Electrostatic Discharge and Grounding Guide for Cisco NCS 2000 Series

First Published: 2017-01-31

Last Modified: 2018-05-16

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This document uses illustrations to explain the workflow that we recommend for grounding the Cisco NCS 2000 Series chassis. It also explains best practices to be followed to prevent electrostatic discharge (ESD) damage, which can occur when the equipment is improperly handled.

The following sections are included in this document:

Prerequisites

Before locating and grounding any chassis, you must complete the following prerequisites:

- Preparing Your Location, on page 2
- Preparing the Rack Room, on page 3
- Preparing Yourself, on page 4

Moving the Shelf

Perform the following steps before moving the shelf to the new site.

Note It is recommended to back up the database before moving the shelf.

- Remove the standby control card from the node.
- Switch off the power to the shelf.
- Remove the active control card from the node.
- Move the node to the desired location.
- Insert the standby control card first in the active slot to boot up the shelf.
- When the shelf is booted up and traffic is running, the Protection Unit Not Available (PROTNA) alarm is raised.
- Insert the previously active control card in the standby slot to clear the PROTNA alarm.

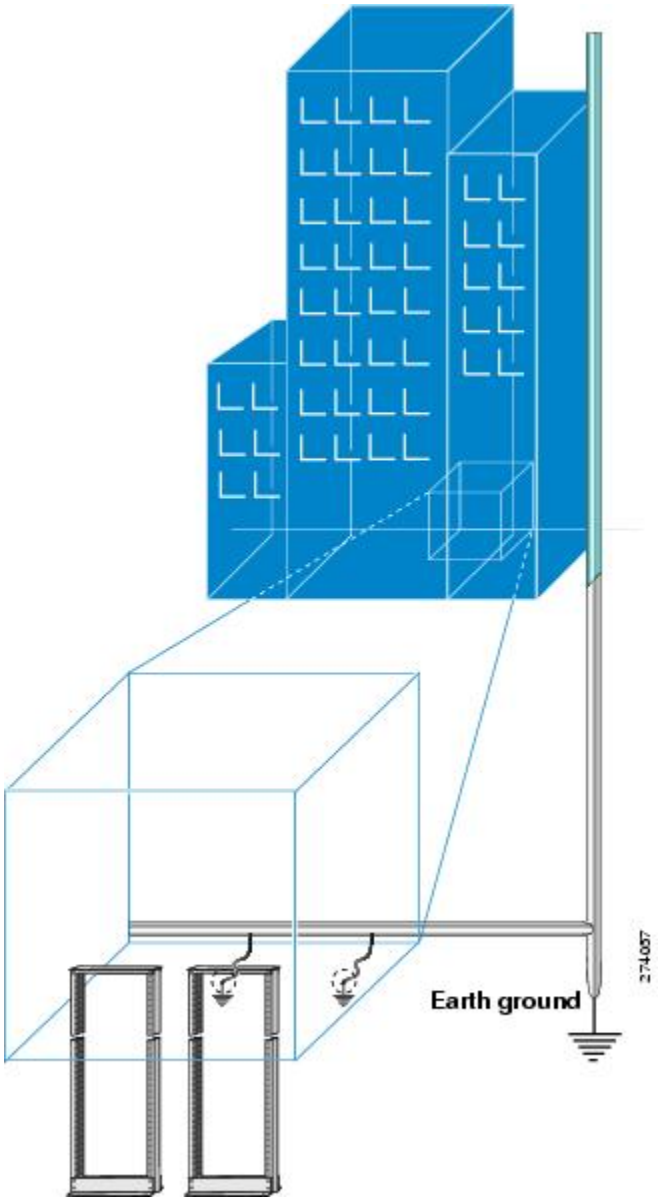
Preparing Your Location

This section illustrates how the building that houses the chassis must be properly grounded to the earth ground. (See the figure below.)

Warning **This product requires short-circuit (overcurrent) protection to be provided as part of the building installation. Install only in accordance with national and local wiring regulations.** Statement 1045.

Warning **A readily accessible two-poled disconnect device must be incorporated in the fixed wiring.** Statement 1022.

Figure 1: Building with Rack Room Connected to Earth Ground

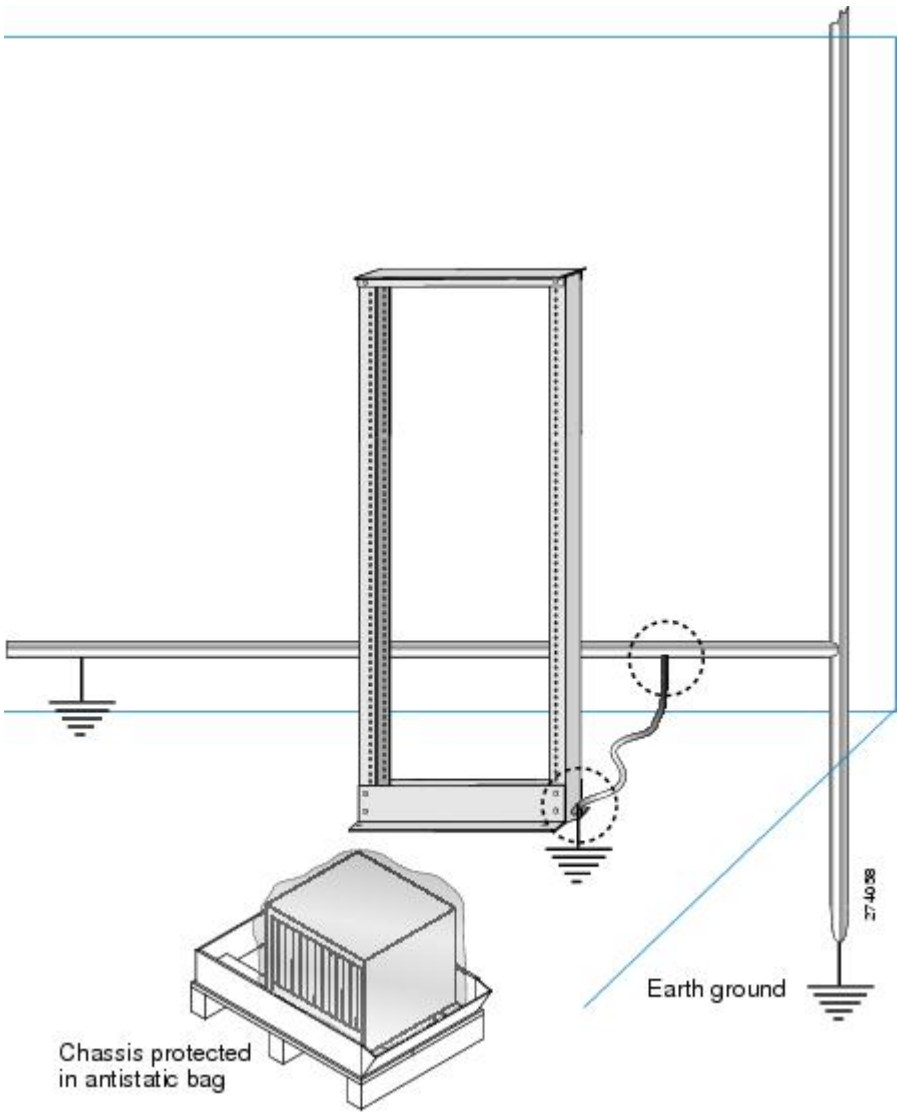


Preparing the Rack Room

This section explains how the rack enclosures must be properly connected to the building earth ground. It also illustrates how to keep the chassis in a sealed anti-static bag until you are ready to install it. (See the figure below.)

Warning **Before performing any of the following procedures, ensure that power is removed from the DC circuit.** Statement 1003.

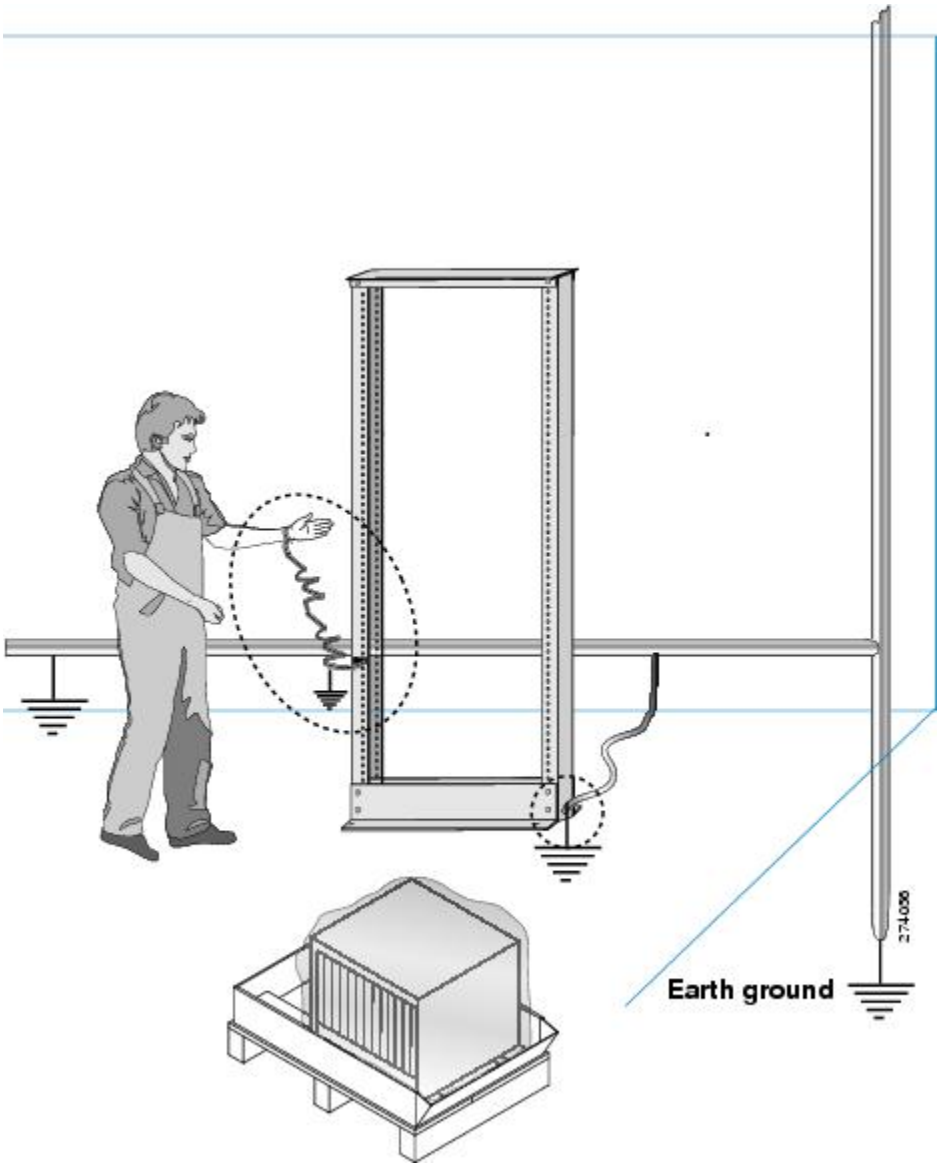
Figure 2: Rack Room Connected to Earth Ground



Preparing Yourself

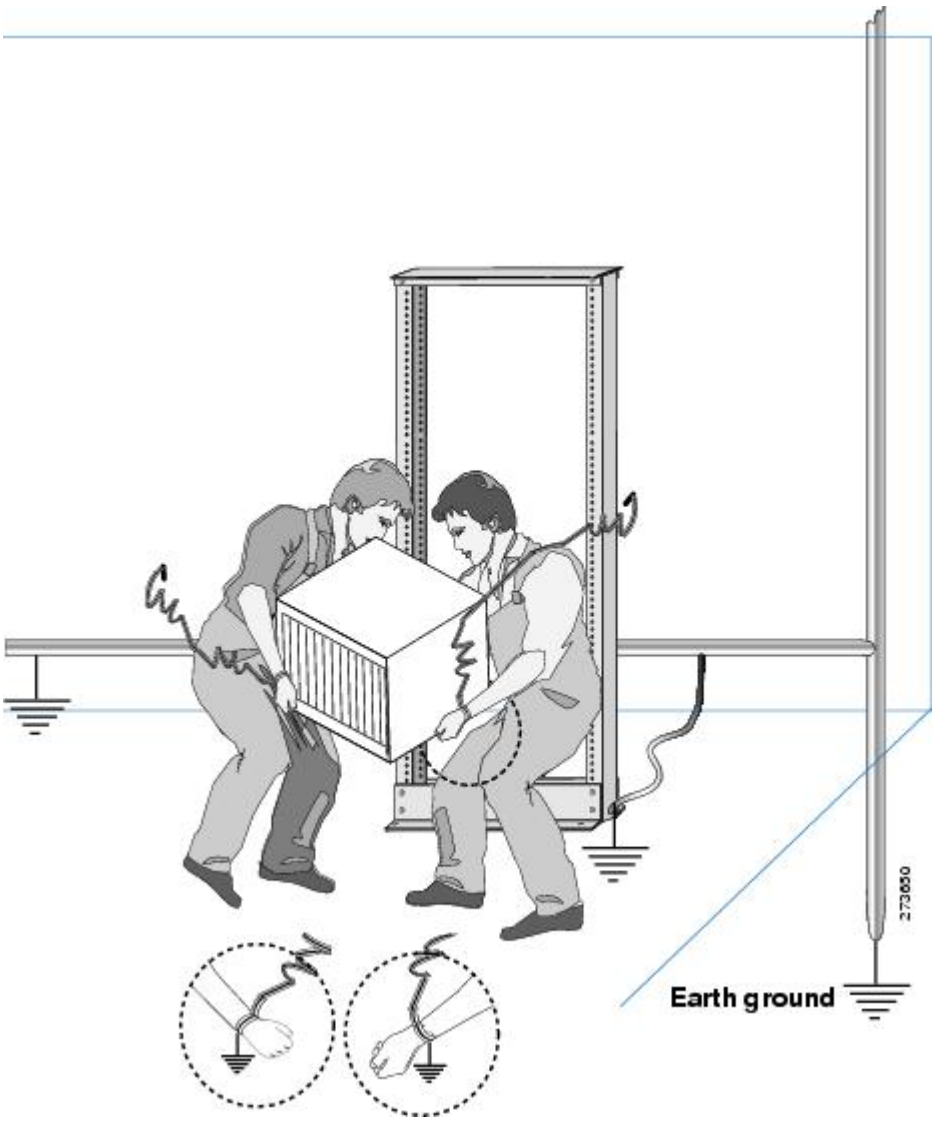
This section illustrates how to prepare yourself before removing the chassis from the sealed anti-static bag. The figure below illustrates how to cuff the ESD strap around the wrist and the ground cord that connects the cuff to the ground. ESD wrist straps are the primary means of controlling static charge on personnel.

Figure 3: Wearing the ESD Strap



The figure below illustrates how you must be properly grounded before handling the chassis.

Figure 4: Handling the Chassis



Locating and Grounding the Chassis

This section explains how to locate and ground the following Cisco NCS chassis:

- Locating and Grounding the Cisco NCS 2002 Chassis, on page 7
- Locating and Grounding the Cisco NCS 2006 Chassis, on page 10
- Locating and Grounding the Cisco NCS 2015 Chassis, on page 12

Warning **This equipment is intended to be grounded. Ensure that the host is connected to earth ground during normal use.** Statement 39.

Warning **Use copper conductors only.** Statement 1025.

Warning **When installing or replacing the unit, the ground connection must always be made first and disconnected last.** Statement 1046.

Note A #6 AWG cable or a 1 inch wide flat copper braid (with minimum total strands count of 1050 x 36 AWG or 260 x 36 AWG) is mandatory to install the Cisco NCS 2000 Series chassis.

Locating and Grounding the Cisco NCS 2002 Chassis

Before locating and grounding the Cisco NCS 2002 chassis, you must complete the prerequisites mentioned in Prerequisites, on page 1. To locate the ground point and attach a ground cable to the Cisco NCS 2002 chassis:

Procedure

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

Note Additional ground cables may be added depending on local site practice. The Cisco NCS 2002 chassis is designated only for a Common Bonding Network (CBN), according to the GR-1089-CORE Issue 4 (sec 9.3) definitions.

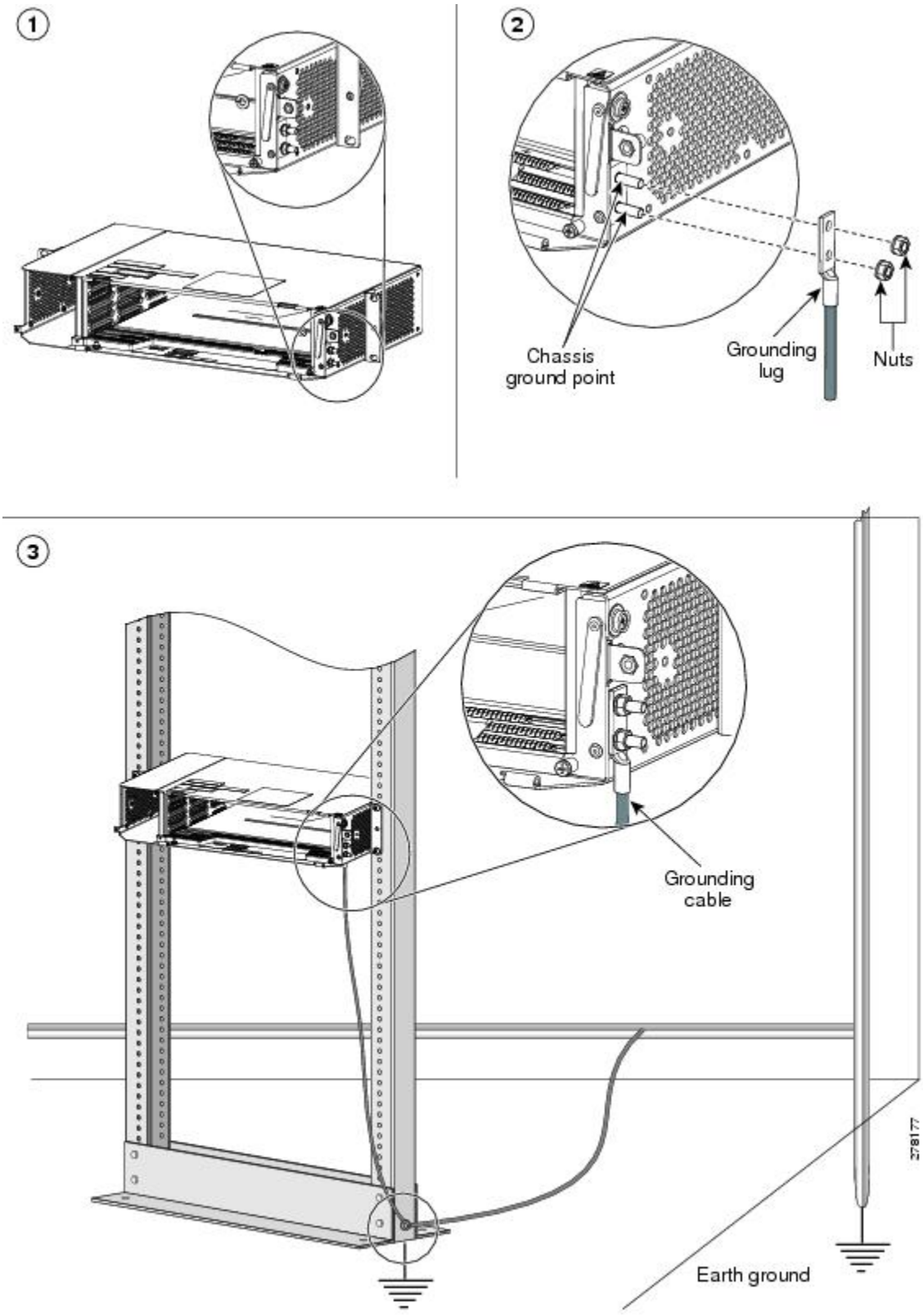
Note The DC power battery return (BR) terminal or positive terminal must be grounded at the source end (power feed or DC mains power end). The DC power BR input terminal is not connected to the equipment frame (chassis), so it is configured as DC-I according to the GR-1089-CORE, Issue 4 (sec 9.8.3) definitions.

Step 2 Remove any paint and other non-conductive coatings from the surfaces between the chassis 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 or 1 inch copper braid) to the ground point on the chassis using the specified dual-hole lug connector. (See diagrams 1 and 2 in the figure below.)

Step 4 Attach the other end of the shelf ground cable to the bay frame using a dual-hole lug connector according to the equipment bay frame specifications. (See diagram 3 in the figure below.)

Figure 5: Grounding NCS 2002 Chassis


1
2
Chassis
ground point
Grounding
lug
Nuts
3
Grounding
cable
Earth ground
27817

Stop. You have completed this procedure.

Locating and Grounding the Cisco NCS 2006 Chassis

Before locating and grounding the Cisco NCS 2006 chassis, you must complete the prerequisites mentioned in Prerequisites, on page 1. To locate the ground point and attach a ground cable to the Cisco NCS 2006 chassis:

Procedure

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

Note Additional ground cables may be added depending on local site practice. The Cisco NCS 2006 chassis is designated only for a Common Bonding Network (CBN), according to the GR-1089-CORE Issue 4 (sec 9.3) definitions.

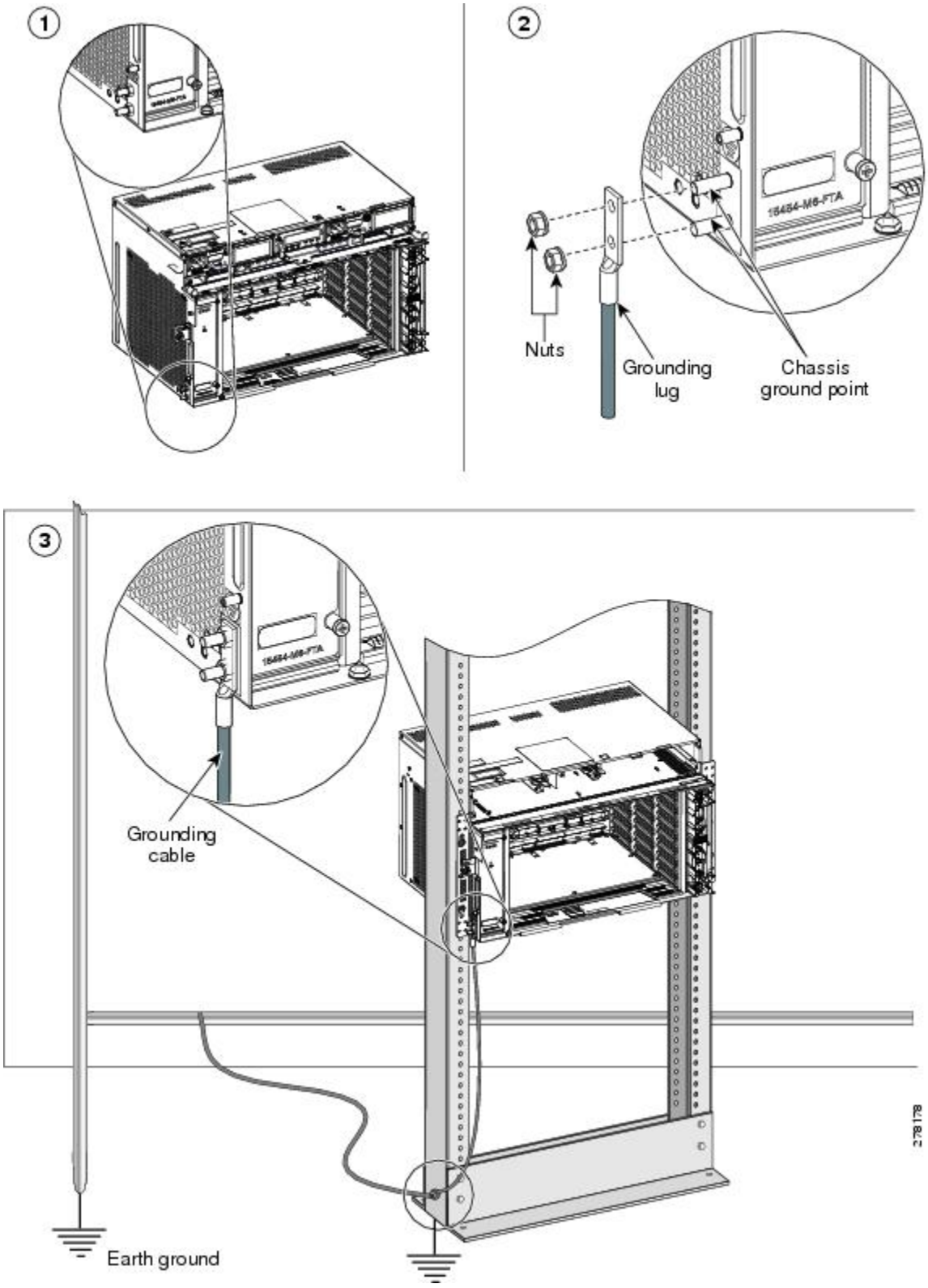
Note The DC power battery return (BR) terminal or positive terminal must be grounded at the source end (power feed or DC mains power end). The DC power BR input terminal is not connected to the equipment frame (chassis), so it is configured as DC-I according to the GR-1089-CORE, Issue 4 (sec 9.8.3) definitions.

Step 2 Remove any paint and other non-conductive coatings from the surfaces between the chassis 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 to the ground point on the chassis using the specified dual-hole lug connector. (See diagrams 1 and 2 in the figure below.)

Step 4 Attach the other end of the shelf ground cable to the bay frame using a dual-hole lug connector according to equipment bay frame specifications. (See diagram 3 in the figure below.)

Figure 6: Grounding NCS 2006 Chassis



Stop. You have completed this procedure.

Locating and Grounding the Cisco NCS 2015 Chassis

Before locating and grounding the Cisco NCS 2015 chassis, you must complete the prerequisites mentioned in Prerequisites, on page 1. To locate the ground point and attach a ground cable to the Cisco NCS 2015 chassis:

Procedure

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

Note Additional ground cables may be added depending on local site practice. The Cisco NCS 2015 chassis is designated only for a Common Bonding Network (CBN), according to the GR-1089-CORE Issue 4 (sec 9.3) definitions.

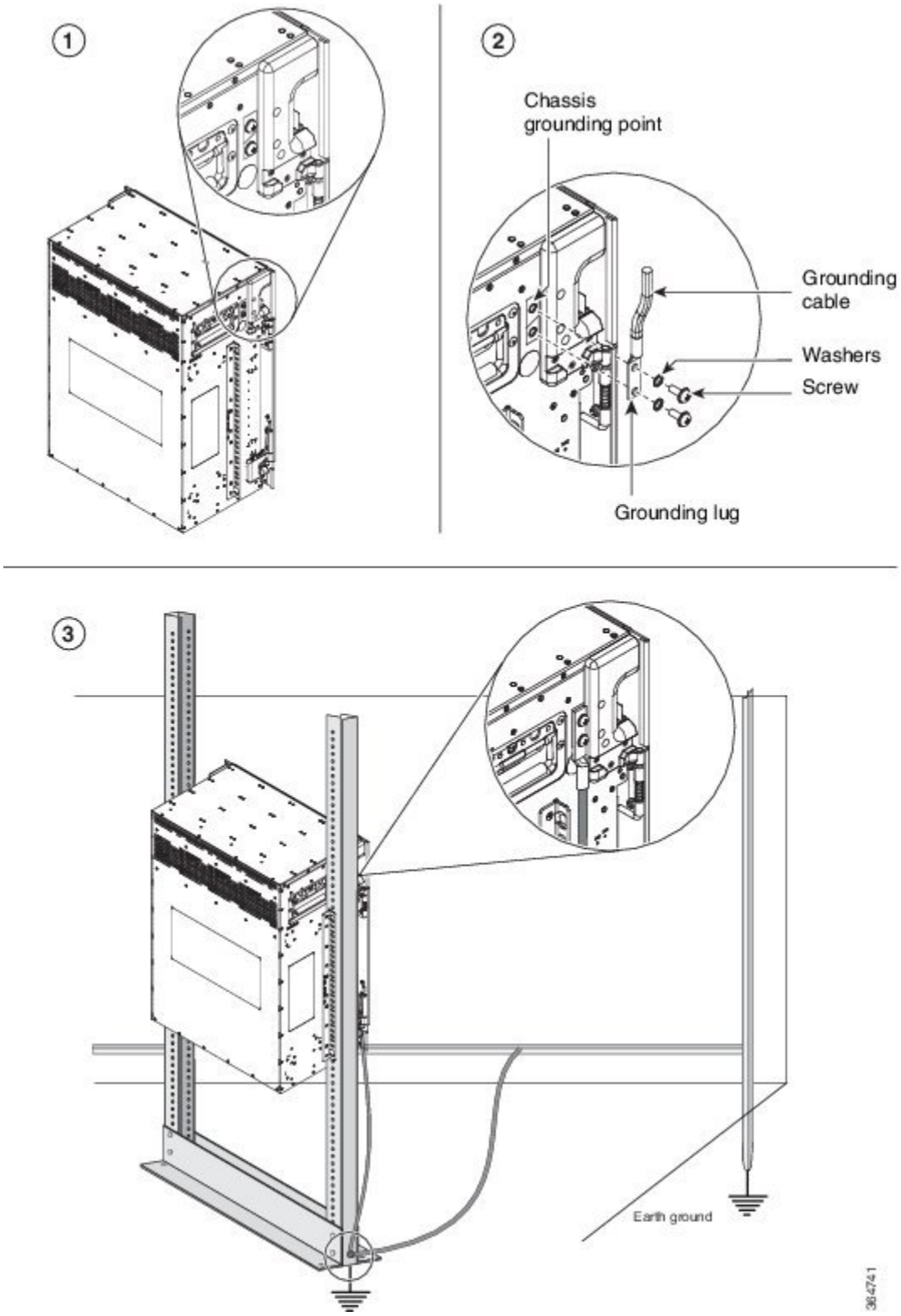
Note The DC power battery return (BR) terminal or positive terminal must be grounded at the source end (power feed or DC mains power end). The DC power BR input terminal is not connected to the equipment frame (chassis), so it is configured as DC-I according to the GR-1089-CORE, Issue 4 (sec 9.8.3) definitions.

Step 2 Remove any paint and other non-conductive coatings from the surfaces between the chassis 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 to the ground point on the chassis using the specified dual-hole lug connector. (See diagrams 1 and 2 in the figure below.)

Step 4 Attach the other end of the shelf ground cable to the bay frame using a dual-hole lug connector according to equipment bay frame specifications. (See diagram 3 in the figure below.)

Figure 7: Grounding NCS 2015 Chassis



Stop. You have completed this procedure.

Installing the Line Cards

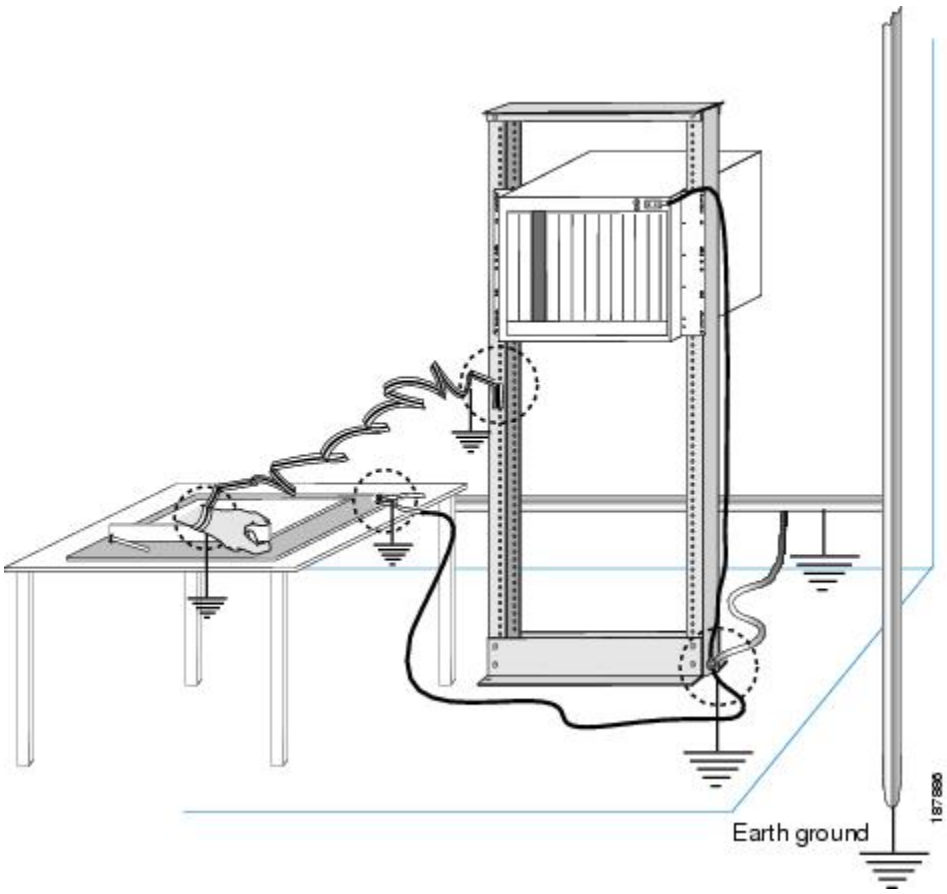
This section describes how to properly install the line cards. The following topics are included in this section:

Preparing the Work Surface for Installing Line Cards

This section illustrates how you and the work surface that you are placing the line card on must be properly grounded. As shown in the figure below, ensure that you follow these steps:

- Ground yourself by wearing an ESD wrist band that is connected to the earth ground.
- Ground the table to the earth ground.
- Ground the chassis to the earth ground.
- Ground the rack to the earth ground.

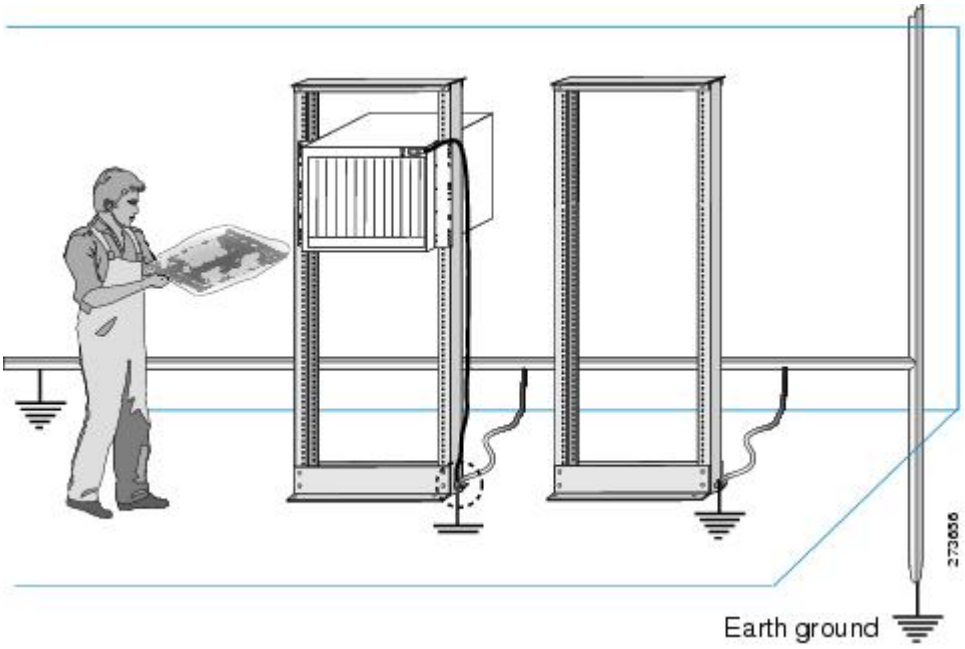
Figure 8: Work Surface for Installing the Line Cards



Transporting Line Cards

This section illustrates how the line card must be kept in a sealed antistatic bag while being transported. (see the figure below)

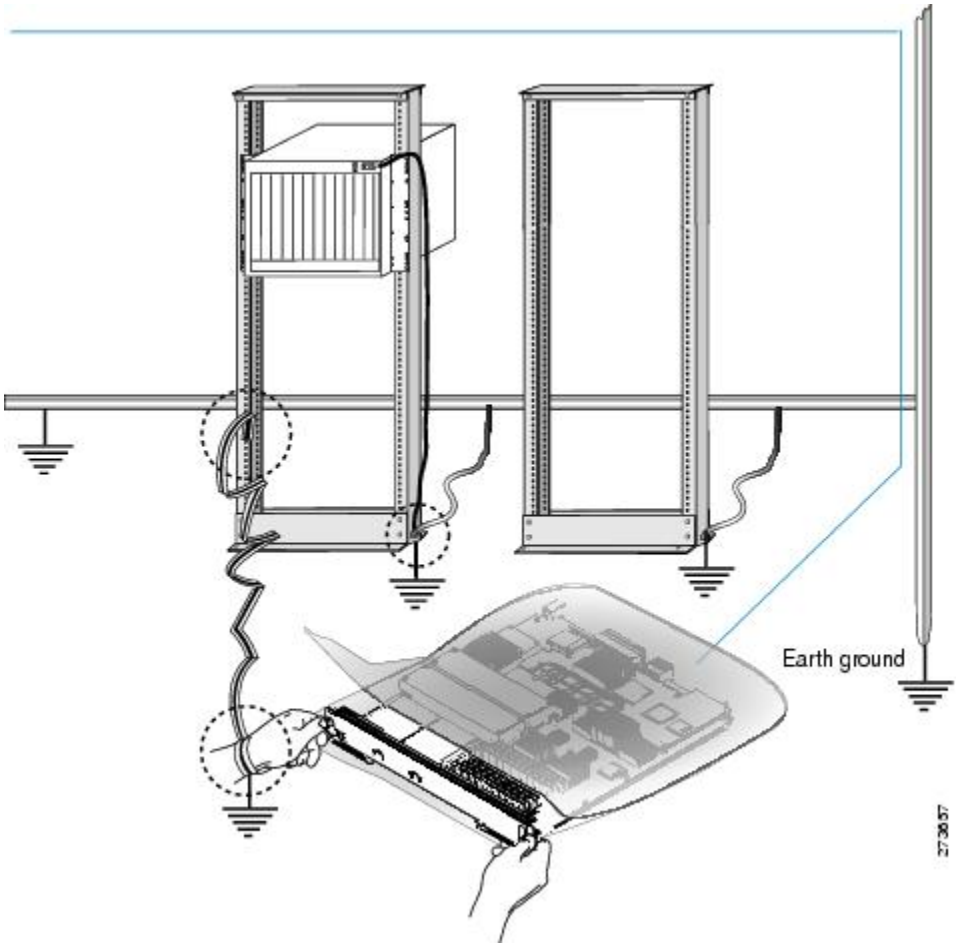
Figure 9: Transporting Line Cards



Handling Line Cards

This section illustrates how you must be properly grounded before removing the line card from the antistatic bag. It also illustrates how you must handle the line card by the front panel and the metal carrier only. (see the figure below)

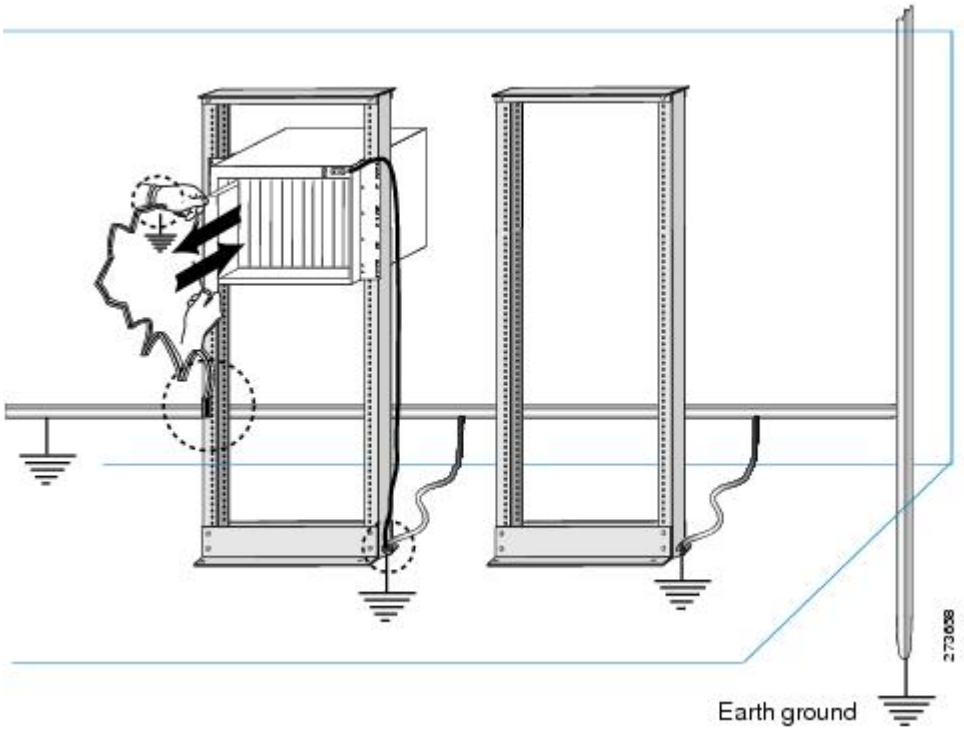
Figure 10: Handling Line Cards



Removing and Installing Line Cards

This section illustrates the precautions to be taken while removing and installing the line cards. (see the figure below)

Figure 11: Removing and Installing Line Cards



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