

Hardware Installation Guide for Cisco NCS 1002

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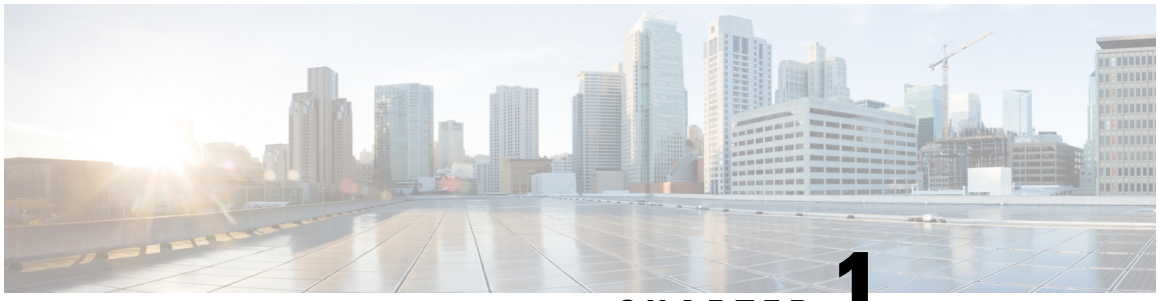
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CHAPTER 1

Cisco NCS 1002 Overview

This chapter provides an overview of Cisco NCS 1002.

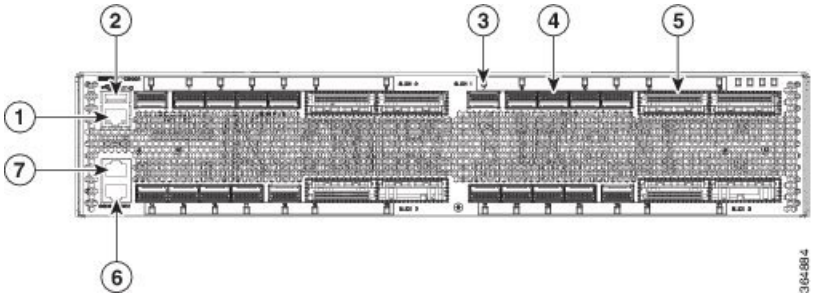
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Cisco NCS 1002 Overview

Cisco NCS 1002 is a 2Tbps muxponder that addresses the growing bandwidth needs of data center DWDM applications. It provides dense, low power (<80W per 100G), and cost optimized DWDM transport for 10G, 40G, and 100G clients. The trunk ports can operate at 100G, 200G, and 250G traffic. The muxponder is 2 RU. NCS 1002 is ROHS6 compliant.

NCS 1002 has four independent slices. Each slice contains five QSFP+/QFSP28 client optical ports and two CFP2 DWDM trunk ports. Each slice delivers up to 500 Gbps traffic.

Figure 1: Cisco NCS 1002 Front View

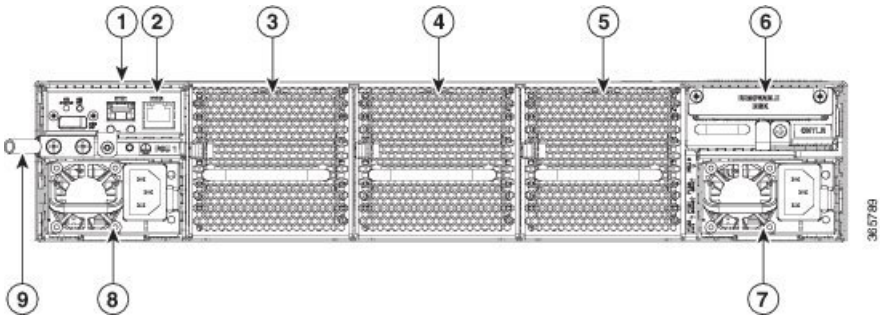


1	ETH0: RJ45 Ethernet management port.
2	USB 2.0 management port.
3	LEDs for the client and trunk ports

Cisco NCS 1002 Overview

4	20 QSFP+/QSFP28 client optical ports
5	8 CFP2 DWDM trunk ports
6	RJ45 console ports for System Admin.
7	RJ45 console ports for IOS XR.

Figure 2: Cisco NCS 1002 Rear View



1	ETH1 SFP, ETH2 RJ45, OIR LED. You can connect an SFP to this management port.
2	ETH2 RJ45 Ethernet port. The unit containing the RJ45 and SFP ports is not field-replaceable.
3	FT0
4	FT1
5	FT2
6	CPU and Solid State Disk (SSD)
7	1800W AC or DC redundant power supply module (PSU 0)
8	1800W AC or DC redundant power supply module (PSU 1)
9	Grounding lug

In case of single PSU, the other PSU slot must be inserted with the PSU filler module to guarantee safety and system cooling compliance.

Physical Characteristics

- Width: 17.4 in (44.19 cm)
- Depth: 23.5 in (59.69 cm)
- Height: 3.45 in (8.76 cm)
- Weight without power supply unit: 40.52 lb (18.38 kg)

  Weight with two power supply units: 45.59 lb (20.68 kg)
- Weight of AC: 2.65 lb (1.2 kg)

- Weight of Fan: 1.77 lb (0.8 kg)
- Weight of SSD: 0.9 lb (0.4 kg)
- Weight of CPU: 3.3 lb (1.5 kg)

Safety Labels

Cisco NCS 1000 Series chassis is classified as Hazard Level 1M as per IEC 60825-2 and Laser Class 1M as per IEC 60825-1, since it includes pluggable optical modules Class 1 or Class 1M.

The Class 1/1M Laser Product label is shown in the following figure:

Figure 3: Class 1/1M Laser Product Label



This section explains the significance of the safety labels attached to the NCS 1002 chassis.

You must understand all warning labels before working on the chassis.

Figure 4: Class 1M Laser Product Label



Complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed. 3., as described in Laser Notice No. 56, dated May 8, 2019.

Conforme à la norme 21 CFR 1040.10 et 1040.11, sauf conformité avec la norme IEC 60825-1 Ed. 3., comme décrit dans l'avis relatif au laser no. 56, daté du 8 Mai 2019.

366295

Safety Precaution for Module Installation and Removal

Ensure to observe the following safety precautions when you are working with the chassis modules.

Invisible laser radiations present. Statement 1016.

Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments. Statement 1051.

Figure 5: Class 1/1M Laser Product Label

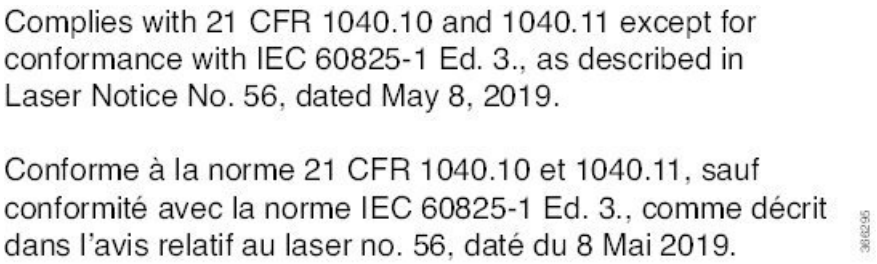


Safety Precaution for Laser Radiation

Cisco NCS 1000 Series chassis is classified as Hazard Level 1M as per IEC 60825-2 and Laser Class 1M as per IEC 60825-1, since it includes pluggable optical modules Class 1 or Class 1M.

Figure 6: Class 1M Laser Product Label





SFP+ Support

Each slice contains five QSFP+ client optical ports and two CFP2 DWDM trunk ports. From R6.5.1, the SFP+ optical modules can be inserted in the QSFP+ client ports (where break out is supported) using the QSA-SFP adapter. This allows the 10G QSFP+ ports to carry traffic on a single lane (Lane 1). All the features applicable to 10G client mode are supported when a QSA with 10G SFP is used.

In a slice configured in 10G client mode, both the SFP and QSFP modules can be combined. This means the same slice can operate with both 4*10G optics and 10G QSA-SFP optics.

Product IDs

The following table describes the product IDs of the components.

Product ID	Description
NCS1002-K9(=)	NCS 1002
NCS1K-2KW-AC=	2KW AC power supply unit
NCS1K-2KW-AC-CBL=	AC IEC C15 to NEMA L6-20P cable
NCS1K-2KW-DC=	2KW DC power supply unit
NCS1K-2KW-DC-CBL=	NCS1000 DC cable with connector
NCS1K-FAN=	Fan
NCS1K-SSD=	SSD with a capacity of 64 GB
NCS1K-CNTLR=	Controller

It is recommended to perform OIR of the client pluggable on the same port with at least two seconds interval.

Supported Pluggables

The following pluggables are supported on NCS 1002.

Product ID	Description
ONS-CFP2-WDM	100G QPSK/200G 16-QAM WDM CFP2 pluggable
QSFP-4X10G-LR-S	QSFP: 4X10G, LR, 10km, SMF
QSFP-40G-SR-BD	40GBASE-SR-BiDi, duplex MMF
QSFP-40G-LR4	40GBASE-LR4, 1310 nm, SMF
QSFP-100G-CWDM4-S	100GE CWDM4, coarse wavelength division multiplex, 1271nm/1291nm/1311nm/1331nm. SMF, S-Class
QSFP28-100G-SR4	
QSFP28-100G-LR4	
QSFP-100G-LR4-S=	100GBASE-LR4, 1310nm SMF, S-Class
QSFP28-100G-SR4-S	100GBASE-SR4, 4 lanes parallel, 850nm, MMF, S-Class
QSFP-100G-AOC	100GBASE QSFP Active Optical Cables
QSFP-40G-CSR4=	QSFP 4x10GBASE-SR Transceiver Module, MPO, 300M
QSFP-40G-SR4=	40GBASE-SR4 QSFP Transceiver Module with MPO Connector
QSFP28-SM-SR	Cisco 100G QSFP28 SM-SR Pluggable Optics Module
QSFP-100G-AOC3M, QSFP-100G-AOC5M, and QSFP-100G-AOC10M	Cisco 100G QSFP28 AOC Pluggable Optics Module
ONS-CFP2-WDM-1KL	100G QPSK/200G 16-QAM WDM CFP2 Pluggable
ONS-CFP2-WDM-1KE	100G QPSK/200G 16-QAM WDM CFP2 Pluggable
CVR-QSFP-SFP10G	QSFP to SFP Adapter
SFP-10G-LR	Cisco 10G SFP LR Pluggable Optics Module
SFP-10G-ER	Cisco 10G SFP ER Pluggable Optics Module
LQ210CR-CPA1	Non-Cisco QSFP28 100G CWDM4 Pluggable Optics Module
QSFP-100G-SM-SR	
QSFP28-100G-CWDM4	
QSFP-100G-FR-S	Cisco 100GE QSFP28 FR Pluggable Optics Module, 2 km over SMF

LEDs in Cisco NCS 1002

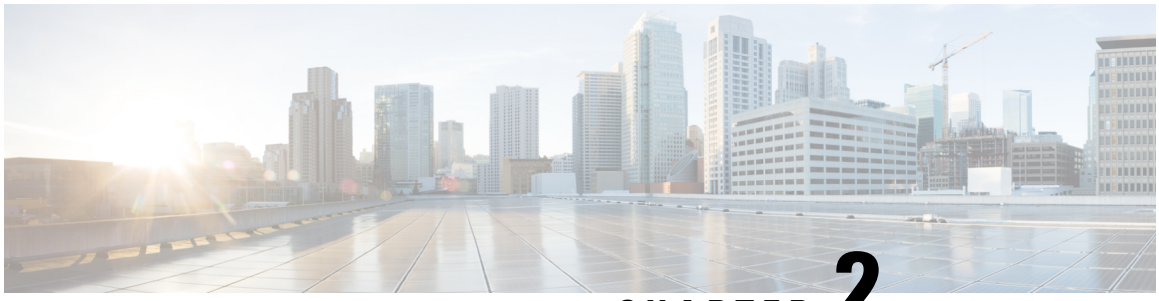
LED	State	Description
Status	Green	The unit is operating correctly.
	Yellow	The unit has one or more errors detected.
	Off	Power is not applied to the unit.
Attention	Blue	The unit needs attention.
	Off	The unit does not need attention.
Port	Green	The link is up (including internal loopback).
	Yellow	The link is down, active alarms are present on this port, or a hardware failure has occurred.
	Off	The port is not provisioned by the software, the optics module is missing, or the port does not have power.
PEM and FAN	Green	The unit is operating correctly.
	Red	The unit has one or more errors detected.
	Off	Power is not applied to the unit.
OIR	Off	The control card is not present or not properly inserted.
	Amber Blinking	The software is not operating correctly as the CPU card may not be inserted correctly.
	Amber Solid	The control card, BIOS, and software are functional. R6.0.0 and R6.0.1 do not support Amber Solid.

Installation Checklist

Table 1: Overview of Installation Steps

Step	See
Read the safety guidelines	Safety Guidelines
Unpack and verify NCS 1002	Unpack and Verify Cisco NCS 1002, on page 10
Determine the type of rack to install NCS 1002	ANSI or ETSI

Step	See
Choose the appropriate bracket to mount NCS 1002	Mount Brackets on NCS 1002 for ANSI or ETSI Rack, on page 11
Install NCS 1002 onto the rack	Install NCS 1002 on a Rack, on page 13
Ground NCS 1002	Ground NCS 1002, on page 16
Connect the AC power cord	Connect AC Power to NCS 1002, on page 17
Connect the DC power cord	Connect DC Power to NCS 1002, on page 18



CHAPTER 2

Prepare to Install Cisco NCS 1002

This chapter explains how to prepare for the Cisco NCS 1002 installation.

- Review Safety Warnings, on page 9
- Prepare to Install Cisco NCS 1002, on page 9
- Unpack and Verify Cisco NCS 1002, on page 10

Review Safety Warnings

Review the safety warnings available at Regulatory Compliance and Safety Information for Cisco NCS 1000 Series.

Prepare to Install Cisco NCS 1002

Cisco Supplied Materials

The following materials are required and are shipped with Cisco NCS 1002. The number in parentheses provides the quantity of the item included in the package.

- (ANSI) Pair of 19-inch mounting brackets
- (ANSI) Pair of 23-inch mounting brackets
- (ETSI) Pair of 21-inch mounting brackets
- Cable management bracket (1)
- M4 screws to fix brackets (16)
- M4 screws to fix ground lug (2)
- Ground lug (1)
- Covers for the QSFP and CFP2 ports

All the unused QSFP and CFP2 ports need to be covered with dust covers.

User Supplied Materials

The following materials, tools, and equipment are required but are not supplied with Cisco NCS 1002.

- Equipment rack
- M4 Phillips screw driver

- Fuse panel
- Wire cutters
- Wire wrapper
- Voltmeter
- Ground cable #6 AWG stranded, specified for up to 90° Celsius (194° Fahrenheit)

Unpack and Verify Cisco NCS 1002

Procedure

Step 1 When you receive Cisco NCS 1002 equipment at the installation site, open the top of the box. The Cisco Systems logo is on the side of the box.

Step 2 Remove the foam inserts from the box. The box contains Cisco NCS 1002 and other items needed for installation.

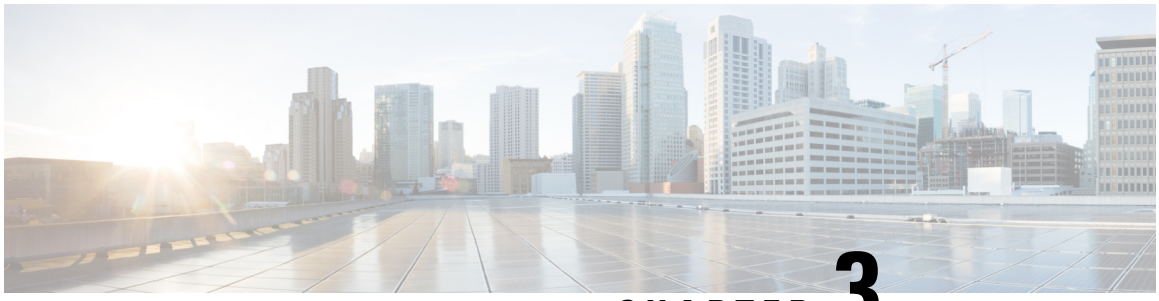
Step 3 To remove the shelf, grasp both rings of the shelf removal strap and slowly lift the shelf out of the box.

Step 4 Verify that you have all items.

Step 5 Verify the following:

- Cisco NCS 1002 is not damaged.
- The cable connectors, EOBC ports, management ports, console ports, and power connectors are not damaged.
- The SFP cages on the front panel are not damaged.

Step 6 If there is any damage, call your Cisco sales engineer for a replacement.



CHAPTER 3

Install Cisco NCS 1002

This chapter describes the procedures to install Cisco NCS 1002.

- Mount Brackets on NCS 1002 for ANSI or ETSI Rack, on page 11
- Install NCS 1002 on a Rack, on page 13
- Ground NCS 1002, on page 16
- Connect AC Power to NCS 1002, on page 17
- Connect DC Power to NCS 1002, on page 18
- Verify AC and DC Power Parameters, on page 20
- Power Supply Switch, on page 23
- Connect to the Console Ports, on page 23
- Connect to the Management Port, on page 24
- Orientation of CFP2 and QSFP Pluggables, on page 24
- Verify NCS 1002 Installation, on page 25
- Related Information, on page 26
- Test File, on page 26

Mount Brackets on NCS 1002 for ANSI or ETSI Rack

Use this procedure to:

- Mount 19-inch brackets on NCS 1002 for ANSI rack
- Mount 23-inch brackets on NCS 1002 for ANSI rack
- Mount 21-inch brackets on NCS 1002 for ETSI rack

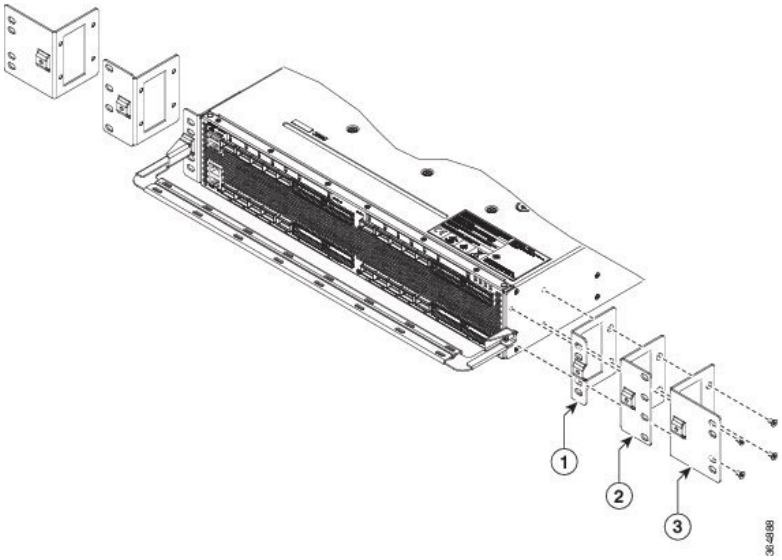
Caution Use only the fastening hardware provided with NCS 1002 to prevent loosening, deterioration, and electromechanical corrosion of the hardware and joined material.

Note In a ANSI rack, NCS 1002 can be installed in the front or the middle position. In a ETSI rack, NCS 1002 can be installed only in the front position.

Procedure

Step 1 Place the wider side of the mounting bracket flush against NCS 1002. The narrow side of the mounting bracket must be towards the front of the shelf.

Figure 7: Mounting Brackets on NCS 1002



1	19-inch ANSI bracket
2	21-inch ETSI bracket
3	23-inch ANSI bracket

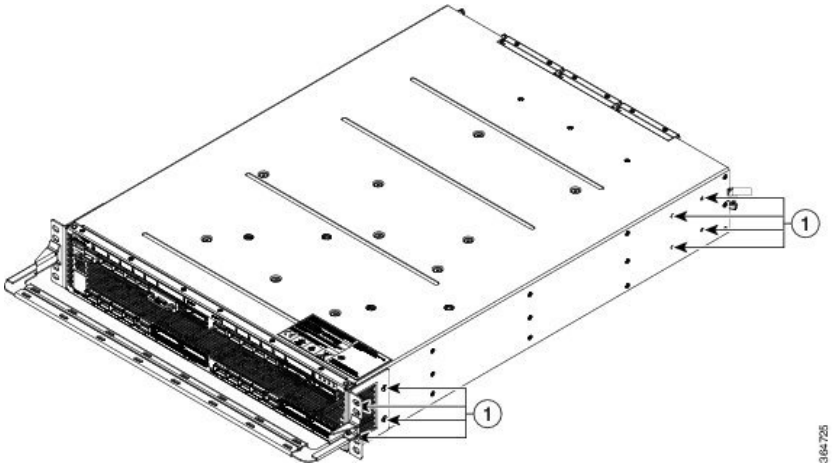
Step 2 Align the mounting bracket screw holes against NCS 1002 screw holes.

Step 3 Insert the M4 flat screws and tighten them to a torque value of 11.5 in-lbs (1.3 N-m).

Step 4 Repeat Step 1 to Step 3 to mount the bracket on the opposite side.

Step 5 Align the cable management bracket screw hole against the mount bracket screw hole.

Figure 8: Mounting the Cable Management Bracket



Step 6 Insert the M4 screw and tighten it to a torque value of 6.5 in-lbs (0.75 N-m) .

Note
The cable guide is made of thick metal. Therefore a lower torque value must be applied to tighten the cable guide screws to avoid breakage.

Step 7 Repeat Step 5 and Step 6 to install the cable guide on the opposite side.

Install NCS 1002 on a Rack

Note In a ANSI rack, NCS 1002 can be installed in the front or the middle position. In a ETSI rack, NCS 1002 can be installed only in the front position.

For a 4 post rack, install the two brackets to the rear together with the front brackets; For a 2 post rack, install the two brackets to the middle with the front brackets used to mount the cable management assembly.

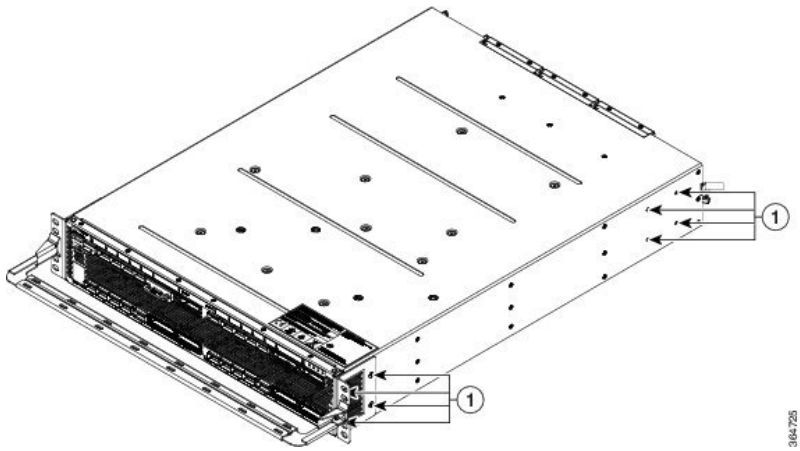
Procedure

Step 1 Verify that the proper fuse panel has been installed in the top mounting space. If the fuse panel is not present, install one according to local practices.

Step 2 Ensure that NCS 1002 is mounted on the appropriate rack equipment:

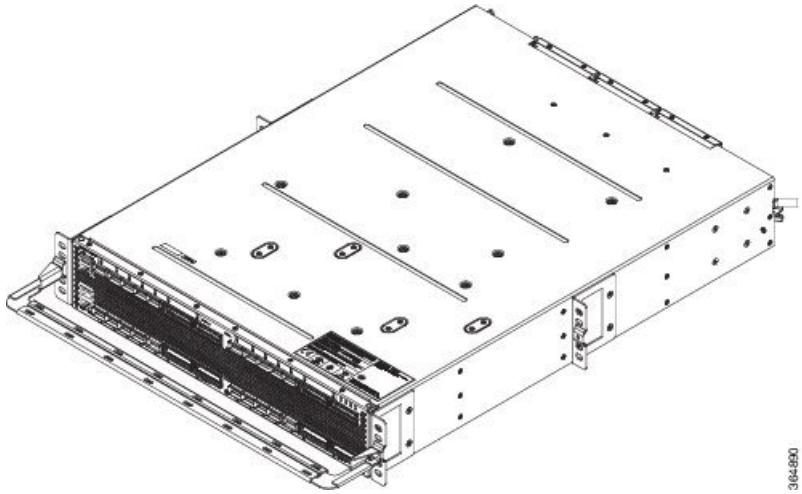
- 19 inches (482.6 mm) or 23 inches (584.2 mm) for ANSI racks
- 600 x 600-mm (23.6 x 23.6-inch) or 600 x 300-mm (23.6 x 11.8-inch) for ETSI racks

Figure 9: Mounting NCS 1002 in a Four Post Rack



1	Screws

Figure 10: Mounting NCS 1002 in a Two Post Rack



Step 3 Lift NCS 1002 to the desired position in the rack.

Step 4 Align the screw holes on the mounting brackets with the mounting holes in the rack.

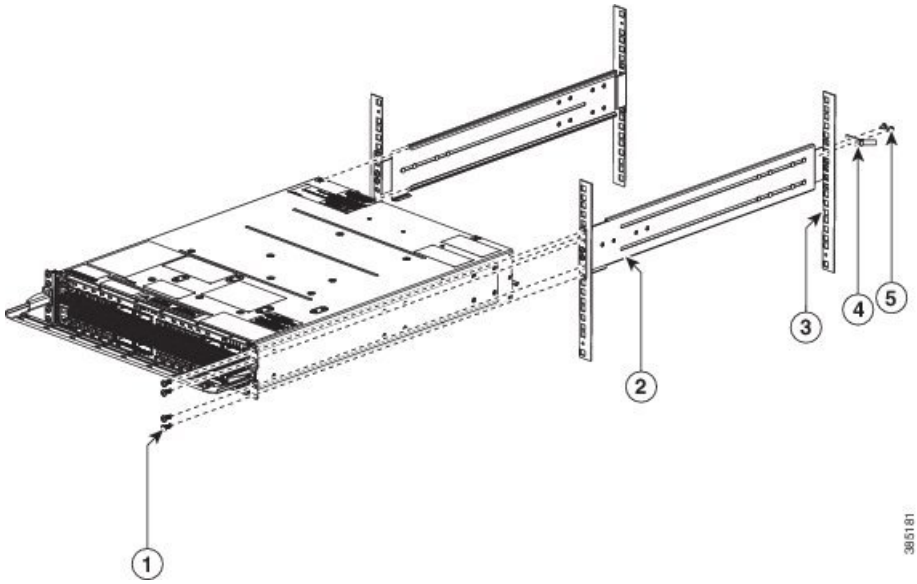
Step 5 Using the Phillips Dynamometric screwdriver, install one mounting screw in each side of the assembly:

- For ANSI rack, use 12-24 x 3/4 pan-head Phillips mounting screws and tighten it to a torque value of 22 in-lbs (2.5 Nm)
- For ETSI rack, use M6 mounting screws and tighten it to a torque value of 22 in-lbs (2.5 Nm)

Step 6 When NCS 1002 is secured to the rack, install the remaining two mounting screws on either side of NCS 1002.

Step 7 Mount NCS 1002 with sliding rails.

Figure 11: Mounting NCS 1002 with Sliding Rails



1	M5 screws
2	Sliding rails
3	Rack post
4	Ground lug
5	M4 screws

The following caution label is displayed on the sliding rails.

Caution
The sliding rail must be used only for first chassis positioning. The chassis must be fixed with screws on the front side. Read Installation Guide.

- Mount part of the sliding rails on NCS 1002.
- Mount the other part of the sliding rails on the rack.
- Insert NCS 1002 inside the rack.
- Lock NCS 1002 inside the rack with front screws.
- Connect the ground lug.

Ground NCS 1002

Caution When terminating the frame ground, do not use soldering lug connectors, screwless (push-in) connectors, quick connect connectors, or other friction-fit connectors.

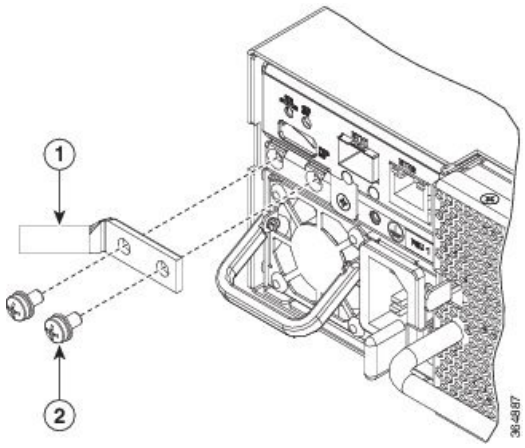
Procedure

Step 1 Verify that the office ground cable is connected to the top of the rack and the office ground, according to local site practice.

Step 2 Remove any paint and other nonconductive coatings from the surfaces between the shelf ground and bay frame ground point. Clean the mating surfaces and apply appropriate antioxidant compound to the bare conductors.

Step 3 Attach one end of the shelf ground cable (#6 AWG cable) to the ground point on the rear of NCS 1002 using the specified dual-hole lug connector.

Figure 12: NCS 1002 Ground Lug



1	Ground lug
2	Screw

Step 4 Tighten the M4 pan-head screw to torque value of 11.5 in-lbs (1.3 N-m).

Step 5 Attach the other end of the shelf ground cable to the bay frame using a dual-hole lug connector according to the equipment rack frame specifications.

Connect AC Power to NCS 1002

Caution NCS 1002 relies on the protective devices in the building installation to protect against short circuit, overcurrent, and ground faults. Ensure that the protective devices comply with local and national electrical codes.

The voltage rating value for AC power ranges either between 200 V to 240 V or between 100 V to 115 V depending on the standards in various countries.

Caution When the input voltage is 110 V, you cannot provision slice 2 and 3 as they are not detected. In this state, alarms are raised for slices 2 and 3.

Note A dual pole breaker is needed for the installation. The rating of the dual pole breaker is 15A.

Procedure

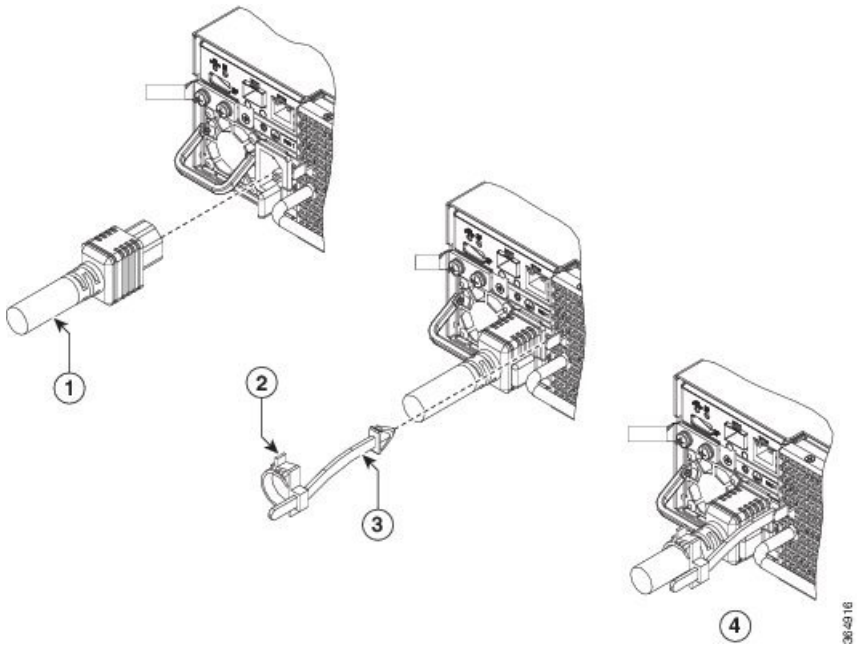
Step 1 Verify that the AC cable is installed in the correct AC source panel. Ensure that either the fuse is removed or the circuit breaker is in the off position and locked out.

For an AC power supply, fuse or breaker rating must not exceed 15A.

Step 2 Attach the AC power cable to the cable connector in the AC power module.

Step 3 Close the cable clamp to secure the power cable.

Figure 13: Connecting AC Power



1	AC Power Cord
2	Cable Clamp
3	Tie Mount
4	Final Assembly

Step 4 Ensure that the lockout device is removed if installed and turn on the circuit breaker(s) to the shelf. Verify that the Green LED on the PSU is on.

Connect DC Power to NCS 1002

This feature is supported from IOS XR Release 6.0.1.

Caution NCS 1002 relies on the protective devices in the building installation to protect against short circuit, overcurrent, and ground faults. Ensure that the protective devices comply with local and national electrical codes.

Note The voltage rating value for DC power ranges between -40 VDC to -72 VDC at 55A.

Note Install one of the following Software Maintance Upgrade(SMU) if you observe a critical alarm when the software is upgraded from Release 6.3.1 to Release 6.3.2 or 6.5.1:

Software Version Link	SMU ID	SMU	Description
Cisco IOS XR Software Release 6.3.2	AA14771	ncs1k-sysadmin -6.3.2.CSCvm62177.tar	Reboot/optional SMU, NCS1002:DC PSU - Cisco IOS XR 6.3.2 does not recognize DC PSU module PID as valid PID - Failed provisioning
Cisco IOS XR Software Release 6.5.1	AA14772	ncs1k-sysadmin -6.5.1.CSCvm62177.tar	Reboot/optional SMU, NCS1002:DC PSU - Cisco IOS XR 6.3.2 does not recognize DC PSU module PID as valid PID - Failed provisioning

Note A dual pole breaker is needed for the installation. The rating of the dual pole breaker is 60A.

Procedure

Step 1 Verify that the correct fuse panel is installed in the top mounting space.

For a 48 VDC power supply, the fuse rating must not exceed 60 A.

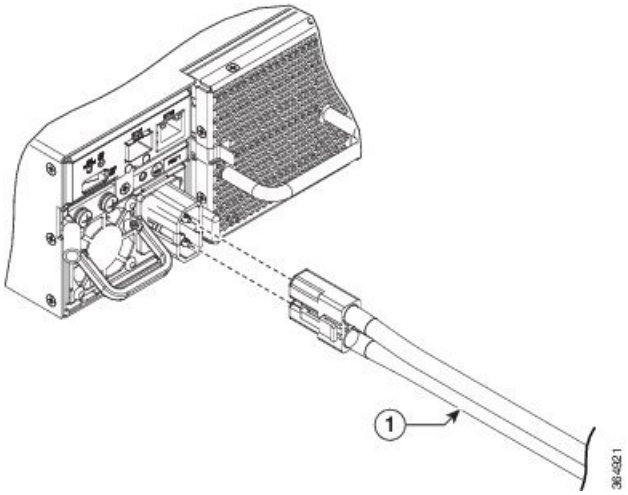
Step 2 Measure and cut the cables as needed to reach NCS 1002 from the fuse panel.

Step 3 Dress the power according to local practice.

Step 4 Connect the office battery and return cables according to the fuse panel engineering specifications.

Step 5 Insert the DC connector into the DC receptacle on the power supply.

Figure 14: Connecting DC Power



1	DC Power Cord

Step 6 Ensure that either the fuse is inserted or the circuit breaker is in the ON position. Verify that the Green LED on the PSU is on.

Verify AC and DC Power Parameters

Before you begin

DC or AC power module must be connected to the NCS 1002.

Procedure

Step 1 Use the **show hw-module fpd** command to display information about the current FPD image version of the power modules.

```
sysadmin-vm:0_RP0# show hw-module fpd
Sat May  7  04:39:44.125 UTC
                                                                    FPD Versions
                                                                   ==============
Location  Card type         HWver FPD device       ATR Status   Run    Programd
--------------------------------------------------------------------------------
0/0       NCS1002           0.0   CTRL_BKP_LOW         NOT READY  0.00    0.00
0/0       NCS1002           0.1   CTRL_BKP_UP      B   CURRENT            1.22
0/0       NCS1002           0.0   CTRL_FPGA_LOW        NOT READY  0.00    0.00
0/0       NCS1002           0.1   CTRL_FPGA_UP         CURRENT    1.22    1.22
0/RP0     NCS1K-CNTLR-K9    0.1   BIOS_Backup      BS  CURRENT   13.10   13.10
0/RP0     NCS1K-CNTLR-K9    0.1   BIOS_Primary      S  NEED UPGD          0.28
0/RP0     NCS1K-CNTLR-K9    0.1   Daisy_Duke_BKP   BS  CURRENT            0.15
0/RP0     NCS1K-CNTLR-K9    0.1   Daisy_Duke_FPGA   S  CURRENT    0.15    0.15
0/PM0     NCS1K-2KW-DC      0.0   PO-PriMCU            CURRENT  1.10    0.00
```

```
0/PM1      NCS1K-2KW-AC       0.0    PO-PriMCU            CURRENT     4.00     4.00
```

Step 2 Use the **show environment power** command to view the power details of the AC and DC power modules.

```
sysadmin-vm:0_RP0# show environment power
Sat May  7  04:39:52.146 UTC
===============================================================================
CHASSIS LEVEL POWER INFO: 0
===============================================================================
   Total output power capacity (N + 1)             :    2000W +    2000W
   Total output power required                     :     975W
   Total power input                               :     226W
   Total power output                              :     164W

Power Group 0:
===============================================================================
   Power       Supply      ------Input----   ------Output---       Status
   Module      Type         Volts     Amps    Volts     Amps
===============================================================================
   0/PM0       2kW-DC        50.1      1.3     12.1      3.4    OK

Total of Power Group 0:          65W/  1.3A        41W/  3.4A

Power Group 1:
===============================================================================
   Power       Supply      ------Input----   ------Output---       Status
   Module      Type         Volts     Amps    Volts     Amps
===============================================================================
   0/PM1       2kW-AC       229.5      0.7     12.0     10.2    OK

Total of Power Group 1:         161W/  0.7A       122W/ 10.2A

===============================================================================
   Location     Card Type             Power       Power       Status
                                      Allocated   Used
                                      Watts       Watts
===============================================================================
   0/0          NCS1002                820           -       ON
   0/RP0        NCS1K-CNTLR-K9          35           -       ON
   0/FT0              -                 40           -       RESERVED
   0/FT1              -                 40           -       RESERVED
   0/FT2        NCS1K-FTA               40           -       ON
```

In the example below, 110 VDC is used.

```
sysadmin-vm:0_RP0# show environment power
Fri Apr  29 00:22:14.501 UTC
===============================================================================
CHASSIS LEVEL POWER INFO: 0
===============================================================================
   Total output power capacity (N + 1)             :    1000W +       0W
   Total output power required                     :     565W
   Total power input                               :      66W
   Total power output                              :      78W

Power Group 0:
===============================================================================
   Power       Supply      ------Input----   ------Output---       Status
   Module      Type         Volts     Amps    Volts     Amps
===============================================================================
   0/PM0       2kW-AC         0.0       0.0     12.1      0.0    FAILED or NO PWR
```

```
Total of Power Group 0:          0W/  0.0A         0W/  0.0A

Power Group 1:
================================================================================
   Power       Supply     ------Input----   ------Output---      Status
   Module      Type        Volts     Amps    Volts     Amps
================================================================================
   0/PM1       2kW-AC      110.0      0.6     12.0      6.5    OK

Total of Power Group 1:         66W/  0.6A        78W/  6.5A

================================================================================
   Location     Card Type            Power       Power       Status
                                     Allocated   Used
                                     Watts       Watts
================================================================================
   0/0          NCS1002               820           -       ON
   0/RP0        NCS1K-CNTLR-K9         35           -       ON
   0/FT0        NCS1K-FTA              40           -       ON
   0/FT1        NCS1K-FTA              40           -       ON
   0/FT2        NCS1K-FTA              40           -       ON
```

Step 3 Use the **show environment temperatures** command to view the temperature values of the AC and DC power modules.

```
sysadmin-vm:0_RP0# show environment temperatures
Sat May  7  04:39:58.690 UTC
================================================================================
Location  TEMPERATURE                 Value   Crit Major Minor Minor Major  Crit
          Sensor                   (deg C)   (Lo) (Lo)  (Lo)  (Hi)  (Hi)   (Hi)
--------------------------------------------------------------------------------
0/0
        ! Down-Inlet Temperature          0    -10     0    10    55    55    75
        ! Down-Remote Inlet Temp          0    -10     0    10    45    45    65
        ! Down-Outlet Temperature         0    -10     0    10    65    65    85
          Up-Inlet Temperature           26    -10     0    10    55    55    75
          Up-Remote Inlet Temp           26    -10     0    10    45    45    65
          Up-Outlet Temperature          28    -10     0    10    65    65    85
0/RP0
          Thermistor 1                   28    -10     0     0    55    55    85
          Thermistor 2                   27    -10     0     0    55    55    85
          Hot Spot Temperature           27    -10     0     0    55    55    85
0/PM0
          Inlet Temperature              28    -10    -5     0    77    80    81
          Outlet Temperature             32    -10    -5     0    95   100   105
          Heat Sink Temperature          30    -10    -5     0    95   100   105
0/PM1
          Inlet Temperature              27    -10    -5     0    70    74    78
          Outlet Temperature             30    -10    -5     0    80    84    88
          Heat Sink Temperature          29    -10    -5     0    89    93    97
```

In the above example, 0/PM0 denotes the DC power module and 0/PM1 denotes the AC power module.

Step 4 Use the **show environment fan** command to view the fan speed of the AC and DC power modules.

```
sysadmin-vm:0_RP0# show environment fan
Mon Aug  8  06:06:53.559 UTC
====================================
                        Fan speed (rpm)
Location     FRU Type           FAN_0
------------------------------------
0/FT0        NCS1K-FTA           4680
```

```
0/FT1         NCS1K-FTA           4800
0/FT2         NCS1K-FTA           4800

0/PM0         NCS1K-2KW-DC        9408

0/PM1         NCS1K-2KW-AC        9664
```

Power Supply Switch

A power supply switch on the rear side is used to completely shut down NCS 1002. The switch is set to ON by default. The switch is protected against accidental activation. A screw driver must be used to activate the switch. When the power supply switch is activated, the following happens.

- Both the power supplies are stopped.
- The PSU LEDs indicate Green (power input is available) and Blinking (system is ready but power supply is disabled).

If NCS 1002 does not boot even after connecting the power supply cables and supplying power, check the status of LEDs on the PSU modules. If the PSU LEDs indicate Green Blinking, the power supply switch is set to OFF. Set the switch to ON and ensure PSU LEDs indicate Green Solid.

Connect to the Console Ports

The system console port is an RJ-45 receptacle for connecting a data terminal to perform the initial configuration of NCS 1002. The console ports requires a straight-through RJ-45 cable.

Follow this procedure to connect a data terminal to the console ports.

Procedure

Step 1 Set your terminal to these operational values: 115200 bps, 8 data bits, no parity, 1 stop bit (115200 8N1).

Step 2 Power off the data terminal.

Step 3 Attach the terminal end of the cable to the interface port on the data terminal.

Step 4 Attach the other end of the cable to the console port.

Step 5 Power on the data terminal.

Table 2: RJ-45 Straight-through Cable Pin-outs

RJ-45 Pin	Signal
1	—
2	—
3	Tx

RJ-45 Pin	Signal
4	Ground (GND)
5	GND
6	Rx
7	—
8	—

Connect to the Management Port

To connect cables to the RP management ports, attach Category 5 UTP cables directly to the MGT LAN 0 and MGT LAN 1 RJ-45 receptacles.

You can use the following RP management ports from R6.1.1:

- ETH0 port—Attach Category 5 UTP cables directly to the MGT LAN 0 and MGT LAN 1 RJ-45 receptacles.
- ETH1 port—Connect an SFP to the port.

You can verify the software mapping of the above management ports using the **show ip interface** command:

- MgmtEth0/RP0/CPU0/0 specifies ETH0
- MgmtEth0/RP0/CPU0/1 specifies ETH1

To connect cables to the ETH0 RP management port:

Procedure

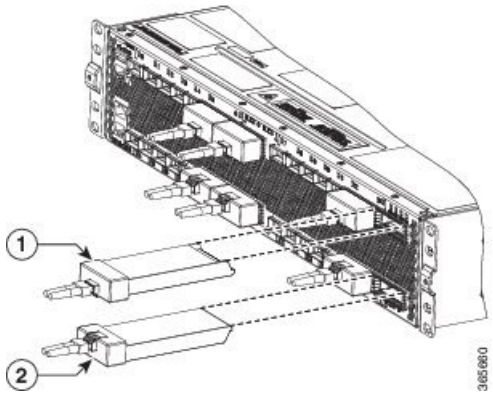
Step 1 Plug the cable directly into the RJ-45 receptacle.

Step 2 Connect the network end of your RJ-45 cable to a switch, hub, repeater, or other external equipment.

Orientation of CFP2 and QSFP Pluggables

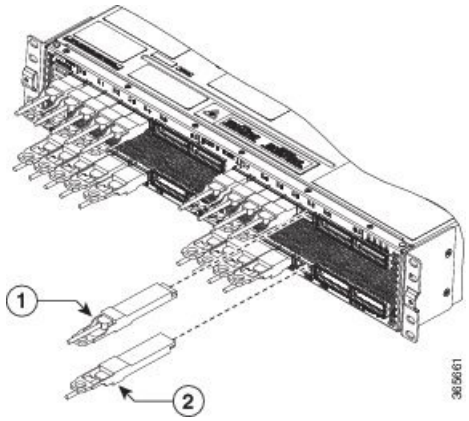
When CFP2 and QSFP pluggables are inserted into the ports of NCS 1002, the orientation varies depending on insertion into upper cage (slices 0 and 1) or lower cage (slices 2 and 3). If the pluggable does not slide easily into the port slot, the orientation might be incorrect. Reorient the pluggable, if necessary.

Figure 15: CFP2 Orientation



1	Reversed insertion in the upper cage for CFP2 pluggables
2	Straight insertion in the lower cage for CFP2 pluggables

Figure 16: QSFP Orientation



1	Reversed insertion in the upper cage for QSFP pluggables
2	Straight insertion in the lower cage for QSFP pluggables

Verify NCS 1002 Installation

- Verify that NCS 1002 is installed in a rack and properly grounded. See Install NCS 1002 on a Rack, on page 13 and Ground NCS 1002, on page 16.
- Verify that the power supply cable is connected through the breaker. See Connect AC Power to NCS 1002, on page 17 and Connect DC Power to NCS 1002, on page 18.
- Power on NCS 1002. Verify that the console port works by checking the prompt on the CLI.
- Verify that the Status LED is Green and Attention LED is Off.
- Verify that the LED on the two power supply units is Green.

Related Information

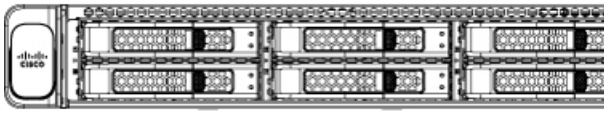
For more information on Cisco NCS 1002 including specifications, see the data sheet.

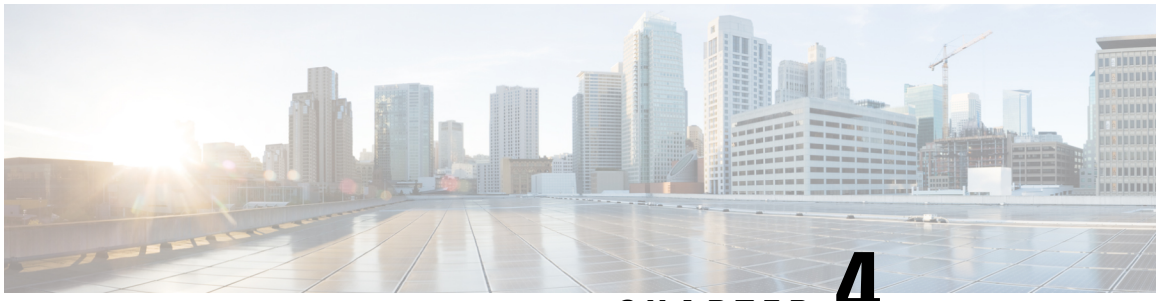
Test File

This is a test file created to test new functions in the AEM.

Procedure

	Command or Action	Purpose
Step 1	This step is for testing the working of the sample gifs.	*Figure 17: This is test GIF for Lug*  *Figure 18: This test gif is for Brackets* 

	Command or Action	Purpose
Step 2	This step is added to chek the third gif.	***Figure 19: This test gif is for Chassis***  ***Figure 20: this is a 2d image*** 



CHAPTER 4

Replace Cisco NCS 1002 Components

This chapter describes the procedures to replace Cisco NCS 1002 components.

- Remove and Reinsert Control Card, on page 29
- Remove Fans, on page 31
- Remove and Replace SSD, on page 32
- Replace Power Supply, on page 33
- Wipe Data in Disk Using Secure Erase, on page 34

Remove and Reinsert Control Card

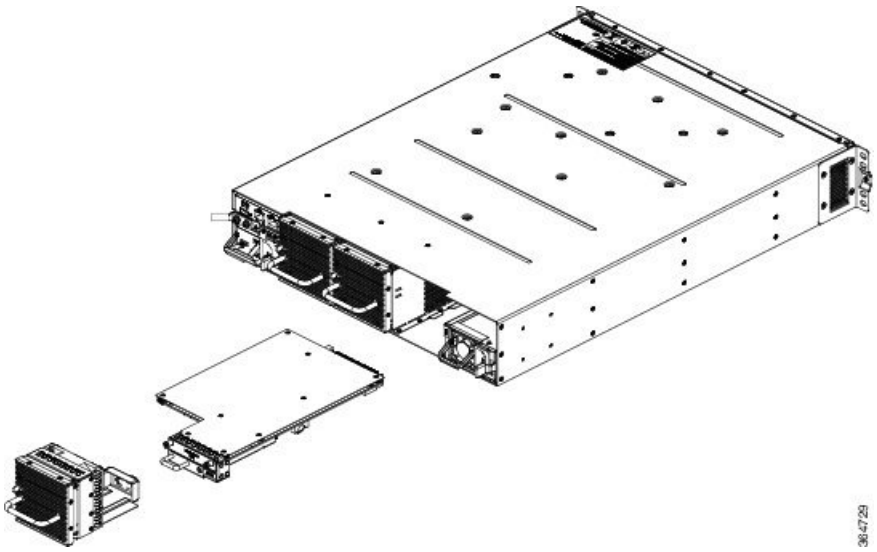
Cisco NCS 1002 can carry traffic with a non-functional control card (headless mode) for up to 72 hours. In case of card failure, the failed control card needs to be physically replaced within 10 minutes.

Procedure

Step 1 Remove control card.

a) Remove the fan on the right back side (Fan 0).
b) Loosen the captive screw to unlock the ejector lever.
c) Pull the handle to remove the control card.

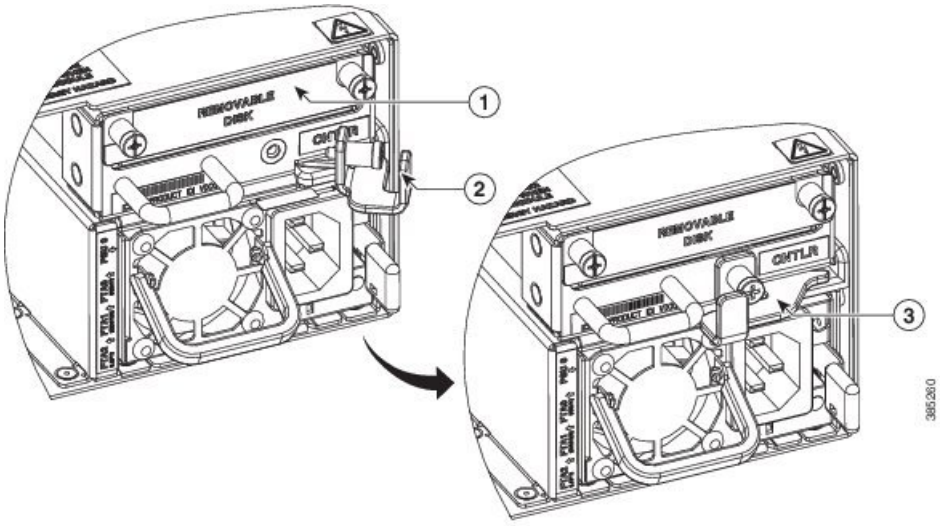
Figure 21: Remove Control Card



Step 2 Reinsert and lock control card.

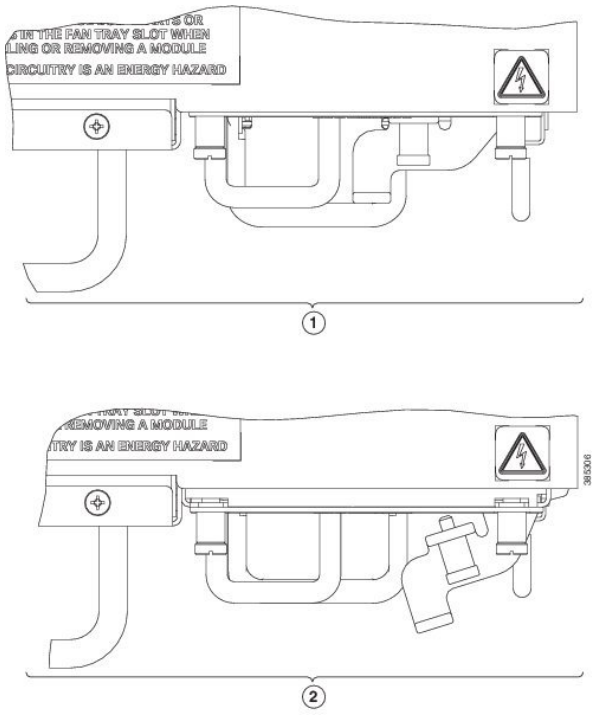
a) Insert the control card in the NCS 1002 box guides.
b) Slide the control card while keeping the ejector open until the faceplate is close to the box and the ejector is engaged.
c) Press the ejector to insert the control card partially.
d) Apply pressure on the control card faceplate to complete the insertion.
e) Ensure that the control card faceplate is aligned to the top cover edge of NCS 1002.
f) Verify that the position of the ejector is final.
g) Fix the screw to lock the ejector.

Figure 22: Insert and Lock Control Card



1	Push this surface area with additional force needed to engage control card
2	Rotate and push ejector lever to engage control card to the connector
3	Lock ejector lever to secure control card

Figure 23: Verify Control Card Insertion



1	The control card is properly seated.
2	The control card is not properly seated.

- Verify that the faceplate of the control card is aligned with the top cover of the box.
- Verify that there is no gap between the ejector and the faceplate of the control card.

Step 3 Re-insert the fan on the right back side (Fan 0).

For information on CPU OIR LEDs, refer LEDs in Cisco NCS 1002, on page 7.

Remove Fans

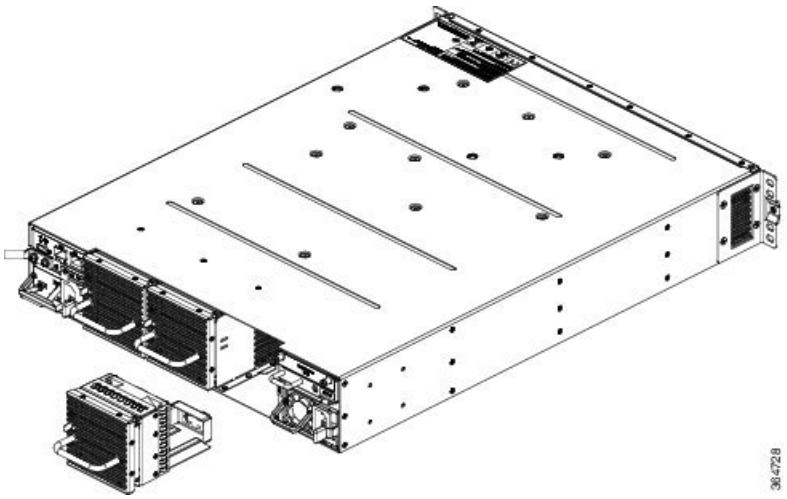
Cisco NCS 1002 has fan redundancy protection mechanism against a single fan failure. If a fan fails, NCS 1002 can work for unlimited time without any performance degrade. When the failed fan is replaced, the new fan needs to be physically placed within 10 minutes.

Procedure

Step 1 Press and pull the latch in each fan area.

Step 2 Pull the handle to remove the fan to be replaced.

Figure 24: Remove Fans



Remove and Replace SSD

If the SSD is removed, it needs to be physically replaced within 10 minutes. If NCS 1002 runs without the SSD, the SSD metallic cover must be placed to close the SSD slot.

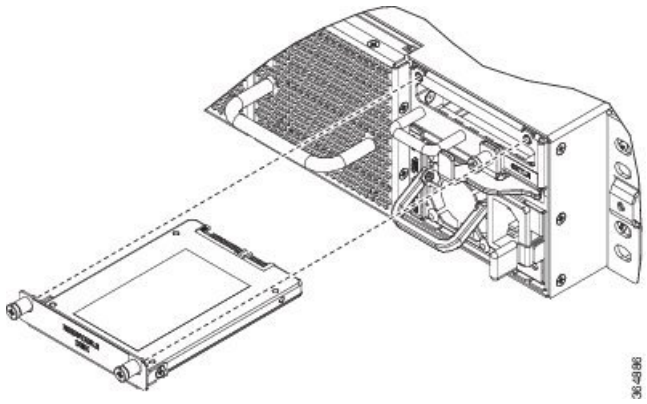
To remove a SSD:

Procedure

Step 1 Loosen the two captive screws in the Removable Disk slot on the back side.

Step 2 Slide out the SSD from the Removable Disk slot.

Figure 25: Remove SSD



To replace a SSD:

Step 3 Slide the SSD into the Removable Disk slot.

Step 4 Tighten the two captive screws to secure the SSD into place.

Replace Power Supply

Use this procedure to replace both the AC and DC power supply units.

Procedure

Step 1 Open the breaker powering the PSU under replacement.

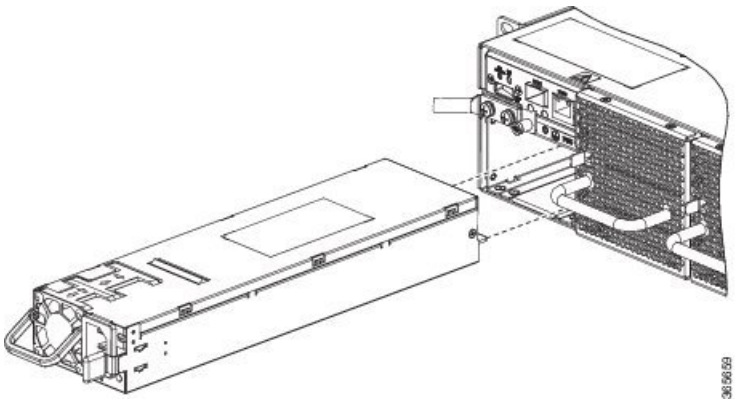
Step 2 Remove the PSU cable.

Step 3 Pull the handle acting on the PSU latch to remove the PSU.

Step 4 Insert the new PSU and connect the PSU cable. See Connect AC Power to NCS 1002, on page 17 and Connect DC Power to NCS 1002, on page 18.

Step 5 Close the breaker powering the replaced PSU.

Figure 26: Remove Power Supply



Wipe Data in Disk Using Secure Erase

When NCS 1002 becomes faulty, contact TAC to open a Return Material Authorization (RMA) request. Before opening a RMA request, the user can securely wipe data in NCS 1002 disks using the Secure Erase feature. The Secure Erase feature is supported from BIOS version v13.10.

Warning Use this procedure only during RMA.

Before you begin

The NCS 1002 unit that is planned for RMA must be taken out of the data center and the network. The user must access NCS 1002 only using the console port.

Procedure

Step 1 When NCS 1002 boots (power cycle), the following message appears.

```
Version 2.17.1245. Copyright (C) 2016 American Megatrends, Inc.
BIOS Date: 03/22/2016 11:19:42 Ver: 0ACBZ1310
Press <DEL> or <ESC> to enter setup.
```

Press DEL or ESC key to enter BIOS.

Step 2 Select the **Security** tab using the arrow keys.

The disk security details such as setting Hard Disk Drive (HDD) password and erasing HDD are displayed in the Security tab.

Step 3 Select **Set HDD Password** to set the new HDD password.

The HDD password can contain only ASCII characters and is not case sensitive. The HDD password needs to be provided after power reset and the password can be set or changed after power reset. The disk security is enabled after setting the HDD password.

Warning
When HDD password is set, the user must remember the password. If the password is lost, the data in HDD cannot be recovered.

Warning
When HDD password is set, BIOS prompts for HDD password to unlock the HDD after each power reset.

Step 4 Select **Erase HDD** using the arrow keys.

The Erase HDD screen appears.

Step 5 Enter the HDD password in the Erase HDD field.

Step 6 Select **OK** in the Erase Confirmation screen that indicates the data in the disk has been securely wiped.

The disk security settings are reverted to factory defaults after the secure erase. The configured HDD password is also wiped.