

Cornerstone CMTS 1500 Release 4.3.1

Release Notes and Letter of Operational Considerations

Cornerstone

Cable Modem Termination System 1500 Software Release 4.3.1 Release Notes and Letter of Operational Considerations

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1 Objectives of This Document

1.1 ARRIS Commitment

ARRIS is committed to developing high quality, value-added products and services to the Multi-Service Operator (MSO). We continually to strive to meet our customers' needs with solutions that will help achieve their business objectives.

1.2 Purpose and Scope of This Release

This document is intended to describe the anomaly resolution implemented in this Cornerstone CMTS 1500 Release 4.3.1. It will also inform operators of known Operational Considerations associated with this product release that have been identified either through ARRIS testing or field operations.

1.3 Product Identification

Described in this document is the Cornerstone Cable Modem Termination System (CMTS) software release 4.3.1. The Cornerstone CMTS software is intended for the ARRIS manufactured Cornerstone CMTS product line (see Hardware Compatibility List). The functionality related to previous software releases is assumed in this document, but any differences between this release and earlier releases will be noted.

Ordering Code	Product	DOCSIS
710372	Cornerstone CMTS v4.3.1 Software CDROM	DOCSIS 1.0 / DOCSIS 1.1 EuroDOCSIS 1.0 / EuroDOCSIS 1.1
710373	Upgrade to CMTS v4.3.1 from v4.2	DOCSIS 1.0 / DOCSIS 1.1 EuroDOCSIS 1.0 / EuroDOCSIS 1.1

1.4 Hardware Compatibility List

The Cornerstone CMTS software release 4.3.1 will operate using the ARRIS products listed and is not intended for any other device.

Part No.	Product	Description
ARCD00048	Cornerstone CMTS1500AC	AC Powered
ARCD00049	Cornerstone CMTS1500DC	DC Powered
ARCD00047	Cornerstone CMTS1500MRC	DC Powered w/ MRC Adapter
ARSVR00031	Cornerstone CMTS1100AC	AC Powered

ARSVR00031 0

Cornerstone CMTS1100DC

DC Powered

1.5 Product Documentation

Product documentation is available on a CD-ROM. The documentation suite includes the following:

Part No.	Product
	Cornerstone CMTS 1500 Installation Guide (v4.3)
ARSVD00729	Cornerstone CMTS 1500 User Guide
ARSVD00756	Cornerstone CMTS 1500 Command Line Interface (CLI) Reference Guide
ARSVD00758	Cornerstone CMTS 1500 v4.3 CLI Quick Reference Guide
ARSVD00757	Cornerstone CMTS 1500 v4.3 Error Codes Guide

2 Release Notes

2.1 Features Changes/Additions

The Cornerstone CMTS 1500 Release 4.3.1 includes feature changes and additions introduced in this release. Previously known Operational Consideration items that have been resolved are documented below in section 2.3 Resolved Operational Considerations.

2.1.1 DOCSIS 2.0 Cable Modems Support

The Cornerstone CMTS 1500/1100 is now able to support DOCSIS 2.0 Cable Modem devices in the network. In earlier releases of the Cornerstone CMTS software, the CMTS 1500 TLV message recognition was limited to DOCSIS 1.1 format only. Due to the modified messaging format of the DOCSIS 2.0 compliant cable modems, the CMTS 1500 and a DOCSIS 2.0 CM were incompatible in TLV communication and thus the cable modem was unable to register. With this new software load, the CMTS 1500 TLV message recognition has been modified and it is now able to register DOCSIS 2.0 (and beyond) cable modems. This new feature for the CMTS 1500 is completely internal and it is not accompanied with a CLI level command.

2.1.2 DOCSIS Upstream Concatenation Support for Cable Modems (in 1.0 mode)

The Cornerstone CMTS 1500/1100 is now able to support DOCSIS Upstream Concatenation for DOCSIS Cable Modems operating in DOCSIS 1.0 mode (using 1.0 configuration files). Earlier releases of Cornerstone CMTS 1500 software would suppress this function for modems operating in DOCSIS 1.0 mode. Changes to support this new feature are completely internal and are not accompanied by any additional CLI commands or associated event log changes. This feature can be supported by the existing *concatenation-control* CLI command (available at the *manage; cable*; level). Please see the existing *Cornerstone*[™] 1500 Command Line Interface (CLI) Reference Guide for more information.

2.1.3 New CMTS Events

The Cornerstone CMTS 1500 now supports additional event messages. These messages will appear in the CMTS's event logs or on a syslog server if configured. The new event messages are DOCSIS messaging that have been added as part of the software compliance with CableLabs[™]. The following table contains the detail information on each message.

Event ID	Event Text Message	Event Definition	Priority
322	Registration rejected authentication failure: TFTP Server Timestamp invalid %.12llx	Registration rejected authentication failure: TFTP Server Timestamp invalid	Warning
1516	SSH session %d user '%s' logged in from '%s'	SSH session logged in	Information
1526	SSH session %d user '%s' logged out from '%s'	SSH session logged out	Information
4400	FH: Non-volatile memory is FULL, config changes will no longer be saved	Non-volatile memory is FULL, configuration changes will no longer be saved	Critical
4500	RFC COLDSTART TRAP	CMTS restart in progress.	Notice
4502	RFC LINKUP TRAP IfEntry_number:%d ifIndex:%d	Interface link is up (operational).	Notice
4503	RFC LINKDOWN TRAP IfEntry_numr:%d ifIndex:%d	Interface link is down (not operational).	Notice
4504	RFC AUTHENTICATION FAILURE invalid_name:'%s' nameLength:%d src_ip_addr"%x failure reason:%d interface:%d	SNMP Authentication Failed.	Error
82010100	No Ranging Requests received from POLLED CM (CMTS generated polls) %.12llxMAC addr: %s	No Ranging Requests received from POLLED CM	Warning
82010200	Retries exhausted for polled CM %.12llx -MAC addr: %s	Retries exhausted for polled CM	Warning
82010300	Unable to Successfully Range %.12llx CM Retries Exhausted -MAC addr: %s	Unable to Successfully Range Unable to Successfully Range	Warning
82010400	Failed to Receive Periodic RNG-REQ from modem (SID %d), timing-out SID -MAC addr: %s	Failed to Receive Periodic RNG-REQ from modem	Warning

2.2 Documentation Clarification – Ingress Avoidance

This section contains clarification to the Ingress Avoidance (IA) as described in the Standard documentation.

The Ingress Avoidance feature is used to assign channels for each upstream port to move to when plant noise makes its assigned channel unusable. IA also relies on carrier paths. Thus, operators can use the same channel for each upstream with each upstream supporting a different part of the network (carrier path). Each carrier path should be assigned its own unique identification. The default is for all 8 upstream ports to be assigned to carrier path 1. When one carrier path identification is used, each upstream port should be assigned to a different frequency. Consider that the provisioned upstream frequency is actually the center frequency, f_c , of an operational upstream range. The bandwidth determines the bounds of the operational range. For a bandwidth of 1.6 MHz, the upstream operational range is $f_c - 0.8MHz$ to $f_c + 0.8MHz$ or $f_c + /- 0.8MHz$; similarly for a bandwidth of 3.2 MHz, the upstream operational range is f_C +/-1.6Mhz. Overlap can occur if the resultant operating frequency ranges of any 2 or more adjacent provisioned upstream frequencies on the same carrier path intersect.

The software will compare all upstream channel information, including the channel information for all upstreams that may be administratively "out of service" (down). Operators have experienced the error "SNMP Error: Wrong Value" when attempting to enable Ingress Avoidance. The CMTS "believes" that all the upstreams are on the same carrier path and it sees close or exact uptstream frequencies as being overlapping and fails to enable ingress avoidance with the error indicated.

Refer to the Cornerstone User and Operator's guides for further instruction and usage of Ingress Avoidance.

2.3 Resolved Operational Considerations

The listed Resolved Operational Considerations/Product Deficiencies have been implemented in this release of the CMTS 1500 4.3.1 software and any future releases.

2.3.1 Resolved Critical Issues

Tracking No.	Description
1-RM7T	When a DSX transaction tries to add 2 classifiers and 2 PHS, rules the CMTS would assert (reset)
1-1QFJ5	Fix a divide by zero error in the function slowtime_now() because the resolution field of the slowtimer structure being reset to zero.

The following is a list of resolved critical issues.

Tracking No.	Description
1-1TB5P	Assert when IfSignalQuality MIB is queried while Ingress Avoidance is enabled
1-1VK0W	Bad pointers being used to update error counts in Haulback status

2.3.2 Resolved Major Issues

The following is a list of resolved major issues.

Tracking No.	Description
1-TTSB	Subscriber Management incorrectly filters downstream traffic when the protocol is set to ICMP only
1-1851U	CMTS crashed when a CM attempted to register with BPI+ parameters SA MAP Wait timeout and SA MAP Max retries set to 100
1-VEH9	IfIndex.x, ifAdminStatus.x, and ifOperStatus.x bindings are incorrect in linkup and linkdown traps.
1-X7OM	The CMTS would sometimes Assert when testing with Agilent test unit while changing the D/S guaranteed bandwidth)
1-19P51	If a SNMP "get" command was performed on a non-existent QoS parameter set, the CMTS could have watchdog reset.
1-1IF16	If a CM has a DHCP lease time of infinite, the CMTS will not pass traffic from that CM $% \left({{\rm D}_{\rm A}} \right)$
1-1LYKP	The CMTS will not register a CM that has a DOCSIS version of 2 or higher in its modem capability TLV
1-1JYQL	The CMTS performance degrades over time as evidenced by long IP ping delays to CMs
1-1R2DD	Implemented Broadcom supplied solution for BCM3137 bad transmitter equalization coefficients
1-1RP4T	Ingress avoidance uses incorrect health counters to determine when to hop.

2.3.3 Resolved Minor Issues

The following is a list of resolved minor issues.

Tracking No.	Description
1-UZA4	Setting the igmpInterfaceRobustness object to 4294967295 from the CLI will result in a value of –1 and the igmpLastMemberQueryInterval was returned by putcfg display after a reset factory.

Tracking No.	Description
1-1CEOD	When a SnmpCommunity was created 32 characters long, putmng / putcfg will displayed all its parameters as "SNMP Error: No Such Name."
1-1G9K5	If left running long enough the Broadcom counters for total FEC blocks would max out at 0xFFFFFFF and stop counting and possibly cause the FEC unErroreds to begin to decrease.
Q00038269	CMTS front panel displays status of "SYSTEM STATE" incorrectly
Q00040225	Channel to frequency mapping was incorrect (on front panel display)
Q00042730	TX-OCTET rate and RX-OCTET rate displayed incorrectly
1-QZOL	At the CLI "manage, cable level", the cm-filter-list table heading format is distorted
1-18854	Generating keys for SSH when flash is full sometimes caused the CMTS to crash
1-17QDT	POC stats could become inaccurate under heavy load.
1-16RFH	After SSH is enabled, an entry of local port 153 appears in the tcpConnState table of the CMTS
1-16PTA	Telnet sessions' displays sometimes would become garbled after terminating an SSH session
1-16LC6	SSH can be enabled without setting server / host keys
1-1EAQ5	When the BPI was disabled and no BPI TLVs were in the CM config file, the CMTS erroneously displayed the event "REG: No MCNS_TLVT_REG_REQ_BASELINE_PRIVACY,. MCNS_TLVT_REG_REQ_BASELINE_PRIVACY, turn off privacy_enable"
1-1FNI5	The CLI "modem alias" command did not work in 4.0.402
1-16GS5	If creating an entry of MAC 00:00:00:00:00:00 for upstream transmitter disable from the CLI under "cable-level -> modem-us-disable-modify/ <mac>", displaying the table LcCmtsCmTxDisableEntry via an SNMP browser would cause the continuous display of a 00 entry,</mac>
1-16V7L	SSH sessions were logged as normal telnet sessions in system log
1-16PT5	SSH did not regenerate keys after setting a specific regenerating period
1-16LC1	CMTS did not retain host/server keys set by the CLI ssh-keygen command
1-14VG9	The CLI commands "Putcfg" and "Putmng" would return garbled characters in SUBMGT PKT FILTER TABLE.
1-NEFX	CLI "bp auth" command did not use the "more" functionality.
Q0042583	A counter that tracks the packets forwarded by the bootp-relay did not update consistently.
1-Q7AH	The snmpInvalidMessage counter did not appear to increment when receiving an SNMP packet with the message flag set to 0x02.

Tracking No.	Description
1-Q7AM	The <i>snmpUnknownPDUHandlers</i> counter did not increment when receiving an SNMP packet that has the context engine identifier encoded as a zero length octet string.
1-Q7AD	The <i>snmpUnknownSecurityModels</i> counter does not increment when sending a get request to the CMTS using an invalid version number for SNMP.
Q00135342	Values of host-key and server-key could not be set in CLI console command "ssh-keygen" separately.
1-OX81	<i>Docsistrapcontrol</i> (docsDevCmtsTrapControl) value in <i>putmng</i> output was incorrect.
1-OX83	<i>send-inform</i> (IcdocsCmtsTrapTypeControl) value in <i>putmng</i> output was incorrect.
1-PMRH	If a v3 user with Authentication, but no Privacy protocol was configured, by cloning it to another v3 user with Authentication and Privacy protocols set, upon resetting the CMTS the privacy protocol would resort back to the protocol of the cloned user.
1-PN01	Documentation changed to reflect: 'When creating SNMPv3 accounts you have to change the V3 passwords before the accounts can be turned on."
1-16LC1	The CMTS did not remember the ssh host/server bits values set by the CLI <i>keygen</i> command.
Q00135348	Debug messages would sometimes show up in telnet sessions

3 Letter of Operational Considerations

3.1 Descriptions of Operational Considerations

System operating considerations for the Cornerstone CMTS 1500 and software release 4.3.1 that may affect service, operations or maintenance of the software and hardware are described below. Unless specifically noted, it is ARRIS's intention to have all these considerations resolved in future software releases.

3.1.1 Assertion in Qd.c

Tracking No.	PROD0006103
Description	Under heavy traffic conditions, the CMTS may experience problems with buffer management. Consequently, the CMTS is unable to forward data traffic downstream. The CMTS detects this error and initiates a reset.
Impact	Service-affecting. The CMTS will reset, after which it will recover autonomously and cable modems will re-register and the system will continue to operate properly.
Probability of Occurrence	Low
Work Around	None
Affected loads	4.3.1
Status Field Bulletin No.	Open

3.1.2 Cannot set message size if snmpTargetAddr table status is active

Tracking No.	1-Q0QA
Description	Cannot set the message-size parameter
	[box/snmp/coex/snmptargetaddrest-specific/] to a legal value
	from the CLI. It returns an error if snmpTargetAddrTAddress
	table status is set to active.
Impact	Non-Service Affecting: Unable to set <i>snmpTargetAddr</i> to
	active.
Probability of Occurrence	Low
Work Around	Set snmpTargetAddrTAddress to disable before setting
	[box/snmp/coex/snmptargetaddrest-specific] using the CLI.
Affected loads	4.2.4, 4.3.1
Status	Open
Field Bulletin No.	

3.1.3	CLI limitation where it is unable to enter the max string
	length (255) for the taglist.

Tracking No.	1-NDA5
Description	The maximum size that the taglist is 255 characters. This problem is related to the limitation of the CLI where the maximum string that can be entered is approximately 90 characters.
Impact	Non-Service Affecting
Probability of Occurrence	Low
Work Around	The workaround to the CLI string length of 255 chars for the taglist can be entered from an SNMP manager.
Affected loads	4.2.4, 4.3.1
Status	Open
Field Bulletin No.	·

3.1.4 Upstream loss in constant frequency changes

Tracking No.	1-17GCP
Description	If the upstream center frequency is changed at a constant interval over a period of several days, the CMTS upstreams may go deaf.
Impact	Cable Modems will not be able to range or register on the CMTS.
Probability of Occurrence	50% of the time during constant frequency changes as a result of poor RF plant performance.
Work Around	The CMTS must be reset in order to recover from this state.
Affected loads	4.2.4, 4.3.1
Status	Open
Field Bulletin No.	

3.1.5CLI "SHOW" menu should be "INFO" in qos-params-specificTracking No.PROD00025151DescriptionParameters at the qos-params-specific level are not settable

	even though they show the choices to select. The parameters should be part of a SHOW menu instead of INFO. INFO menu options are generally settable, but in this case should be considered read-only.
Impact	Non-service affecting: Attempts to change the values are rejected.
Probability of Occurrence	High under the described conditions.
Work Around	None
Affected loads	4.3.1
Status	Open
Field Bulletin No.	·

3.1.6 CLI session text gets scrambled in *qos-params-list*

Tracking No.	PROD00025150
Description	CLI access to <i>qos-params-list</i> can cause screen output to be scrambled.
Impact	Non-service affecting, operational: The "scrambled" output will be difficult to read.
Probability of Occurrence	High under conditions described using <i>qos-params-list</i> commands.
Work Around	Parameters can be be managed properly by using SNMP management <i>or</i>
	Logout of the CLI interface/sesson, then restart: Another session will clear scrambled output.
Affected loads	4.3.1
Status Field Bulletin No.	Open

3.1.7 Max D	OS rate set between 1 and 7 causes the CMTS reset
Tracking No.	PROD00025820
Description	Setting the Max Downstream Rate for a CM configuration to 1- 7 bits/sec will cause the CMTS to reset.
Impact	The CMTS will reset automatically; however, when the offending CM attempts to register again, the reset will re-occur.
Probability of Occurrence	High under conditions described.
Work Around	Values within this range are believed invalid for field applications. Accepted values are 8 and greater.
Affected loads	4.3.1
Status Field Bulletin No	Open
Field Bulletin No.	

4 Customer Service and Support

Contact your account representative for further information on the Cornerstone CMTS software or hardware. For technical support:

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Emergency support is available after normal business hours via the listed contact information. Additional contact information can be obtained from the ARRIS web page <u>http://www.arrisi.com</u> under Customer Service.

Appendix A - Acronyms and Terms

The CMTS 1500 has specific acronyms and terms that may be unfamiliar. Many of these terms are derived from the DOCSIS specifications or are data networking vocabulary.

CLI	Command Line Interface
CMTS	Cable Modem Termination System
DOCSIS	Data Over Cable Service Interface Specification
IA	Ingress Avoidance
PHS	Payload Header Suppression
QoS	Quality of Service
SNMP	Simple Network Management Protocol
SSH	Secure Shell
TLV	Time Link Value