v1 trap • send-notification • send-inform • no-trap

docs-traps [i]

Use the **docs-traps** "info" subtree command to configure SNMP traps which can be generated by DOCSIS 1.1-compliant cable devices.

Command Path

```
[] box#  snmp ↵
[] snmp#  traps ↵
[] traps#  docs-traps ↵
```

Syntax

```
info
```

docs-traps [i] info

Table 159: docs-traps info parameters

Parameter	Description or Values	Default
docsistrapcontrol	Controls which traps are sent	none
docsiseventhandler	Controls the trap format	send-notificaiton
send-inform	Defines which traps to send inform	all-traps

nmaccess [?]

Use the **nmaccess** "? (next level)" command to display the SNMP nmaccess list.

Command Path

```
[] box# snmp ↵
[] snmp# nmaccess ↵
```

Syntax

```
?
```

Table 160: nmaccess next level commands

Next Level Command	Page #
access-list [s]	page 3-269
access-specific/<index> [i]	page 3-270
community-list [s]	page 3-272
alarms [s,i] ?	page 3-273

access-list [s]

Use the **access-list** "show" subtree command to display the SNMP access list.

Command Path

```
[] box# snmp ↵
[] snmp# nmaccess↵
[] nmaccess# access-list ↵
```

Syntax

```
show
```

access-list [s] show

Table 161: access-list [s] show data items

Data Item	Description	Typical Value or Range
Index	Index to access-list table "2147483647" is default entry for system administrator	1 to 10 *Note:* 2147483647 is the default value
Status	User access status	• Active • Not-In-Service • CreateAndGo (4) • createAndWait (5) • notReady • Destroy
IP Address	IP address assigned to user 255.255.255.255 is default	255.255.255.255 valid IP address
IP mask	IP mask 255.255.255.255 is default	valid mask default is 255.255.255.255
Control	Access privilege control	• rd/wr traps • read
Interfaces	CMTS interfaces accessible by user	• ether+cable • ether • cable

access-specific/<index> [i]

Use the **access-specific/<index>** "info" subtree command to view the list of SNMP users and user-privileges, selected from the access-list table.

Command Path

```
[] box# snmp ↵
[] snmp# nmaccess↵
[] nmaccess# access-specific/<index> ↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<index>	Specifies user row entry (from access-list table)

access-specific/<index> [i] info

Table 162: access-specific/<index> info parameters

Parameter	Description or Values	Default	Range
ip-addr	User IP address 255.255.255.255 means any address is valid	255.255.255.255	valid IP address
ip-mask	IP mask for access privileges 255.255.255.255 means any mask is valid	255.255.255.255	valid IP mask
community	Community access string	"public"	Display text
control	User privilege control	read-only	• none • read-only • read-write • ro-with-traps • rw-with-traps • traps-only
interfaces	CMTS interfaces accessible by user	ethernet+cable	• ethernet • cable • ether-net+cable
extensions	User privilege extensions	none	• none • reset-allowed • account-man-ager
status	User account status	not-in-service	• Active • Not-In-Service • CreateAndGo (4) • createAnd-Wait (5) • notReady • Destroy

community-list [s]

Use the **community-list** "show" subtree command to display the community string list. This table will have at least one default entry for the account manager, which is assigned a default index number of "2147483647".

Note: This command can be accessed only by users with read-write privileges.

Command Path

```
[] box# snmp ↵
[] snmp# nmaccess ↵
[] nmaccess# community-list ↵
```

Syntax

```
show
```

community-list [s] show

Table 163: community-list show data items

Data Item	Description	Typical Value or Range
Index	Index to access-list table. "2147483647" is default entry for system administrator.	1 to 10 2147483647 (default)
Status	User access status	• Active • Not-In-Service • CreateAndGo (4) • createAndWait (5) • notReady • Destroy
Community Name	Community string shared between the CMTS and the cable modems	Display text. Default value is "public"
Control	User privileges	• read • rd/wr
Extensions	Additional user privileges	• none • account-manager • reset-allowed

alarms [s,i] ?

Use the **alarms** "show and info" subtree commands to view alarm information and configure alarms in the CMTS.

Note: The CMTS may not display the correct number of packet ports generating alarms after a major alarm has been cleared. If that occurs, you must manually reset the packet port alarms via CLI or SNMP.

The packet-port-auto provisioning feature controls automatic provisioning of ARRIS packet ports. When this feature is turned ON, the CMTS determines if registering devices are packet ports, and will then associate an LOC alarm table with the device. Once a packet port (cable modem [CM] device) is auto-provisioned, the information is stored in CMTS flash memory, and remains stored until cleared either by a CLI or an SNMP set.

Command Path

```
[] box#    snmp ↵
[] snmp#   nmaccess ↵
[] nmaccess#  alarms ↵
```

Syntax

```
show
info
?
```

alarms [s] show

Table 164: alarms show data item

Data Item	Description	Typical Value or Range
loss-of-comm-alarms	Count of modems losing communication with the CMTS. The cable modem must be capable of generating the alarm	—

alarms [i] info

Table 165: alarms info parameters

Parameter	Description or Values	Default	Range
packet-port-autoprovisioning	CMTS is enabled for packet port auto-provisioning for alarms via CPS 2000 Provisioning Server. If this setting is changed, the CMTS must be re-started in order to detect the change.	no	no yes
manager-ip-address	IP address of the Loss of Communications manager	0.0.0.0	any valid IP address
notification-retry-timer	Interval between notification retries. 0 indicates no retry	0 seconds	—

alarms [?] (next level)

Table 166: alarms next level commands

Next Level Command	Page #
active-list [s]	page 3-275
loc-list [s]	page 3-276
loc-provisioning/<mac-addr> [i]	page 3-277

active-list [s]

Use the **active-list** "show" subtree command to display the list of active alarms.

Command Path

```
[] box# snmp ↵
[] snmp# nmaccess ↵
[] nmaccess# alarms ↵
[] alarms# active-list ↵
```

Syntax

```
show
```

active [s] show

Table 167: active show data items

Data Item	Description	Value or Range
notif-ID	Unique Notification ID assigned to alarm	—
alm-list	Alarm status	—
description	Description of alarm	—

loc-list [s]

Use the **loc-list** "show" subtree command to display a list of active alarms.

Command Path

```
[] box#     snmp ↵
[] snmp#    nmaccess ↵
[] nmaccess# alarms ↵
[] alarms#  loc-list ↵
```

Syntax

```
show
```

loc-list [s] show

Table 168: loc-list show data items

Data Item	Description	Typical Value or Range
Mac Address	MAC address of the cable modem device generating the alarm	valid MAC address
UpCh	Upstream channel that the cable modem device is attached to	1 through 8
Enable-Status	Current status of the cable modem device	• initial (0) • alarmed (1) • alarmSupprd (2) • alarmCleared (3)
Alarm-Status	Current alarm status	create delete not-in-service

loc-provisioning/<mac-addr> [i]

Use the **loc-provisioning/<mac-addr>** "info" subtree command to provision the loss-of-communication alarm for the specified modem. If the MAC address is not listed in the loc-list, a new row entry is created with default setting

Command Path

```
[] box#  snmp  ↵
[] snmp#  alarms  ↵
[] alarms#  loc-provisioning/<mac-addr>  ↵
```

Syntax

```
info
```

Syntax Qualifier	Description
<mac-addr>	Cable modem MAC address

loc-provisioning/<mac-addr>[i] info

Table 169: loc-provisioning/<mac-addr> info parameters

Parameter	Description or Values	Default	Range
status	Loss of communication alarm status	not-in-service	• active • not-in-service • delete

baseline-privacy [s, i]

Use the **baseline-privacy** "show and info" subtree commands to view baseline-privacy statistics, and to configure the baseline privacy parameters. The CMTS supports both standard Baseline Privacy (BPI), and also Baseline Privacy Plus (BPI+).

The **baseline-privacy** command controls the basic data privacy for cable modem users across the RF network. The baseline privacy function encrypts the traffic flows between a cable modem and the CMTS. Baseline Privacy insures that a cable modem, uniquely identified by its 48-bit IEEE MAC address, can only obtain Traffic Encryption Key (TEK) information for services it is authorized to access.

Command Path

```
[] box# baseline-privacy ↵
```

Syntax

```
show
info
```

baseline-privacy [s] show

Table 170: baseline-privacy show data items

Data Item	Description	Typical Value or Range
authent-infos	Number of authentication information messages received by the CMTS from any cable modem	—
auth-requests	Number of authentication request messages received by the CMTS from any cable modem	—
auth-replies	Number of times the CMTS has transmitted an authorization reply message to any cable modem	—
auth-rejects	Number of times the CMTS has transmitted an authorization rejected message to any cable modem	—
auth-invalids	Number of times the CMTS has transmitted an authorization invalid message to any cable modem	—
sa-map-requests	Number of Security Association (SA) MAP requests received by the CMTS	—
sa-map-replies	Number of Security Association (SA) MAP replies sent by the CMTS	—
sa-map-rejects	Number of Security Association (SA) MAP rejections sent by the CMTS	—

baseline-privacy [i] info

Table 171: baseline-privacy info parameters

Parameter	Description or Values	Default	Range
auth-lifetime-default	Default lifetime assigned to authorization keys (in seconds)	604800 seconds	1 to 6048000
tek-lifetime-default	Default lifetime assigned to traffic encryption keys (in seconds)	43200 seconds	1 to 604800
self-signed-manuf-cert-trust	Default trust of all (new) self-signed manufacturer certificates obtained after setting the objects.	trusted	trusted untrusted
check-cert-validity-period	When set to TRUE, certificate validity periods (and their chain's validity periods) are checked against the current time of day. When set to FALSE, certificates do not have theil (new) self-signed manunst the current time of day.	true	true false

baseline-privacy [?] (next level)

Table 172: baseline-privacy next level commands

Next Level Command	Page #
auth-list [s]	page 3-282
authorization/<mac-addr> [s, i]	page 3-283
said-bp-list [s]	page 3-287
said-bp-modify/<said-num> [i]	page 3-288
ip-mcast-list [s]	page 3-291
ip-mcast-modify/<mcast-index> [s,i]	page 3-292
mcasst-authlist [s]	page 3-294
mcast-auth-modify/<mcast-said-num>/<cm-mac-addr> [s, i]	page 3-295
prov-cm-cert-list [s]	page 3-291
prov-cm-cert-modify/<mac-addr> [s, i]	page 3-297
ca-cert-list [s]	page 3-299
ca-cert-modify/<index> [s, i]	page 3-300

auth-list [s]

Use the **auth-list** "show" subtree command to display information about the cable modem baseline-privacy keys collected by the CMTS.

Command Path

```
[] box# baseline-privacy ↵
[] baseline-privacy# auth-list ↵
```

Syntax

```
show
```

auth-list [s] show

Table 173: auth-list show data items

Data Item	Description	Typical Value or Range
CM Mac Addr	MAC address used with authorization association	valid MAC address
CM Key Expires New	Actual clock time when the current authorization for the cable modem expires. If the cable modem does not have an active authorization, then the value is of the expiration date and time of the last active authorization.	Date and time
KeyLife	Lifetime of authorization key (in seconds)	1 to 6048000 seconds
Version	Baseline privacy version (BPI or BPI+) used by cable modem	• BPI • BPI Plus
AuthReply	Count of authorization replies from this cable modem address	—
AuthRejct	Count of authorization rejections for this cable modem address	—

authorization/<mac-addr> [s, i]

Use the **authorization/<mac addr>** "show and info" subtree commands to display information about the cable modems' authorization status, and configure parameters for the cable modem authorization keys.

Command Path

```
[] box# baseline-privacy ↵
[] baseline-privacy# authorization/<mac addr> ↵
```

Syntax

```
show
info
```

Syntax Qualifier	Description
<mac-addr>	Cable modem MAC address

authorization/<mac-addr> [s] show

Table 174: authorization/<mac-addr> show data items

Data Item	Description	Typical Value or Range
cm-mac-addr	Cable modem MAC address	valid MAC address
cm-bpi-version	Version of MAC level security protocol running across cable wire	bpi bpi-Plus
cm-public-key	Cable modem public key (displayed as set of decimal integers). This is a DES-encoded RSA PublicKey ASN.1 type string.	Octet string (bits size): • 74 (512-bit) • 106 (768-bit) • 140 (1024-bit) • 204 (1536-bit • 270 (2048-bit)
cm-key-sequence-number	Most recent authorization key sequence number for this FSM	0 to 15
cm-key-expires-old	Expiration date and time of previous authorization key	date and time value
cm-key-expires-new	Expiration date and time of authorization key	date and time value
key-grace-period	Amount of time, in seconds, allowed prior to expiration of authorization key	60 seconds
auth-infos-from-cm	Count of authorization information messages from this cable modem	—
auth-request-from-cm	Count of authorization requests from this cable modem	—
auth-reply-to-cm	Count of authorization replies from CMTS to this cable modem	—
auth-reject-to-cm	Count of authorization rejects from CMTS to this cable modem	—
auth-invalid-to-cm	Count of authorization invalids from CMTS to this cable modem	—

Table 174: authorization/<mac-addr> show data items (continued)

Data Item	Description	Typical Value or Range
reject-error-code	Error code sent during most recent authorization rejects	• none (1) • unknown (2) • unauthorized cable modem (3) • unauthorized SID (4) • Default set to none
reject-error-string	Description of authorizaiton reject error code.	Display string zero length if no authorization reject message is sent since reboot
invalid-error-code	Error code sent during most recent authorization invalid	• none (1) • unknown (2) • unauthorized cable modem (3) • unauthorized-SAID (4) • permanentAuthoriza-tionFailure (8) • timeofDayNotAc-quired (9)
invalid-error-string	Authorization invalid error code	Display string Zero-length if no Authorization Invalid message sent since reboot
primary-sa-id	Primary Security Association identifier	—
cm-cert-valid	Defines why a CM's certificate is deemed valid or invalid	valid-cm-chained
cm-cert	CM Certification sent as part of a BPKM Authorization Request. A NULL string is returned if the entire certificate is not retained in the CMTS	—

authorization/<mac-addr> [i] info

Table 175: authorization/<mac-addr> info parameters

Parameter	Description or Values	Default	Range
cm-key-lifetime	Lifetime of cable modem key (in seconds). Typically this value is set by the system administrator.	See Table 171: baseline-privacy info parameters on page -280	1 to 6048000
invalidate-cm-keys	Control action for authorization key, set by system administrator	—	• no-reset-requested • invalidate-auth • send-auth-invalid • invalidate-teks

said-bp-list [s]

Use the **said-bp-list** "show" subtree command to view security and timing information. The Security Association ID (SAID) is the index for baseline privacy based on authorization status and the cable modem authorization keys.

Command Path

```
[] box# baseline-privacy ↵
[] baseline-privacy# said-bp-list ↵
```

Syntax

```
show
```

said-bp-list [s] show

Table 176: said-bp-list show data items

Data Item	Description	Typical Value or Range
SAID	Security Association ID (SAID) number	1 to 16383
TEK Life	Lifetime (in seconds) of the Traffic Encryption Key (TEK)	1 to 604800 seconds
TEK Grace	Grace period (in seconds) of the TEK	—
TEK Expires New	Expiration date and time when the newest TEK expires	Date and time
Key Replies	Count of TEK replies	—
Key Rejects	Count of TEK rejects	—

said-bp-modify/<said-num> [s, i]

Use the **said-bp-modify/<said-num>** "show and info" subtree commands to display and set cable modem security and timing information. This command controls a specific cable modem Service Association Identifier (SAID) number and associated temporary Traffic Encryption Key ("TEK").

Command Path

```
[] box# baseline-privacy ↵
[] baseline-privacy# said-bp-modify/<said-num> ↵
```

Syntax

```
show

info
```

Syntax Qualifier	Description
<said-num>	Security Association ID number used to select row entry in said-bp-list table

said-bp-modify/<said-num> [s] show

Table 177: said-bp-modify/<said-num> show data items

Data Item	Description	Typical Value or Range
security-association-id	DOCSIS Security Association ID (SAID)	—
tek-sa-type	Type of Security Association	none(0) primary(1) dynamic(3)
tek-data-encrypt-alg	Data encryption algorithm being utilized	none(0) des56CbcMode(1) des40CbcMode(2)
tek-data-authent-alg	Data authentication algorithm being utilized	none
tek-grace-time	Grace time for the TEK in seconds	1..302399
tek-key-sequence-number	Most recent traffic encryption key (TEK) sequence number for this TEK FSM	0-15
tek-expires-old	Amount of time for expiration of the immediate predecessor of the most recent TEK for this FSM	Date and Time
tek-expires-new	Amount of time for expiration of the most recent TEK for this FSM	Date and Time
key-requests	Number of times the cable modem has transmitted a Key Request message	—
key-replies	Number of times a cable modem receives a Key Reply message	—
key-rejects	Number of times a cable modem receives a Key Reject message	—
key-reject-error-code	Enumerated description of the Error-Code in most recent Key Reject message received by the cable modem. This has value unknown(2) if the last Error-Code value was 0 None(1) if no Key Reject message has been received since reboot	none(1) unknown(2) unauthorized SAID (4)
key-reject-error-string	The value of this object is the Display-String in most recent TEK Invalid message received by the CM. This is a zero length string if no TEK Invalid message has been received since reboot.	0 - 128

Table 177: said-bp-modify/<said-num> show data items (continued)

Data Item	Description	Typical Value or Range
tek-invalids	Number of times the CMTS has transmitted a TEK Invalid message	—
tek-invalid-error-code	Enumerated description of the Error-Code in the most recent key reject message sent in association with this SAID. This has value unknown(2) if the last Error-Code value was 0, and none(1) if no key reject message has been received since reboot.	none(1) unknown(2) invalidKeySequence(6)
tek-invalid-error-string	The value of this object is the Display-String in most recent TEK Invalid message received by the cable modem. This is a zero length string if no TEK Invalid message has been received since reboot.	—

said-bp-modify/<said-num>[i] info

Table 178: said-bp-modify/<said-num>[i] info

Parameter	Description or Values	Default	Range
tek-lifetime	TEK lifetime (in seconds)	Refer to Table 171: baseline-privacy info parameters on page -280for tek-life-time-default parameter	1 to 604800 seconds
invalidate-tek	CMTS Control action on TEK (reset MIB object)	false	true false

ip-mcast-list [s]

Use the **ip-mcast-list** "show" subtree command to view a list of indexes, multicast IP addresses, Masks, SAID numbers, Requests, rejections and control for each index.

Command Path

```
[] box# baseline-privacy ↵
[] baseline-privacy# ipmcast-list ↵
```

Syntax

```
show
```

ip-mcast-list [s] show

Table 179: ip-mcast-list show data items

Data Item	Description	Typical Value or Range
Index	Index number	1-10000
Multicast IP	Multicast IP address	—
Mask	Defines the part of the address matched against	FF:FF:FF:FF (typically)
SAID	Security Association identification	Number between 8192 and 16383
SA Map Requests (Reqs)	Number of Security Association Map Request messages	—
SA Map Rejects (Rejs)	Number of Security Association map reject messages	0 (zero)
Control	Row status	—

ip-mcast-modify/<mcast-index> [s, i]

Use the **ip-mcast-modify/<mcast-index>** "show and info" subtree commands to modify the internet protocol multicast index.

Command Path

```
[] box# baseline-privacy ↵
[] baseline-privacy# ip-mcast-modify/<mcast-index> ↵
```

Syntax

```
show

info
```

Syntax Qualifier	Description
<mcast-index>	index of IP multicast entry

ip-mcast-modify/<mcast-index> [s] show

Table 180: ipmcast-modify/<mcast-index> show data items

Data Item	Description	Typical Value or Range
sa-map-requests	Number of Security Associaton map requests	—
sa-map-replies	Number of Security Associaton map replies	—
sa-map-rejects	Number of Security Associaton map rejects	—
sa-map-reject-error-code	Value of most recent Security Associaton map reject error code	none (1)
sa-map-reject-error-string	Text representation of Security Associaton map reject error code	none (null)

ip-mcast-modify/<mcast-index> [i] info

Table 181: ip-mcast-modify/<mcast-index> [i] info

Parameter	Default Value
mcast-ip-addr-type	IPV4
mcast-ip-addr	—
mcast-mask-type	IPV4
mcast-mask	—
mcast-security-association-id	8192 through 16383
mcast-sa-type	dynamic
mcast-data-encrypt-alg	des56-CBC-mode
mcast-data-encrypt-alg	none
map-control	row status *Note: Row creation is not supported with this table*

mcast-auth-list [s]

Use the **mcast-auth-list** "show" subtree command to view a list of Multicast SAID numbers, CM MAC addresses associated with cable modems and controls for CM operation for each multicast security authorization identification (SAID.)

Command Path

```
[] box# baseline-privacy ↵
[] baseline-privacy# mcast-auth-list ↵
```

Syntax

```
show
```

mcast-auth-list [s] show

Table 182: mcast-auth-list show data items

Data Item	Description	Typical Value or Range
Multicast SAID	Security Association ID associated with MAC address	• Number between 8192 and 16383
CM Mac Addr	MAC address associated with cable modem	• Number between 8192 and 16383
Control	Controls CM operation for each multicast SAID	• active • not-in-service • not-ready • create-and-go • create-and-wait • destroy

mcast-auth-modify/<mcast-said-num>/<cm-mac-addr> [s, i]

Use the **mcast-auth-modify/<mcast-said-num>/<cm-mac-addr>** "show and info" subtree commands to view the multicast SAID and CM MAC address.

Command Path

```
[] box# baseline-privacy ↵
[] baseline-privacy# mcast-auth-modify/<mcast-said-num>/cm-mac-addr>
↵
```

Syntax

```
show
info
```

Syntax Qualifier	Description
<mcast-said-num>	Security Association number for multicast ID
<cm-mac-addr>	MAC address associated with the CM

mcast-auth-modify/<mcast-said-num>/<cm-mac-addr> [s] show

Table 183: mcast-auth-modify/<mcast-said-num>/<cm-mac-addr> show data items

Data Item	Description	Typical Value or Range
mcast-security-associa-tion-id	Multicast ID security association number	• Number between 8192 and 16383
CM Mac Addr	Cable modem MAC address	—

mcast-auth-modify/<mcast-said-num>/<cm-mac-addr> [i] info

Table 184: mcast-auth-modify/<mcast-said-num>/<cm-mac-addr> > [i] info

Parameter	Description or Values
auth-control	• Active • not-in-service • not-ready • create-and-go • create-and-wait • destroy

prov-cm-cert-list [s]

Use the **prov-cm-cert-list** "show" subtree command to display the list of provisioned cable modem certificates recognized by the CMTS.

Command Path

```
[] box# baseline-privacy ↵
[] baseline-privacy# prov-cm-cert-list ↵
```

Syntax

```
show
```

prov-cm-cert-list [s] show

Table 185: prov-cm-cert-list show data items

Data Item	Description	Typical Value or Range
CM Mac Address	Cable modem MAC address	valid MAC address
Trust	Trust state for the provisioned cable modem certificate entry	• trusted (1) • untrusted (2)
Source	Indicates how the certificate reached the CMTS	• snmp (1) • configurationFile (2) • external Database (3) • other (4)
Status	Indicates row-entry status in this table	• active • not-in-service • not-ready • create-and-go • create-and-wait • destroy

prov-cm-cert-modify/<mac-addr> [s,i]

Use the **prov-cm-cert-modify/<mac-addr>** "show and info" subtree commands to display or configure provisioned cable modem certificates, based on the MAC address of the cable modem. The provisioned cable modem certificate overrides the cable modem certificate transmitted by the cable modem as part of the BPI+ protocol.

Command Path

```
[] box# baseline-privacy ↵
[] baseline-privacy# prov-cm-cert-modify/<mac-addr> ↵
```

Syntax

```
show
info
```

Syntax Qualifier	Description
<mac-addr>	MAC address of cable modem used to select row entry in prov-cm-list table

prov-cm-cert-modify/<mac-addr> [s] show

Table 186: prov-cm-cert-modify/<mac-addr> show data items

Data Item	Description	Typical Value or Range
cm-mac-address	Cable modem MAC address	valid MAC address
source	Indicates how the certificate reached the CMTS	• snmp (1) • configurationFile (2) • external Database (3) • other (4)

prov-cm-cert-modify/<mac-addr>[i] info

Table 187: prov-cm-cert-modify/<mac-addr> info parameters

Parameter	Description or Values	Default	Range
trust	Certificate trust level	trusted	trusted untrusted
status	Current certificate status. create-and-wait should be performed first.	Depends on other object values.	active not-in-service not-ready create-and-go create-and-wait destroy
cert	Certificate represented as an octet string	—	Octet string

ca-cert-list [s]

Use the **ca-cert-list** "show" subtree command to display the list of manufacturer certificates.

Command Path

```
[] box# baseline-privacy ↵
[] baseline-privacy# ca-cert-list ↵
```

Syntax

```
show
```

ca-cert-list [s] show

Table 188: ca-cert-list [s] show

Data Item	Description	Typical Value or Range
Index	Index to table row-entry used by ca-cert-modify command	—
trust	Certificate trust level. Root certificates must be given root trust; manufacturer certificates must not be given root trust.	trusted (1) untrusted (2) chained (3) root (4)
Source	Indicates how the certificate reached the CMTS	snmp (1) configurationFile (2) externalDatabase (3) other (4) authentInfo (5) compiledIntoCode (6)
Status	Certificate status	active not-in-service not-ready create-and-go create-and-wait destroy
Subject	Print description of the certificate subject, including at a minimum the organization name. Additional fields may be present and should be separated by CR LF.	Text description

ca-cert-modify/<index> [s,i]

Use the **ca-cert-modify/<index>** "show and info" subtree commands to view or configure cable modem certificates.

Command Path

```
[] box# baseline-privacy ↵
[] baseline-privacy# ca-cert-modify/<index> ↵
```

Syntax

```
show
info
```

Syntax Qualifier	Description
<index>	Index to the ca-cert-list table row entries

ca-cert-modify/<index> [s] show

Table 189: ca-cert-modify/<index> show data items

Data Item	Description	Typical Value or Range
index	Index to table	—
subject	Printable representation of the organization name portion of the certificate's subject name. Additional fields may be present and should be separated by CR LF.	X509 Certificate Default is "" (NULL)
issuer	Printable representation of the common name portion of the certificate's issuer name. Additional fields may be present and should be separated by CR LF.	Text string
serial-number	Certificate serial number	Octet string length
source	Source of certificate	snmp (1) configurationFile (2) externalDatabase (3) other (4) authentInfo (5) compiledIntoCode (6)
thumbprint	SHA-1 hash of certificate	—

ca-cert-modify/<index> [i] info

Table 190: ca-cert-modify/<index> info parameters

Parameter	Description or Values	Default	Range
trust	Type of trust for certificate.	Self-signed manufacturer certificate default value comes from SelfSigned-ManufCertTrust object; otherwise default is chained (or root).	trusted untrusted chained root
status	Administrative status of certificate.	—	active not-in-service not-ready create-and-go create-and-wait destroy

Table 190: ca-cert-modify/<index> info parameters

Parameter	Description or Values	Default	Range
cert	An X509 DER-encoded certificate authority certificate. NOTE: The null string must be returned on reads, if the entire certificate is not retained by the CMTS.	X509 Certificate Default is "" (NULL)	octet string

event-level [s, i]

Use the **event-level** "show and info" commands to display or configure event reporting by the CMTS. The event-level command allows you to create and distribute reports of selected system events.

The system log of events can be turned on or off, and stored at a primary and two backup log server addresses.

Command Path

```
[] box# event-level ↵
```

Syntax

```
show
info
```

event-level [s] show

Table 191: event-level show data items

Data item	Description	Range
throttle-inhibited	Number of events in event log is limited	false true

event-level [i] info

Table 192: event-level info parameters

Parameter	Description or Values	Default	Range
control	Event-log action	use-default-reporting	reset-log use-default-reporting
syslog-ip-addr	IP address of primary syslog server	0.0.0.0	valid IP address
syslog2-ip-addr	IP address of secondary syslog server	0.0.0.0	valid IP address
syslog3-ip-addr	IP address of second backup syslog server	0.0.0.0	valid IP address
admin-status-of-throttle	CMTS administrative throttle status. This controls the size of the event log. When unconstrained, all events are retained. The threshold limits the number of events. When inhibited, events are throttled.	inhibited	• unconstrained • maintain-below-threshold • stop-at-threshold • inhibited
threshold-of-throttle	Number of events triggering throttle	100	any number
interval-of-throttle	Duration of throttle interval (in seconds)	10	1 to 2147483647
alert-reporting	Reporting method for emergency events. The CMTS can be configured to send local alarms, trap messages, record in syslog, or none (no action).	local	local traps syslog none
alert-reporting	Reporting method for alert events. The CMTS can be configured for local alerts, trap messages, syslog messages, or none (no action).	local	local traps syslog none

Table 192: event-level info parameters (continued)

Parameter	Description or Values	Default	Range
critical-reporting	Reporting method for critical events. The CMTS can be configured for local alerts, trap messages, syslog messages, or none (no action)	local	local traps syslog none
error-reporting	Reporting method for errors	local	local traps syslog none
warning-reporting	Reporting method for warning events. The CMTS can be configured for local alerts, trap messages, syslog messages, or none (no action).	local	local traps syslog none
notice-reporting	Reporting method for notice events. The CMTS can be configured for local alerts, trap messages, syslog messages, or none (no action).	local	local traps syslog none
information-reporting	Reporting method for information events. The CMTS can be configured for local alerts, trap messages, syslog messages, or none (no action).	local	local traps syslog none
debug-reporting	Reporting method for debugging events. The CMTS can be configured for local alerts, trap messages, syslog messages, or none (no action).	none	local traps syslog none

event-level [?] (next level)

Table 193: event-level next level commands

Next Level Command	Page #
events-list [s]	page 3-306

events-list [s]

Use the **events-list** "show" subtree command to display the event log maintained by the CMTS.

A text description of the event is displayed below the show data. A typical description is "Software upgrade reports Booted from flash album" or "Last system reset was due to HW: POWER CYCLE RESET."

Command Path

```
[] box# event-level ↵
[] event-level# events-list ↵
```

Syntax

```
show
```

events-level [s] show

Table 194: events-level show data items

Data Item	Description	Typical Value or Range
First Date-Time	First instance of the event logged by the CMTS. If the timer has not been set, then the date-time will be shown as "01/01/1970 00:00:00".	DD/MM/YYYY and HH:MM:SS format
Latest Date/Time	Last instance of the event logged by the CMTS. If the timer has not been set, then the date-time will be shown as "01/01/1970 00:00:00".	DD/MM/YYYY and HH:MM:SS format
Repeat Count	Count for event	integer
Event Id	Event ID Number	
Severity Level	Event severity level	Information Error

serial-port [i]

The serial port "info" command configures the CMTS serial port. Typically, the serial port is used as a console connection for the CLI.

Command Path

```
[] box# serial-port ↵
```

Syntax

```
info
```

serial-port [i] info

Table 195: serial-port info parameters

Parameter	Description or Values	Default	Range
baud-rate	Serial port baud rate	9600-baud	1200-baud 2400-baud 4800-baud 7200-baud 9600-baud 14400-baud 19200-baud 28800-baud 38k-baud 56k-baud 64k-baud 76k-baud 96k-baud 115k-baud
data-bits	Number of data-bits per byte	8	any number
parity	Parity value for serial port	none	none odd even
stop-bits	Stop bit value for serial port	1-bit	1-bit 1 5-bit 2-bits
modem-enable	CMTS can be connected to a modem for remote access via the serial port	disabled	enabled disabled

Modem Command

Use the modem commands to display information for all cable modems on the network.

The modem commands consist of the basic modem command, plus a set of subcommands. The modem subcommands are defined by the sub-verb attached to the modem command. These **modem** subcommands are used to select specific modems or sub-sets of modem actions. The affected cable modem selection is indicated by `<modem>`.

The modem command **help** lists the available qualifiers.

Note: The CMTS may have hundreds of cable modems connected to it, and the modem command output may list all of these cable modems, depending on the display options selected.

Modem Command Syntax

```
modem<subverb><mac-addr>|* [qualifiers]
```

Table 196: modem command and subcommand syntax

Subverb		Description
modem		Lists modems attached to the CMTS
<subverb>	activity	Displays specified modem operations as they occur
	alias	Assigns a text-based name to a specific modem
	connected	Lists active modems attached to the CMTS
	history	Lists recent events for a specified modem
	restart	Forces the modem to re-arrange and re-register
	state	Displays current state of the modem
	total	Displays total number of active modems
	unalias	Clears text-based alias assigned to a modem
	worst	Lists modems worst characteristics
<mac-addr>		Specifies cable modem by MAC address
<alias-name		Select modem based on alias name assigned to modem
* (Wildcard)		Selects all cable modems
<qualifiers>		Modifies <sub-verb> action. Refer to individual commands for details.

Note: **If the more command is active, you can quit this display.**

Note: **<Ctrl C> is also used to quit the display**.

modem

Use the basic **modem** command to view or modify cable modem information. Use the **modem** command, by itself, to list all cable modems recognized by the CMTS, in table format.

Command Path

```
[] Console> modem ↵
```

Syntax

```
modem <subverb> < mac-addr | alias-name | * > [qualifiers]
```

Syntax Qualifier	Description
<subverb>	Subcommand descriptor
<mac-addr>	Cable modem MAC address
<alias-name>	Cable modem alias-name (alternate to MAC address)
*	Wildcard indicating all modems
[qualifiers]	Subcommand options and settings

modem Command Data Items

Table 197: modem Command Data Items

Data Item	Description	Typical Value or Range
Index	Index to row entry in table	—
Chan	Upstream channel assigned for cable modem	1 through 8
Station ID	Station ID attached to cable modem	valid Station ID
Status	Current cable modem status	valid cable modem status
IP Address	Cable modem IP address	valid IP address
SIDs	Service ID numbers associated with cable modem	valid SID number

modem activity

Use the **modem activity** subcommand to view cable modem activity on the network. Modem activity bits for various cable modem activities are cleared or set with this command. When activity bits are set, an output line is displayed on the CLI terminal. Use the modem activity qualifiers to specify a particular cable modem, or select all cable modems.

The modem activity command is turned *off* for normal CMTS operation, but is turned *on* for *all* activity or for specific types of modem activity.

The modem alias (if present) is used instead of a MAC address to identify modems. When a wildcard is used, the settings apply to all current and future modems. Setting to a specific modem overrides the * (wildcard) values for that modem. Subsequent * (wildcard) settings override any previous individual settings.

Command Path

```
[ ] Console> modem activity <modem> <qualifier> ↵
```

Syntax

modem activity <modem> <qualifier>

Syntax Qualifier	Description
<modem>	Specifies modem or modems affected by subcommand: • <mac-addr> specifies cable modem MAC address • <alias-name> specifies cable modem alias • * (wildcard) specifies all cable modems. You will be prompted to confirm this choice, since it may produce a lot of output mixed with other CLI information.
[qualifiers]	Command qualifiers: • initial_ranging • ranging_with_perm_sid • registration • authorization • dhcp • tftp • all (all of the above) • off (turn off all settings)

Modem Activity Qualifier Descriptions

Table 198: Modem Activity Qualifier Descriptions

Qualifier	Description
initial_ranging	Displays **initial ranging** activity when the cable modem synchronizes communication with the CMTS. Initial ranging information indicates whether the cable modem is properly connected to the cable modem network, or if there are any connection problems. • timestamp • cable modem alias or MAC address • upstream channel receiving ranging request • adjustment (offset) in time ticks (based on distance) • channel frequency (center frequency in Hz)
ranging_with_perm_sid	Gathers cable modem SID (Service Identification) activity, which is a reference number for each cable modem service flow. The cable modem obtains its SID after completion of initial ranging. • timestamp • MAC address • ranging responses received/sent • SID
registration	Displays the cable modem **registration** information. This registration data displays the message exchanges among the CMTS, the provisioning server, and the cable modem that occurs when the cable modem joins the network.
authorization	Displays **authentication** activity during the registration and baseline privacy configuration process. Use this subcommand when you want to determine if a cable modem failed the authorization or baseline privacy configuration processes.
dhcp	Displays **DHCP** activity between the cable modem and the DHCP/TFTP server. This qualifier is used when you want to view the cable modem DHCP discover address, the source MAC address, the source IP address, the IP address mask, and the IP address gateway. This command displays the cable modem settings, and can be compared with the settings for the DHCP/TFTP server itself.
tftp	Displays the **TFTP** activity for the modem. TFTP configuration settings and file transfer from the provisioning server to the cable modem are displayed.
all	Turns on **all** modem activity qualifier settings. The <modem> identifier is the cable modem MAC address or the alias assigned to the cable modem.
off	Turns **off** all modem activity bits for the specified cable modem device

Examples

To display all activity information for a modem with the MAC address 00:00:ca:14:13:3d, type the following:

```
[ ] Console> modem activity 00:00:ca:14:13:3d all ↵
```

To display TFTP activity for the modem "775Parker":

```
[ ] Console> modem activity 775Parker tftp ↵
```

To turn off all modem activity displays for all modems:

```
[ ] Console> modem activity * off ↵
```

modem alias

Use the **modem alias** subcommand to associate an alias to the cable modem MAC address. An alias is a substitute name or designation. Once a cable modem has an alias, it is used in place of the MAC address in other commands. The alias feature helps you identify and select modems using a convenient text name. For certain displays, both the alias and the MAC address are shown.

Command Path

```
[ ] Console> modem alias ↵
```

Syntax

```
modem alias < * | mac-address > <name>
```

Syntax Qualifier	Description
*	Wildcard selecting all cable modems
<mac-address>	Specifies cable modem MAC address
<name>	Alias name assigned to cable modem

Examples

To show all MAC/alias pairs for cable modems:

```
[] console> modem alias * ↵
```

To show MAC address for the given alias name:

```
[] console> modem alias <name> ↵
```

To show the alias for the given MAC address:

```
[] console> modem alias <mac-address> ↵
```

To assign the alias name to the cable modem MAC address:

```
[] console> modem alias <MAC address> <name> ↵
```

modem connected

Use the **modem connected** subcommand to view a list of ranged cable modems attached to the CMTS.

The **modem connected** command is slightly different from the solitary **modem** command:

- **modem connected** displays modems with an active connection to the CMTS.
- **modem** displays all modems known to the CMTS (stored in the Forwarding Data Base).

Command Path

```
[ ] Console> modem connected ↵
```

Syntax

```
modem connected
```

modem connected Command Data Items

Table 199: modem connected Command Data Items

Data Item	Description	Typical Value or Range
Indx	Index to row entry in table	—
Chan	Upstream channel assigned for cable modem	1 through 8
Station ID	Station ID linked to modem	valid station ID
Status	Displays current cable modem status	valid cable modem status
IP Address	Cable modem IP address	valid IP address
SIDs	Service ID numbers linked to cable modem	valid SID number

modem history

Use the **modem history** command to display records of cable modem events that are maintained by the CMTS (stored in the history log). This log includes events for all cable modems. You select a cable modem by the MAC address, alias, or ***** (wildcard) for *all* modems. You can also use qualifiers to select certain event types, or limit the maximum number of output lines (maximum is 128 lines).

When you use the ***** (wildcard) character, a message is displayed warning you that the history for *all* modems will be displayed, and that you must select **Y** to continue. The warning is displayed because you requested to view thousands of events.

The **modem history** command qualifiers are similar to the **modem activity** command qualifiers. The **modem history** command displays the past events, while the **modem activity** command displays on-going modem activity.

Command Path

```
[ ] Console> modem history <modem> [history type] [output-line-count]↵
```

Syntax

```
modem history <modem> [history type] [output-line-count]
```

Syntax Qualifier	Description
<modem>	Specifies modem or modems affected by subcommand: • <mac-addr> specifies cable modem MAC address • <alias-name> specifies cable modem alias • * specifies all cable modems. You will be prompted to confirm this choice, since it may produce a lot of output mixed with other CLI information.
[history type]	Selects history type to display: • initial_ranging • ranging_with_perm_sid • registration • authorization • dhcp • tftp
[output-line-count]	Limits number of output lines (1 to 128). If no number is specified, up to 128 lines of output are displayed.

Modem History Qualifier Descriptions

Table 200: Modem History Qualifier Descriptions

History Qualifier	Description
authorization	Displays authentication activity during modem registration and base-line privacy configuration
dhcp	Displays the DHCP exchanges by the cable modem, including the IP address assigned by the DHCP server to the cable modem
initial_ranging	Displays the initial ranging process between the cable modem and the CMTS
ranging_with_perm_sid	Displays cable modem ranging activity history up to the permanent SID assignment
registration	Displays cable modem registration information
tftp	Displays the cable modem exchanges with the TFTP server

modem restart <modem>

Use the **modem restart** command to restart individual modems, specified by the MAC address or alias. You cannot restart all modems with the ***** (wildcard) option. The modem restart subcommand does not restart inactive or unregistered modems.

The **modem restart** command is used when you want to reconfigure the cable modem with a different configuration file. When the cable modem restarts, the entire ranging and registration process is performed, including loading the latest cable modem configuration file from the TFTP server.

Command Path

```
[] Console> modem restart <modem> ↵
```

Syntax

```
modem restart <modem>
```

Syntax Qualifier	Description
<modem>	Specifies modem or modems affected by subcommand: • <mac-addr> specifies cable modem MAC address • <alias-name> specifies cable modem alias

modem state

Use the **modem state** command to display detailed state information known to the CMTS for a specific modem.

The modem command displays the device class identifier which shows the type of modem. For example: CCCM is a CPE controlled cable modem.

Command Path

```
[ ] Console> modem state <modem> ↵
```

Syntax

```
modem state <modem>
```

Syntax Qualifier	Description
<modem>	Specifies modem or modems affected by subcommand: • <mac-addr> specifies cable modem MAC address • <alias-name> specifies cable modem alias

Cable modem information is described in Table 201 on page 4-13.

The "*" choice is not allowed in this command.

Modem state display items

Table 201: Modem state display items

Display Item	Description
\<modem\>	MAC address of modem
Current state	cable modem current administrative state: • Ranging • Registered
Ranging info	Shows this data: • Ranged on upstream (channel) • Power level (tenths-of-dBmV) • Distance one-way (offset)
Device Class Identi-fier	CCCM Displayed when the modem indicates its class to the CMTS
Registration info	Lists registration activity between the CMTS and the cable modem: • Registered as IP address
Modem Capabilities	• Concatenation • DOCSIS version • Fragmentation • Payload Header Suppression • IGMP • Privacy Support Type • Optional Filtering • Downstream SAIDs supported • Upstream SIDs supported • Downstream channel change support
Hosts	Displays the MAC address of the CPE when BPI is turned on. Displays the IP address of the CPE when the CMTS is in mode B forwarding.
Privacy	Displays **disabled** if baseline privacy is disabled for the cable modem, or **Authorization Key is valid** when the cable modem has a valid key
Uptime	Shown in days, hours, minutes and seconds. Uptime is measured since the last restart of the modem (power reset or software restart).

Table 201: Modem state display items

Display Item	Description
Counts	Statistics for the following activity: • Initial Rangings • Invalid Rangings • Aborted Rangings • Registrations • Bad Registrations • Failed Registrations • CRC Errors • HCS Errors • T5 Timeouts
Upstream service flows	Upstream service flow information is shown when service flow activity occurs
Downstream service flows	Downstream service flow information is shown when service flow activity occurs

modem total

Use the **modem total** command to display the total number of currently registered modems.

Command Path

```
[ ] Console> modem total ↵
```

Syntax

```
modem total <all|group|channel>
```

Syntax Qualifier	Description
<all>	All modems
<group>	Group of modems
<channel>	Upstream channel

modem unalias

Use the **modem unalias** command to remove an alias assigned to a specific cable modem, or all cable modems on the network with the * (wildcard). The MAC address does not change when the alias is removed. A warning message is displayed before you can remove aliases for *all* cable modems, to prevent accidental name deletion.

Command Path

```
[ ] Console> modem unalias ↵
```

Syntax

```
modem unalias <alias|mac|*>
```

Syntax Qualifier	Description
<alias>	Cable modem alias-name (alternate to MAC address)
<mac-addr>	Cable modem MAC address
*	Wildcard indicating all modems

Examples

To remove the alias for a specific modem:

```
modem unalias <alias>
```

To remove all cable modem aliases:

```
modem unalias *
```

modem worst

Use the **modem worst** command to display cable modems with *worst* characteristics. This command lists modems with specific characteristics.

Command Path

```
[ ] Console> modem worst [qualifier] [output-line-count] ↵
```

Syntax

```
modem worst [qualifier] [output-line-count]
```

Syntax Qualifier	Description
[qualifier]	Qualifies or limits command: • crc-errors • hcs-errors • rangings-initial • invalid-rangings • abort-rangings • registrations • bad-registrations • failed-registrations • t5-timeouts • uptimes-active • up-all-times
[output-line-count]	Limits number of output lines (1 to 128). If no number is specified, up to 128 lines of output are displayed.

modem worst qualifiers

The modem worst command qualifiers are described in the following table:

Table 202: modem worst qualifiers

Qualifier	Description
crc-errors	Displays modems with the highest number of CRC (Cyclic Redundancy Check) errors. CRC errors are produced when a data packet fails a checksum test used to trap various transmission errors.
hcs-errors	Displays all modems with HCS (Head Check Sum) errors. HCS errors occur when the header bits in the data frame fail a checksum test used to trap transmission errors.
rangings-initial	Display modems with initial ranging errors
invalid-ranging	Display modems with invalid ranging information. Invalid rangings is caused by incorrect channel, incorrect frequency, or invalid time-slot information.
abort-rangings	Displays all cable modems which aborted or halted the initial ranging process
registrations	Displays all cable modems that have missing registration information
bad-registrations	Displays all cable modems that have incorrect registration information
failed-registrations	Displays all cable modems that failed the registration process
t5-timeouts	Lists cable modems with t5 (timeout) errors. T5 errors occur when the transmission time between the cable modem and the CMTS exceed an allowed time interval. These timing errors are caused by problems with the cable plant.
uptimes-active	Displays a list of cable modems with the shortest active up-times. A short period of up-time is caused by different factors. Can be used to locate cable modems that have recently joined the network.
up-all-times	Displays uptimes for all active and inactive modems known to the CMTS (by MAC address and/or alias)

CMTS 1500 software license

Restricted Rights Legend

Use, duplication, or disclosure by the United States Government is subject to restrictions as set forth in subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause at DFARS 252.227-7013.

Notwithstanding any other license agreement that may pertain to, or accompany the delivery of, this computer software, the rights of the United States Government regarding its use, reproduction, and disclosure are as set forth in the Commercial Computer ARRIS Software-Restricted Rights clause at FAR 52.227-19.

Statement of Conditions

In the interest of improving internal design, operational function, and/or reliability, ARRIS reserves the right to make changes to the products described in this document without notice.

ARRIS does not assume any liability that may occur due to the use or application of the product(s) or circuit layout(s) described herein.

Portions of the code in this software product may be Copyright © 1988, Regents of the University of California. All rights reserved. Redistribution and use in source and binary forms of such portions are permitted, provided that the above copyright notice and this paragraph are duplicated in all such forms and that any documentation, advertising materials, and other materials related to such distribution and use acknowledge that such portions of the software were developed by the University of California, Berkeley. The name of the University may not be used to endorse or promote products derived from such portions of the software without specific prior written permission.

SUCH PORTIONS OF THE SOFTWARE ARE PROVIDED "AS IS" AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

In addition, the program and information contained herein are licensed only pursuant to a license agreement that contains restrictions on use and disclosure (that may incorporate by reference certain limitations and notices imposed by third parties).

ARRIS Software License Agreement

NOTICE: Please carefully read this license agreement before copying or using the accompanying software or installing the hardware unit with pre-enabled software (each of which is referred to as "Software" in this Agreement). BY COPYING OR USING THE SOFTWARE, YOU ACCEPT ALL OF THE TERMS AND CONDITIONS OF THIS LICENSE AGREEMENT. THE TERMS EXPRESSED IN THIS AGREEMENT ARE THE ONLY TERMS UNDER WHICH ARRIS WILL PERMIT YOU TO USE THE SOFTWARE. If you do not accept these terms and conditions, return the product, unused and in the original shipping container, within 30 days of purchase to obtain a credit for the full purchase price.

1. License Grant. ARRIS ("ARRIS") grants the end user of the Software ("Licensee") a personal, non exclusive, nontransferable license: a) to use the Software either on a single computer or, if applicable, on a single authorized device identified by host ID, for which it was originally acquired; b) to copy the Software solely for backup purposes in support of authorized use of the Software; and c) to use and copy the associated user manual solely in support of authorized use of the Software by Licensee. This license applies to the Software only and does not extend to ARRIS Agent software or other ARRIS software products. ARRIS Agent software or other ARRIS software products are licensed for use under the terms of the applicable ARRIS Software License Agreement that accompanies such software and upon payment by the end user of the applicable license fees for such software.

2. Restrictions on use; reservation of rights. The Software and user manuals are protected under copyright laws. ARRIS and/or its licensors retain all title and ownership in both the Software and user manuals, including any revisions made by ARRIS or its licensors. The copyright notice must be reproduced and included with any copy of any portion of the Software or user manuals. Licensee may not modify, translate, de compile, disassemble, use for any competitive analysis, reverse engineer, distribute, or create derivative works from the Software or user manuals or any copy, in whole or in part. Except as expressly provided in this Agreement, Licensee may not copy or transfer the Software or user manuals, in whole or in part. The Software and user manuals embody ARRIS' and its licensors' confidential and proprietary intellectual property. Licensee shall not sublicense, assign, or otherwise disclose to any third party the Software, or any information about the operation, design, performance, or implementation of the Software and user manuals that is confidential to ARRIS and its licensors; however, Licensee may grant

permission to its consultants, subcontractors, and agents to use the Software at Licensee's facility, provided they have agreed to use the Software only in accordance with the terms of this license.

3. Limited warranty. ARRIS warrants each item of Software, as delivered by ARRIS and properly installed and operated on ARRIS hardware or other equipment it is originally licensed for, to function substantially as described in its accompanying user manual during its warranty period, which begins on the date Software is first shipped to Licensee. If any item of Software fails to so function during its warranty period, as the sole remedy ARRIS will at its discretion provide a suitable fix, patch, or work around for the problem that may be included in a future Software release. ARRIS further warrants to Licensee that the media on which the Software is provided will be free from defects in materials and workmanship under normal use for a period of 90 days from the date Software is first shipped to Licensee. ARRIS will replace defective media at no charge if it is returned to ARRIS during the warranty period along with proof of the date of shipment. This warranty does not apply if the media has been damaged as a result of accident, misuse, or abuse. The Licensee assumes all responsibility for selection of the Software to achieve Licensee's intended results and for the installation, use, and results obtained from the Software. ARRIS does not warrant a) that the functions contained in the software will meet the Licensee's requirements, b) that the Software will operate in the hardware or software combinations that the Licensee may select, c) that the operation of the Software will be uninterrupted or error free, or d) that all defects in the operation of the Software will be corrected. ARRIS is not obligated to remedy any Software defect that cannot be reproduced with the latest Software release. These warranties do not apply to the Software if it has been (i) altered, except by ARRIS or in accordance with its instructions; (ii) used in conjunction with another vendor's product, resulting in the defect; or (iii) damaged by improper environment, abuse, misuse, accident, or negligence. THE FOREGOING WARRANTIES AND LIMITATIONS ARE EXCLUSIVE REMEDIES AND ARE IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Licensee is responsible for the security of its own data and information and for maintaining adequate procedures apart from the Software to reconstruct lost or altered files, data, or programs.

4. Limitation of liability. IN NO EVENT WILL ARRIS OR ITS LICENSORS BE LIABLE FOR ANY COST OF SUBSTITUTE PROCUREMENT; SPECIAL, INDIRECT, INCIDENTAL, OR CONSEQUENTIAL DAMAGES; OR ANY DAMAGES RESULTING FROM INACCURATE OR LOST DATA OR LOSS OF USE OR PROFITS ARISING OUT OF OR IN CONNECTION WITH THE PERFORMANCE OF THE SOFTWARE, EVEN IF ARRIS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. IN NO EVENT SHALL THE

LIABILITY OF ARRIS RELATING TO THE SOFTWARE OR THIS AGREEMENT EXCEED THE PRICE PAID TO ARRIS FOR THE SOFTWARE LICENSE.

5. Government Licensees. This provision applies to all Software and documentation acquired directly or indirectly by or on behalf of the United States Government. The Software and documentation are commercial products, licensed on the open market at market prices, and were developed entirely at private expense and without the use of any U.S. Government funds. The license to the U.S. Government is granted only with restricted rights, and use, duplication, or disclosure by the U.S. Government is subject to the restrictions set forth in subparagraph (c)(1) of the Commercial Computer Software—Restricted Rights clause of FAR 52.227-19 and the limitations set out in this license for civilian agencies, and subparagraph (c)(1)(ii) of the Rights in Technical Data and Computer Software clause of DFARS 252.227-7013, for agencies of the Department of Defense or their successors, whichever is applicable.

6. Use of Software in the European Community. This provision applies to all Software acquired for use within the European Community. If Licensee uses the Software within a country in the European Community, the Software Directive enacted by the Council of European Communities Directive dated 14 May, 1991, will apply to the examination of the Software to facilitate inter operability. Licensee agrees to notify ARRIS of any such intended examination of the Software and may procure support and assistance from ARRIS.

7. Term and termination. This license is effective until terminated; however, all of the restrictions with respect to ARRIS' copyright in the Software and user manuals will cease being effective at the date of expiration of the ARRIS copyright; those restrictions relating to use and disclosure of ARRIS' confidential information shall continue in effect. Licensee may terminate this license at any time. The license will automatically terminate if Licensee fails to comply with any of the terms and conditions of the license. Upon termination for any reason, Licensee will immediately destroy or return to ARRIS the Software, user manuals, and all copies. ARRIS is not liable to Licensee for damages in any form solely by reason of the termination of this license.

8. Export and Re-export. Licensee agrees not to export, directly or indirectly, the Software or related technical data or information without first obtaining any required export licenses or other governmental approvals. Without limiting the foregoing, Licensee, on behalf of itself and its subsidiaries and affiliates, agrees that it will not, without first obtaining all export licenses and approvals required by the U.S. Government: (i) export, re-export, transfer, or divert any such Software or technical data, or any direct product thereof, to any country to which such exports or re-exports are restricted or embargoed under United

States export control laws and regulations, or to any national or resident of such restricted or embargoed countries; or (ii) provide the Software or related technical data or information to any military end user or for any military end use, including the design, development, or production of any chemical, nuclear, or biological weapons.

9. General. If any provision of this Agreement is held to be invalid or unenforceable by a court of competent jurisdiction, the remainder of the provisions of this Agreement shall remain in full force and effect. This Agreement will be governed by the laws of the state of California.

Should you have any questions concerning this Agreement, contact ARRIS, LLC, 6 Riverside Drive, Andover, MA 01810.

LICENSEE ACKNOWLEDGES THAT LICENSEE HAS READ THIS AGREEMENT, UNDERSTANDS IT, AND AGREES TO BE BOUND BY ITS TERMS AND CONDITIONS. LICENSEE FURTHER AGREES THAT THIS AGREEMENT IS THE ENTIRE AND EXCLUSIVE AGREEMENT BETWEEN ARRIS AND LICENSEE, WHICH SUPERSEDES ALL PRIOR ORAL AND WRITTEN AGREEMENTS AND COMMUNICATIONS BETWEEN THE PARTIES PERTAINING TO THE SUBJECT MATTER OF THIS AGREEMENT. NO DIFFERENT OR ADDITIONAL TERMS WILL BE ENFORCEABLE AGAINST ARRIS UNLESS ARRIS GIVES ITS EXPRESS WRITTEN CONSENT, INCLUDING AN EXPRESS WAIVER OF THE TERMS OF THIS AGREEMENT.

Cornerstone

CMTS 1500 Command Line Interface
Reference Guide

Printed in USA