

Cisco NCS 540 Large Density Routers Overview

Cisco NCS 540 large density router is a 1RU, cost optimized platform supporting QSFP56-DD ports, that offers customers 400G coherent transport solution. NCS 540 large density platform enhances the existing NCS 540 portfolio offering high throughput and flexible 400/200/100/50/40/25/10/1GE interfaces.

Benefits of NCS 540 Router

- Reduce costs and streamline operations with automation.
- Simplify network management with zero-touch provisioning.
- Increase output with fewer resource.
- Versatile Ethernet interface options: 400/200/100/50/40/25/10/1GE

Variants of NCS 540 Large Density Routers

The NCS 540 large density platform include the following variants.

- N540-24Q8L2DD-SYS
- N540-24Q2C2DD-SYS

For more information about its features and benefits, see the Cisco Network Convergence System 540 Large Density Routers Data sheet.

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Key Features of Cisco NCS 540 Large Density Routers

The key features include:

- 1RU small form factor
- Front-to-back airflow
- Environmental hardened, suitable for deployments in indoor or outdoor sealed cabinets
- Low latency forwarding, Class C compliant
- 400G/100G ZR/ZR+ optics support
- Integrated GNSS receiver

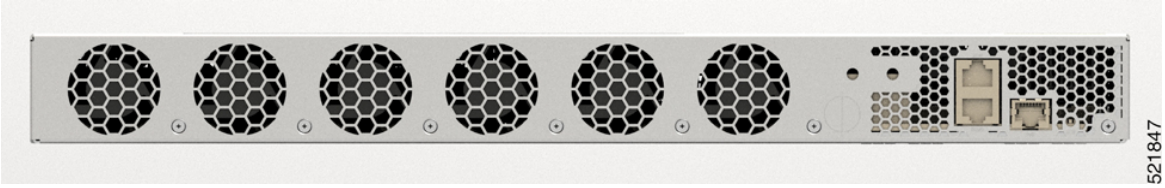
Hardware Features of Cisco N540-24Q8L2DD-SYS Router

- 2 x 40G/100G/200G/400G QSFP56-DD ports
- 8 x 1G/10G/25G/50G SFP56 ports
- 24 x 1G/10G/25G SFP28 ports

Figure 1: N540-24Q8L2DD-SYS Front View



Figure 2: N540-24Q8L2DD-SYS Rear View



Hardware Features of Cisco N540-24Q2C2DD-SYS Router

- 2 x 40G/100G/200G/400G QSFP56-DD ports
- 2 x 40G/100G QSFP28 ports
- 24 x 1G/10G/25G SFP28 ports

Figure 3: N540-24Q2C2DD-SYS Front View

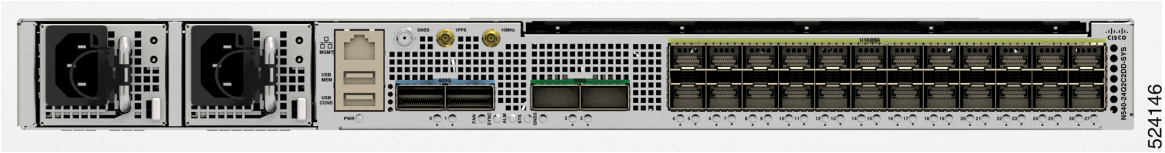
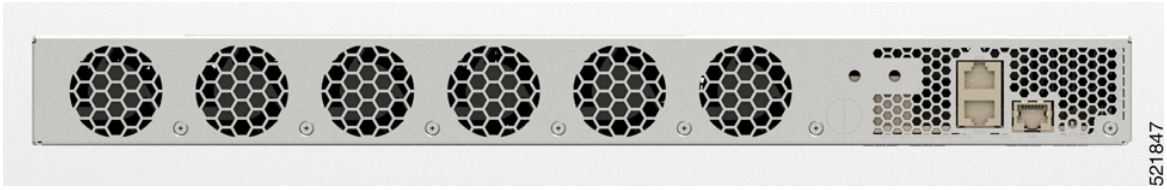


Figure 4: N540-24Q2C2DD-SYS Rear View



Specification

For information on physical specification, temperature, Route Processor, and other details, see *Cisco NCS 540 chassis specification* in the Cisco Network Convergence System 540 Large Density Routers Data sheet.

Interface Naming

Interface Naming for N540-24Q8L2DD-SYS

The following table shows the interface naming of the N540-24Q8L2DD-SYS:

Table 1: Port Numbering

40G/100G/200G/400G (QSFP56-DD)		1G/10G/25G/50G (SFP56)			1G/10G/25G (SFP28)		
0	1	2	to	8	10	to	32
		3		9	11		33

The interface-path-id is rack/slot/module/port. The slashes between values are required as part of the notation.

Note Multi-rate functionality is supported only with the supported SFP.

Table 2: Maximum Number of Interfaces for Cisco N540-24Q8L2DD-SYS

Category	Maximum Port Number Interface	Port Number
1GE	32	0/2-0/33
10GE	32	0/2-0/33
25GE	32	0/2-0/33
40GE	2	0/0-0/1
50GE	8	0/2-0/9

Category	Maximum Port Number Interface	Port Number
100GE	2	0/0-0/1
200GE	2	0/0-0/1
400GE	2	0/0-0/1

Interface Naming for N540-24Q2C2DD-SYS

The following table shows the interface naming of the N540-24Q2C2DD-SYS:

Table 3: Port Numbering

40G/100G/200G/400G (QSFP56-DD)		40G/100G (QSFP28)		1G/10G/25G (SFP28)		
0	1	2	3	4	to	26
				5		27

The interface-path-id is rack/slot/module/port. The slashes between values are required as part of the notation.

Note Multi-rate functionality is supported only with the supported SFP.

Table 4: Maximum Number of Inerfaces for Cisco N540-24Q2C2DD-SYS

Category	Maximum Port Number Interface	Port Number
1GE	24	0/4-0/27
10GE	24	0/4-0/27
25GE	24	0/4-0/27
40GE	4	0/0-0/3
100GE	4	0/0-0/3
200GE	2	0/0-0/1
400GE	2	0/0-0/1

Network Timing Interfaces

- 1PPS input or output and ToD input or output—This shielded RJ-45 interface is used for input or output of time-of-day (ToD) and 1PPS pulses. ToD format includes both NTP and IEEE 1588-2008 time formats.

The same RS422 pins for 1PPS and TOD are shared between input and output directions. The direction for each can be independently configurable through software.

Use an SMB connector on the front panel for the following:

- Timing 10Mhz input and output—10MHz input for timing synchronization
- Timing 1 PPS input and output—1 PPS input for timing synchronization

GNSS Receiver

The chassis has in-built GNSS receiver with SMA connector present at the front panel. GNSS supports the following constellations:

- GPS
- Galileo
- Glonass
- BeiDou

GNSS Receiver RF Input Requirements

- The antenna connector specification is as follows:
  - SMA Female 50 Ohm connector
  - 50 Ohm antenna cable with SMA Male connector
- For optimal performance, the GNSS receiver requires an active GNSS antenna with built-in Low-Noise Amplifier (LNA). The antenna LNA amplifies the received satellite signals for two purposes:
  - Compensation of losses on the cable
  - Lifting the signal amplitude to the suitable range for the receiver frontend

  The Amplification required is 22dB gain + cable/connector loss + Splitter signal loss.

  The recommended range of LNA gain (minus all cable and connector losses) at the connector of the receiver module is 22dB to 30dB with a minimum of 20dB and a maximum of 35dB.
- GNSS receiver provides 5V to the active antenna through the same RF input.
- Surge requirement:
  - GNSS receivers have built-in ESD protections on all pins, including the RF-input pin. However, additional surge protection may be required if rooftop antennas are to be connected, to meet the regulations and standards for lightning protection of countries where the end-product is installed.
  - A lightning protection must be mounted at the place where the antenna cable enters the building. The primary lightning protection must be capable of conducting all potentially dangerous electrical energy to Protection Earth or Protection Ground (PE).

- Surge arrestors should support DC-pass and suitable for the timing frequency range (1.575GHz) with low attenuation.

- Antenna Sky visibility:
  - Timing signals can only be received on a direct line of sight between antenna and satellite. The antenna must have a clear view of the sky. For proper timing, minimum of four satellites should be locked.

Note The antenna terminal should be earthed at the building entrance in accordance with the ANSI/NFPA 70, the National Electrical Code (NEC), in particular Section 820.93, Grounding of Outer Conductive Shield of a Coaxial Cable.

- Use a passive splitter if more than one GNSS receivers are fed from a single antenna.

Note The splitter should have all the RF ports capable of DC-pass, if the antenna needs to feed power from GNSS receiver.

External Alarm Inputs

The router supports four dry contact alarm inputs through an RJ-45 jack at the rear panel.

- Normally Open—indicates that no current flows through the alarm circuit and the alarm is generated when the current is flowing.

Each alarm input can be provisioned as critical, major, or minor.

Console

The RS232 console port, connected through RJ-45 jack at rear panel, provides transmission (Tx), reception (Rx), and ground (Gnd).

USB Console

A single USB 2.0 and 3.0 Type-A receptacle on the front panel of the router provides console access to Cisco IOS XR, and diagnostics. While it uses the Type-A connector, it operates as a USB peripheral only for connection to an external host computer.

Note Use of the USB console is mutually exclusive of the RS232 console port. This interface requires the use of a Type-A to Type-A USB cable.

Online Insertion and Removal

The router supports the following Online Insertion and Removal (OIR) operations:

- When an QSFP-DD/QSFP28 is removed, there is no effect on traffic flowing on other ports.
- When an QSFP-DD/QSFP28 is installed, the system initializes that port for operation based on the current configuration. If the inserted QSFP-DD/QSFP28 is incompatible with the current configuration of that port, the port does not become operational until the configuration is updated.
- When both power supplies are installed and active, the load may be shared between them or a single PSU supports the whole load. When a power supply is not working or the input cable is removed, the remaining power supply takes the entire load without disruption.

Supported Transceiver Modules

For more information on the supported transceiver modules, see Transceiver Module Group (TMG) Compatibility Matrix. In the **Begin your Search** search box, enter the keyword NCS540 and click **Enter**.