

# Cisco NCS 540 Small Density Routers Overview

The Cisco NCS 540 Small Density Routers are temperature-hardened, fixed port, one rack unit form-factor router. An IOS XR-based cell site router, the router extends Cisco's 5G Converged SDN Transport to edge of the networks as a cell site (CSR)/Network Interface Device (NID)/Customer Premises Equipment (CPE), with the smallest footprint, ever.

This document includes the following small density router variants:

- N540X-6Z18G-SYS-A/D
- N540X-8Z16G-SYS-A/D
- N540X-4Z14G2Q-A/D
- N540X-6Z18G-SYS-A/D
- N540X-6Z6G-SYS

For more information about the router features and benefits, see the Cisco Network Convergence System 540 Small Density Router Data Sheet.

The Cisco N540X-6Z18G-SYS-A/D, N540X-8Z16G-SYS-A/D, N540X-4Z14G2Q-A/D, and N540X-6Z6G-SYS router variants include the following components:

- The PSU is conformal coated. The PSU is fixed and non-removable. The dual power supplies (AC and DC) are installed inside the router.
- The mother board has no conformal coating.

**Note** The Cisco N540X-6Z18G-SYS-A/D router has no conformal coating.

The Cisco N540X-6Z6G-SYS small density hardened router has field replaceable PSU supporting 1+1 redundancy and replaceable fan tray supporting 1+n fan redundancy. The Cisco N540X-6Z6G-SYS contains six 1G SFP ports that supports 1 Gpbs data rate and six dual rate SFP+ ports that supports 1 or 10 Gpbs data rate.

**PSU Redundancy Lost Alarm**:

PSU redundancy lost alarms are generated when there's no proper input feed applied on any one of Power Modules (PMs) (PM0 or PM1). The alarms are also generated when the output for PM0 or PM1 isn't proper.

This is applicable to Cisco N540X-6Z18G-SYS-A/D, N540X-8Z16G-SYS-A/D, and N540X-4Z14G2Q-A/D routers with fixed PSUs.

The following alarms are raised for PSU redundancy lost event with a faulty PM0:

- Power Module Generic Fault
- Power Module Error
- Power Group Redundancy Lost


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# Network Interfaces

The Cisco N540X-6Z18G-SYS-A/D and N540X-6Z18G-SYS-A/D routers have the following network interfaces:

- 18 x 1G SFP+ ports
- 6 x 1G/10G SFP+ ports

The Cisco N540X-8Z16G-SYS-A/D router has the following network interfaces:

- 8 CSFP ports
- 4 SFP ports
- 4 Copper ports
- 8 x 1/10GSFP+ ports

The Cisco N540X-4Z14G2Q-A/D router has the following network interfaces:

- 4 x 1G/10G SFP+ ports
- 2 x 25G SFP28 ports
- 4 Copper ports/SFP ports
- 10 x 1G SFP ports

The Cisco N540X-6Z6G-SYS-A/D router has the following network interfaces:

- 6 x 1G SFP ports
- 6 x 1G/10G SFP+ ports

*Figure 1: Cisco N540X-6Z18G-SYS-A Router*




*Figure 2: Cisco N540X-6Z18G-SYS-D Router*

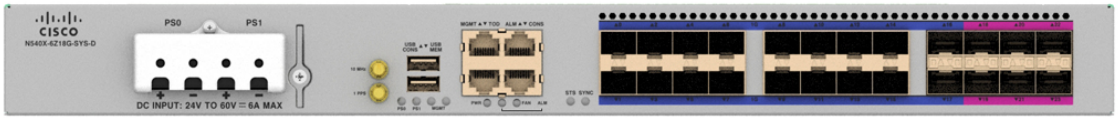



*Figure 3: Cisco N540X-8Z16G-SYS - A Router*

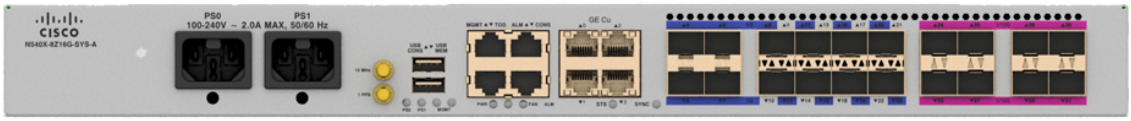



*Figure 4: Cisco N540X-8Z16G-SYS - D Router*

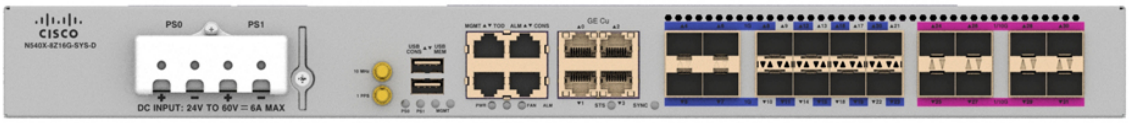



*Figure 5: Cisco N540X-4Z14G2Q-A Router*

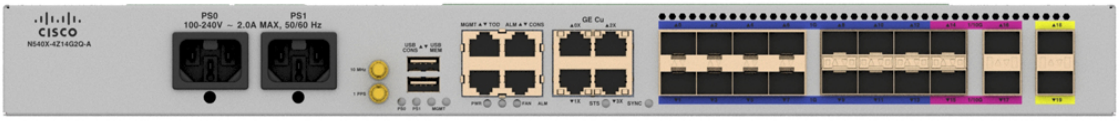



*Figure 6: Cisco N540X-4Z14G2Q-D Router*

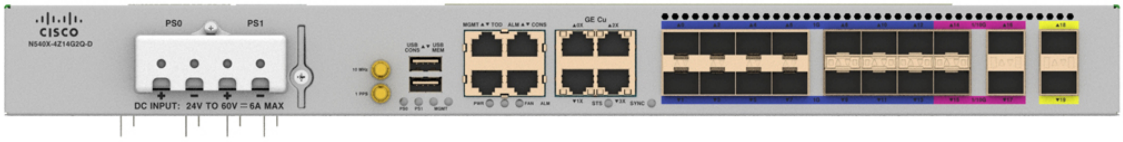



*Figure 7: Cisco N540X-6Z18G-SYS-A Router*

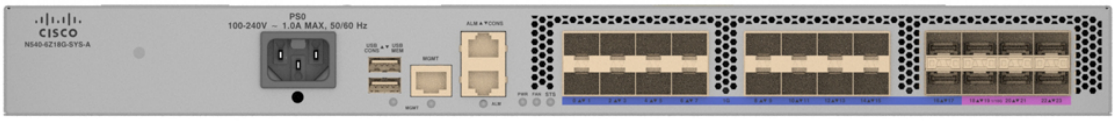
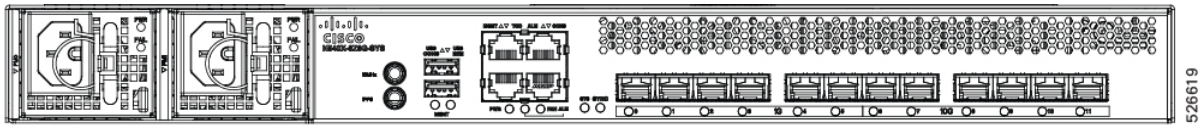


*Figure 8: Cisco N540X-6Z18G-SYS-D Router*



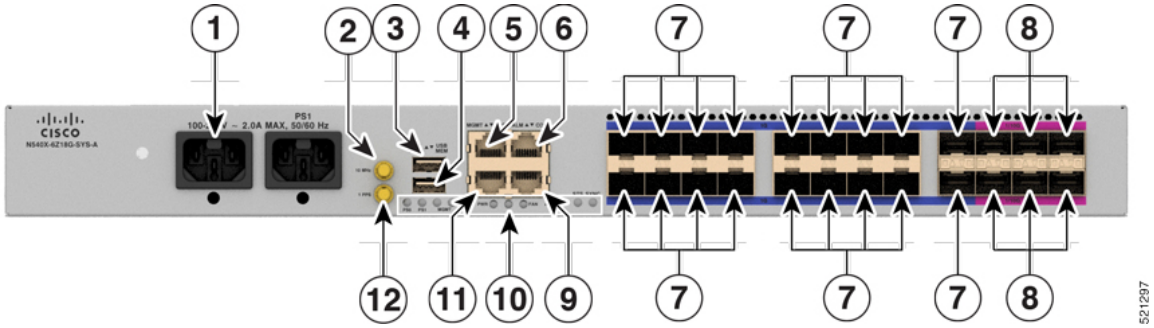

**Note** All ports are color coded in the chassis for ease of identification; for example, the 10G SFP+ ports are in pink, the 1G SFP ports are in blue, and 25G ports are in yellow.

*Figure 9: Cisco N540X-6Z6G-SYS Router*



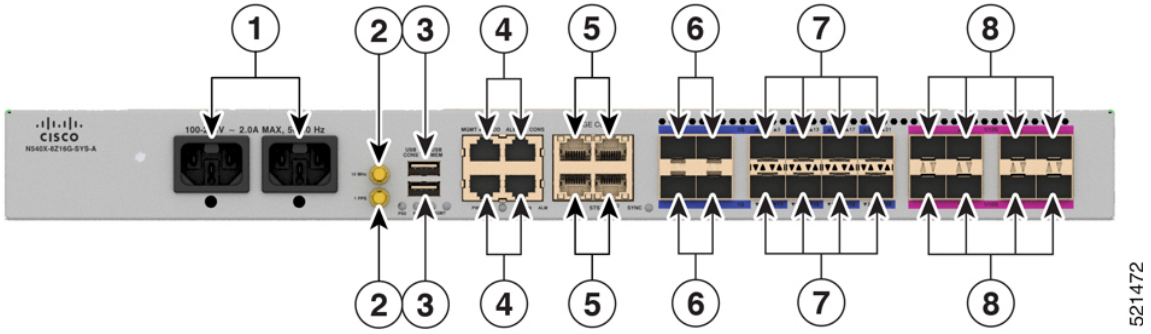

# Cisco NCS 540 Small Density Router Features

*Figure 10: Cisco N540X-6Z18G-SYS-A/D Router Components on Front View*



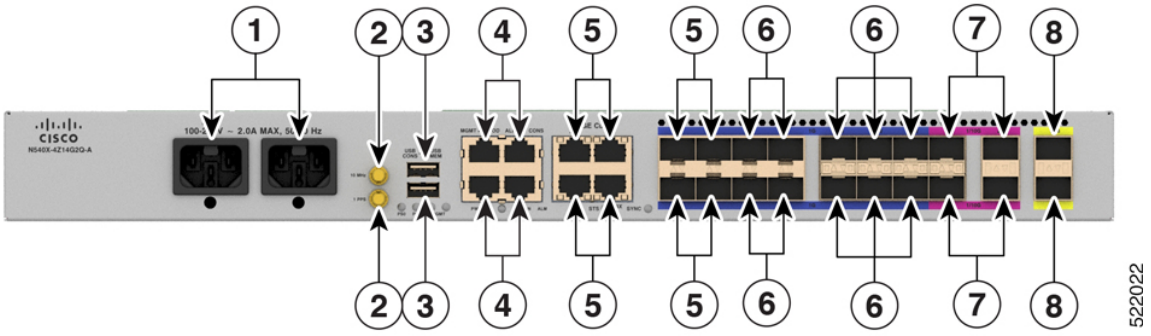

| | | | |
|---|---|---|---|
| 1 | AC Power Input | 2 | 10 MHz Input or Output |
| 3 | USB Console | 4 | USB 2.0 MEM port |
| 5 | Management Port | 6 | Alarm Port |
| 7 | 1G ports (port 0 to 17) | 8 | 10G SFP ports (port 18 to 23) |
| 9 | Console Port | 10 | Status LEDs |
| 11 | Time of Day (TOD) Port | 12 | 1 PPS Input or Output Port |

*Figure 11: N540X-8Z16G-SYS-A/D Router Port and LED details on Front View*



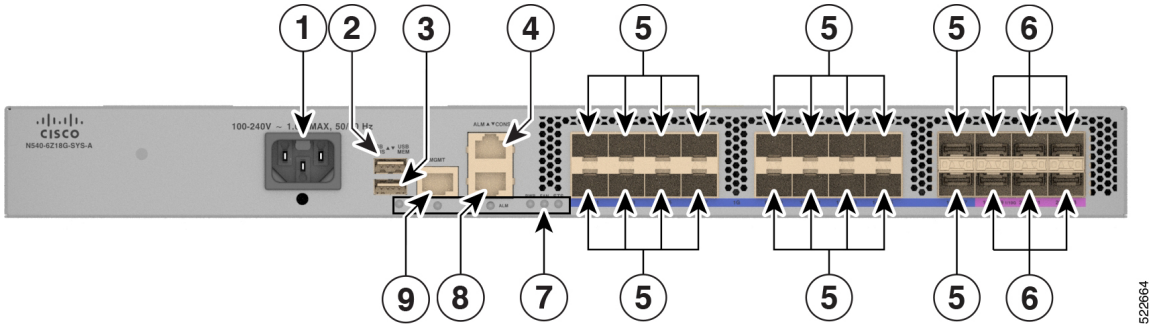

| | | | |
|---|---|---|---|
| 1 | AC Power Input | 2 | 10 MHz Input or Output<br>1 PPS Input or Output Port |
| 3 | USB Console<br>USB 2.0 MEM port | 4 | Management Port<br>Alarm Port |
| 5 | 4 - Cu ports (ports 0 to 3) | 6 | 4 - 1G SFP ports (ports 4 to 7) |
| 7 | 8 - 1G SFP ports (ports 8 to 23)<br>For these cages, each cage opening has two port names, hence total number of ports 8X2 =16 ( port 8 to 23).<br>You can also use CSFP optical modules in these cages. | 8 | 8 - 1/10G SFP+ ports (ports 24 to 31) |

*Figure 12: N540X-4Z14G2Q-A/D Router Port and LED details on Front View*



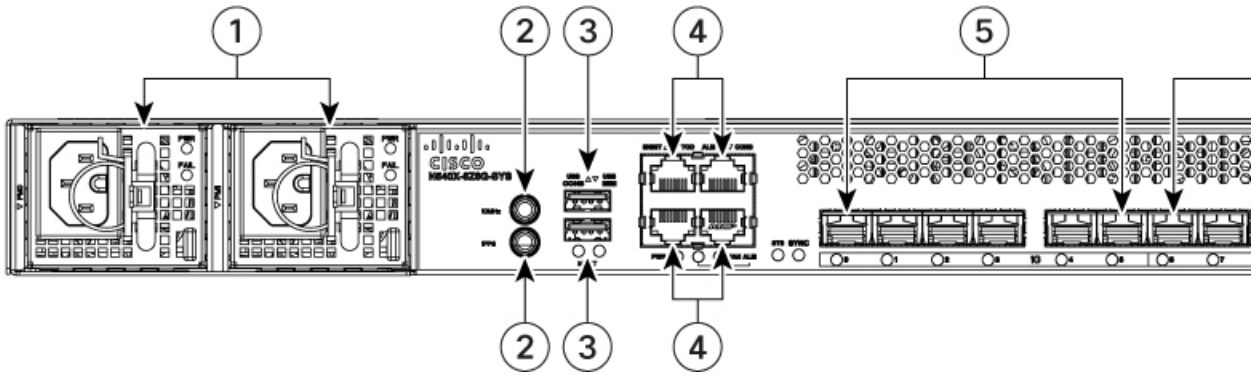
| | | | |
|---|---|---|---|
| 1 | AC Power Input | 2 | 10 MHz Input or Output Port<br>1 MHz Input or Output Port |
| 3 | USB Console<br>USB 2.0 MEM port | 4 | Management Port<br>Alarm Port<br>TOD Port<br>CONS Port |
| 5 | 1G copper/SFP combo (ports 0 to 3) | 6 | 10X 1G SFP ports (4 to 13) |
| 7 | 4X 1G/10G SFP+ ports (14 to 17) | 8 | 2X 25G SFP28 ports (18 to 19) |

*Figure 13: Cisco N540X-6Z18G-SYS-A/D Router Port and LED details on Front View*




| | | | |
|---|---|---|---|
| 1 | AC Power Input | 2 | USB Console |
| 3 | USB 2.0 MEM port | 4 | Alarm Port |
| 5 | 1G ports (port 0 to 17) | 6 | 10G SFP ports (port 18 to 23) |
| 7 | Status LEDs | 8 | Console Port |
| 9 | Management Port | - | - |

*Figure 14: Cisco N540X-6Z6G-SYS Router Port and LED details on Front View*




| | | | |
|---|---|---|---|
| 1 | Modular or Redundant (concurrent AC + DC) Power Input | 2 | 10 MHz Input or Output Port<br>1 PPS Input or Output Port |
| 3 | USB Console<br>USB 2.0 MEM port | 4 | Management Port<br>Alarm Port<br>Power Port<br>Fan Alarm Port |
| 5 | 1G SFP Ports (port 0 to 5) | 6 | 10G SFP+ Ports (port 6 to 11) |

# Specification

For information on physical specification, temperature, and other details for the router, see *Cisco NCS 540 chassis specification* in the Cisco Network Convergence System 540 Small Density Router Data Sheet.

# Interface Naming

The following table shows the interface naming of the Cisco N540X-8Z16G-SYS-A/D, N540X-4Z14G2Q-A/D, and N540X-6Z18G-SYS-A/D routers:

***Table 1: Port Numbering***

| 1G ports (SFP) | 1G/10G Dual rate ports (SFP+) |
|---|---|
| 0/0 to 0/17 | 0/18 to 0/23 |

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

- **GigE** — 0/0/0/0 - 0/0/0/17
- **TenGigE** — 0/0/0/18 - 0/0/0/23

**Note** Dual-Rate functionality is supported only with the supported SFP.

*Table 2: Maximum Number of Ports*

| Category | Maximum Number of Ports | Port Number |
|---|---|---|
| 1GE | 24 | 0/0 - 23 |
| 10GE | 6 | 0/18 - 23 |

The following table shows the interface naming of the N540X-8Z16G-SYS-A/D router:

*Table 3: Port Numbering*

| 1G Copper ports | 1G SFP ports | 1G SFP ports (Including CSFP) | 1G/10G Dual rate SFP+ ports |
|---|---|---|---|
| 0/0 to 0/3 | 0/4 to 0/7 | 0/8 to 0/23* | 0/24 to 0/31 |

* ports 9, 10, 13, 14, 17, 18, 21, and 22 are enabled only with CSFP optical modules.

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

- **GigE** — 0/0/0/0 to 0/0/0/23 (ports 9, 10, 13, 14, 17, 18, 21, and 22 are enabled only with CSFP optics)
- **TenGigE** — 0/0/0/24- 0/0/0/31

*Table 4: Maximum Number of Ports*

| Category | Maximum Number of Ports | Port Number |
|---|---|---|
| 1GE copper | 4 | 0/0 to 0/3 |
| 1GE SFP | 20 (including CSFP ports) | 0/4 to 0/23 |
| 10GE | 8 | 0/24 to 0/31 |

The following table shows the interface naming of the N540X-4Z14G2Q-A/D router:

*Table 5: Port Numbering*

| 1G Copper/SFP combo Ports | 1G SFP Ports | 10G SFP+ Ports | 25G SFP28 Ports |
|---|---|---|---|
| 0/0 to 0/3 | 0/4 to 0/13 | 0/14 to 0/17 | 0/18 and 0/19 |

- 1GE Combo – 0/0/0/0-0/0/0/3
- 1GE SFP – 0/0/0/4-0/0/0/13
- 10GE – 0/0/0/14-0/0/0/17
- 25GE- 0/0/0/18-0/0/0/19

*Table 6: Maximum Number of Ports*

| Category | Maximum Number of Ports | Port Number |
|---|---|---|
| 1GE | 14 | 0/0 to 0/13 |
| 10GE | 4 | 0/14 to 0/17 |
| 25GE | 2 | 0/18 and 0/19 |

### N540X-6Z6G-SYS

The following table shows the interface naming of the Cisco N540X-6Z6G-SYS routers:

*Table 7: Port Numbering*

| 1G ports (SFP) | 1G/10G Dual rate ports (SFP+) |
|---|---|
| 0/0 to 0/5 | 0/6 to 0/11 |

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

- **GigE** — 0/0/0/0 - 0/0/0/5
- **GigE/TenGigE** — 0/0/0/6 - 0/0/0/11

**Note** Dual-Rate functionality is supported only with the supported SFP.

*Table 8: Maximum Number of Ports*

| Category | Maximum Number of Ports | Port Number |
|---|---|---|
| 1GE | 12 | 0/0 - 11 |
| 10GE | 6 | 0/6 - 11 |

# External Alarm Inputs

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

# Air Plenum

Air plenum or air baffle assembly is used to change the air flow pattern of the unit. When the router is installed with the plenum, the air flow pattern is changed from, from front-to-side to front-to-back. The air flow front-to-back pattern provides a rack installation bay with a cool front zone and hot rear zone. For installing the plenum, see *Installing the Chassis in the Air Plenum*.



**Note** The system operating temperature is limited to 50 degrees Celsius. The air plenum changes the direction from front-to-side to front-to-back.

The air plenum is only available for Cisco N540-6Z18G-SYS-A/D router variant.

# Console

The RS232 console port provides transmission (Tx), reception (Rx), and ground (Gnd).

## USB Console

A single USB 2.0 Type-A receptacle on the front panel of the router provides console access to uboot, 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. This interface requires the use of a Type-A to Type-A connector instead of a standard USB cable.

**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. If you insert the USB cable and connect to the host computer, then you can only enter the commands using the USB.

# Online Insertion and Removal

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

- When an SFP is removed, there is no effect on traffic flowing on other ports.
- When an SFP is installed, the system initializes that port for operation based on the current configuration. If the inserted SFP 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.
- The power supply modules are fixed and cannot be removed.

# 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 and click **Enter**.