Lenovo RackSwitch G8332

Release Notes

For Networking OS 8.3

lenovo®

Note: Before using this information and the product it supports, read the general information in the *Safety information and Environmental Notices and User Guide* documents on the Lenovo *Documentation* CD and the *Warranty Information* document that comes with the product.

Release Notes

This release supplement provides the latest information regarding Lenovo Networking OS 8.3 for the Lenovo RackSwitch G8332 (referred to as G8332 throughout this document).

This supplement modifies and extends the following Lenovo N/OS documentation for use with *N/OS* 8.3:

- *Lenovo Networking OS 8.3 Application Guide*

- *Lenovo Networking OS 8.3 ISCLI Reference*

- *Lenovo RackSwitch G8332 Installation Guide*

The publications listed above are available from the following website:

http://publib.boulder.ibm.com/infocenter/systemx/documentation/index.jsp

Please keep these release notes with your product manuals.

Hardware Support

N/OS 8.3 software is supported on the G8332, a high performance Layer 2-3 network switch.

The G8332 is a 1U rack-mountable aggregation switch used for combining traffic from multiple high-speed server racks. The G8332 uses a wire-speed, non-blocking switching fabric that provides simultaneous wire-speed transport of multiple packets at low latency on all ports.

The switch unit contains the following switching ports:

- Twenty-four 40 Gigabit Ethernet (GbE) Quad Small Form Pluggable Plus (QSFP+) ports, each of which can optionally be used as four 10 GbE SFP+ ports

- Eight additional 40 GbE QSFP+ ports through the Media Dependent Adapter (MDA) module

Figure 1. RackSwitch G8332 front panel

Management Panel

QSFP+ Ports

MDA Module QSFP+ Ports
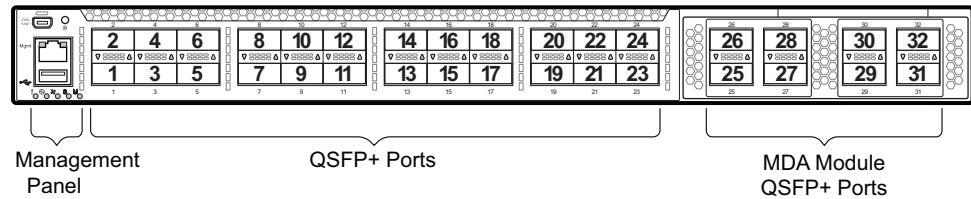
Updating the Switch Software Image

The switch software image is the executable code running on the G8332. A version of the image comes pre-installed on the device. As new versions of the image are released, you can upgrade the software running on your switch. To get the latest version of software supported for your G8332, go to the following website:

http://www.support.lenovo.com/

To determine the software version currently used on the switch, use the following switch command:

```
G8332# show version
```

The typical upgrade process for the software image consists of the following steps:

- Load a new software image and boot image onto an FTP or TFTP server on your network.

- Transfer the new images to your switch.

- Specify the new software image as the one which will be loaded into switch memory the next time a switch reset occurs.

- Reset the switch.

For instructions on the typical upgrade process, see "Loading New Software to Your Switch" on page 6.

Note: Due to Lenovo firmware security guidelines, it is not possible at this time to upgrade or migrate a switch from IBM Networking OS to Lenovo Networking OS.

Updating VLAG Switches with Lenovo Networking OS 8.x

Following are the steps for updating the software image and boot image for switches configured with VLAG:

1. Save the configuration on both switches using the following command:

```
G8332(config)# copy running-configuration startup-configuration
```

2. Use TFTP or FTP to copy the new OS image and boot image onto both vLAG switches.

3. Shut down all ports except the ISL ports and the health check port on the primary switch (Switch 1).

    Note: Do not save this configuration.

4. Reload Switch 1, Switch 2 will assume the vLAG primary role

5. Once Switch 1 has rebooted, Switch 1 will take the secondary role.

6. Shut down all ports except the ISL ports and the health check port on Switch 2.

    Note: Do not save this configuration.

7. Reload Switch 2, Switch 1 will reassume the vLAG primary switch role.

8. Once Switch 2 has reloaded, make sure Switch 1 has transitioned to vLAG primary and Switch 2 has transitioned to secondary.

9. Verify all the vLAG clients have converged using the following command:

```
G8332(config)# show vlag information
```

Loading New Software to Your Switch

The G8332 can store up to two different switch software images (called `image1` and `image2`) as well as special boot software (called `boot`). When you load new software, you must specify where it should be placed: either into `image1`, `image2`, or `boot`.

For example, if your active image is currently loaded into `image1`, you would probably load the new image software into `image2`. This lets you test the new software and reload the original active image (stored in `image1`), if needed.

Attention: When you upgrade the switch software image, always load the new boot image and the new software image before you reset the switch. If you do not load a new boot image, your switch might not boot properly (To recover, see).

To load a new software image to your switch, you will need the following:

● The image and boot software loaded on an FTP or TFTP server on your network.

   Note: Be sure to download both the new boot file and the new image file.

● The hostname or IP address of the FTP or TFTP server

   Note: The DNS parameters must be configured if specifying hostnames.

● The name of the new software image or boot file

When the software requirements are met, use the following procedures to download the new software to your switch.

1. In Privileged EXEC mode, enter the following command:

```
G8332(config)# copy {sftp|tftp|ftp} {image1|image2|boot-image}
```

2. Enter the hostname or IP address of the FTP or TFTP server.

```
Address or name of remote host: <name or IP address>
```

3. Enter the name of the new software file on the server.

```
Source file name: <filename>
```

The exact form of the name will vary by server. However, the file location is normally relative to the FTP or TFTP directory (for example, `tftpboot`).

4. If required by the FTP or TFTP server, enter the appropriate username and password.

5. The switch will prompt you to confirm your request.

Once confirmed, the software will begin loading into the switch.

6. When loading is complete, use the following commands to enter Global Configuration mode to select which software image (image1 or image2) you want to run in switch memory for the next reboot:

```
G8332# configure terminal
G8332(config)# boot image {image1|image2}
```

The system will then verify which image is set to be loaded at the next reset:

```
Next boot will use switch software image1 instead of image2.
```

7. Reboot the switch to run the new software:

```
G8332(config)# reload
```

The system prompts you to confirm your request. Once confirmed, the switch will reboot to use the new software.

Note: If you select "No" when asked to confirm the reload, any changes made to the configuration since the last reboot will be lost.

New and Updated Features

N/OS 8.3 for RackSwitch G8332 has been updated to include several new features, summarized in the following sections. For more detailed information about configuring G8332 features and capabilities, refer to the complete N/OS 8.3 documentation as listed on .

Auto VLAN Tagging on Trunk Ports

This enhancement facilitates the process of adding trunk ports in VLANs by automatically adding them to all VLANs from their allowed ranges. By default, all VLANs are allowed on each port.When a port is configured as trunk port, it is automatically added to all VLANs from its allowed range. Also, when a new VLAN is created, all trunk ports which have that VLAN in their allowed ranges are automatically added to it.

BGP Pre Append AS path

This enhancement facilitates the process of routing maps by influencing the BGP route selection so that one path is preferred over another. This is especially useful when customers are dual home to two different Internet Service Providers (ISPs) and they want to have a primary path to one ISP and use the other ISP as a backup path.

Decoupling Active VLANs from an MSTP Configuration

This feature enables the decoupling of the VLAN configurations from an MSTP configuration and changes the MSTP configuration menu to a more simplified one. By doing so, specifying a mapping between one or more VLANs and MSTI will not create any VLANs, and the participation of the VLANs in MSTP will not depend on the VLAN creation.

Dynamic ARP Inspection

This enhancement enables the device to intercept and examine all ARP requests and response packets in a subnet. The feature discards those packets with invalid IP to MAC address bindings. This capability protects the network from some man-in-the-middle attacks.

Interrupt Mode Enable

This feature changes the way FDB learns. New HASH mechanism is enabled to enhance the capability for FDB learning.

Increase MAX ARPs to 16K

This is an enhancement to support 16K ARP entries on the platforms using Trident+ and T2 chipsets.

Link Aggregation Control Protocol (LACP) Individual Mode

When this feature is enabled on an LACP portchannel, if a member port of the portchannel does not receive any LACPDU over a period of time, it will be treated as a normal port that may forward data traffic according to its STP state.

Private VLAN

This release supports Private VLAN configurations as described in RFC 5517.

Secure Image Signing

This release adds a signature to the header of the image to ensure that the image loaded onto the switch is a genuine Lenovo official image.

SNSC

This release adds the option to disable terminal prompting in SNSC.

Spanning Tree Protocol (STP) Range Enhancement

Existing Spanning Tree Protocol (STP) commands now support configuration of a range of STP groups at once. STP range groups configurations are also displayed in a configuration dump.

vLAG MSTP Enhancement

This enhancement removes STP configuration restrictions, such as changing the MSTP instance and VLAN associations, that were enforced in previous releases when vLAG and MSTP were both enabled. The vLAG interswitch link ports are no longer error-disabled when there is an MSTP region mismatch between the vLAG switches. Instead, a recurring warning message appears during the duration of the configuration mismatch.

Supplemental Information

This section provides additional information about configuring and operating the G8332 and N/OS.

The Boot Management Menu

The Boot Management menu allows you to switch the software image, reset the switch to factory defaults, or to recover from a failed software download.

You can interrupt the boot process and enter the Boot Management menu from the serial console port. When the system displays Memory Test, press **<Shift B>**. The Boot Management menu appears.

```
Resetting at 10:55:49 Sun Apr 19, 2015…
Memory Test ...............................
Boot Management Menu
I - Change booting image
C - Change configuration block
R - Boot in recovery mode (tftp and xmodem download of images to recover
switch)
Q - Reboot
E - Exit
Please choose your menu option: I
Current boot image is 1. Enter image to boot: 1 or 2: 2
Booting from image 2
```

The Boot Management menu allows you to perform the following actions:

- To change the booting image, press **I** and follow the screen prompts.

- To change the configuration block, press **C**, and follow the screen prompts.

- To perform a TFTP/Xmodem download, press **R** and follow the screen prompts.

- To reboot the switch, press **Q**. The booting process restarts

- To exit the Boot Management menu, press **E**. The booting process continues.

Recovering from a Failed Software Upgrade

Use the following procedure to recover from a failed software upgrade.

1. Connect a PC to the serial port of the switch.

2. Open a terminal emulator program that supports XModem Download (for example, HyperTerminal, SecureCRT, PuTTY) and select the following serial port characteristics:

   - Speed: 9600 bps

   - Data Bits: 8

   - Stop Bits: 1

   - Parity: None

   - Flow Control: None

3. To access the Boot Management menu, you must interrupt the boot process from the Console port. Boot the G8332, and when the system begins displaying Memory Test progress (a series of dots), press **<Shift B>**. The Boot Management menu will display:

```
Resetting at 10:55:49 Sun Apr 19, 2015…
Memory Test ...............................
Boot Management Menu
I - Change booting image
C - Change configuration block
R - Boot in recovery mode (tftp and xmodem download of images to recover
switch)
Q - Reboot
E - Exit
Please choose your menu option:
```

4. Select **R** for **Boot in recovery mode**. You will see the following display:

```
Entering Rescue Mode.
Please select one of the following options:
        T) Configure networking and tftp download an image
        X) Use xmodem 1K to serial download an image
        P) Physical presence (low security mode)
        R) Reboot
        E) Exit

Option?:
```

- If you choose option **X** (Xmodem serial download), go to step 5.
- If you choose option **T** (TFTP download), go to step 6.

5. **Xmodem download**: When you see the following message, change the Serial Port characteristics to 115200 bps:

```
Change the baud rate to 115200 bps and hit the <ENTER> key before
initiating the download.
```

a. Press <**Enter**> to set the system into download accept mode. When the readiness meter displays (a series of "C" characters), start XModem on your terminal emulator.

b. When you see the following message, change the Serial Port characteristics to 9600 bps:

```
Change the baud rate back to 9600 bps, hit the <ESC> key.
```

c. When you see the following prompt, enter the image number where you want to install the new software and press <**Enter**>.

```
Install image as image 1 or 2 (hit return to just boot image): 1
```

d. The following message is displayed when the image download is complete. Continue to step 7.

```
Entering Rescue Mode.
Please select one of the following options:
        T) Configure networking and tftp download an image
        X) Use xmodem 1K to serial download an image
        P) Physical presence (low security mode)
        R) Reboot
        E) Exit

Option?:
```

6. **TFTP download**: The switch prompts you to enter the following information:

```
Performing TFTP rescue. Please answer the following questions (enter 'q'
to quit):
IP addr    :
Server addr:
Netmask    :
Gateway    :
Image Filename:
```

a. Enter the required information and press <**Enter**>.

b. You will see a display similar to the following:

```
        Host IP    : 10.10.98.110
        Server IP  : 10.10.98.100
        Netmask    : 255.255.255.0
        Broadcast  : 10.10.98.255
        Gateway    : 10.10.98.254
Installing image G8332-8.2.1.0_OS.img from TFTP server 10.10.98.100
```

c. When you see the following prompt, enter the image number where you want to install the new software and press <**Enter**>.

```
Install image as image 1 or 2 (hit return to just boot image): 1
```

d. The following message is displayed when the image download is complete. Continue to step 7.

```
Entering Rescue Mode.
Please select one of the following options:
        T) Configure networking and tftp download an image
        X) Use xmodem 1K to serial download an image
        P) Physical presence (low security mode)
        R) Reboot
        E) Exit

Option?:
```

7. Image recovery is complete. Perform one of the following steps:

   ● Press **r** to reboot the switch.

   ● Press **e** to exit the Boot Management menu

   ● Press the Escape key (<**Esc>**) to re-display the Boot Management menu.

Recovering from a Failed Boot Image Upgrade

Use the following procedure to recover from a failed boot image upgrade.

1. Connect a PC to the serial port of the switch.

2. Open a terminal emulator program that supports Xmodem download (such as HyperTerminal, CRT, or PuTTY) and select the following serial port characteristics:

   o Speed: 9600 bps
   o Data Bits: 8
   o Stop Bits: 1
   o Parity: None
   o Flow Control: None

3. Boot the switch and access the Boot Management menu by pressing <**Shift B**> while the Memory Test is in progress and the dots are being displayed.

4. Select **X** for **Xmodem download**. You will see the following display:

```
Perform xmodem download

To download an image use 1K Xmodem at 115200 bps.
```

5. When you see the following message, change the Serial Port characteristics to 115200 bps:

```
Change the baud rate to 115200 bps and hit the <ENTER> key before
initiating the download.
```

   a. Press <**Enter**> to set the system into download accept mode. When the readiness meter displays (a series of "C" characters), start Xmodem on your terminal emulator.You will see a display similar to the following:

```
Extracting images ... Do *NOT* power cycle the switch.
**** RAMDISK ****
Un-Protected 38 sectors
Erasing Flash...
..................................... done
Erased 38 sectors
Writing to Flash...9....8....7....6....5....4....3....2....1....done
Protected 38 sectors
**** KERNEL ****
Un-Protected 24 sectors
Erasing Flash...
....................... done
Erased 24 sectors
Writing to Flash...9....8....7....6....5....4....3....2....1....
```

   b. When you see the following message, change the Serial Port characteristics to 9600 bps:

```
Change the baud rate back to 9600 bps, hit the <ESC> key.
```

   Boot image recovery is complete.

VLAGs

For optimal VLAG operation, adhere to the following configuration recommendations:

- Any port-related configuration, such as applied ACLs, must be the same for all ports included in the same VLAG, across both peer switches.

- Configure VLAG health checking as shown in the *Application Guide*.

After configuring VLAG, if you need to change any configuration on the VLAG ports, you must adhere to the following guidelines:

- If you want to change the STP mode, first disable VLAG on both the peers. Make the STP mode-related changes and re-enable VLAG on the peers.

- If you have MSTP on, and you need to change the configuration of the VLAG ports, follow these steps:

On the VLAG Secondary Peer:

1. Shutdown the VLAG ports on which you need to make the change.

2. Disable their VLAG instance using the command:
   ```
   G8332 (config)# no vlag adminkey <key> enable (or)
   G8332 (config)# no vlag portchannel <number> enable
   ```

3. Change the configuration as needed.

   On the VLAG Primary Peer:

4. Disable the VLAG instance.

5. Change the configuration as needed.

6. Enable the VLAG instance.

   On the VLAG Secondary Peer:

7. Enable the VLAG instance.

8. Enable the VLAG ports.

   Note: This is not required on non-VLAG ports or when STP is off or when STP is PVRST.

Known Issues

This section describes known issues for N/OS 8.3 on the RackSwitch G8332.

Note: Please review the Change History documentation posted with the Switch Firmware to check if any of these issues have been fixed in the latest release.

Debug

- Lenovo N/OS debug commands are for advanced users. Use the debug commands with caution as they can disrupt the operation of the switch under high load conditions. This could be dangerous in mission-critical production environments. Before debugging, check the MP utilization to verify there is sufficient overhead available for the debug functionality. When debug is running under high load conditions, the CLI prompt may appear unresponsive. In most cases, control can be returned by issuing a no debug <function> command.

- Removing the MDA board while the switch is operating, without prior MDA shutdown, may generate the following error message:

      i2cWrite_byte MDA LM75 0:0xee @ 0x00 1 Error 5 (-1)

  This error is not critical and does not interfere with any switch functionality (ID: XB262550 and XB264278).

DOVE

- In the current release, the DOVE Management Console (DMC version 1.1.0.140219) does not support clearing a VLAN gateway from the WebUI. To avoid this, use the DMC's command line interface. (ID: XB264861)

- Changing the TEP IP interrupts data traffic. To fix this, disable and enable DOVE on the switch. (ID: XB271897)

- In the current release, only 10GbE ports are supported as reserved ports. (ID: XB270743)

EVB

- When a VM cannot be associated, because the maximum number of ACLs supported on a port (256) has been reached, the console may be flooded with syslog messages stating the association failed due to insufficient ACL resources. (ID: XB263550)

FCoE and CEE

- Globally enabling or disabling CEE may halt L3 traffic. To avoid this, temporarily suspend data traffic when changing CEE settings. Otherwise, reload the switch to fix the disrupted traffic. (ID: XB137860)

- When using static trunks to set up FCoE links between two switches, both participating switches must have their corresponding portchannels enabled. Otherwise, multicast frames may enter loops and cause frame drops. (ID: XB260972)

- After enabling FIP snooping on an FIP Snooping Bridge, it may take up to two minutes for the FCoE sessions to initiate. (ID: XB262043)

- When displaying FC zone status information for a VLAN, the PWWN member count indicates the number of unique members, instead of the total number. PWWN members that belong to multiple zones, are counted only once. (ID: XB256730 and XB258881)

- When changing the FIP Keep Alive Advertisement period, it is recommended to wait for a duration five times longer than the highest value in the interval before submitting another change. For instance, when increasing the period from 20 to 75 seconds, or decreasing it from 75 to 45 seconds, it is recommended to wait for 75 x 5 = 375 seconds before changing it again.

  It is also recommended to divide large FIP Keep Alive Advertisement period changes in smaller increments. For instance, if lowering the value from 90 seconds to 4 seconds, you should lower it from 90 to 20 seconds in a first stage and, after waiting for 90 x 5 = 450 seconds, lower the period from 20 to 4 seconds in a second stage. (ID: XB268990)

IGMP

- The switch keeps forwarding IPMC traffic with IP options to multicast routers after the IGMP group expires. (ID: XB256781)

- Avoid scenarios where IGMP is enabled on one VLAN while another VLAN has flooding disabled (but no IGMP configuration). Otherwise, the report processing mechanism may, after several minutes, generate out of memory messages for reports sent at a high rate over multiple member ports in the VLAN with flooding disabled. To avoid this, lower the IGMP CoPP rate to 2000 pps or less, or stop the IGMP reports stream. (ID: XB258760)

Jumbo Frames

All jumbo frames are counted as multicast packets on the ingress ports. (ID: XB261919)

LACP

Up to 104 portchannels can be created, but the verified scaling limit is 64 portchannels.

MDA

Repeatedly enabling and disabling the MDA board may lock-up random ports. To fix this, remove and reinstall the affected transceiver. (ID: XB263409)

MLD

In case the multicast flooding feature is disabled, MLD packets are still software flooded for at least one IPv6 interface configured. It does not have to be linked to the VLAN where the MLD packets need to be flooded. (ID: LV305657)

NAT

- DNAT+NAPT rules that map destination IP addresses between the default and the inside/outside realm, will route packets at CoPP rates if only the destination IP addresses match, wile the destination port numbers do not match. To avoid this:

  a. Do not create DNAT rules mapping destination IPs between the default realm and the inside/outside realm.

  b. Otherwise, do not create DNAT+NAPT rules that do not match the packets' L4 destination port numbers.

  c. If the above is unavoidable, define additional DNAT+NAPT rules to match all the L4 destination ports employed in traffic. (ID: XB266690)

Openflow

- Static FDB flows are stored as ACL flows. (ID: XB262456)

- Using a port-mod message to change the OFPPC_NO_FLOOD bit does not reprogram the already installed flows. (ID: XB259385)

PIM

Receiving multicast packets at rates of 1,000,000 pps, or within the 100K – 111K pps range, causes slow learning for (S, G) entries. To avoid this, configure the Control Plane Protection bandwidth for the unknown-destination packets (queue 0 by default) to a prime number larger than 1000 (ID: XB261554).

```
RS G8332(config)# qos protocol-packet-control
                  rate-limit-packet-queue 0 2113
```

VLAG

- If Protocol Independent Multicast (PIM) is configured in a VLAG topology, when disabling and re-enabling IGMP or IGMP snooping on a secondary VLAG switch, some of the PIM outgoing interfaces may fail to change back from forwarding to pruned state. To limit this issue, it is recommended to wait at least 1 minute between disabling and enabling back IGMP or IGMP snooping on a secondary VLAG switch when running PIM. (ID: XB264621)

- VLAG scalability is limited by system load. Under heavy load, when disabling and enabling back multiple VLAG instances on a switch, some of the instances on its peer may remain in LOCAL-UP state instead of changing to FORMED state. (ID: XB263527)

VRRP

Virtual router interfaces do not support Telnet sessions. (ID: XB255037)