

Lenovo RackSwitch G8296

Release Notes

For Lenovo Cloud Network Operating System 10.7

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 (March 2018)

© Copyright Lenovo 2018
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 10.7 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 10.7:

- *Lenovo Network Application Guide for Lenovo Cloud Network Operating System 10.7*
- *Lenovo Network Command Reference for Lenovo Cloud Network Operating System 10.7*
- *Lenovo Network Python Programming Guide for Lenovo Cloud Network Operating System 10.7*
- *Lenovo Network REST API Programming Guide for Lenovo Cloud Network Operating System 10.7*
- *Lenovo RackSwitch G8296 Installation Guide for Lenovo Network Operating System*

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

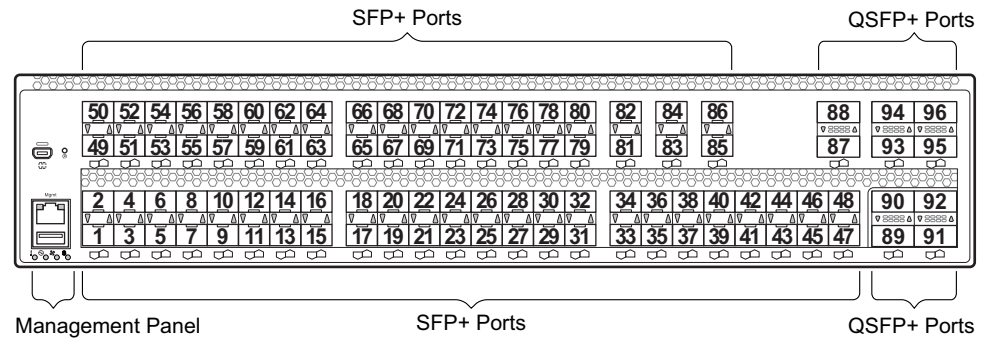
Hardware Support

CNOS 10.7 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>

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

```
G8296> enable
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>/G8272-8.4.1.0_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. Reload the switch, confirming the operation when prompted.

```
G8296# reload
reboot system (y/n) ? y
```

4. After the switch reloads, log in and verify that the switch is running the ENOS 8.x image.

```
G8296# show boot
Current running image version: 8.4.1.0
Currently set to boot software image1, unknown config block.
NetBoot: disabled, NetBoot tftp server: , NetBoot cfgfile:
Current boot Openflow protocol version: 1.0
USB Boot: disabled
Currently profile is default, set to boot with default profile next time.
Current FLASH software:
  image1: version 8.4.1.0 downloaded 10:29:59 Wed Nov 23, 2016, Mode
Stand-alone
  image2: version 8.4.1.0 downloaded 10:32:19 Wed Nov 23, 2016, Mode
Stand-alone
  boot kernel: version 8.4.1.0
Currently scheduled reboot time: none
```

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 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, 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> enable
G8296# copy tftp image1 address <TFTP server address> filename <location on TFTP
server relative to tftpboot location>/G8296-CNOS-10.7.2.0.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) ?
```

Enter **y** to continue the reload.

5. 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> enable
G8296# display boot
Current ZTP State: Enable
Current FLASH software:
  active image: version 10.7.2.0, downloaded 08:56:56 UTC Tue Feb 7 2017
  standby image: version 10.7.2.0, downloaded 10:56:42 UTC Tue Feb 7 2017
  Uboot: version 10.7.2.0, downloaded 08:56:58 UTC Tue Feb 7 2017
  ONIE: version 10.7.2.0, 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:

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

```
G8296# cp tftp tftp://<TFTP server address>/G8296-CNOS-10.7.2.0.imgs
system-image all vrf management
Confirm download operation? (y/n) [n] y
```

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

```
Boot loader now contains Software Version 10.7.2.0
Standby image now contains Software Version 10.7.2.0
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.

```
The system is going down for reboot NOW!
INIT: reboot: Restarting system
...

Press shift-B for startup menu or shift-R for recovery mode: ..
Running Startup Menu
...

Boot Management Menu
  I - Change booting image
  C - Change configuration to factory default
  R - Boot in recovery mode (tftp and xmodem download of images to
recover switch)
  P - Reset the Network Administrator (admin) password
  B - Reset the password required to enter privileged exec mode
  Q - Reboot
  E - Exit
Please choose your menu option:
```

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

- To change the booting image, press **I** and follow the screen prompts.
- To reset the switch configuration to factory defaults, press **C** and follow the screen prompts.
- To boot in recovery mode, press **R**.
- To reset the Network Administrator account (admin) password, press **P** and follow the screen prompts.
- To reset the password required to enter Privileged EXEC configuration mode, press **B** and follow the screen prompts.
- To reload the switch, press **Q**. The reloading process will start again.
- To exit the Boot Management menu, press **E**. The reloading 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: 9,600 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:

```
The system is going down for reboot NOW!
INIT: reboot: Restarting system
...

Press shift-B for startup menu or shift-R for recovery mode: ..
Running Startup Menu
...

Boot Management Menu
  I - Change booting image
  C - Change configuration to factory default
  R - Boot in recovery mode (tftp and xmodem download of images to
recover switch)
  P - Reset the Network Administrator (admin) password
  B - Reset the password required to enter privileged exec mode
  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-10.7.2.0_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 115,200 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 9,600 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 **Esc** to re-display the Boot Management menu

New Features in This Release

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

BGP Unnumbered and BFD

BGP unnumbered can be used in conjunction with Bidirectional Forwarding Detection (BFD) to extend the capabilities of BGP unnumbered to make setting up large configurations easier and faster by enabling BFD on all BGP unnumbered neighbors.

CLI Keyword Syntax Changes

This release brings CLI syntax changes for the following keywords:

Table 1. *CLI Keyword Syntax Changes*

OLD KEYWORD SYNTAX	NEW KEYWORD SYNTAX
<code>configure device</code>	<code>configure terminal</code>
<code>routing-protocol</code>	<code>router</code>
<code>bridge-port</code>	<code>switchport</code>
<code>port-aggregation</code>	<code>port-channel</code>
<code>aggregation-group</code>	<code>channel-group</code>
<code>cancel</code>	<code>abort</code>
<code>startup</code>	<code>boot</code>
<code>remove</code>	<code>clear</code>
<code>cp</code>	<code>copy</code>
<code>apply</code>	<code>set</code>
<code>display</code>	<code>show</code>
<code>save</code>	<code>write</code>
<code>dbg</code>	<code>debug</code>

Note: The old CLI syntax is still supported to allow any configurations present on the switch to be automatically converted to the new CLI syntax.

Explicit Congestion Notification

Explicit Congestion Notification (ECN) extends the functionality of Weighted Random Early Detection (WRED) by marking packets instead of discarding them when the average queue length exceeds the configured threshold. Network devices configured with WRED and ECN use the marking of packets as a signal that the network is congested and packet transmission is slowed down.

Network Policy Agent - VMware VDM Plug-in

The functionality of the Network Policy Agent has been extended to work with VMware Virtual Domain Manager (VDM). Interactions between the switch and the external VMware VDM is handled by the Lenovo VDM plug-in.

Warning Message Displayed when Changing the Default Network Administrator Password

The following warning message is displayed reminding the users to change the default Network Administrator password as soon as possible:

Warning: Please change the default Network Administrator password as soon as possible. Note that in the next CNOS release (10.8.x or later), user will be forced to change the default password upon first successful login.

Known Issues

This section describes known issues for CNOS 10.7 on the Lenovo RackSwitch G8296.

Lenovo HCI Solution with Nutanix

This release supports Nutanix AOS software versions 5.1.0 and 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.

Network Policy Agent

The following limitations exist:

- When configuring a virtual machine (VM) name, use only alphanumeric characters. (ID: 127222)
- When multiple ESXi clusters are managed by the same vCenter server, the switch receives events from all clusters, regardless if the cluster is connected to the switch or not. (ID: 126713)
- IP information for a VM's virtualized Network Interface Card (vNIC) is not propagated to the vCenter if the VM does not have installed VMware's guest tool. Therefore, vCenter notifications do not contain IP information. In this scenario, a security policy cannot be attached to a VM if the VM is identified by its IP address. (ID: 126728)
- When a VM is migrated to another host, there is a delay in receiving IP information from the vCenter. During this delay, if a security policy was attached to the VM via its IP address, traffic does not follow the configured clauses of the policy until IP information is received from the vCenter. (ID: 127960)

Network Virtualization Gateway

The following limitations exist:

- For optimal performance, it is recommended that the number of VLAN-VxLAN Network Identifier (VNI) mappings does not exceed 1,000 entries. Going above this limit leads to longer convergence times when attaching or detaching the Lenovo hardware Layer 2 gateway to or from NSX logical switches. (ID: 99467)
- For optimal Equal Cost Multiple Paths (ECMP) load balancing, it is recommended that only Layer 3 routed ports are used for connecting to spine switches. (ID: 123627)
- When broadcast, unknown unicast, and multicast (BUM) traffic is received on the switch, it is replicated on all member ports of the same VxLAN Network, except the port that is the source port of the BUM traffic. This is displayed in the source port statistics as dropped packets. (ID: 95658)
- Throughput statistics of the southbound interface of the VxLAN gateway do not display on the NSX GUI. (ID: 113832)

- After Bidirectional Forwarding Detection (BFD) failover, when using the default value for the probe interval of 300 ms, the active service node election takes approximately three seconds to occur. (ID: 116882)
- In the switch Application-specific Integrated Circuit (ASIC), the lookup to VxLAN-translation takes place first, before the dot1q tunnel VLAN. The dot1q tunnel VLAN is not used during VxLAN processing. Therefore, dot1q tunnel feature in conjunction with VxLAN is not operational. (ID: 101708)
- The VLAN used in VLAN-VxLAN Network Identifier (VNI) mapping must be used exclusively for switching within the associated VNI domain. Different access vPorts belonging to the same VLAN must be mapped to the same VNI. Hence, only one-to-one VLAN-VNI bindings are supported. (ID: 100606, 123143)
- In case the vLAG instance goes down on one of the vLAG switches, the MAC addresses learned on that instance are not be moved to the ISL. This means that the traffic will be flooded on both ISL and other potential access ports. The flooding on ISL means that the traffic eventually gets to the vLAG instance on the peer, so no traffic is lost. The hosts on the other access ports drop the traffic as it is not addressed to them. (ID: 108729)
- In case all network ports go down on one of the vLAG switches, all ingress traffic received on the local access ports is flooded to all other local access ports from the same VxLAN Network Identifier (VNI). Flooding stops when the network ports are back up. (ID: 110732)
- In High Availability (HA) mode, the recommended maximum number of local unicast MAC addresses is 32,000. If this limit is exceeded, MAC address synchronization between the vLAG switches might not work properly. More than 32,000 unicast MAC addresses can be used, but the synchronization process fails to function normally. (ID: 113145)

Privileged EXEC Mode Password Persistence

When upgrading the switch firmware image from CNOS version 10.3 or 10.4 to CNOS version 10.7, if there exists a previously configured encrypted password used to enter Privileged EXEC mode, it persists across the upgrade process. It is overwritten only when configuring a new clear text password and the switch running configuration is saved.

If a previously configured encrypted password is still used for entering Privileged EXEC configuration mode after the upgrade process, then only the first eight characters are checked when entering the password.

When downgrading the switch firmware image from CNOS version 10.7 to a previous version, if a previously configured Privileged EXEC encrypted password is present in the switch startup configuration file, then the password persist across the downgrade process. The password is required to enter Privileged EXEC configuration mode after the downgrade process is done. (ID: 119771)

Routed Ports

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

Virtual Ports

Inconsistent behavior occurs when IEEE 802.1Q (dot1q) tunnel traffic is received on a virtual port. (ID: 101708)

WRED

The following limitations exist:

- Explicit Congestion Notification (ECN) does not work with Weighted Random Early Detection (WRED) for unknown unicast, multicast, and broadcast packets. (ID: 129278)
- If WRED is configured with a minimum threshold higher than 2142 packets, the queue begins to discard packets before the minimum threshold is reached, and thus ECN is not triggered. (ID: 128909)

