Maintaining the Cisco ISE 3300 Series Appliance

All Cisco Identity Services Engine (ISE) 3300 Series appliances are configured to order and are ready for installation when they leave the factory. After you install and configure an appliance in your own network environment, you may need to perform some specific maintenance procedures or operations to ensure that the appliance is operating properly and is integrated into your network. These types of preventive procedures maintain your appliance in good operating condition and minimize the need for costly, time-consuming service procedures.

⚠ **Caution** To help prevent problems, before performing any procedures in this appendix, review all Related Documentation, page -xiii, and Safety Guidelines, page A-1.

The following sections discuss various environmental factors that can adversely affect the performance and longevity of your appliance.

Maintaining Your Site Environment and Appliance

Good preventive maintenance includes regular visual inspections of the appliance, including exterior cleaning and inspection. This appendix provides the following topics that describe some best practices for maintaining your site and appliance:

General Exterior Cleaning and Inspection

This section describes cleaning requirements for the exterior surfaces of your appliance. In addition, it also provides guidelines for inspecting cables and adapter cards.

⚠️
Caution   Never spray cleaning solution on the surfaces of the appliance. Over-spray can penetrate the appliance, and this can increase the potential for electrical problems or corrosion of internal components.

Appliance

Use a lint-free, nonabrasive cloth to perform cleaning. Do *not* use a solvent, abrasive cleaning agents, or tissue paper. If the appliance is dirty (for example, with thick dust), use a soft, damp cloth and gently wipe the surface of the appliance. Make sure you immediately wipe any water or other liquid off the appliance.

Dust and Particles

A clean operating environment can greatly reduce the negative effects of dust and other particles, which act as insulators and can interfere with the operation of an appliance's mechanical components. Besides performing regular and periodic cleaning, you should follow these guidelines to avoid contamination of the appliance:

- Do not permit smoking anywhere near the appliance.
- Do not permit food or drink near the appliance.

Cables and Connectors

Periodically inspect all your cables and connectors that run to and from your appliance. This practice ensures that the cable and connectors are properly connected, provides a visual check for wear and condition, and detects any loose connections before they become a problem.

Adapter Cards

Check the connections on the adapter cards. Ensure that they are firmly secured to the appliance and have not been jarred loose or mechanically damaged.

Corrosion

Skin oil from fingers and hands, or prolonged exposure to high temperature or humidity, can corrode the gold-plated edge connectors and pin connectors on adapter cards. Because corrosion on adapter card connectors is a gradual process, this can eventually lead to intermittent failure of electrical circuits.

To prevent corrosion, avoid touching contacts on adapter cards. Protecting the appliance from corrosive elements is especially important in damp, moist, and salty environments, all of which tend to promote corrosion. Also, as a further deterrent to corrosion, the appliance should not be used in extreme temperatures. For details, see Temperature, page D-3.

Cooling

Exhaust fans in the power supply and in the appliance itself cool the power supply and the appliance by drawing air in through various intake openings in the front of the appliance and blowing it out the back through exhaust vents.

However, these fans also draw dust and other particles into the appliance, which causes contaminant buildup, that can directly cause an increase in the internal temperature of the appliance. Increased temperatures and contaminants interfere with the proper operation of various appliance components.

To avoid these conditions, we recommend keeping your work environment as clean as possible to reduce the amount of dust and dirt around the appliance. This best practice reduces the amount of contaminants that can be drawn into your appliance by the fans.

Temperature

Temperature extremes can cause a variety of problems, including premature aging and failure of integrated circuits or mechanical failure of devices.

Extreme temperature fluctuations can cause integrated circuits to become loose in their sockets and can cause expansion and contraction of disk drive platters, which can directly result in read or write data errors. The heat emission of a Cisco ISE appliance is in the range of 341 to 1024 BTUs (100 to 300 W).

To minimize the negative effects of temperature on appliance performance, observe the following guidelines:

- Table D-1 lists the air temperature that you must maintain according to the altitude where your Cisco ISE appliance is located.

Table D-1   Air Temperature Maintenance

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Appliance State	Altitude	Air Temperature
On	3000 ft (0 to 914.4 m)	50.0° to 95.0°F (10° to 35°C)
On	3000 ft to 7000 ft (914.4 m to 2133.6 m)	50.0° to 89.6°F (10° to 32°C)
Off	Maximum altitude: 7000 ft (2133.6 m)	50.0° to 109.4°F (10° to 43°C)
Shipping	Maximum altitude: 7000 ft (2133.6 m)	-40° to 140°F (-40° to 60°C)

- Ensure that the appliance has adequate ventilation. Do not place it within a closed-in wall unit or on top of cloth, which can act as insulation. Do not place the appliance where it receives direct sunlight, particularly in the afternoon. Do not place the appliance next to any heat source of any kind, including heating vents during winter.

Adequate ventilation is particularly important at higher altitudes. Your appliance performance may not be optimum when it is operating at high temperatures as well as high altitudes. Observe the following guidelines:

- Ensure that all slots and openings on the appliance remain unobstructed, especially the fan vents on the rear panel of the appliance.

- Clean the appliance at regular intervals to avoid any buildup of dust, dirt, or debris, which can all contribute to causing the appliance to overheat.

- If the appliance has been exposed to abnormally cold temperatures, allow a two-hour warm-up period for it to come back up to a normal operating temperature range before powering it on. Failure to follow this practice can damage internal components, particularly the hard disk drive.

Humidity

High-humidity conditions can cause moisture migration and penetration into the appliance. This moisture can cause corrosion of internal components and degradation of properties such as electrical resistance, thermal conductivity, physical strength, and size. Extreme moisture buildup inside the appliance can result in electrical shorts, which can cause serious damage to the appliance.

Each appliance is rated to operate at 8 to 80 percent relative humidity, with a humidity gradation of 10 percent per hour. Buildings in which climate is controlled by air conditioning in the warmer months and by heat during the colder months usually maintain an acceptable level of humidity for appliances.

However, if an appliance is located in an unusually humid location, a dehumidifier can be used to maintain the humidity within an acceptable range.

Altitude

Operating an appliance at higher altitudes (with lower atmospheric pressure) reduces the efficiency of forced and convection cooling which can result in electrical problems related to arcing and coronal effects. This condition can also cause sealed components with internal pressure, such as electrolytic capacitors, to fail or perform at reduced efficiency.

ESD

ESD results from the buildup of static electricity on the human body and certain other objects. This static electricity is often produced by simple movements, such as walking across a carpet.

ESD is a discharge of a static electrical charge that occurs when a person whose body contains such a charge touches a component in the appliance. This static discharge can cause components, especially integrated circuits (ICs), to fail. ESD is a problem particularly in dry environments where the relative humidity is below 50 percent. To reduce the effects of ESD, you should observe the following guidelines:

- Wear a grounding wrist strap. If a grounding wrist strap is unavailable, touch an unpainted metal surface on the appliance chassis periodically to neutralize any static charge.

- Keep components in their antistatic packaging until they are installed.

- Avoid wearing clothing made of wool or synthetic materials.

EMI and RFI

EMI and RFI from an appliance can adversely affect devices such as radio and television receivers operating near the appliance. Radio frequencies emanating from an appliance can also interfere with cordless and low-power telephones.

RFI is defined as any EMI with a frequency above 10 kHz. This type of interference can travel from the appliance to other devices through the power cable and power source, or through the air, like transmitted radio waves. The Federal Communications Commission (FCC) publishes specific regulations to limit the amount of EMI and RFI emitted by computing equipment. Each appliance meets these FCC regulations.

To reduce the possibility of EMI and RFI, observe the following guidelines:

- Operate the appliance only with the appliance cover installed.
- Ensure that the screws on all peripheral cable connectors are securely fastened to their corresponding connectors on the rear of the appliance.
- Always use shielded cables with metal connector shells for attaching peripherals to the appliance.

Magnetism

Hard disk drives are susceptible to the effects of magnetism as they store data magnetically. Hard disk drives should never be stored near the following types of magnetic sources:

- Monitors
- Printers
- Telephones (with electrically driven bells)
- Fluorescent lights

Power Source Interruptions

Appliances are especially sensitive to variations in the voltage supplied by AC power sources. Problems with overvoltage, undervoltage, or transient voltages (spikes) can erase data from the memory or even cause some components to fail. To protect against these types of problems, power cables should always be properly grounded and one, or both, of the following methods should be used:

- Place the appliance on a dedicated power circuit (rather than sharing a circuit with other electrical equipment).
- For best practices, do **not** allow the appliance to share a circuit with any of the following devices:
  - Photo-copier machines
  - Teletype machines
  - Laser printers
  - Fax machines
  - Any other motorized equipment

In addition to the equipment just noted, the greatest threat to an appliance's power supply are the surges or blackouts caused by electrical storms.

If a blackout occurs—even a temporary one—while the appliance is turned on, turn off the appliance immediately and disconnect it from the electrical outlet. Leaving the appliance on may cause problems when the power is restored.

Maintaining Your Cisco ISE 3300 Series Appliance

This section provides information about the following appliance-related topics:

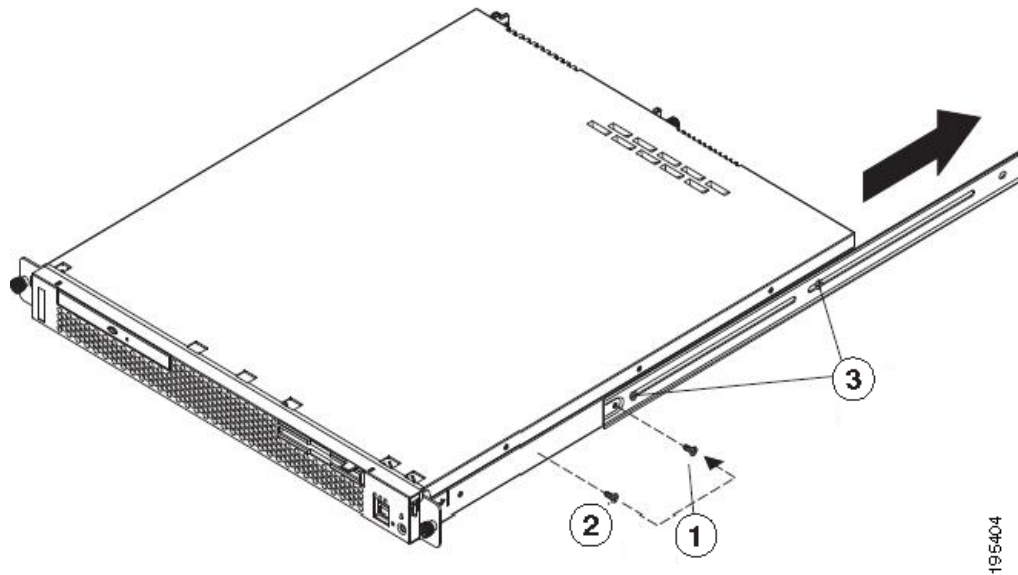- Preparing to Transport the Rack Cabinet, page D-6

Preparing to Transport the Rack Cabinet

Ensure that you complete all necessary pre-transport tasks before you attempt to transport the Cisco ISE 3300 Series appliance to another location after the appliance has been installed.

To prepare the Cisco ISE 3300 Series appliance for transport, complete the following steps:

Step 1   Remove the large screw (see Figure D-1) and discard it.

Step 2   Remove and save the front screw.

Step 3   Loosen the other two rear screws.

Step 4   Fully extend the rail and insert the screw you saved into the position where the large screw had been located.

Step 5   Tighten all screws to secure the rail.

Step 6   Repeat the steps from 1 to 5 for the other rail.

Figure D-1   *Preparing to Transport the Rack Cabinet*

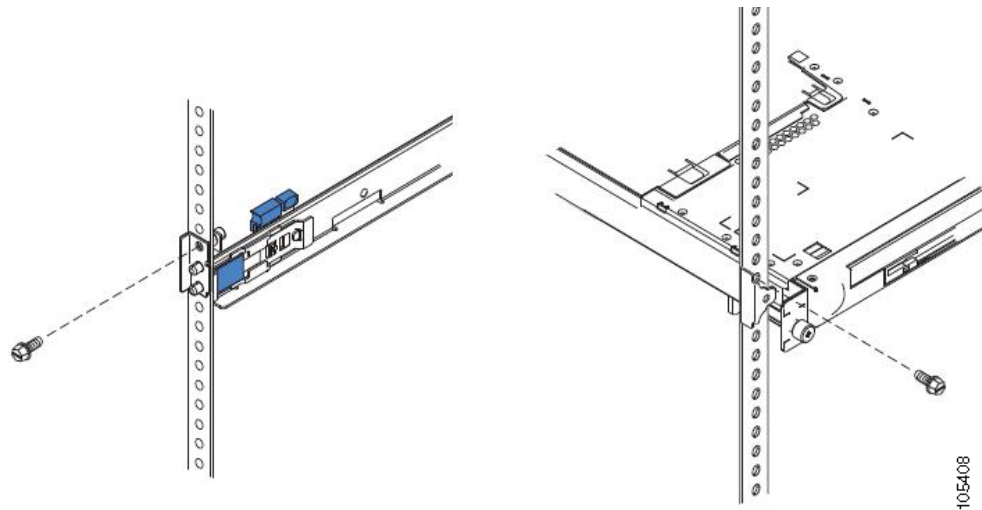

The following table describes the callouts in Figure D-1.

1	Large screw	3	Rear screws (2)
2	Front screw		

Step 7   Secure the server to the rack:

   a.   If necessary, disconnect the cables from the rear of the server.

   b.   Slide the server out of the rack 150 mm (6 inches) and insert the M6 screws in each slide rail.

   c.   Secure the server to the rack cabinet with the M6 screws (see Figure D-2).

Step 8   Ensure that the rails are fully extended to the rear of the rack cabinet.

If you have removed the shipping brackets on the slide rails, you must reinstall them before you transport the rack cabinet with the server installed. Reverse the instructions on the shipping bracket to reinstall it, as shown in Figure B-6.

Figure D-2   Preparing to Move the Rack Cabinet to Another Location

Removing or Replacing the Cisco ISE 3300 Series Appliance

⚠ **Warning**   **Before working on a system that has an On/Off switch, turn the AC power off and unplug the power cord.** Statement 1

⚠ **Warning**   **Ultimate disposal of this product should be handled according to all national laws and regulations.** Statement 1040

This section contains information about the following topics:

   • Removing a Cisco ISE 3300 Series Appliance, page D-8

   • Replacing a Cisco ISE 3300 Series Appliance, page D-8

Removing a Cisco ISE 3300 Series Appliance

To remove a Cisco ISE 3300 Series appliance from your network, complete the following steps:

Step 1   Turn off the appliance to be removed.

Step 2   Disconnect the power cords and network cables.

Step 3   Physically remove the appliance from the rack.

Because a Cisco ISE 3300 Series appliance is typically in constant communication on your network, when the network notices that the appliance is no longer responding to it, the network stops sending any requests to the appliance. This change will be visible to users.

✎ **Note**   If other appliances are attached to the network, the network continues sending requests to the other appliances.

Replacing a Cisco ISE 3300 Series Appliance

To replace an appliance, complete the following steps:

Step 1   Ensure that the appliance being replaced has been removed from the network.

Step 2   Install a new appliance by using the same installation procedures that you used for the appliance that was removed.

Step 3   Configure the new appliance by using the same configuration parameters that you used for the appliance you removed.