Lenovo RackSwitch G8296

Release Notes

For Lenovo Cloud Network Operating System 10.4

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 Cloud Network Operating System 10.4 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* 10.4:

- *Lenovo Network Application Guide for Lenovo Cloud Network Operating System 10.4*

- *Lenovo Network Command Reference for Lenovo Cloud Network Operating System 10.4*

- *Lenovo Network Python Programming Guide for Lenovo Cloud Network Operating System 10.4*

- *Lenovo Network REST API Programming Guide for Lenovo Cloud Network Operating System 10.4*

- *Lenovo Rackswitch G8296 Installation Guide*

These publications are available from the following website:

http://systemx.lenovofiles.com/help/topic/com.lenovo.systemx.common.nav.doc/overview_rack_switches.html

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/elie-1.7.1/licenses/. For details on how to obtain open source code, please contact Lenovo Support.

Hardware Support

CNOS 10.4 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
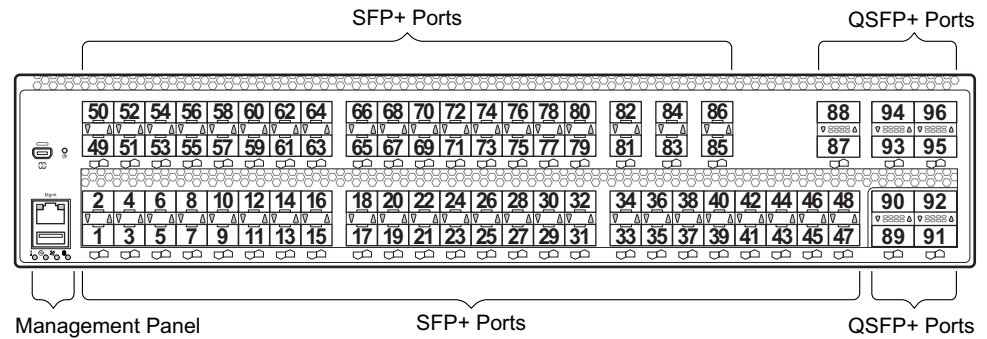
Converting the Switch Software Image from CNOS to ENOS

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

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

http://support.lenovo.com

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.
```

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.
```

Note: Reboot the switch.

```
G8296#  reload
```

Converting the Switch Software Image from ENOS to CNOS

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

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

http://support.lenovo.com

1. Connect to the switch through the console terminal. 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-10.4.2.0.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 10.4.2.0 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 10.4.2.0, downloaded 08:56:56 UTC Tue Feb  7 2017
  standby image: version 10.4.2.0, downloaded 10:56:42 UTC Tue Feb  7 2017
  Uboot: version 10.4.2.0, downloaded 08:56:58 UTC Tue Feb  7 2017
  ONIE: version 10.4.2.0, 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:

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

```
G8296# cp tftp tftp://<TFTP server address>/G8296-CNOS-10.4.2.0.imgs system-image all vrf
management
Confirm download operation? (y/n) [n] y
```

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

```
Boot loader now contains Software Version 10.4.2.0
Standby image now contains Software Version 10.4.2.0
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.
```

Note: After this step, reloading the switch is not mandatory.

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 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
     O - ONIE boot menu
     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 boot in ONIE menu, press **O**. The submenu is available, but executing any of its options results in an error, unless the ONIE license key is installed.

- 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
     O - ONIE boot menu
     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-10.4.2.0_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.

Lenovo HCI Solution with Nutanix

This release supports Nutanix AOS software version 5.1.0/5.1.1.

Note: The release of Nutanix AOS 5.1.2 inadvertently removed the network APIs so it cannot be used with ThinkAgile Network Orchestrator. The APIs will be restored in AOS 5.1.3. ThinkAgile Network Orchestrator is supported with Nutanix AOS v5.1.1.3 or 5.1.3.

LACP Standby

This feature introduces a new state called Standby for ports in a LACP Port Channel.

Minimum Links per LACP

This feature allows configuration of minimum number of ports that need to be in Link Up state and bundled into a LACP Port Channel. If the number of Link Up ports in a LACP Port Channel is lower than the configured value, the LACP member ports will be moved to Standby state and won't be operational to forward traffic.

Telemetry agent for real-time analytics

This feature enables the support for network telemetry on Lenovo switches providing network insights for the following use cases:

- Congestion Detection

  Provide in-depth insights on network congestion at various stages including device, interface and traffic type along with class-of-service.

- Data Center Planning

  Identify network bandwidth requirement by long-term monitoring of switch hardware resource utilization.

- Streaming Telemetry

  Provide real time monitoring data with asynchronous reporting and REST APIs to support latest cloud data center and analytics eco-system.

Telemetry Analytics Tool: Ganglia Plug-ins for supported Telemetry features

CNOS telemetry is integrated with Ganglia 3.7.2 for the network visualization related to congestion detection and buffer statistics.

Ganglia Plugins for supported Telemetry features is posted on github at https://github.com/lenovo/networking-telemetry.

DHCP Snooping

This release includes support for DHCP Snooping that acts like a firewall between untrusted hosts and DHCP servers. DHCP Snooping provides security by filtering untrusted DHCP packets and by building and maintaining a DHCP Snooping binding table.

DNS Client

This feature supports configuring and using DNS client to resolve easy to memorize domain names to numerical IP addresses.

OSPF via REST/Python API

This feature supports retreiving a subset of OSPF related information via REST/Python APIs.

Public Key Infrastructure

This feature includes support for externally signed or CA Signed Certificates. It also includes support for generation of CSR or Certificate Signing Request on the switch.

Command Aliasing

This feature provides a means for the user to define alias commands to replace frequently used commands. The command alias can represent all or part of the command syntax with string replacement. This feature provides the following benefits:

- Map each existing command to a configured alias name.
- The alias configuration will be persistent across switch reboots.
- Auto-completion or description of alias commands is available.

REST API Global Health Status

This release adds the *global* health status in the response of /nos/api/sysinfo REST API. This feature is required by the vRealize Orchestrator Plug-in.

CNOS Syslog Messages Enhancement

This release supports an unique string *cnos* in the CNOS syslog messages. The string allows the user to differentiate the messages produced by our switches from syslogs originated from other vendor's devices. This feature is primarily used by the vRealize Log Insight Content Pack.

Known Issues

This section describes known issues for CNOS 10.4 on the RackSwitch G8296.

Routed Ports

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