Touchstone® Gateway Firmware

Release 9.1.80A

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 Multiple System Operator (MSO). ARRIS continually strives toward meeting our customer's needs with solutions that will help achieve their business objectives.

1.2 Purpose and Scope of This Document

This document describes the value-added features and anomaly resolutions associated with this release. It also informs 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 and Purpose of Release

Described in this document is the Touchstone Gateway Firmware. This Touchstone Firmware release is intended for ARRIS manufactured E-MTAs. Information pertaining to support for this specific release is detailed in the table below.

Product Description	**GA – TS 9.1.80A**
Validation Sequence	• **Generally Available (GA)**
Supported DOCSIS Standard(s)	• **DOCSIS® 3.0** • **Euro-DOCSIS® 3.0**
Supported Signaling Protocol(s)	• **Network-Based Call Signaling (NCS)** • **Session Initiation Protocol (SIP)**
Supported PacketCable Standards	• **PacketCable® 1.5** • **PacketCable® 2.0**
Firmware Filename	**TS090180A_042315**
SysDescriptor	**SW_REV: 9.1.80A**
PacketACE	**DOCSIS 3.0 PacketACE Release 3.66 or later**

1.4 Firmware Filename Variant Information

The table below presents the filename extensions used on Touchstone products.

FILENAME EXTENSION	PURPOSE OF EXTENSION
_NA	North America signed firmware image
852	Supports the TG852 hardware platform
862	Supports the TG862 hardware platform
MODEL_860	Supports the DG860 hardware platform
MODEL_7_8	Supports the TM702/TM722/TM802/TM822/TM804 hardware platforms
WBM760_CM820	Supports WBM760/CM820 hardware platforms
MONO	Monolithic P5 image containing both eRouter and DOCSIS images
1602	Supports the TM1602 hardware platform
16XX	Supports the TG1672/DG1670/TG1662/DG1660 hardware platforms
24XX	Supports the DG2460/TG2472/DG2470/TG2492/DG3260/DG3270 hardware platforms
GW.ATOM	Monolithic (atomic) P6-image containing both eRouter and DOCSIS images
MAC14	Used to validate upgrades and downgrades
SIP	Session Initiation Protocol (SIP) firmware image
PC20	PacketCable 2.0 firmware image

1.5 Minimum Firmware Baseline for Hardware

The table below shows the minimum released firmware that has been verified to directly upgrade to this firmware release.

Hardware Model	Firmware Image
WBM760	TS070550A_070412 (TS 7.5.50A)
TM702	TS070550A_070412 (TS 7.5.50A)
TM722	TS070550A_070412 (TS 7.5.50A)
TM802	TS070550A_070412 (TS 7.5.50A)
TM804	TS070550A_070412 (TS 7.5.50A)
TM822	TS070550A_070412 (TS 7.5.50A)
CM820	TS070532D_050712 (TS 7.5.32D)
TG852	TS070532D_050712 (TS 7.5.32D)
DG860	TS070532D_050712 (TS 7.5.32D)
TG862	TS070532D_050712 (TS 7.5.32D)
TM1602A	TS090126A_072114 (TS 9.1.26A)
TM1602G	TS090157_103014 (TS 9.1.57)
DG1660	TS0801102G_030714 (TS 8.1.102G)
TG1662	TS0801102G_030714 (TS 8.1.102G)
DG1670	TS080098_041014 (TS 8.0.98)
TG1672	TS080098_041014 (TS 8.0.98)
DG1680	TS090161F_122214 (TS 9.1.61F)
DG2460	TS0901617D_013115 (TS 9.1.67D)
DG2470	TS090161F_122214 (TS 9.1.61F)
TG2472	TS090161F_122214 (TS 9.1.61F)
TG2492	TS090175A_031215 (TS 9.1.75A)

DG3260 DG3270	TS090165_121814 (TS 9.1.65)

1.6 Product Documentation

Other relevant information is included in the following documentation:

Product
Touchstone® Firmware Guide (TS9.1)

2 Release Notes

The Release Notes describe the New Product Features introduced in the Touchstone Firmware for the ARRIS Touchstone E-MTA and Gateway Modem(s). Included in the Resolved Product Deficiencies section is a list of resolved operational considerations noted in previous releases.

2.1 New Product Features

Added in TS 9.1.80A

Wi-Fi Airtime Management (TG862 Products)

This firmware release supports the Airtime Management feature on the TG862 product lines. Transmit opportunities are allocated based on configurable weight (percentage of airtime) to each BSSID. All clients in a BSSID share the airtime percentage allocated to the BSSID. Airtime Fairness evenly distributes available air time among client devices. This prevents clients with poor connections from consuming too much airtime.

16 -> 24 -> 32 Downstream Channel Bonding Upgrade

A new MIB 'arrisCmDoc30SetupExpandedBondingKey' is implemented for this feature. This MIB is settable only via the CM configuration file. Setting with a key string will upgrade the modem's bonding capability. When walked, The MIB returns either 'valid' or 'invalid'. Another new MIB 'arrisCmDoc30BondingModeCapability' is implemented to configure and verify a modem's bonding capability.

IPv6 Speed Test (TM1602 and TG1682 Products)

This feature is enhanced to support IPv6 Speed Test hardware acceleration.

LGI Default Values (TG2492 UPC)

This firmware release supports UPC LGI-defined default values for configuration parameters based on the Customer ID (Brand).

Added in TS 9.1.76B

IPv6 Speed Test (TM1602 and TG1682 Products)

This firmware release supports the ability to originate Speed Test activities on the TM1602 and TG1682 product lines, when the CM interface is configured with IPv6 format. This Speed Test feature is supported by the custom MIB group *arrisSpeedTestMib*, by the TR181 (TR143) Download and Upload profiles, and a SpeedTest GUI page under Advanced.

Wifi Client List Enhancement

This firmware release provides additional information for connected WiFi clients, extending the list of values available in the MIB Table *arrisRouterWiFiClientInfoTable*.

TR69: Ignore Data Model Selection

This firmware release provides a MIB, *arrisTR69DataModelSelectIgnoreNonPuma5*, to allow the device to ignore the directive of MIB *arrisTR69DataModelSelect*, if present in config file. The new MIB itself is ignored on 7XX and 8XX products.

MTA DNS: Ignore RD Validation

This firmware release provides a MIB, *arrisCmDoc30SetupIgnoreMtaDnsRDValidation*, to allow the device to ignore the RD flag in the DNS response received by the Mta layer. This feature may be needed in environments where the DNS server is incorrectly modifying the flag before returning response to modem.

WiFi: Improved Performance in High Packet Error Environment

This firmware release provides a MIB, *arrisRouterWifiLowInitRate*, to improve WiFi performance in cases of increasing packet error ratio. This feature lowers the data rate, to accommodate the increased error rate. This feature is useful in environments with significant barriers like thick walls.

Added in TS 9.1.75A

TG2492 Hardware Support

This firmware release introduces support for the DOCSIS 3.0 Residential Gateway products with 802.11ac Dual-band Concurrent Wireless capabilities, internal 4 port 10/100/1000 Base-T Router interface, providing 2-lines of voice, and ultra-high speed

data throughput based on the DOCSIS 3.0 cable modem specifications with support for up to 24 bonded downstream channels, and up-to 8 bonded upstream channels.

HomePlug AV Monitoring (16XX and 24XX GW Products)

This firmware release introduces support for the monitoring of HPAV (HomePlug AV) Adaptors, when the device is attached to a local adaptor with Ethernet. The key chips supported are the Qualcomm INT6300 and INT6400, and newer chipsets are also taken into account. This feature is managed via the custom MIB group *cmHomeplugAV.mib*.

IPv4 SpeedTest *cmTest MIB* (16XX and 24XX GW Products)

This firmware release extends support for the Ipv4 SpeedTest feature to the custom MIB group *cmTest.mib*.

Euro PC2.0 Support

This firmware release provides support for the European version of PacketCable 2.0 voice standard.

Country Voice Templates

This firmware release introduces support for the country templates supporting tone and ring cadence definitions for the following nations:

- United Kingdom
- Ireland
- Romania
- Czech Republic
- Slovakia

Horizontal over Temperature (HOT) for TG2492

This firmware release extends support of the Horizontal Over Temperature (HOT) feature to the TG2492 models.

Enhanced Firmware Loading

This firmware release brings support of the advanced feature for downloading of modem firmware files, allowing the operator specify different load lineups for different models. This capability is managed by the custom MIBs *arrisCmDoc30SwTable* in the MIB file *arrisCmDoc30Mib*.

Hotspot Transport Enhancements

This firmware release provides flexibility for hotspot transport requirements. Operators can now configure Hotspot GRE tunnels to locally originate/terminate at the CM interface (instead of default GW interface), and the operator can also choose to originate/terminate the RADIUS portion only at CM Interface.

Hotspot Support for RADIUS

This firmware release provides enhancement for Hotspot applications to support RADIUS procedures to authenticate, authorize and perform accounting for client hotspot usage.

DSLite TCP MSS Clamping

This firmware release provides configuration control to activate MSS Clamping for TCP traffic over DS Lite.

Added in TS 9.1.67D

IPv4 Speed Test (16XX and 24XX Products)

This firmware release supports the ability to originate Speed Test activities on the 16XX and 24XX product lines, when the CM interface is configured with IPv4 format. This Speed Test feature is supported by the custom MIB group *arrisSpeedTestMib*, by the TR181 (TR143) Download and Upload profiles, and a SpeedTest GUI page under Advanced.

Model 7 and Model 8 Product Support

This firmware release introduces support Model 7 and Model 8 devices. Please refer to the table in section 1.5 Minimum Firmware Baseline for Hardware.

DG2460 Hardware Support

This firmware release introduces support for the DOCSIS 3.0 Residential Gateway products with 802.11ac Dual-band Concurrent Wireless capabilities, internal 4 port 10/100/1000 Base-T Router interface, for ultra-high speed data throughput based on the DOCSIS 3.0 cable modem specifications with support for up to 24 bonded downstream channels, and up-to 8 bonded upstream channels.

IPv6 GRE

The TS9.1.67D firmware release introduces acceleration of IPv6 GRE packets by the Intel Packet Processor.

Added in TS 9.1.61F

DG2470 Hardware Support

The TS 9.1.61F firmware release introduces support for the DOCSIS 3.0 Residential Gateway products with 802.11ac Dual-band Concurrent Wireless capabilities, internal 4 port 10/100/1000 Base-T Router and MoCA 2.0 interface, for ultra-high speed data throughput based on the DOCSIS 3.0 cable modem specifications with support for up to 24 bonded downstream channels, and up-to 8 bonded upstream channels.

TR69/181

The TS9.1.61F firmware release supports specified TR69/TR181 parameters for configuring L2oGRE and standard TR181 GRE.

IPv6 GRE

The TS9.1.61F firmware release introduces IPv6 GRE feature, it is an extension of existing IPv4 GRE. Both IPv4 packets and IPv6 packets can be relayed by IPv6 GRE tunnel. The IPv6 GRE tunnel in this release is not accelerated by the Intel Packet Processor and the GRE tunnel over 5G radio is not supported.

AP Scan WebGUI page (16XX and 24XX products only)

The TS 9.1.61F firmware release introduces the AP Scan web GUI page. This page provides an approach to measure both 2.4GHz and 5GHz SSIDs currently active on the network. These can be from your router as well as other routers nearby. The view shows the channels being used and the power of signal. Data can be displayed in both graphical and tabular form. The AP Scan feature is only available for technician user and is supported on 16xx/24xx hardware platform. The service will be affected during the scan process.

DS Spectrum Analysis WebGUI page (16XX and 24XX products only)

The TS 9.1.61F firmware release introduces DS spectrum analysis web GUI page. This page provides a localized approach to measure the downstream RF signal performance. The RF Spectrum View web GUI shows the RF input coming into the cable modem. Each measurement is a data that provides the power of the signal at a frequency within a specified range. The Downstream Spectrum Capture feature is only available for technician user and is supported on 16xx/24xx hardware platform.

Increase UNII-1 Band 5G Transmit Power limit for recent FCC change (1682 and 2470 products use QCA WiFi chipset only)

Compliance to recent FCC changes in 5G band to increase maximum transmit power from 17dBm to 30 dBm on UNII band 1 (5GHz channels 36-48); it applies to US Country Code only.

Added in TS 9.1.60

TM1602G Hardware Support

The TS 9.1.60 firmware release introduces support for the TM1602G DOCSIS 3.0 E-MTA product, with battery backup support and Power Management functionality in addition to providing 2-lines of voice service and ultra-high speed data throughput based on the DOCSIS 3.0 cable modem specifications with 16x4 channel bonding (upgradeable to 24x8 functionality).

Added in TS 9.1.26A

TM1602 Memory Increase

The TS 9.1.26A FW release supports increased memory on the TM1602A variants.
Please refer to ARRIS Technical Bulletin ATB14-066 for additional information.

Added in TS 9.1.26

TM1602 Hardware Support

The TS 9.1.26 firmware release introduces support for the TM1602A DOCSIS 3.0 E-MTA product which provides support for 2-lines of voice service and ultra-high speed data throughput based on the DOCSIS 3.0 cable modem specifications with 16x4 channel

bonding. The TM1602 is upgradable to 24x4 channel bonding functionality which will be introduced as a future FW licensing option. For additional description of product features, please refer to the TS 9.1 Firmware User Guide.

2.2 Resolved Field Bulletin(s)

The following field bulletin issues were resolved in this Touchstone firmware release or previous firmware releases.

Field Bulletin Number	Field Bulletin Title	Product Defect Number
-	Not applicable	-

2.3 Resolved Product Deficiencies

ARRIS continues to resolve any product deficiencies discovered. This Touchstone Firmware release contains closure for the detailed issues listed in the following section.

The following issues were resolved in release 9.1.80A:

2.3.1 Single snmpset Command with multiple OIDS	
Tracking No.	PD 2842
Description	Unable to set docsDevSwServerAddressType and docsDevSwServerAddress or similar MIBs in a single snmpset command.
Impact	Service
Occurrence	High
2.3.2 MTA: GUPI TFTP Override Provisioning	
Tracking No.	PD 3361
Description	Unable to complete MTA provisioning with GUPI TFTP override.
Impact	Service
Occurrence	High
2.3.3 MTA: Need to Update the UK Country Template.	
Tracking No.	PD 2746
Description	Update the stutter dial tone as below: Level at NTP 0dBm to -27dBm Frequency 400Hz ± 5% & 350Hz ± 5% Duty cycle Continuous 0.75s On 7 0.75s Off
Impact	Service
Occurrence	High
2.3.4 'arrisRouterFWMacBridgingWebPageEnabled' is not supported	
Tracking No.	PD 2057
Description	'arrisRouterFWMacBridgingWebPageEnabled' was not implemented.
Impact	Service
Occurrence	High

2.3.5 Online LED Stays ON when RF is Disconnected During Firmware Download	
Tracking No.	PD 2431
Description	Online LED stays ON when RF is disconnected during firmware download
Impact	Service
Occurrence	High
2.3.6 MTA PC20: The OPTIONS Method is not Properly Handled	
Tracking No.	PD 2502
Description	The MTA is not properly handling the OPTIONS method while in 3-way conference.
Impact	Service
Occurrence	High
2.3.7 "GHOST" Security Vulnerability	
Tracking No.	PD 1911
Description	A potential issue to the "GHOST" vulnerability exists, in which attackers can exploit the modem via the gethostbyname function.
Impact	Service
Occurrence	Low
2.3.8 Telemetry: Charger FW Load does not Upgrade on 8XX	
Tracking No.	PD 2574
Description	The battery charger Firmware loads are not able to upgrade on the 8XX product line.
Impact	Operational
Occurrence	High

2.3.9 SpeedTest: Domain Name not working for Server Address	
Tracking No.	PD 2543
Description	The SpeedTest function is not able to successfully perform DNS resolution if the server address is provisioned as a domain name.
Impact	Operational
Occurrence	High
2.3.10 PSM: Modem Unable to Recover if Reset	
Tracking No.	PD 2754
Description	When fully in PSM mode due to AC power disconnected, if the modem is then reset, then the modem does not recover.
Impact	Service
Occurrence	High
2.3.11 TG862: Bonding Mode Does Not Change to 1x1 After Call is Terminated	
Tracking No.	PD 2080
Description	On TG862 modems, if the system enters PSM (goes on battery), and call is in progress, the modem does not properly change to 1x1 bonding mode after the call is released (on-hook).
Impact	Service
Occurrence	High
2.3.12 GW: Incorrect Index for MIB walk of *arrisRouterLanSrvTable* Causes GW Issues	
Tracking No.	PD 3281
Description	If performing a MIB walk of the *arrisRouterLanSrvTable,* and an incorrect index is used, then the modem's SNMP engine will be corrupted.
Impact	Service
Occurrence	High

The following issues were resolved in release 9.1.76B:

2.3.13 GW: Setting Primary Subnet to Bridge Mode Disables SSIDs	
Tracking No.	PD 1900
Description	When the routing mode for the primary subnet is set to "bridge" in the CM config file (via MIB *arrisRouterLanPassThru*), the associated SSIDs are disabled.
Impact	Service
Occurrence	High
2.3.14 24XX Does not interop with ActionTEC WCB-3000N using WPS configuration	
Tracking No.	PD 2516
Description	The eRouter does not share the WPA key over WPS to the extender.
Impact	Service
Occurrence	High
2.3.15 24XX WPS does not automatically re-authenticate after an RF disconnect	
Tracking No.	PD 2513
Description	Devices that are connected to a 24XX using WPS will not be automatically authenticated after an RF signal loss. A re-initialization of the WPS process is required to re-authenticate the devices.
Impact	Service
Occurrence	High
2.3.16 Reserved DHCP IP Address not Assigned to Client CPE	
Tracking No.	PD 2521
Description	Connected Devices are not assigned the Static IP Address that was reserved for the Client on the GW.
Impact	Service
Occurrence	Medium

2.3.17 MIB *pktcSigDefCallSigTos* does not set Signaling DSCP Correctly	
Tracking No.	PD 2521
Description	The DSCP value in the MIB *pktcSigDefCallSigTos* is not correctly used to setup the TOS/DSCP value in the associated CallP signaling messages.
Impact	Service
Occurrence	High
2.3.18 GUI: Unable to hide MoCA Page	
Tracking No.	PD 2356
Description	Operators are unable to hide GUI pages like MoCA page, as the MIB arrisRouterWebAccessLevel is not working properly.
Impact	Operational
Occurrence	High
2.3.19 "POODLE" Potential Security Issue	
Tracking No.	PD 2149
Description	The device is a vulnerable to the man-in-the-middle attack known as the "POODLE" issue, which occurs due to an ability to drop back to SSL 3.0
Impact	Service
Occurrence	High

The following issues were resolved in release 9.1.75A:

2.3.20 Incorrect Default for arrisMtaDevPwrSupplyDataShutdownTime	
Tracking No.	PROD00221036
Description	The MIB *arrisMtaDevPwrSupplyDataShutdownTime* default value is reporting 900 where the correct default value is 300.
Impact	Operational
Occurrence	High
2.3.21 Loop Diagnostics Not Supported	
Tracking No.	PD 2208
Description	Loop Diagnostics is not supported in this release.
Impact	Operational
Occurrence	High
2.3.22 RIP: Low Throughput	
Tracking No.	PD 2180
Description	RIP throughput is limited to approximately 30Mbps in this release, as RIP traffic is not accelerated.
Impact	Service
Occurrence	High
2.3.23 SpeedTest does not work with Absolute File Path	
Tracking No.	PD 2099
Description	The SpeedTest feature will not function properly if the download URL is provisioned with an absolute file pathname.
Impact	Operational
Occurrence	High
2.3.24 TM7X2: Ethernet Port does not Power Down After entering PSM	
Tracking No.	PD 2019
Description	When the TM702 and TM722 modems lose AC power and start running on battery, the Ethernet port does not power down.
Impact	Service
Occurrence	High

2.3.25 GW: Post Provisioning Ignored in Bridge Mode	
Tracking No.	PD 1903
Description	Post provisioning does not get applied if the modem is in bridge mode after the CM config file is processed.
Impact	Service
Occurrence	High
2.3.26 MoCA2.0: Devices Unable to Recover after Upgrade	
Tracking No.	PD 1935
Description	On upgrade of units that feature MoCA 2.0 support, some of the units are not able to properly boot, and cannot be recovered.
Impact	Service
Occurrence	Medium
2.3.27 DG2470: Incorrect sysDescr	
Tracking No.	PROD00222882
Description	The System Descriptor for the DG2470 incorrectly reports as DG2400 for the modem name.
Impact	Operational
Occurrence	High
2.3.28 GUI: Web Access Blocked with Multiple Rules Configured	
Tracking No.	PD 2331
Description	When more than one IP range is configured via MIB *arrisRouterWebAccessWANACL*, all WAN side access to the GUI is blocked
Impact	Service
Occurrence	High
2.3.29 GUI: Web Pages Access Control Not Configurable	
Tracking No.	PD 2236
Description	Most of the *arrisRouterWebAccessTable* MIB settings do not properly block web page content as required.
Impact	Operational
Occurrence	High

2.3.30 GUI is Inoperative when the Modem uses XML for Configuration	
Tracking No.	PD 2004
Description	Systems using XML Config files can lead to issues with the internal SNMP Engine, causing all GUI access to be blocked.
Impact	Operational
Occurrence	Medium
2.3.31 *arrisRouterWebAccessLevel* MIB Values Incorrect	
Tracking No.	PD 2389
Description	Two of the possible values for this MIB are associated with the wrong numeric value: • *accessUser* is 3, but should be 2 *accessAll* is 2, but should be 3
Impact	Operational
Occurrence	High

The following issues were resolved in release 9.1.67D:

2.3.32 RIP Configuration may not Persist over Upgrade	
Tracking No.	PROD00219115/PROD00223997/PD 1063
Description	RIP configuration may not persist after upgrade to TS 9.1 FW.
Impact	Service
Occurrence	Low

2.3.33 ERouter MIBs over upgrades	
Tracking No.	PROD00222519
Description	On a GW running TS 7.5 or TS 7.7 FW, static WAN configuration by subscriber WebGUI may not persist after upgrade to TS9.1 FW. Further, settings of the following MIBs previously configured by technician user in TS7.5 or TS7.7 FW may not persist following the upgrade: arrisRouterWanMTUSize.0 arrisRouterWanConnType.0 arrisRouterWanStaticIPAddr.1 arrisRouterWanStaticPrefix.1 arrisRouterWanStaticGateway.1 arrisRouterWanUserName.0 arrisRouterWanPassword.0 arrisRouterWanEnableIdleTimeout.0 arrisRouterWanIdleTimeout.0 arrisRouterWanTunnelHostName.0 arrisRouterWanEnableKeepAlive.0 arrisRouterWanKeepAliveTimeout.0 arrisRouterLanEnvironmentControl.200 arrisRouterFWDDNSEnable.0 arrisRouterFWEnableMulticast.0 arrisRouterSNTPServerAddr.1 arrisRouterSNTPServerAddr.2 arrisRouterLanEtherPortEnabled.1 arrisRouterLanEtherPortEnabled.2 arrisRouterLanEtherPortEnabled.3 arrisRouterLanEtherPortEnabled.4 arrisRouterLanEtherPortDuplex.1 arrisRouterLanEtherPortDuplex.2 arrisRouterLanEtherPortDuplex.3 arrisRouterLanEtherPortDuplex.4 arrisRouterLanEtherPortAuto.1 arrisRouterLanEtherPortAuto.2 arrisRouterLanEtherPortAuto.3 arrisRouterLanEtherPortAuto.4
Impact	Service
Occurrence	High

2.3.34 ERouter DHCPv4 Option 43.2 is Incorrect	
Tracking No.	PD 1150
Description	The eRouter's DHCPv4 option 43.2 “Device Type” gives "00", which should be "02".
Impact	Operational
Occurrence	High
2.3.35 WiFi: 5G Clients Unable to Connect via WPS	
Tracking No.	PD 1719
Description	Clients are unable to connect on the 5G radio using the WPS security mechanisms.
Impact	Service
Occurrence	High
2.3.36 PSM: ERouter Unable to Recover after Running On Battery	
Tracking No.	PD 1576, 1742
Description	After recovering from a short AC outage, the Gateway portion of the modem does not return to service.
Impact	Service
Occurrence	High
2.3.37 WiFi: Customized SSID String Includes “-“	
Tracking No.	PROD00224271
Description	When constructing SSID Names based on MIB *arrisRouterWiFiCustomSSIDStr*, the character “-“ is incorrectly added between the string and the 4 MAC digits.
Impact	Service
Occurrence	High
2.3.38 PSM: Modem Unable to Recover after RF Cut while Running on Battery	
Tracking No.	PROD00224249
Description	The modem does not recover if running on battery, and then experiences a loss of WAN side RF.
Impact	Service
Occurrence	High

2.3.39 WiFi: Country Codes AN, GD, JM Unable to use Channels 12,13	
Tracking No.	PROD00221312
Description	If configured for country codes AN, GD, or JM, the radio is not able to use channels 12 or 13.
Impact	Service
Occurrence	High
2.3.40 Extended Upstream Value Should Not Be Stored Persistently	
Tracking No.	PROD00221987
Description	The MIB *arrisCmDoc30SetupExtendedUpstreamTransmitPowerValue*, when set in the CM config file, is being stored persistently, surviving resets and removal from CM config file. The Value should be reset to defaults after a reset.
Impact	Operational
Occurrence	High
2.3.41 MoCA: Network Loop Causes Modem Resets	
Tracking No.	PROD00221290
Description	In cases where modems form a MoCA network loop (insufficient plant filters), multicast packets can flood the loop and cause modems to run out of memory and reboot.
Impact	Service
Occurrence	High
2.3.42 WiFi: Country Code EU Not Accepted	
Tracking No.	PROD00221728
Description	The CM Config file setting "arrisRouterWiFiCountry.0=EU" causes the CM Config file to be rejected.
Impact	Service
Occurrence	High

The following issues were resolved in release 9.1.61F:

2.3.43 WAN Access of DMZ Server	
Tracking No.	PROD00220396
Description	If configured in the DMZ, attempts to access a LAN side HTTP server from a WAN-side host may not be successful.
Impact	Service
Occurrence	High
2.3.44 One-Way Audio during Off-net Call	
Tracking No.	PROD00221924
Description	For an EMTA line configured with HD Voice (G.722), the far-end of an off-net call may not hear the near-end EMTA caller if the far-end is not enabled for HD Voice.
Impact	Service
Occurrence	High
2.3.45 BPI Authorization Does Not Complete	
Tracking No.	PROD00219826, PROD00220949
Description	On certain CMTSs, the 16XX modems with sysUptime values longer than approximately 40 days will be unable complete the registration sequence due to BPI authorization errors.
Impact	Service
Occurrence	High
2.3.46 Subscriber Cannot Duplicate SSID Names Across 2.4GHz and 5GHz SSID	
Tracking No.	PROD00213734
Description	It is not possible for the subscriber to duplicate the SSID name for both 2.4GHz and 5GHz radios.
Impact	Service
Occurrence	High
2.3.47 LAN side CPE can't get Stateful IPv6 address	

Tracking No.	PROD00223853
Description	If enable stateful DHCPv6, DHCPv6 server sometimes would not start up correctly during initialization.
Impact	Service
Occurrence	Low

2.3.48 Upgrade from some old version FW would cause modem continuously reboot.	
Tracking No.	PROD00223666
Description	Some old FW writes invalid information to /nvram/8/clientdb.txt file, it would cause modem continuously reboot after upgrade to TS9.1.60 FW.
Impact	Service
Occurrence	Low

The following issues were resolved in release 9.1.60:

2.3.49 UI Security Issue	
Tracking No.	PROD00219824, PROD220571, PROD00220646
Description	Security Issue Reported - Cross-site Request (CSRF), Cross-site Scripting
Impact	Service
Occurrence	Low

2.3.50 UCC May Cause Loss of Layer 3	
Tracking No.	PROD00222890
Description	While DS bonded and not US bonded, TM822 IP layer stops responding following move command or upstream channel change (UCC) from the CMTS.
Impact	Service
Occurrence	High

3 Letter of Operational Considerations

The Letter of Operational Considerations is to inform operators of any system considerations for the Touchstone Firmware that may affect service, operations, or maintenance for this product release.

3.1 Operational Considerations

Listed are known Operational Considerations that have been identified during ARRIS' standard quality testing that can affect normal operation. Any additional items discovered during field deployments would be noted in future *Release Notes and Letter of Operational Consideration* or *Field Bulletins*. Unless specifically noted, it is ARRIS' intention to have all considerations resolved in future product releases.

3.1.1 SpeedTest: Select Devices Not Supported	
Tracking No.	PD 2081
Description	The SpeedTest capability is not supported on the following devices due to memory constraints: - DG860 - TM8xx - TM7xx - CM820 - WBM760
Impact	Operational
Occurrence	High
Workaround	None

3.1.2 WEP Password Change for one SSID Applies to all SSIDs	
Tracking No.	PD 1995
Description	For certain models (24XX), a change of a WEP password for any one SSID will modify the WEP password for all SSIDs
Impact	Service
Occurrence	High
Workaround	None

3.1.3 16XX: Modem Reboots When Entering PSM	
Tracking No.	PD 1854
Description	When configured for WiFi Shutdown Only, the 16XX modems reboot when attempting to enter Power Save Mode.
Impact	Service
Occurrence	Medium
Workaround	Choose alternate PSM settings.

3.1.4 AP Scan Displays One Channel for 80MHz	
Tracking No.	PD 1820
Description	When the surrounding AP works at 80MHz, the AP Scan result displays only one channel and the frequency bandwidth is equal to 20MHz on the GUI.
Impact	Operational
Occurrence	High
Workaround	None

3.1.5 Hotspot: Max Clients Setting does not extend to Multiple SSIDs	
Tracking No.	PD 1807
Description	The MIB *arrisRouterSoftGreMaxSessions* does not limit the concurrent SoftGRE client sessions connecting to multiple hotspot SSIDs.
Impact	Service
Occurrence	High
Workaround	Set *arrisRouterBssMaxWifiClients* for each SSID.

3.1.6 Syslog Messages Formatted Incorrectly	
Tracking No.	PD 3233
Description	Syslog output includes characters that violate the Base-64 string formatting.
Impact	Operational
Occurrence	High

3.1.7 GW: 2.4G Channel Bandwidth Default is Incorrect	
Tracking No.	PD 3225
Description	The default for channel bandwidth for the 2.4G radio is incorrectly set to 20/40MHz, it should be 20MHz.
Impact	Service
Occurrence	High

3.1.8 IPv6 GW: DHCPv6 Issues on Second SSID	
Tracking No.	PD 2925
Description	If DHCP is enabled in Gateway for IPv6 clients, and if an IPv6 client is associated with the first (primary) SSID, then an IPv6 client associating with the second (or later) SSID is unable to associated. This is due to modem incorrectly sending out Lifetime of 0.
Impact	Service
Occurrence	Medium

3.1.9 Hotspot: Missing Accounting Message after Client DHCP Renew/Rebind	
Tracking No.	PD 2925
Description	If a hotspot client fails a DHCP renew or rebind, then the RADIUS accounting messages (request, stop) will not be sent.
Impact	Operational
Occurrence	High

Workaround	Correct DHCP issues

3.1.10 MAC Bridging: IPv6 not supported

Tracking No.	PD 2447
Description	Clients that are configured against the MAC Bridging feature are unable to pull an appropriate IPv6 address.
Impact	Service
Occurrence	High
Workaround	Use IPv4 address

3.1.11 TR69: Special Characters not Supported

Tracking No.	PD 2215
Description	TR69 is unable to properly encode special characters (eg. "&", "<" and ">"), and is not able to deliver parameter values containing these characters successfully to the ACS. One example of possible use of special characters is SSID Names.
Impact	Service
Occurrence	High
Workaround	Do not utilize special characters in parameter values.

3.1.12 IPv6 SoftGRE Traffic is not Accelerated

Tracking No.	PD 1218
Description	IPv6 softGRE data traffic is not accelerated via the modem's packet processor.
Impact	Service
Occurrence	High
Workaround	None

3.1.13 SpeedTest: The Payload and Total Interface Traffic Counters are incorrect from SNMP	
Tracking No.	PD 3706
Description	MIB values ‘arrisTR143DownloadTestBytesReceived’ and ‘arrisTR143DownloadTotalBytesReceived’ are incorrect.
Impact	Operational
Occurrence	High
Workaround	None

3.1.14 IPv6 SpeedTest Feature Requires Use of One CPE MAC Address	
Tracking No.	PD 3985
Description	One internal MAC address will be counted as a CPE, which will impact the max CPE number counting (docsDevMaxCpe).
Impact	Operational
Occurrence	High
Workaround	Increase max CPE by one.

3.2 Unsupported Features

The following features are not supported in the TS 9.1 release at this time.

- Voice / Media Security (Encryption of RTP stream capabilities)
- Voice Payload Header Suppression
- Silence Suppression and UGS/AD Service Flows
- USB
- HD Voice Loop Diagnostics
- 64ms Echo Canceller tail length for UK.

3.3 Upgrade Considerations

The following considerations are important to take into account when upgrading to this firmware release.

Added in TS 9.1.80A

TS 7.6 to TS 9.1 Upgrade Process only Applied Once

The user settings are only transferred on the first upgrade from TS 7.6 to TS 9.1. Subsequent changes will not be retained when migrating from one release to another.

Performing a factory reset on TS 7.6 will only affect provisioning for TS 7.6. Similarly, performing a factory reset on TS 9.1 will only affect provisioning for TS 9.1.

MIB OID Changes

1) *arrisRouterFWSrvTr69LastInstance*
   The OID of this MIB node has moved from 1.3.6.1.4.1.4115.1.20.1.1.4.34 to 1.3.6.1.4.1.4115.1.20.1.1.4.46
2) *arrisRouterRIPInterface*
   The OID of this MIB node has moved from 1.3.6.1.4.1.4115.1.20.1.1.2.5.19 to 1.3.6.1.4.1.4115.1.20.1.1.2.5.23
3) *arrisRouterCpuSpeed*
   The OID of this MIB node has moved from 1.3.6.1.4.1.4115.1.20.1.1.5.51 to 1.3.6.1.4.1.4115.1.20.1.1.5.64

MIB Name Changes

1) Change MIB ‘arrisrouterWifiLowInitRate’ to ‘arrisRouterWifiLowInitRate’

Added in TS 9.1.67D

MIB OID Changes

In order to properly align with MIB OID definitions established in the TS7.X series of releases, the following MIB node OIDs have been modified:

1) *arrisRouterLanUSBPortTable*
   The OID of this MIB node has moved from 1.3.6.1.4.1.4115.1.20.1.1.2.12 to 1.3.6.1.4.1.4115.1.20.1.1.2.16.

2) *arrisRouterLanFileSharingObjs*

This MIB node's OID has changed from 1.3.6.1.4.1.4115.1.20.1.1.2.13 to 1.3.6.1.4.1.4115.1.20.1.1.2.17.
The MIB *arrisRouterLanMaxIPv6RAInterval* is now at OID 1.3.6.1.4.1.4115.1.20.1.1.2.13.

3) *arrisRouterWMM50Cfg*
The change in OID for this WiFi MIB Node is from 1.3.6.1.4.1.4115.1.20.1.1.3.52 to 1.3.6.1.4.1.4115.1.20.1.1.3.63.
The original OID is reserved for MIB *arrisRouterWiFiAllChannelsAllowed*.

4) *arrisRouterWPS50Cfg*
For this MIB Node, the OID has migrated from 1.3.6.1.4.1.4115.1.20.1.1.3.53 to 1.3.6.1.4.1.4115.1.20.1.1.3.65.

5) *arrisRouterWiFiExtensionChannel*
This WiFi MIB has altered its OID from 1.3.6.1.4.1.4115.1.20.1.1.3.54 to 1.3.6.1.4.1.4115.1.20.1.1.3.64. The WiFi MIB *arrisrouterWifiClientIdleTimeout* has reserved OID 1.3.6.1.4.1.4115.1.20.1.1.3.54.

MIB *arrisRouterLanClientAdapterType* Value Changes

In order to provide finer granularity for client information (per SSID and per Ethernet Port data), there have been some minor modifications to the values returned by the read-only MIB *arrisRouterLanClientAdapterType*.

One value has changed:

- ***wireless(2)* is now *usb(2)***

The following values are newly introduced:

- *dsg(4),*
- *wireless1(5),*
- *wireless2(6),*
- *wireless3(7),*
- *wireless4(8),*
- *wireless5(9),*
- *wireless6(10),*
- *wireless7(11),*
- *wireless8(12),*
- *wireless9(13),*
- *wireless10(14),*
- *wireless11(15),*
- *wireless12(16),*
- *wireless13(17),*
- *wireless14(18),*
- *wireless15(19),*
- *wireless16(20),*

- *ethernet2(21),*
- *ethernet3(22),*
- *ethernet4*(23)

Added in TS 9.1.61F

ARRIS Interactive LLC Manufacturer CVC Expiration

The current ARRIS DOCSIS and Euro-DOCSIS Manufacturer CVCs for "Arris Interactive L.L.C." covering the following products have expired:

Models 7xx, 8xx, DG1660, TG1662, DG1670, and TG1672.

Per agreement with CableLabs, ARRIS is permitted to continue using the existing "Arris Interactive L.L.C." CVCs for existing field deployed products, and will ensure that all future firmware loads are "signed" with a valid date code within the range for upgrade compatibility purposes. MSOs will continue to be able to both upgrade and downgrade their existing products without needing to modify their CM configuration files.

For customers that co-sign the images with their MSO CVC, there is no impact. No changes are required.

New ARRIS Group Inc. Manufacturer CVC

Going forward, ARRIS will use a new DOCSIS and Euro-DOCSIS Manufacturer "ARRIS Group, Inc." CVCs starting with the following products:

TM1602, DG2470, and TG2472.

In the sysDescr.0 MIB object (for these products) the vendor field will be "ARRIS Group, Inc.".

For customers that co-sign the images with their MSO CVC, there is no impact. No changes are required.

Customers that utilize the existing ARRIS Interactive Manufacturer's CVC in their CM configuration files are impacted if they plan to deploy the new hardware models above, as DOCSIS specifications only allow one Manufacturer's CVC per configuration file. To address the issue, customers should plan to deploy separate CM configuration files for the different hardware models.

Please contact ARRIS Tech Support for assistance.

Web Browser Cache after Downgrade from TS 9.1 to TS 7.X Releases

Following a downgrade of a GW device from TS 9.1 to TS 7.5 or TS 7.7, users accessing the Technician GUI will observe that some options are not displayed or are greyed-out. A refresh of the Web Browser's cache will resolve.

Downgrades from TS 9.1.61F to Previous TS7.X Releases

Customer downgrades from TS9.1 to prior TS 7.5 or TS 7.7 release are fully supported as TS 7.x non-volatile settings are retained after upgrade. However, after a downgrade, any subsequent provisioning changes made on a TS 7.5 or TS 7.7 firmware release will NOT be preserved upon return to TS 9.1.45A.

Upgrading from NCS to SIP

The following provides general information about upgrading from NCS to SIP.

PacketCable 1.5 NCS to PacketCable 2.0 Upgrade via Configuration File:

Existing customer:

1. The modem is up and running PacketCable 1.5 NCS. Voice service is functional.
2. Reboot the unit with the new PacketCable 2.0 firmware image name in the CM configuration file.
3. The modem boots up, downloads the new image, and resets. The upgrade is successful.
4. The modem boots up again and comes back on line using the PacketCable 1.5 NCS MTA configuration file. Data service is functional. Voice service is not.
5. The back-office changes the MTA configuration file to PacketCable 2.0.
6. The modem is reset.
7. The modem boots up and comes back online in PacketCable 2.0 mode.

New Customer (with unit loaded with PacketCable 1.5 NCS image):

1. The new PacketCable 2.0 firmware image name is added to the CM configuration file.
2. The MTA configuration file is constructed for PacketCable 2.0 SIP.

3. Power up the modem.
4. The modem boots up, downloads the new image, and resets. The upgrade is successful. During the short period of time in which the modem is online during the upgrade voice service is not functional.
5. The modem boots up and comes back online in PacketCable 2.0 mode.

PacketCable 1.5 NCS to PacketCable 2.0 Upgrade via SNMP:

Existing customer:

1. The modem is up and running PacketCable 1.5 NCS. Voice service is functional.
2. An upgrade via SNMP is triggered for the PacketCable 2.0 firmware image.
3. The modem downloads the new image and resets.
4. The modem boots up and comes back on line using the PacketCable 1.5 NCS MTA configuration file. Data service is functional. Voice service is not.
5. The back-office changes the MTA configuration file to PacketCable 2.0.
6. The modem is reset.
7. The modem boots up and comes back online in PacketCable 2.0 mode.

New Customer (with unit loaded with PacketCable 1.5 NCS image):

1. A standard CM configuration file is used. The PacketCable 2.0 firmware image name is not included.
2. The MTA configuration file is constructed for PacketCable 2.0 SIP.
3. Power up the modem.
4. The modem boots up and comes on line using the PacketCable 2.0 SIP MTA configuration file. Data service is functional. Voice service is not.
5. An upgrade via SNMP is triggered for the PacketCable 2.0 firmware image.
6. The modem downloads the new image and resets.
7. The modem boots up and comes back online in PacketCable 2.0 mode.

Note that the contents of the CM configuration file may affect these procedures particularly if they are different between PacketCable 1.5 NCS and PacketCable 2.0 SIP.

Added in TS 9.1.26A

No Upgrade Path from TS 9.1.26 (TM1602A platform only)

The TS 9.1.26A release is the initial introduction of Firmware for the enhanced TM1602A platform with increase memory. Early TM1602 platforms running TS 9.1.26 cannot upgrade to TS 9.1.26A. In addtion, enhanced devices running TS 9.1.26A cannot be downgraded to TS 9.1.26. Please refer to ARRIS Technical Bulletin ATB14-066 for additional information on distinguishing these platforms.

CM Interface Table (ifTable)

The TS 9.1 release supports expanded US and DS capabilities. For current and future feature capabilities across multiple platforms, the indecies for

ifIndex	ifType	ifDescr	ifName	Purpose
48-78	docsCableDownstream (128)	RF Downstream Interface #	dsch(x) where x = one of available dschs	Secondary RF Downstream Channel(s)
80-86	docsCableUpstream (129)	RF Upstream Interface #	usch(x) where x = one of available uschs	Secondary RF Upstream Channel(s)

The full Cable Modem Interface Table is as follows:

CM Interface MIB Table (ifTable)

ifIndex	ifType	ifDescr	ifName	Purpose	Changes from TS 7.5
1	other (1)	eRouter Embedded Interface	esafe0	Controls the Operator-Facing Interface. **	Replaces index 10 in TW loads. Ethernet CPE Interface moved to index 6
2	docsCableMacLayer (127)	RF MAC Interface	cni0		
3	docsCableDownstream (128)	RF Downstream Interface	dsch(x) where x = one of the available dschs	Primary RF Downstream	
4	docsCableUpstream (129)	RF Upstream Interface	usch(x) where x = one of the available uschs	Primary RF Upstream	

ifIndex	ifType	ifDescr	ifName	Purpose	Changes from TS 7.5
6 – 9	ethernetCsmacd (6)	External Switch Port # Where # = 1..4	ext1 – ext4	Enable /disables Ethernet Port # Where # = 1..4	Controls Adds the ability of shutting/starting individual Ethernet port and also to get the statistics.
12	ieee80211 (71)	Wireless Interface	wifi	Used to enable/disable access to residential subscribers BSSs/SSID	Removed interface number Control for SSID1 on 2.4GHz radio is now index 10100
16	other (1)	PacketCable Embedded Interface	esafe1	Used to enable/disable MTA/EDVA functionality.	
40	mocaVersion1 (236)	MoCA Interface	moca	Used to enable/disable access to the MoCA interface	New interface for future release.
48 - 79	docsCableDownstream (128)	RF Downstream Interface # (# = 1..31)	dsch(x) (x = available dschs)	Secondary RF Downstream	
80 - 86	docsCableUpstream (129)	RF Upstream Interface # (# = 1..7)	usch(x) (x = available uschs)	Secondary RF Upstream	
200 – 2xx (xx = highest LAN index)	ipforward (142)	Logical Lan Interface # (# = 1..16)	l2sd0.2 – l2sd0.xx	Logical Lan's/IP information defined in DHCP servers for SSID/ETH/USB ETC…	New interface
300	ipforward (142)	Wan Side Interface 1: For CM	wan0	WAN Side Interface for CM	
301	ipforward (142)	Wan Side Interface 2: For eRouter	erouter0	WAN Side Interface for eRouter	Called lbr0 in 7.5
302	ipforward (142)	Wan Side Interface 3: For MTA	mta0	WAN Side Interface for MTA	Was located at index 16 in 7.5
10000	ieee80211 (71)	Wi-Fi Radio interface	wifi24	2.4GHz Radio interface	New interface

ifIndex	ifType	ifDescr	ifName	Purpose	Changes from TS 7.5
10001 - 10016	ieee80211 (71)	Wi-Fi SSID sub-interface # (# = 1..8, see Note 2)	wifi24_1 – wifi24_8	SSID 1-8 on 2.4GHz Radio interface	New interface Indexes 10001 – 10004 replace indexes 12-15
10100	ieee80211 (71)	Wi-Fi Radio interface	wifi50	5.0GHz Radio interface	New interface
10101 - 10116	ieee80211 (71)	Wi-Fi SSID sub-interface # (# = 1..8, see Note 2)	wifi50_1 – wifi50_8	SSID 1-8 on 5.0GHz Radio interface	New interface

NOTE 1: Operator-Facing Interface - The eRouter interface that is connected to the embedded cable modem. As defined in [RFC 6204], this is a Wide Area Network (WAN) interface. In CWMP this is called an upstream interface.

NOTE 2: TS 9.1 for the Time Warner release will only have support for eight (8) Wireless Interfaces (SSIDs) per radio.

4 Customer Service and Support

For Technical Support, please visit the ARRIS Technical Support web page at http://ask.arrisi.com.

Other methods for contacting the support organization are listed below.

North America

Email	techsupport.na@arrisi.com
Telephone	(888) 221 9797 (US toll free) +1 678 473 5656 (Worldwide)
Office Hours	8:00 a.m. to 8:00 p.m. EST

South America – Chile

Email	techsupport.cala@arrisi.com
Telephone	+56 2 678 4500
Office Hours	9:00 a.m. to 6:00 p.m. (Chile local time).

Europe – Amsterdam, The Netherlands

Email	techsupport.europe@arrisi.com
Telephone	+31 20 311 2525
Office Hours	8:30 a.m. to 17:30 p.m. CET

Japan – Tokyo

Email	techsupport.japan@arrisi.com
Telephone	+81 (0) 3 5371 4142
Office Hours	9:30 a.m. to 6:00 p.m. (Tokyo local time)

Asia

Email	techsupport.asia@arrisi.com
Telephone	+82 31 783 4893
Office Hours	9:30 a.m. to 6:00 p.m. (local time)

Korea

Email	techsupport.asia@arrisi.com
Telephone	+82 31 783 4893
Office Hours	9:30 a.m. to 6:00 p.m. (local time)

Worldwide – North America

Email	techsupport@arrisi.com
Telephone	USA +1 678 473 5656

Emergency support is available after normal business hours for customers with a support contract ID via the listed contact information.

Touchstone®
Gateway Firmware

Release 9.1.80A

Release Notes and Letter of Operational Consideration

Version:1.0
Status: Approved