# Cisco NCS 520 Series Ethernet Access Device Overview

The Cisco NCS 520 Series Ethernet Access Device is a family of low cost, fixed Carrier Ethernet Network Interface Devices (NID) and a switch that is targeted to be the next generation replacement of the Cisco ME 3400 series Access Switches. The Cisco NCS 520 Series Ethernet Access Device adds 10G NID and low-cost MBH switch to the existing Service Provider Access portfolio, with the following features:

- MEF CE 3.0 compliant
- Premium SKUs with support for extended temperature (from -40C to 65C)
- Conformal coating on the PCBAs (to be able to support installation in ventilated enclosures)

This release note contains information about the Cisco NCS 520 Series Ethernet Access Device, provides features information for these devices, hardware support, limitations and restrictions, and caveats.

This release note provides information for these variants of the Cisco NCS 520 Series Ethernet Access Device:

- N520-4G4Z-A (Base)
- N520-X-4G4Z-A (Premium)
- N520-X-4G4Z-D (Premium)
- N520-20G4Z-A (Base)
- N520-20G4Z-D (Base)
- N520-X-20G4Z-A (Premium)
- N520-X-20G4Z-D (Premium)

# Feature Navigator

Use the Cisco Feature Navigator to find information about feature, platform, and software image support. To access the Cisco Feature Navigator, go to http://www.cisco.com/go/cfn. An account on cisco.com is not required.

# Feature Matrix

The feature matrix lists the features supported for each platform. For more information, see the Cisco NCS 520 Ethernet Access Devices Feature Compatibility Matrix.

# Software Licensing Overview

The Cisco NCS 520 Series Ethernet Access Device supports the following types of licenses:

- Port Licensing—Port Upgrade license is available as a "Pay as you Grow" model.
  - 10G upgrade license
  - 1G upgrade license
- Metro Access (default)

The following method is used to activate the above licenses:

- Cisco Software Licensing—The Cisco Software License Activation feature is a set of processes and components to activate Cisco software feature sets by obtaining and validating fee-based Cisco software licenses.

**Note** Licenses that are generated by the Cisco Software Licensing are tied to the UDI of the chassis and a corresponding watchtower device certificate (WDC) is stored in the system.

The following features are supported for the software licenses:

- QoS, with deep buffers and hierarchical QoS (HQOS)
- Layer 2: 802.1D, 802.1Q
- Ethernet Virtual Circuit (EVC)
- Ethernet OAM (802.11g, 802.3ah)
- IPv4 host connectivity
- IP Access License

### Smart Licensing

If you are using Cisco IOS XE Bengaluru 17.6.1 or an earlier release version, Smart Licensing is not enabled by default. To enable Smart Licensing, see Software Activation Configuration Guide (Cisco NCS 520 Series).

# Upgrade to Cisco IOS XE Cupertino 17.9.x

This section explains the procedure to upgrade the Cisco NCS 520 Series Ethernet Access Device from Cisco IOS XE Fuji 16.9.x to Cisco IOS XE Gibraltar 16.12.x or later versions.

ROMMON version 1.5 is backward compatible. The backward compatibility of different ROMMON versions with IOS XE versions is in the following table:

| Supported Cisco IOS XE release | Supported ROMMON Version |
|---|---|
| Cisco IOS XE Fuji 16.8.x<br>Cisco IOS XE Fuji 16.9.x<br>Cisco IOS XE Gibraltar 16.11.x | 1.2 |
| Cisco IOS XE Fuji 16.9.4 and later<br>Cisco IOS XE Gibraltar 16.11.2 and later<br>Cisco IOS XE Gibraltar 16.12.1 and later<br>Cisco IOS XE Amsterdam 17.1.1 and later | 1.5 |
| Cisco IOS XE Amsterdam 17.3.1 and later<br>Cisco IOS XE Bengaluru 17.4.1 and later<br>Cisco IOS XE Bengaluru 17.5.1 and later<br>Cisco IOS XE Bengaluru 17.6.x and later<br>Cisco IOS XE Cupertino 17.7.x and later<br>Cisco IOS XE Cupertino 17.8.x and later<br>Cisco IOS XE Cupertino 17.9.x and later | 1.6<br>**Note** The Cisco IOS XE versions that support ROMMON version 1.5, are also supported for 1.6. |

Perform the following steps to migrate to Cisco IOS XE Cupertino 17.9.x:

**Step 1** At the command prompt, run the following command to check the current ROMMON version.

```
Device# show platform
Chassis type: N520-X-4G4Z-A
Slot      Type                State                 Insert time (ago)
--------- ------------------- --------------------- -----------------
 0/0      4xGE-4x10GE-FIXED   ok                    8w5d
R0        N520-X-4G4Z-A       ok, active            8w5d
F0                            ok, active            8w5d
P0        NCS520-PSU0         ok                    never
P1        NA                  ok                    never
P2        NCS520-FAN          ok                    never

Slot      CPLD Version        Firmware Version
```

```
--------- ------------------- ----------------------------------------
R0        0003001E            1.2(20180810:133528) [ncs520-dev] --> the ROMMON version is 1.2
F0        0003001E            1.2(20180810:133528) [ncs520-dev]
```

**Note** Do not migrate if the ROMMON version is 1.5 or above.

**Step 2** Copy the running configuration to the bootflash for backup.

```
Device# copy running-config bootflash:backup_config
Destination filename [backup_config]?
15549 bytes copied in 0.404 secs (38488 bytes/sec)
```

**Step 3** Copy the migration image to a bootflash location.

You can download the migration image from the location:
https://software.cisco.com/download/home/286320761/type/286317642/release/1.5.

```
Device# copy tftp: bootflash:
Address or name of remote host []? 10.64.99.152
Source filename []? ncs520-1.5rommon-auto-upgrade-xe.bin
Destination filename [ncs520-1.5rommon-auto-upgrade-xe.bin]?
Accessing tftp://10.64.99.152/ ncs520-1.5rommon-auto-upgrade-xe.bin...
Loading ncs520-1.5rommon-auto-upgrade-xe.bin from 10.64.99.152 (via GigabitEthernet0):!!!
```

**Step 4** Copy the Cisco IOS XE Cupertino 17.9.x software image to bootflash.

**Step 5** Set the boot variable to migration image and reload the router.

```
boot system bootflash:ncs520-1.5rommon-auto-upgrade-xe.bin
```

**Caution** Do not perform any power cycle or remove the power cable during the ROMMON upgrade. If there is a power loss during the upgrade, it may result in corruption of the boot image and it may require RMA of the equipment.

**Step 6** Verify the ROMMON image version.

For the RJ-45 console: Check for the following logs during bootup. These logs indicate successful ROMMON upgrade. After a successful ROMMON upgrade, the node auto reloads. This action takes at least 5 minutes to complete successfully.

```
Full Package address :0xC79BF018 Max-Address for IOS-Pkg Allocation:0xC79BEC18
%IOSXEBOOT-4-BOOTLOADER_UPGRADE: (rp/0): ### Wed Jul 31 11:51:41 Universal 2019 PLEASE DO NOT POWER
 CYCLE ### BOOT LOADER UPGRADING

%IOSXEBOOT-4-BOOTLOADER_UPGRADE: (rp/0): Boot loader golden upgrade succesful


%IOSXEBOOT-4-BOOTLOADER_UPGRADE: (rp/0): Boot loader upgrade succesful
%IOSXEBOOT-4-BOOTLOADER_UPGRADE: (rp/0): To activate the new Rommon ,system will reload now!!!!

 %IOSXEBOOT-4-BOOTLOADER_UPGRADE: (rp/0): ### After reload, PLEASE LOAD CCO IMAGE ###
N520-54-S1#show platform
Chassis type: N520-X-4G4Z-A

Slot      Type                State                 Insert time (ago)
--------- ------------------- --------------------- -----------------
 0/0      4xGE-4x10GE-FIXED   ok                    00:00:51
R0        N520-X-4G4Z-A       ok, active            00:03:07
F0                                        ok, active            00:03:07
P0        NCS520-PSU0         ok                    never
P1        NA                                ok                    never
P2        NCS520-FAN          ok                    never

Slot      CPLD Version        Firmware Version
--------- ------------------- ----------------------------------------
```

```
R0        0003001E            1.5(20190415:181241) [ncs520-dev] --> the ROMMON version is 1.5
F0        0003001E            1.5(20190415:181241) [ncs520-dev]
```

For VTY Session: Wait for 30 minutes for auto upgrade to complete, and the router to boot up. Reestablish the VTY session.

```
Device#show platform
Chassis type: N520-X-4G4Z-A

Slot      Type                State                 Insert time (ago)
--------- ------------------- --------------------- -----------------
 0/0      4xGE-4x10GE-FIXED   ok                    00:00:51
R0        N520-X-4G4Z-A       ok, active            00:03:07
F0                                       ok, active            00:03:07
P0        NCS520-PSU0         ok                    never
P1        NA                  ok                    never
P2        NCS520-FAN          ok                    never

Slot      CPLD Version        Firmware Version
--------- ------------------- ------------------------------------
R0        0003001E            1.5(20190415:181241) [ncs520-dev] --> the ROMMON version is 1.5
F0        0003001E            1.5(20190415:181241) [ncs520-dev]
```

**Step 7** Set the boot variable to the Cisco IOS XE Cupertino 17.9.x software image and delete the migration image from the bootflash. Reload the router to activate the Cisco IOS XE Cupertino 17.9.x software image.

```
Device#configure terminal
Device(config)#no boot system bootflash:ncs520-1.5rommon-auto-upgrade-xe.bin
Device(config)#boot system bootflash:<CCO Image>
Device(config)#end
Device#write memory
Device#del bootflash:ncs520-1.5rommon-auto-upgrade-xe.bin
```

**Step 8** After booting the Cisco IOS XE Cupertino 17.9.x image, ROMMON and FPGA will automatically upgrade and the node is reloaded. Once the node is up, the output is displayed:

```
Device#show platform
Chassis type: N520-X-20G4Z-A

Slot Type State Insert time (ago)
--------- ------------------- --------------------- -----------------
0/0 20xGE-4x10GE-FIXED ok 1w5d
R0 N520-X-20G4Z-A ok, active 1w5d
F0 ok, active 1w5d
P0 NCS520-PSU0 ps, fail never
P1 NCS520-PSU1 ok never
P2 NCS520-FAN ok never

Slot CPLD Version Firmware Version
--------- ------------------- ------------------------------------
R0 00030025 1.6(20191125:124452) [ncs520-dev]
F0 00030025 1.6(20191125:124452) [ncs520-dev]
```

# Supported Packages and System Requirements

## Supported FPGA Version

The table below lists the FPGA version of the software releases.

***Table 1: FPGA Versions for this release***

| Release | FPGA Version |
|---|---|
| Cisco IOS XE Cupertino 17.9.6 | 0x00030025 |
| Cisco IOS XE Cupertino 17.9.5a | 0x00030025 |
| Cisco IOS XE Cupertino 17.9.4a | 0x00030025 |
| Cisco IOS XE Cupertino 17.9.4 | 0x00030025 |
| Cisco IOS XE Cupertino 17.9.3 | 0x00030025 |
| Cisco IOS XE Cupertino 17.9.2a | 0x00030025 |
| Cisco IOS XE Cupertino 17.9.1 | 0x00030025 |

**Note** The FPGA automatically upgrades to **0x00030025** from Cisco IOS XE Cupertino 17.7.1 onwards.

The Cisco NCS 520 Series Ethernet Access Device will take around 210 seconds to reboot after a successful FPGA upgrade. Do not power-cycle the Ethernet Access Device during FPGA upgrade.

## Supported ROMMON Version

***Table 2: Supported ROMMON Version***

| Supported Cisco IOS XE Release | ROMMON Version |
|---|---|
| Cisco IOS XE Cupertino 17.9.6 | 1.6 |
| Cisco IOS XE Cupertino 17.9.5a | 1.6 |
| Cisco IOS XE Cupertino 17.9.4a | 1.6 |
| Cisco IOS XE Cupertino 17.9.4 | 1.6 |
| Cisco IOS XE Cupertino 17.9.3 | 1.6 |
| Cisco IOS XE Cupertino 17.9.2a | 1.6 |

| Supported Cisco IOS XE Release | ROMMON Version |
|---|---|
| Cisco IOS XE Cupertino 17.9.1 | 1.6 |

**Note** ROMMON automatically upgrades to **1.6** from Cisco IOS XE Cupertino 17.7.1 onwards.

# Limitations and Restrictions on the Cisco NCS 520 Series Ethernet Access Device

**Note** The error message "PLATFORM-1-NOSPACE: SD bootflash : no space alarm assert" may occur in the following scenarios:

- Any sector of SD Card gets corrupted
- Improper shut down of router
- power outage.

This issue is observed on platforms which use EXT2 file systems.

We recommend performing a reload of the router. As a result, above alarm will not be seen during the next reload due to FSCK(file systems check) execution.

However, If the error persists after a router reload, we recommend to format the bootflash or FSCK manually from IOS.

- The **default interface** command is used to default the parameters under that interface. However, when speed is configured on the interface, the following error is displayed:

  ```
  Speed is configured. Remove speed configuration before enabling auto-negotiation
  ```

- Adding or deleting the Trunk Ethernet flow points (TEFPs) with scaled bridge-domain, without delay causes the Cisco NCS 520 Series Ethernet Access Device to crash.
- Virtual services should be deactivated and uninstalled before performing replace operations.
- The **controller** and **nid-controller** commands are not supported.
- Cisco NCS 520 Series Ethernet Access Device displays an error in Hierarchical QoS policy while trying to remove the **bandwidth** and **bandwidth percent** commands from the default parent class dynamically. To remove the commands, you must first remove the bandwidth from child class and then from the parent class.
- When port is in OPER-DOWN state, applying Hierarchical QoS followed by speed change sets wrong bandwidth values on standard queues. To work around the mismatch, you must reattach the policy to the port level again.