



Maintenance

This section provides maintenance procedures for the physical components of the SES. It includes:

- [Removing and Replacing the Fan Tray Assembly, page 4-1](#)
- [Removing and Replacing an AC Power Supply Module, page 4-3](#)
- [Removing and Replacing a DC Power Entry Module, page 4-5](#)
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This section does not include detailed troubleshooting information for the SES as PNNI controller application.

Removing and Replacing the Fan Tray Assembly

The fan tray Assembly, shown in [Figure 4-1](#), can be removed and replaced when an SES is running if it is done very quickly. When the SES is running, remove and replace the fan tray assembly in less than two minutes. Individual fans in the fan tray assembly are not field replaceable.

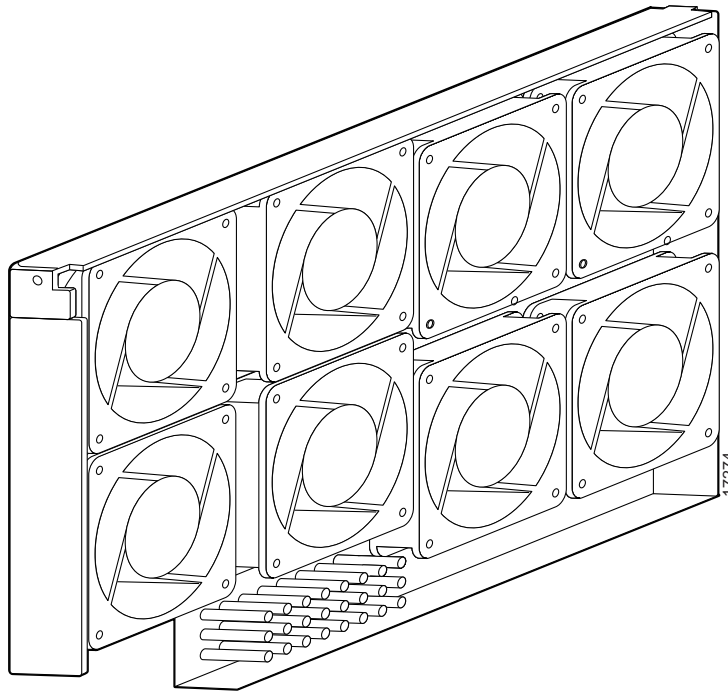
The fan tray assembly is vertically installed on the left-side of the front of the SES chassis. It is held in place by one captive screw on its bottom; there is also an ejector lever on the bottom of the fan tray assembly that can be used to unseat it from the backplane.



Caution

Because of its shape, the fan tray assembly has a tendency to drop suddenly against the chassis as it is being removed. Firmly hold the fan tray assembly with two hands until it is completely removed from the chassis. A small standoff on the upper left side of the fan tray slot exists in the SES card cage on which the fan tray assembly rides as it is removed and installed in the chassis. Ensure to hold the fan tray assembly firmly until it is completely removed from the chassis.

Figure 4-1 Fan Tray Assembly



Once a fan tray assembly is determined to be faulty, complete the following steps to remove and replace it.

**Note**

Make sure that the replacement fan tray assembly and tools are available.

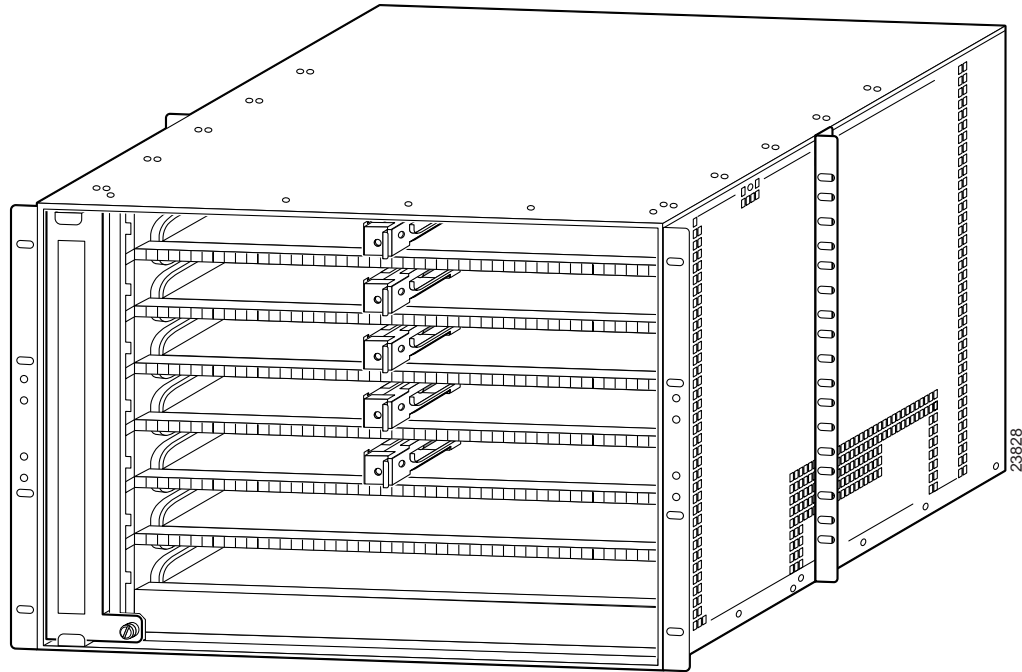
- Step 1** Open the SES door, if applicable, and locate the fan tray assembly, shown in the left-side of the SES chassis as seen from the front. See [Figure 4-2](#).
- Step 2** Loosen the captive screw holding the fan tray assembly to the SES chassis.
- Step 3** Use the ejection lever added to the bottom of the fan and chassis to unseat the fan tray assembly from the backplane.

You can use the combination tool used to open the door that is provided with the SES or a regular screwdriver for leverage on the injector. Slip it through the opening in the ejector lever and pull the lever out away from the SES.

- Step 4** Pull the fan tray assembly out carefully, holding it firmly with two hands so it does not drop suddenly against the SES chassis as it is removed.

There is a small standoff on the upper-left side of the chassis which the fan tray assembly rides on that helps support it as it is being removed. But, still be careful.

Figure 4-2 Fan Tray Assembly in SES Chassis



To replace the fan tray assembly, complete the following steps.

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- Step 1** Slide the replacement fan into the SES chassis; make sure to get the upper left edge of the fan tray assembly over the small standoff on the upper left wall of the card cage in the fan slot.
 - Step 2** Carefully press it until the plug on the rear of the fan tray assembly mates with the connector on the backplane of the SES.
 - Step 3** Tighten the captive screw securing the fan to the SES chassis.
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Removing and Replacing an AC Power Supply Module

There can be up to two 1200 Watt AC power supply modules installed in the AC power supply tray. The optional AC power supply tray is factory installed. Each AC power supply module has its own Enable (On/Off) switch, connectors, and status LEDs. The AC power supply modules are independent of one another, and one can be replaced while the other powers the SES.

Figure 4-3 illustrates a rear view of an AC power supply module. Figure 4-4 illustrates the rear panel of an SES with two AC power supply modules installed. There is a captive nut on the flange on the top of the rear panel of each AC power supply module used to secure the AC power supply modules to the AC power supply tray and the SES chassis, once they are installed.

Figure 4-3 AC Power Supply Module, Rear View

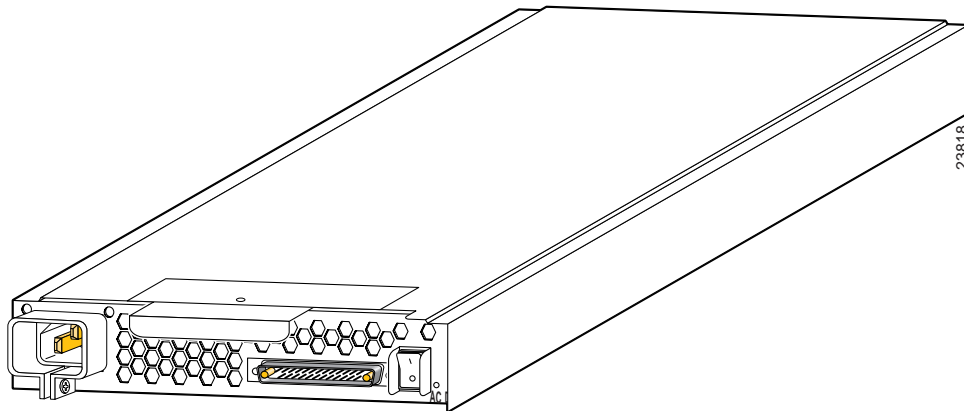
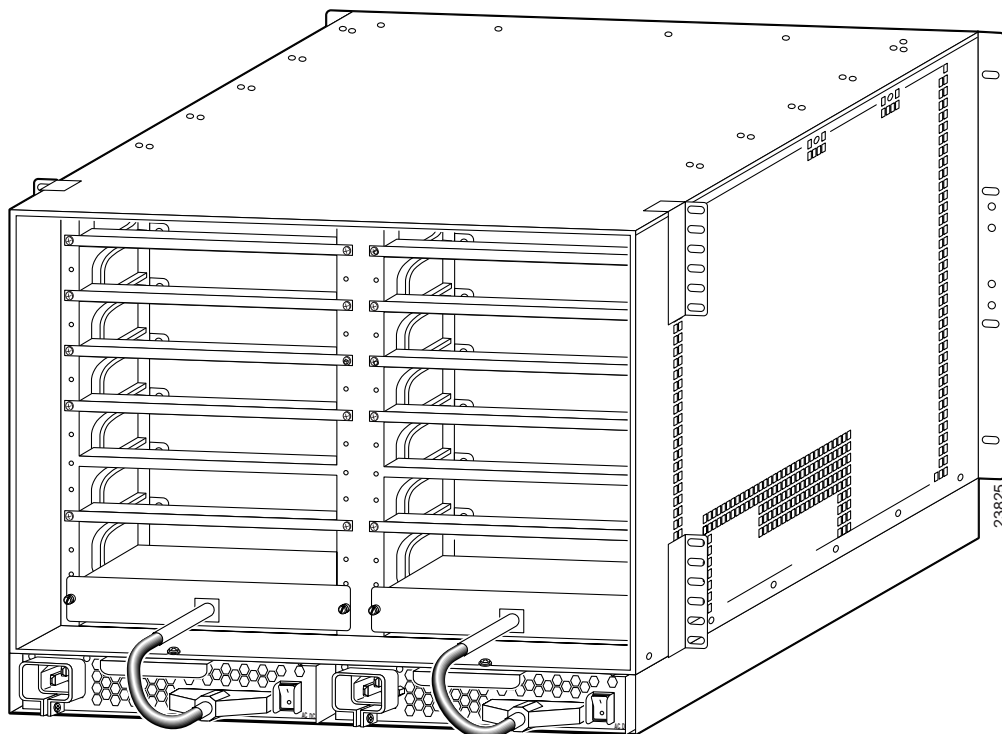


Figure 4-4 SES with Two AC Power Modules Installed



After determining that an AC power supply is faulty -- the front panel AC LED is on, but the DC LED is off -- follow these steps to remove and replace it:

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- Step 1 Turn off the Enable (On/Off) switch on the appropriate AC power supply module.
 - Step 2 Turn off power at the AC source for the appropriate AC power supply module.

- Step 3** At the rear of the SES, disconnect the AC power cord from the AC input of the appropriate AC power supply module.
- Step 4** Disconnect DC power cable -- the special cable from the AC power supply module with the fixture that fits in the DC PEM slot and connects to the SES backplane -- from the appropriate AC power supply module.



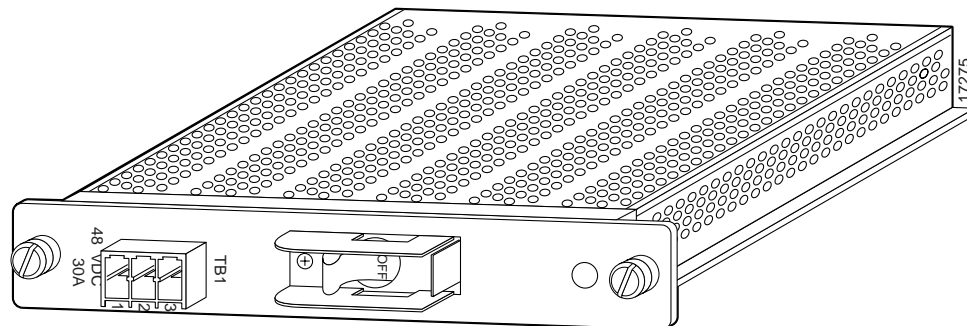
Caution If there are two AC power supply modules installed in the system, some of the pins on the DC power cable connector just removed from the AC power supply module have live DC voltage on them. Be careful to keep this connector from coming in contact with conducting parts of the SES chassis or rack.

- Step 5** Loosen the set screw at the top of the AC power supply module that secures it to the AC power supply tray.
- Step 6** Pull AC power supply module out.
- Step 7** Insert the new AC power supply module.
- Step 8** Tighten the set screw at the top of the AC power supply module.
- Step 9** Reattach the DC power cable.
- Step 10** Reattach the AC power input cable.
- Step 11** Turn the AC source power on.
- Step 12** Turn the Enable switch on the AC power module to On.
- Step 13** From the front of the SES, verify that both LEDs (AC and DC) on the replacement AC power supply module are lit.

Removing and Replacing a DC Power Entry Module

There can be two DC PEMs located on the rear panel of an SES. After determining that a DC PEM, shown in [Figure 4-5](#), needs to be removed and replaced, complete the following steps.

Figure 4-5 DC Power Entry Module



- Step 1** Turn off the DC source power.

- Step 2 Turn off the switch on the DC PEM.
- Step 3 Unplug the pluggable terminal block at TB1.
- Step 4 Loosen the captive screws holding the DC PEM to the SES.
- Step 5 Slide the DC PEM out of the SES.

To replace a DC PEM, follow these steps:

- Step 1 Slide the DC PEM into its slot on the back of the SES.
 - Step 2 Secure the DC PEM to the SES with the two captive screws.
 - Step 3 Plug the pluggable terminal block back in at TB1.
 - Step 4 Turn on the DC PEM switch.
 - Step 5 Turn on the power at the DC source.
 - Step 6 Verify that the DC MON status (environmental alarm) is in the range of 42–56 VDC.
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Backplane Fuses

The SES has fuses in the backplane to protect individual card slots. Backplane fuses on the SES rarely, if ever, need replacement. These fuses, which are shown in [Figure 4-6](#), are accessed from the rear of the card cage. They require a special tool for removal and replacement and should only be changed by certified field personnel.

Backplane fuses are intended to prevent catastrophic damage to the backplane in the event of accidental shorting of –48 VDC on the backplane to chassis ground. This type of event could be caused by bent backplane pins, contact of conductive elements (EMI Cans, EMI Gaskets, and so on) to power pins. These events would most likely happen during a factory build.

Because of design constraints, these fuses need to be in sockets on the backplane and are therefore not readily accessible. Cisco recommends that only factory-trained personnel do the procedure.

If a bad card slot is verified, call Cisco TAC. If a card with an open fuse is verified, return it to Cisco.



Warning

Replacing a fuse requires only Cisco personnel using a special tool with the power off.

Figure 4-6 Backplane Fuses

