

Lenovo RackSwitch G8296

Release Notes

For Cloud Network Operating System 10.3

LenovoTM

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.

First Edition (February 2017)

© Copyright Lenovo 2017
Portions © Copyright IBM Corporation 2014.

LIMITED AND RESTRICTED RIGHTS NOTICE: If data or software is delivered pursuant a General Services Administration "GSA" contract, use, reproduction, or disclosure is subject to restrictions set forth in Contract No. GS-35F-05925.

Lenovo and the Lenovo logo are trademarks of Lenovo in the United States, other countries, or both.

Release Notes

This release supplement provides the latest information regarding Lenovo Cloud Network Operating System 10.3 for the Lenovo RackSwitch G8296 (referred to as G8296 throughout this document).

This supplement modifies and extends the following Cloud NOS documentation for use with CNOS 10.3:

- *Lenovo Network Application Guide for Lenovo Cloud Network Operating System 10.3*
- *Lenovo Network Command Referernce for Lenovo Cloud Network Operating System 10.3*
- *Lenovo RackSwitch G8296 Installation Guide*

These publications are available from the following website:

<http://systemx.lenovofiles.com/help/index.jsp>

Please keep these release notes with your product manuals.

Note: The Lenovo Cloud Network Operating System is based on the Embedded Linux Integration Environment (ELIE). To obtain open source code licenses, go to <https://github.com/lenovo/ELIE/tree/master/elic-1.7.1/licenses/>. For details on how to obtain open source code, please contact Lenovo Support.

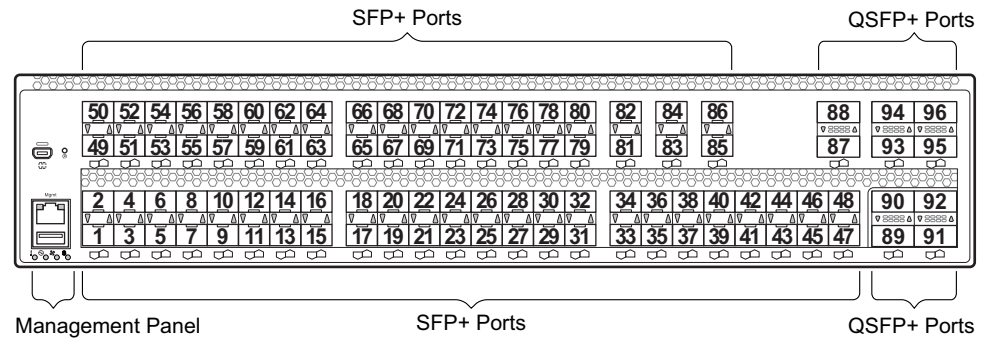
Hardware Support

CNOS 10.3 software is supported on the G8296 high performance Layer 2-3 network switches.

The G8296 is a 2U rack-mountable aggregation switch. The G8296 uses a wire-speed, non-blocking switching fabric that provides simultaneous wire-speed transport of multiple packets at low latency on all ports.

- Eighty-six 10 Gigabit Ethernet (GbE) Small Form Pluggable Plus (SFP+) ports which also support legacy 1 GbE connections
- Ten 40 GbE Quad Small Form Pluggable Plus (QSFP+) ports, two of which (Ethernet 1/87 and Ethernet 1/88) can optionally be used as four 10 GbE SFP+ ports

Figure 1. G8296 front panel



Updating the Switch Software Image

The new Lenovo Cloud Network OS image cannot coexist on the switch with your legacy 8.x Lenovo NOS. If you are running Lenovo NOS 8.x, follow these instructions to replace the operating system with Lenovo CNOS.

Note: To download all necessary software images, go to the following website:

<http://support.lenovo.com>

1. Make sure you are running Lenovo NOS 8.4.1.0 or later.

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

```
G8296# show version [brief]
```

If you are running a version of Lenovo ENOS earlier than 8.4.1.0, download and install a more recent version of the Lenovo NOS image before going to the next step.

2. From the 8.4.1 or later image, download the Cloud NOS image:

```
G8296# copy tftp image1 address <TFTP server address> filename <location on TFTP server relative to tftpboot location>/G8296-CNOS-10.3.1.0.imgs mgt-port
```

Note: CNOS consists of a single image to install that contains all components, including boot and operating system.

During the download, you are presented with the following message:

```
WARNING: This is the ONLY region with valid bootable image.
          If download fails, switch will not be able to boot.
          Please download into image2 to prevent potential fatal error!

Confirm overwriting the ONLY bootable image (y/n) ?
```

Enter y to continue.

```
Confirm overwriting the ONLY bootable image (y/n) ? y
Image download started to image1
File appears valid
Download in progress
.....
```

3. When the image is successfully downloaded, the switch will ask you to confirm the update:

```
Download Complete
Valid image detected.
Processing 10.x upgrade image - all data in /user will be lost,
including configuration
Confirm upgrade (y/n) ?
```

Enter y to continue.

```
Confirm upgrade (y/n) ? y
```

4. When the download has completed, reset the switch:

```
G8296# reload
Reset will use software "image1" and the active config block.
>> Note that this will RESTART the Spanning Tree,
>> which will likely cause an interruption in network service.
Confirm reload (y/n) ?
```

5. Enter y to continue the reload.
6. When the switch finishes rebooting, log in and verify the image to make sure it is the correct image running the correct version of the software:

```
G8296 login: admin
Password: <password>
Last login: Mon Feb 13 12:19:34 2016 from 10.42.1.100
<build note>

NOS version 10.3.1.0 LENOVO G8296, Tue Feb 14 15:01:20 PDT 2016

G8296# enable
G8296# display boot
Current ZTP State: Enable
Current FLASH software:
  active image: version 10.3.1.0, downloaded 08:56:56 UTC Tue Feb  7 2017
  standby image: version 10.3.1.0, downloaded 10:56:42 UTC Tue Feb  7
2017
  Uboot: version 10.3.1.0, downloaded 08:56:58 UTC Tue Feb  7 2017
  ONIE: version 10.3.1.0, downloaded 14:48:08 UTC Tue Feb  7 2017
Currently set to boot software active image
Current port mode: default mode
```

Note: If this is first time switching NOS versions the image version may appear as unknown. To fix this:

1. Reinstall the CNOS image again following standard image install methods:

```
G8296# cp tftp tftp: /<TFTP server address>/G8296-CNOS-10.3.1.0.imgs
system-image all vrf management
Confirm download operation? (y/n) [n] y
```

2. When prompted to change the active boot image to the standby image, enter **y** to confirm:

```
Boot loader now contains Software Version 10.3.1.0
Standby image now contains Software Version 10.3.1.0
Switch is currently set to boot active image.
Do you want to change that to the standby image? (y/n) [n] y
Switch is to be booted with standby image.
Currently profile is default, set to boot with default profile next time.
Current FLASH software:
  image1: version 10.3.1.0, downloaded 12:13:52 Mon Feb 6, 2017
  image2: version 10.3.1.0, downloaded 16:49:37 Tue Feb 7, 2017
  boot kernel: version 10.3.1.0
Currently scheduled reboot time: none
```

Reloading the ENOS Image

If you want to return to the legacy 8.x ENOS image, you must reinstall it:

1. Download the ENOS boot image to the switch and enter **y** to confirm the download operation.

```
G8296# cp tftp tftp://<tftp server IP>/G8296-8.4.1.0_Boot.imgs system-image
boot vrf management
Confirm download operation? (y/n) [n] y
Download in progress
.....
Copy Success

Install image...This takes about 90 seconds. Please wait
Check image signature succeeded
Extracting image: 100%
Installing enOS RFS:
Updating flash: 100%
Extracting image: 100%
Installing enOS Kernel:
Updating flash: 100%
Extracting image: 100%
Installing enOS DFT:
Updating flash: 100%
Extracting image: 100%
Installing uboot:
Updating flash: 100%
Boot image installation succeeded.
OS image installation failed.
```

Note: You can ignore the OS image installation failed error message.

2. Download the ENOS system image to the switch and enter **y** to confirm the download operation:

```
G8296# cp tftp tftp://<tftp server IP>/G8296-8.4.1.0_OS.imgs system-image os
vrf management
Confirm download operation? (y/n) [n] y
Download in progress
.....
Copy Success
Install image...This takes about 90 seconds. Please wait
Check image signature succeeded
Extracting image: 100%
Installing E-NOS image to image1
Installing image to E-NOS image1: 100%
Boot image installation failed.
OS image installation succeeded.
```

3. Reboot the switch.

```
G8296# reload
```

Supplemental Information

This section provides additional information about configuring and operating the G8296 and CNOS.

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 Feb 19, 2017...
Memory Test .....
Boot Management Menu
  I - Change booting image
  R - Boot in recovery mode (tftp and xmodem download of images to
recover switch)
  P - Password reset
  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 boot in recovery mode, press **R**.
- To reset the default user password, press **P** 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 TFTP (preferred) or Xmodem download (for example, HyperTerminal, SecureCRT, PuTTY). If using Xmodem, make sure the following settings are in effect:
 - 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 G8296, 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 Feb 12, 2017...
Memory Test .....
Boot Management Menu
  I - Change booting image
  R - Boot in recovery mode (tftp and xmodem download of images to
recover switch)
  P - Password reset
  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)
  F) Filesystem check
  R) Reboot
  E) Exit

Option?:
```

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

5. **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 G8296-CNOS-10.3.1.0_OS.imgs 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)
  F) Filesystem check
  R) Reboot
  E) Exit

Option?:
```

6. **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)
    F) Filesystem check
    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.

New Features in This Release

This release of Lenovo Cloud Network Operating System contains the following significant fixes, enhancements, and other changes.

RADIUS

The following enhancements have been added to CNOS RADIUS support.

- You can now create a RADIUS group definition in Authentication, Authorization, and Accounting (AAA) mode.
- In addition to pluggable authentication module (PAM) support, CNOS RADIUS now supports the MS-CHAP-V2 authentication method.

Converged Enhanced Ethernet (CEE)

CNOS now supports Converged Enhanced Ethernet (CEE), a set of IEEE standards designed to allow different physical networks with different data handling requirements to be converged together. These standards simplify management, increasing efficiency and use, and leverage legacy investments without sacrificing growth. This includes the following features.

- Priority-Based Flow Control (PFC)
Priority-based Flow Control (PFC) is defined in IEEE 802.1Qbb. PFC extends the IEEE 802.3x standard flow control mechanism that lets you choose which traffic gets priority by allowing the switch to pause specified types of traffic on the port, while other traffic on the port continues.
- Data Center Bridging Capability Exchange (DCBX)
Data Center Bridging Capability Exchange (DCBX) protocol enables peer CEE devices to exchange information about their advanced capabilities. Using DCBX, neighboring network devices discover their peers, negotiate peer configurations, and detect misconfigurations.

Enhanced Transmission Selection (ETS)

Enhanced Transmission Selection (ETS) is defined in IEEE 802.1Qaz. ETS provides a method for allocating port bandwidth based on 802.1p priority values in the VLAN tag. Using ETS, different amounts of link bandwidth can be specified for different traffic types, such as LAN, SAN, and management.

Known Issues

This section describes known issues for CNOS 10.3 on the RackSwitch G8296.

ECMP Routes

Recursive ECMP routes are not counted in ECMP route statistics. (ID: 43134)

Link Operation on QSFP+ Ports

QSFP+ ports are set to 40G fixed (non auto-negotiate) mode. The link partner needs to meet the same requirements for the link to be fully functional. (ID: 52025)

QoS

The ranges displayed for the following QoS parameters are not accurate:

- *Committed information rate;*
- *Peak information rate.*

The displayed range is **1bps - 1gbps**, but the user can configure rates beyond the 1gbps upper limit using the kbps, mbps, and gbps options. (ID: 47847)

Routed Ports

On the RackSwitch G8296, the maximum number of routed ports is 94.

VLAG

- When VLAG Peer Gateway is enabled, IPv4 unicast packets cannot be exchanged between the Switch VLAN Interfaces (SVI) of VLAG Peer switches over ISL.
- VLAG Peer Gateway with IPv6 is not supported in this release. (ID: 62141, 70211)