

Site Planning Considerations

This chapter describes the general considerations to address while planning for the installation of the Cisco NCS 4016 chassis. As you plan for your system, keep in mind the specifications listed in System Specifications

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Basic Site and Installation Planning

As you plan for basic site and installation requirements, consider the following:

- Does the installation site have adequate power for the routing system?
- Can the routing system be positioned close to the AC or DC power source, and are the power receptacles easy to reach?
- Does the site have appropriate equipment racks with space available in which to install the system? Are additional equipment racks required?
- Is there a scissor lift or similar lifting device available to lift the chassis into the equipment rack?

In addition, make sure that the installation site meets the following access requirements:

- At least 36 inches (92 cm) of clearance exists between rows of equipment racks. This space is needed to access components in the chassis. Additional clearance may be necessary for installation.
- Enough room exists for the system console terminal, and that the console cable is long enough to reach the routing system from the terminal.
- Fan tray exhaust vents are not blocked, and airflow at the bottom of the chassis is not blocked.

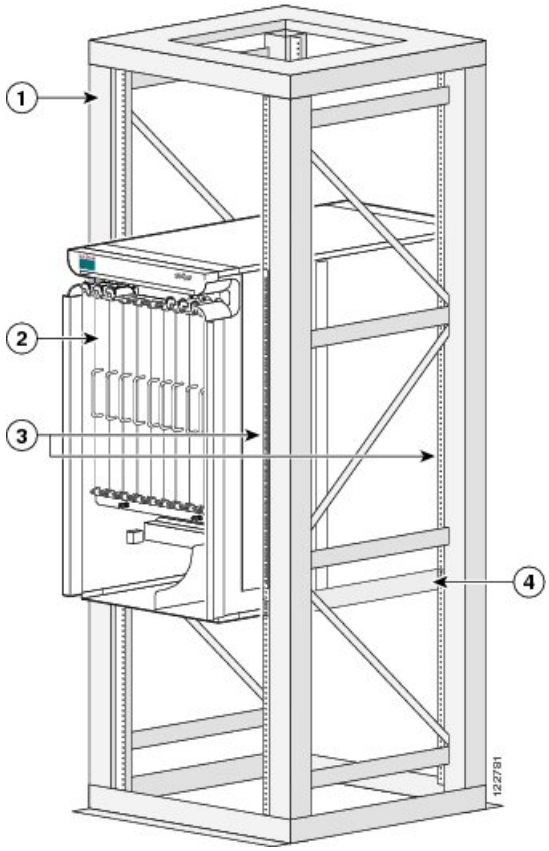
When planning the site, you should think about potential expansion of the system. Consider the following:

- Equipment rack space for additional chassis
- Power and cooling requirements for additional chassis
- Cable management for routing system cables

Equipment Rack Considerations

A fully loaded Cisco NCS 4016 chassis weighs 412 lb (187 kg). The chassis is mounted in a two-post or a four-post rack. This image shows a four-post rack.

Figure 1: Cisco NCS 4016 Chassis Mounted in an Equipment Rack



1	Equipment rack	3	Vertical mounting brackets
2	Cisco NCS 4016 chassis	4	Horizontal mounting brackets

Warning **The chassis should be mounted on a rack that is permanently affixed to the building.** Statement 1049

Note We recommend that you use a scissor lift or similar lifting device to position the chassis in the rack and to hold the chassis in place while you bolt it to the rack. *A forklift is not recommended for this purpose* .

As you plan the installation of the chassis into the equipment rack, consider the following:

- Make sure that the floor mounting bolts on the equipment rack are accessible, especially if annual retorquing of bolts is required.
- For chassis installation, you must have access to the vertical mounting rails at each corner of the equipment rack.
- Consider whether the area around the rack is large enough to accommodate the scissor lift (or similar lifting device) and installation personnel.
- A minimum of 48 mounting screws (10-32 x 5/8 in. socket head cap screws are provided with the chassis) are needed to secure the chassis to the rack. To secure the chassis to the rack, install twelve screws on each of the four vertical mounting brackets.

Note If you plan to use mounting screws other than the ones shipped with the chassis, you can use 10-32, 10-24, 12-24, or M5 screws. (M6 and 1/4-20 screws do not fit.)

- The rack should have horizontal shelf brackets to place the chassis on. The brackets must be able to support at least 650 lb. (294.8 kg). If the rack does not have horizontal mounting rails, a set of rails is included in the installation kit, which is available as an option (NCS4K-INST-KIT=).

Caution Standard rack-mounting screws are not strong enough to secure the chassis to the equipment rack. Use only those mounting screws that are shipped with the chassis.

For complete instructions on mounting and securing the chassis to a rack, see the *Cisco Network Convergence System 4000 Series Routers Unpacking, Moving, and Securing Guide* .

Aisle Spacing and Maintenance Access Floor Plan

The floor plan for the Cisco NCS 4016 chassis must include enough space to install the chassis in the equipment rack and allow sufficient airflow for the system. The floor plan must also provide enough room to access chassis components for maintenance (for example, to remove fan trays, power modules, cables, and air filters).

Note For chassis installation, make sure that enough room exists in front of the chassis to accommodate installation personnel and the scissor lift (or similar lifting device) used to hold the chassis in the rack while it is bolted in.

Front and Rear Clearances

The site requires the following front and rear clearances for chassis installation and maintenance access:

- To install the chassis in the equipment rack: approximately 40 inches (101.6cm)
- To service components and allow system airflow (both in front of and behind the chassis): 36 inches (91.4 cm)

Note Maintain at least 6 inches (15.2 cm) of clearance at both the inlet and exhaust openings on the chassis and on the power modules to allow sufficient airflow.

Cable Management

As the size of the routing system increases, the cabling required for the chassis increases. For example, a fully loaded Cisco NCS 4016 chassis has more cables connected to it than a partially loaded chassis. The cabling runs must be carefully planned. The basic configurations for various routing systems should be arranged to minimize the complexity and length of the cable runs. Precut and terminated cables are considered part of the basic configuration.

- CONSOLE or AUX RJ-45 RS-232 serial ports on the route processor cards for terminal connections
- Ethernet ports on the route processor cards for connecting network management equipment
- Modular service cards (MSCs) and physical layer interface modules (PLIMs) for data connections

The upper and lower cable management trays are for organizing these interface cables to keep the front of the chassis clear and to eliminate sharp bends in the cables.

Caution Excessive bending can damage interface cables.

Route Processor Cables

As you consider system cabling, see the table below, to determine the types of cables required to connect to ports on the route processor (RP).

Table 1: Route Processor Cables

RP Port	Required Cable Type
Ethernet management	STP[1] cable (Category 5 or better). Required for enhanced immunity to external electromagnetic disturbance levels of 10 V/m and 10 Vrms
Alarm	Shielded cable. Required for EMC compliance.
External (BITS) clock	Cat5 or better unshielded twisted pair (UTP) cable. Required for EMC compliance.

RP Port	Required Cable Type
Timing expansion port (TE ports)	Cables listed below to be used for TE ports on ECU2: • 15m cable (Cisco PID ONS-SYNC-CBL-15=) • 25m cable (Cisco PID ONS-SYNC-CBL-25=) • 50m cable (Cisco PID ONS-SYNC-CBL-50=) • 75m cable (Cisco PID ONS-SYNC-CBL-75=) • 100m cable (Cisco PID ONS-SYNC-CBL-100=) Choose the cable, depending on the length required to connect between the chassis in multi-chassis setup. **Note** ECU2 is a must requirement for the multi-chassis configuration.

[1] STP = shielded twisted-pair

Interface Cables

You must provide the interface cables

Because the type and number of interfaces can vary, plan these cable runs prior to the installation. When planning the cable runs, consider the following:

- Number and type of interface connections (OC-48/STM-16 or STS-48, OC-192/STM-64 or STS-192, OC-768/STM-256 or STS-768, 10-Gigabit Ethernet, and 100-Gigabit Ethernet)
- Termination at the other end of the cables (such as patch panel or optical transport equipment)
- Proper length and termination of cables

Noise Control

The Cisco NCS 4016 chassis has some built-in noise reduction, such as fan speed control. If the routing system is installed in an environment where excessive noise could be harmful to personnel, some other noise reduction options could be attempted. Passive noise reduction could include the installation of foam panels to insulate the surrounding area from the noise.

Additional noise-reduction measures have to be designed on an individual site basis.

Cisco Installation Services

Cisco or a Cisco partner can provide a complete installation, from planning to power up. For information about Cisco or Cisco partner installation services, consult Cisco Customer Advocacy.

System Testing, Certification, and Warranties

After the routing system has been installed, it must be tested and certified. Consult Cisco Customer Advocacy for information about testing, certification, and warranties.