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Software upgrade and downgrade on Smart Switches

Nexus operating system on Smart Switches

N9300 Series Smart Switches, such as N9324C-SE1U and N9348Y2C6D-SE1U, introduced in NX-OS Release 10.6(2)F, come with the NX-OS software pre-installed.

The software image and upgrade options determine how you install software and perform maintenance on N9300 Series Smart Switches.

Software image for Smart Switches

The NX-OS software image for Smart Switches is a software image that

- is a 64-bit software image,
- has a file name that begins with the prefix `nxos64-s1-dpu`, for example, nxos64-s1-dpu.10.6.3s.F.bin, and
- includes both the operating system and the Electrically Programmable Logic Device (EPLD) image.

The EPLD image on all N9000 Series Switches is a bundled firmware package that updates several EPLD components in the switch hardware. However, if you prefer, you can choose to skip the EPLD image update. For EPLD upgrade, refer to Cisco Nexus 9000 Series FPGA/EPLD Upgrade Release Notes.

Software image

The NX-OS software image is mandatory on N9324C-SE1U and N9348Y2C6D-SE1U Smart switches. Minimum software version for the N9300 Smart Switches is NX-OS Release 10.6(2)F. Beginning with NX-OS 10.6(2)F, only network mode is supported. Beginning with NX-OS Release 10.6(3s)F, these switches support two modes: network and DPU security mode. In the network mode, only the networking features are supported. In the DPU security mode, both network and DPU security features are supported.

Beginning with NX-OS Release 10.6(3s)F, the DPU image (`nxos64-s1-dpu`) includes both the NX-OS and the DPU images for N9300 Smart Switches. With this image the switch functions as an NX-OS switch in network mode by default (feature service-acceleration is disabled by default). If you enable feature service-acceleration, it powers up the DPUs, and the switch can provide both network and DPU security mode features.

Note

Only Disruptive upgrade, on page 2 is supported on the Smart switches.

Software upgrade options in NX-OS

In network environments, software upgrades mean updating the software or firmware on devices to improve performance, fix bugs, enhance security, or add new features.

Beginning with NX-OS Release 10.6(3s)F, Smart Switches support

- disruptive upgrades,
- Power-on Auto Provisioning (POAP), and

- Graceful Insertion and Removal (GIR).

These features help improve switch performance, enhance security, and enable smoother device maintenance.

Disruptive upgrade

The N9324C-SE1U and N9348Y2C6D-SE1U switches support disruptive upgrade only. Disruptive upgrade is a software upgrade that

- is the simplest upgrade and the default method in NX-OS,
- requires the switch to fully reload, causing temporary network downtime, and
- does not allow forwarding of traffic as the switch is unavailable until the reload and software installation is complete.

Before performing a disruptive upgrade, it is important to back up your configurations, review the release notes for compatibility and feature support, and notify network users about the planned downtime. The disruptive upgrade should be carefully planned and performed during a scheduled maintenance window to minimize impact on network operations.

Upgrade Smart Switches

As Smart Switches support only disruptive upgrade, follow these instructions to perform a software upgrade from earlier versions to the current version:

1. Start the upgrade using the **install all nxos** *image-name* command.

   For more details about NX-OS upgrade and downgrade, refer to Cisco Nexus 9000 Series NX-OS Software Upgrade and Downgrade Guide.

2. Apply the service acceleration configuration. For configuration details, refer to the Cisco Smart Switches Configuration Guide for DPU Security Mode.

Power-On Auto Provisioning

The N9324C-SE1U and N9348Y2C6D-SE1U switches support Power-On Auto Provisioning (POAP). POAP is an automation feature that

- automates the initial deployment,
- simplifies provisioning, and
- complements other automation and programmability features to support streamlined data center operations.

POAP automatically upgrades software images and installs configuration files on new network devices without manual steps. It allows switches to start up and configure themselves, significantly speeding up deployment and reducing the need for manual setup.

To configure POAP, see Cisco Nexus 9000 Series NX-OS Fundamentals Configuration Guide.

Graceful Insertion and Removal

Graceful Insertion and Removal (GIR) is a maintenance feature that

- lets you isolate a switch from the network to perform upgrades or debugging without affecting production traffic,
- allows you to customize maintenance and normal mode profiles to isolate, shut down, or restore certain protocols and interfaces during maintenance, and

- supports snapshots, which capture the running state of selected features before and after maintenance to compare and verify changes in the operational state of the switch.

The N9324C-SE1U and N9348Y2C6D-SE1U switches support Graceful Insertion and Removal.

When a switch is placed in GIR maintenance mode:

1. All protocols are gracefully brought down or isolated from the network, effectively removing the switch from active forwarding paths.
2. Physical ports are shut down or isolated, disconnecting the switch from traffic forwarding.
3. After maintenance, the switch can be returned to normal mode, restoring all protocols and ports without disruption.

The GIR process ensures smooth switch removal and reinsertion with minimal impact on network operations.

To configure GIR, refer to Cisco Nexus 9000 Series NX-OS System Management Configuration Guide.

Features related to software upgrade

This section comprises information about transceiver firmware upgrade, modular packages and RPMs, and migration of switches in vPC topology for Smart Switches in network mode, which is similar to that of rest of the N9000 Series Switches.

Transceiver firmware

Refer to Transceiver Firmware to know

- about transceiver firmware software upgrades
- how to perform firmware upgrade using NX-OS commands for supported models, and
- parallel firmware download.

Optionality

Optionality is a feature in NX-OS software that

- uses modular packages for selective feature upgrades
- supports both base and full modes, and
- enables independent upgrade or removal of optional RPMs without service disruption.

For more information about modular packages, NX-OS image boot modes, Red Hat Package Managers (RPMs), Dandified YUM commands, configuring FTP server, and creating user roles for install operation, refer to Optionality.

Migrate switches in a vPC topology

To migrate from one pair of N9000 Series Switches to another within a vPC topology, covering both forklift upgrades and specific procedures for the -R series models, refer to Migrate Switches in a vPC Topology.

Downgrade

Downgrade refers to the process of reverting the switch's NX-OS software to an earlier software release.

To perform downgrade, see Cisco Nexus 9000 Series NX-OS Software Upgrade and Downgrade Guide, Release 10.6(x)