GE MDS

PRODUCT RELEASE NOTES Rev AE
v8.0.8

RELEASE NOTE For: MDS Master Station Firmware Version 8.0.8
RELEASE DATE: September 4, 2020

FIRMWARE

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MDS™ Master Station

COVERING FIRMWARE – v8.0.8

Overview

This section describes Software/Firmware updates for the MDS Master Station.

- Products: MDS Master Station
  - Variants: MPRS, MPRL, MPRU
- System Firmware Version: v8.0.8
  - SD Radio Module Firmware: v3.9.0
  - LN Radio Module Firmware: v3.2.5
  - NX Radio Module Firmware: v0.7.2
  - LW Radio Module Firmware: v0.5.0

NOTICE FOR CUSTOMERS UPGRADING TO THIS VERSION

As part of an enhanced security posture this release uses a SHA256 firmware certificate. When upgrading from earlier firmware versions (before 7.0) it is necessary to overwrite the previous GE MDS firmware certificate with this new one. Related information:

- The new certificate can be found at the GE Industrial Communications website at https://www.gegridsolutions.com/Communications/MDS/software.asp?directory=Master_Station/Support_items
- Certificates can be loaded individually (see Certificate Management, at the bottom of the navigation pane)
- Certificates can be broadcast to a network using remote management.

IMPORTANT NOTES:

- This firmware applies to all MPR (MPRS/MPRL/MPRU) except as described below
  - This firmware does NOT support Evolution/Migration Master station (serial-router).
- Once running 4.x or later system firmware, 3.x system firmware ***cannot*** be downloaded into the Master Station. To preserve the ability to boot back to 3.x firmware, ***do not*** overwrite your inactive 3.x firmware image.
  - See the section labeled "Special Instructions: Booting to 3.x firmware in the inactive image (MPRS Only)" later in the release notes for detailed instructions.
- Both active and inactive Radio Modules have their own firmware that the MPR upgrades together and keeps in sync. The Radio modules use different versioning than the Master Station system firmware. See the firmware version list in the Overview section for the expected radio module firmware versions.

- When the Firewall experiences an error, all traffic is dropped with the exception of the HTTPS and SSH protocols. These protocols can be used to recover the device to a functional state.

Supported Radio Modules

- **MDS Master Station with LN Radio Modules (MPRL)**
  - LN1B
  - LN1C
  - LN2X
  - LN4A
  - LN4C
  - LN4E
  - LN7A
  - LN9A
  - LN9C
- **MDS Master Station with LW Radio Modules (MPRL)**
  - LW7
- **MDS Master Station with SD Radio Modules (MPRS):**
  - SDM4B
  - SDM4C
  - SDM4D
  - SDM9C
  - SDM9K
- **MDS Master Station with Unlicensed 900MHz Radio Modules (MPRU)**
  - NX

New Features

- **Features MDS Master Station since v7.6.5**
  - LN Profiles
    - Similar to "Cell Profiles" but applicable to the Orbit Licensed Narrowband family
    - Provides ability to automatically switch from one pre-programmed LN radio configuration to another based on connectivity timeouts
    - Can be used at APs but is more commonly used in remotes.
  - Redundant AP support
    - Collection of advanced features to support highly reliable operation with redundant APs.
    - Facility operates by extending existing Orbit features such as VRRP (Virtual Router Redundancy Protocol) and Netmon to work with GE MDS Proprietary radios (LN/NX/LW). Feature support works across MCR/ECR/MPRL
    - A new redundant AP Wizard provides step-by-step configuration of all key related components.
    - Configuration has provisions to ensure backhaul integrity to distinguish a broken link from a broken radio, and prevent two units from both becoming active APs.
  - Added support for L1C NIC module
    - L1C (135-156MHz), 12.5, 25.0, 50.0KHz channels
    - ETSI RED compliant / CE Marked
  - Added support for L9A Licensed Narrowband hardware
    - L9A (800-870MHz), 12.5, 25.0, 50.0KHz channels
    - FCC and AUSTEST approved
    - For applications in the USA, this covers the 318 new ''interstitial'' 12.5KHz channels created in the 800MHz Mid-Band supporting public safety and other Private Land Mobile Radio (PLMR) users.
  - Netmon enhancements
    - Netmon adds a conditional-operation option (AND, OR) to allow complex test generation.
    - Netmon adds a radio-monitor option which tests the health of an LN/NX/LW NIC interface.

- TACACS+
  - Cisco protocol for User Authentication and Authorization.

Changes to Existing Features

- Static DHCP assignments are now supported. List entries are specified by "client ID" bound to IP address.
- Multiple Web GUI enhancements have been implemented to improve user experience

Resolved Issues (Fixed) & Improvements

Note: numbers in brackets [] represent internal issue tracking numbers.

- **MDS Master Station since v7.6.5:**
  - While the MDS Master Station supports management and routing via IPv6, not all services have support for IPv6. [1254] [1342]
  - When disabling DHCP, a reboot is recommended to clear any stale settings provided by the DHCP server [2035]
  - There may be issues managing a serial pass-through configuration in basic web mode if it was initially set up in advanced web, or the cli. [1706]
  - When a firewall rule is changed such that certain traffic was previously explicitly allowed, but now would match the default drop rule, any previously allowed flows would still have access to the channel. For instance if a rule allowing SSH was removed, any ongoing SSH sessions would still be allowed. Either reboot the unit after such a change, or explicitly block that traffic. [1562]
  - If the maximum user sessions is reached, then login on the web is not available. However the admin user can log in via CLI and force off another session [1832]
  - Resolved issue with wrong options displayed on Advanced Config tab after changing device from Basic Config.
  - Passthrough configuration can now be removed in Basic web mode
  - Over-the-air reprogramming properly shows 100% complete through LN SAF units. This previously never showed 100% completion.
  - SNMP could previously use up all available login sessions. SNMP, WebUI, CLI and Netconf are now all properly limited to 5 sessions each.
  - LN1 minimum step size is now properly set to 1.25KHz
  - Issues with Legacy Packet with MAC, Ethernet, and DLINK operation, causing traffic stalls introduced in 7.5.6

Preserving ability to run previous configuration

New versions of Master Station code use updated configuration data models that are not backwards compatible with older releases. When a unit running a *previous* release is upgraded to this release, a snapshot of its configuration is made and stored on the unit called "Auto". The unit's configuration is automatically migrated to newer data model. The user can downgrade back to the *previous* firmware version only by choosing to revert to the legacy configuration snapshot as described here. Any firmware can be loaded that is greater than or equal to the Factory snapshot version, but may require a different firmware cert be loaded (See SPECIAL NOTICE FOR CUSTOMERS UPGRADING TO THIS VERSION section above).

To maintain ability to run previous firmware follow the procedure below.

1. Should it be determined that reverting to the previous firmware is necessary, perform the following command on the CLI to reboot to the old firmware, and restore the system using a configuration snapshot. The Auto or a user snapshot can be used if available, but the factory snapshot will always be available.

```
> request system recovery rollback which-image { inactive } snapshot Auto
```

2. You will be prompted to confirm this action:
   The current system configuration will be erased and replaced with the snapshot. Proceed? [no,yes]
3. Type 'yes' and press enter, and the system will restart to the *previous* configuration
4. Note that the recovery operation *may* include restoration of a previous SHA1 FW certificate. If so, then it will be necessary to reinstall the new SHA256 FW certificate before newer software can be downloaded again.

Special Instructions: Booting to 3.x firmware in the inactive image (MPRS Only)

To switch between 3.x firmware and 4.x system firmware on an MPRS follow the procedure below.

1. IMPORTANT: Once you are running 4.x firmware or greater, be sure to not overwrite the 3.x firmware in the inactive firmware location, or you will not be able to revert back to that version. E.g. copying active firmware to inactive location, or installing a new version to the inactive firmware location.
2. Should it be determined that reverting to the old 3.x firmware is necessary, perform the steps from the "Preserving ability to run previous configuration" section above to load the inactive image with a previous snapshot.

Known Errata

Note: numbers in brackets [] represent internal issue tracking numbers.

- **MDS Master Station Platform (including MPRS/MPRL/MPRU):**
  - Syslog is not fully compliant with RFC5424.
  - A QoS modify policy will act like it is automatically applied to all interfaces
  - When using QoS, you cannot have a shaping policy as the next-policy of priority policy.
  - For MPR SD, we do not support multiple TCP connections in TCP multi-host mode.
  - Multihost feature is not functional with more than one poller. [1842]
  - Changes may not be applied immediately when changing Data Device Mode to either DCE or CTS Key mode. They will be applied after a reboot or failover.
  - A QoS modify policy is not tied to an interface and must be deleted to disable it.
  - Instead of prioritizing on the DSCP field, it is recommended to prioritize with the TOS equivalent.
  - When making changes to QOS settings, changes will not occur after committing if traffic flow is already in progress. Reset the interface (or reboot the device) to ensure that changes will be in effect.
  - When configuring the Static Routes Next Hop parameter, leave the Outgoing Interface blank. Otherwise, the routing table will not be properly configured and data passing may stop.

Operational Notes and Limitations

Note: numbers in brackets [] represent internal issue tracking numbers.

- **MDS Master Station Platform (including MPRS/MPRL/MPRU)**
  - The HTTP Protocol is not supported for exporting files. Files can be sent through a browser but not directly uploaded to an http server.
  - While the MDS Master Station supports management and routing via IPv6, not all services have support for IPv6.
  - A com port configured as Console mode only supports 8N1 formatting even though the serial settings can be set otherwise, operates correctly when in data mode.
  - SCEP operations require certificate information to contain a Common Name, otherwise the operation will fail. No direct indication of failure is provided.
  - On a Microsoft CA server, the SCEP template used should not include Extended Key Usage.
  - The "\" character is an escape character for the CLI. If you want to enter a "\" into a text field (such as a user password), you will need to use "\\". [1212,1234]
  - A user may not modify an already saved 'user snapshot'. Instead, delete and remake the snapshot with the necessary changes.
  - If web page display seems to render incorrectly, try refreshing the page. [1783]
  - Timeout of MODBUS transactions, can cause an dropped TCP connections. Potential fixes to increase poll rate or increase transaction timeout.
  - If a remote unit is not responding to broadcast reprogram, connect to it directly via ssh or web and reset the remote management service.

- Header compression is not recommended for large serial polled system or system with only broadcast downstream messaging.
- In a LN system, if the modulation is forced to 64 QAM, it is recommended that FEC (forward error correction) is enabled.
- Broadcast firmware push tries to keep pushing data until all data has been pushed, but if it takes too many errors it may have to be re-initiated.[1459]
- When configuring L7W (Licensed 700MHz Wide), do not set NIC-id. It is not supported in this release and will prevent link establishment.
- Current release of MPRL NIC module hardware does not set the TX LED correctly, if operating in simplex mode. It is constantly on even when the NIC is receiving.
- With configuration change of radio parameters, an entire poll cycle may be needed in LN advanced polling mode.
- Operating as a Repeater with local-data when using modem “none” may not work properly when using SDM9C or SDM9K Radio Modules. In this case, set the repeater mode to “repeater” instead of “repeater-with-local-data”. This does not apply when using SDM4B or SDM4C Radio Modules. For these modules, “repeater-with-local-data” should be used. [542]
- If the operational mode of the radio is changed (e.g. from transparent to packet-with-mac), all mode specific parameters will assume their default values, even if previously set to a different value (e.g. MAC AP vs. Remote). [611]
- An SD Radio Module configured as a Dlink root will not send local Dlink messages over the air if the radio is also configured for Repeater Mode "repeater". An SD repeater that is also a Dlink root must be set to “repeater-with-local-data”. [750]
- When using PulseNET or PulseNET Enterprise to monitor an MPRS in Packet w/ MAC mode, the Passive Collection Repeat Interval (in PulseNET) must be changed from the default 5000ms to a recommended value of 130000ms. This value must be changed for EACH MPRS being monitored in PulseNET.
- An MPRS in transparent mode using ip-payload may require a reduction in the transparent-rx-timeout value, if the data streams are longer than 1480 continues bytes.
- When operating in RTS keying mode, full-duplex operation is not supported. For full-duplex operation, continuous keying must be used. [324]
- When operating the SDMS as a DATAKEY Repeater with SDx/x710 radios as remote endpoints in 9600 modem, it is recommended that the following parameters be configured in the remotes for acceptable polling performance.

  SDx/SDMS Polling Remote SCD: 8ms

  x710/SDx Remote SCD: 12ms

  SDx/SDMS Polling Remote and x710/SDx Remote PTT

  For baud 96008N1: 0ms

  For baud 96008E1: 4ms

  When operating the SDMS as a CKEY Repeater with SDx/x710 radios as remote endpoints in 9600 modem, it is recommended that the following parameters be configured in the remotes for acceptable polling performance.

  SDx/SDMS Polling Remote SCD: 6ms

  x710/SDx Remote SCD: 8ms
- When operating as a repeater in x710 or transparent mode, using modem 9600 and baud rate 9600-8E1, the new repeater-tolerance parameter should be set to ‘custom’ to reduce errors. [758] [760]
- Due to a limitation of SD data compression when operating with certain modems, this feature has been removed. [825]
- When configured with a SDM4B receiver frequency of 400.000, 425.000, 450.000, 475.000, or 500.000MHz, the radio will operate with reduced performance [700]
- On MPR, if SD interface returns error about unsupported mode, in some cases this is erroneous and can be ignored. There can be errors in the detection of the SD nic type that manifest this way.

- There is no MPR VSWR support for LN 100MHz or 200MHz .
- UDP Iperf server does not return a report. Use TCP mode to see bandwidth.
- For the LW radio in the MPR, the LED behavior on the card may not be as expected.
- If there is an error downloading firmware from an HTTP server, the unit may require a reboot.
- In the event of Web display issues, try clearing the browser cache.
- When configuring custom layer-2 protocol filters use 0x as a prefix when entering the value as Hex, otherwise enter the decimal value. Example for ARP: Enter 0x0806 or 2054.
- STP is not functional over interfaces belonging to a VLAN.
- While MDS Orbit supports management and routing via IPv6, not all services have support for IPv6.
- In the CLI, deleting a single entry in a leaf-list with bracket notation will delete the entire list. Do not use brackets in the command when deleting an element in the list.