C H A P T E R **4**

Installing Hardware Options for the WAVE-594 and WAVE-694

This chapter provides basic instructions for installing hardware options in your WAVE-594 and WAVE-694. These instructions are intended for technicians who are experienced with setting up Cisco WAVE-594 and WAVE-694 hardware.

This chapter contains the following sections:

- Installing a Cisco WAVE Interface Module
- Replacing a Hard Disk Drive/Solid State Drive
- Replacing a Fan
- Replacing a Power Supply
- Installing Memory

Installing a Cisco WAVE Interface Module

In addition to the two onboard Gigabit Ethernet ports, the WAVE-594 and WAVE-694 can accommodate one optional Interface Module network module:

- 4-port Gigabit Ethernet Copper Bypass Interface Module
- 8-port Gigabit Ethernet Copper Bypass Interface Module
- 4-port Gigabit Ethernet Fiber Optic Bypass Interface Module
- 2-port 10 Gigabit Ethernet Fiber Optic SPF+ Interface Module

For information on the features of the Cisco WAVE Interface Modules and cabling requirements, see Chapter 5, "WAVE Interface Modules."

Note   Interface Modules are not hot-swappable therefore it is necessary to power the system down before installing or replacing.

Caution   To maintain proper system cooling, do not operate the appliance for more than 1 minute without either an Interface Module or a filler panel installed in the bay.

To install a Cisco Interface Module in the Interface Module slot, follow these steps:

Step 1   Review the information in the Safety Warnings and Cautions and Safety Guidelines sections in Chapter 2, "Preparing to Install the WAVE-594 and WAVE-694."

**Step 2**   Power down the appliance.

> **Note**   You must power down the appliance before installing or removing an Interface Module. Interface Modules are not hot-swappable.

Step 3   Locate the Interface Module slot in the appliance chassis and slide the Cisco Interface Module into the slot until the ejector lever is seated.

To remove an Interface Module, first use the ejector lever to unlatch and then pull out the Interface Module. (See Figure 4-1.)

Figure 4-1   Interface Module—Removal
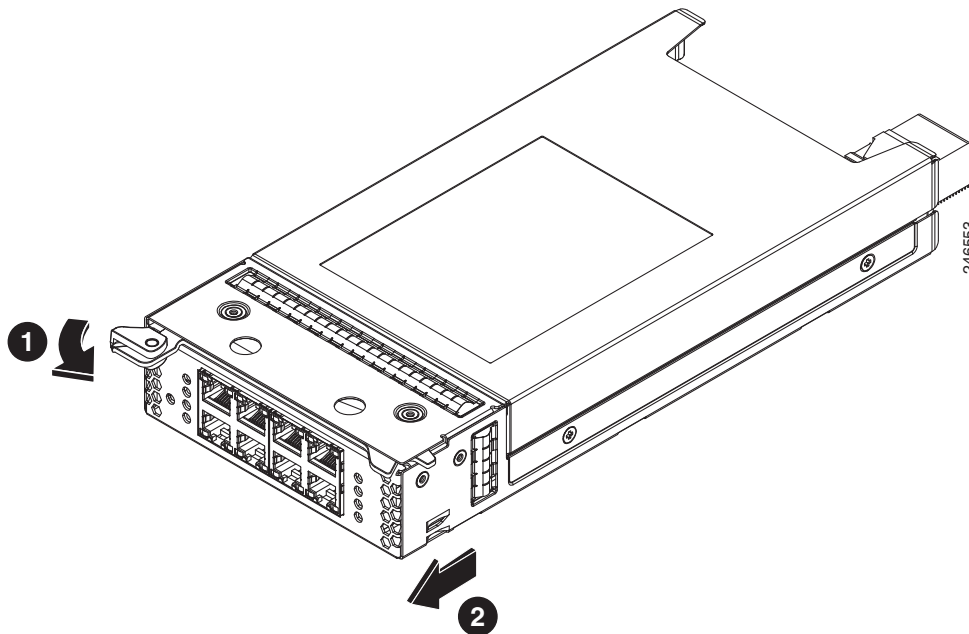
Step 4   Power on the appliance.

Step 5   For information about connecting cables to the Cisco WAVE Interface Module ports, see Chapter 5, "WAVE Interface Modules."

Replacing a Hard Disk Drive/Solid State Drive

The WAVE appliance supports as many as two 2.5-inch (Small Form Factor) hard drives. The WAVE-594 and WAVE-694 support both Hard Disk Drives and Solid State Drives.

> **Note** The WAVE-594 and WAVE-694 support both Hard Disk Drives and Solid State Drives, but you cannot mix HDD and SSD in the same chassis. For details about the WAVE-594 and WAVE-694 appliance specifications, see Appendix A, "Appliance Specifications".

Replacing a Hard Disk Drive

Hard drives are hot-swappable therefore it is not necessary to power the system down before installing or replacing.

When removing hard drives from the WAVE appliance, observe the following general guidelines:

- The system automatically sets all drive numbers.
- Drives must be the same capacity to provide the greatest storage space efficiency when drives are grouped together into the same drive array.

> **Note** All hard disk drives being used in the appliance must be identical.

> **Note** The HDD should not be replaced with SSD when WAVE is in CM device mode, as it is not supported.

> **Caution** To maintain proper system cooling, do not operate the appliance for more than 1 minute without either a hard disk drive or a filler panel installed in each bay.

To replace a hard disk drive in a bay, follow these steps:

Step 1 Review the information in the Safety Warnings and Cautions and Safety Guidelines sections in Chapter 2, "Preparing to Install the WAVE-594 and WAVE-694.

Step 2 Press the button and swing the handle out. (See Figure 4-2).

> **Note** Wait 5 seconds before removing to let the disk spin down.

Figure 4-2   *Removing a Hard Disk Drive*
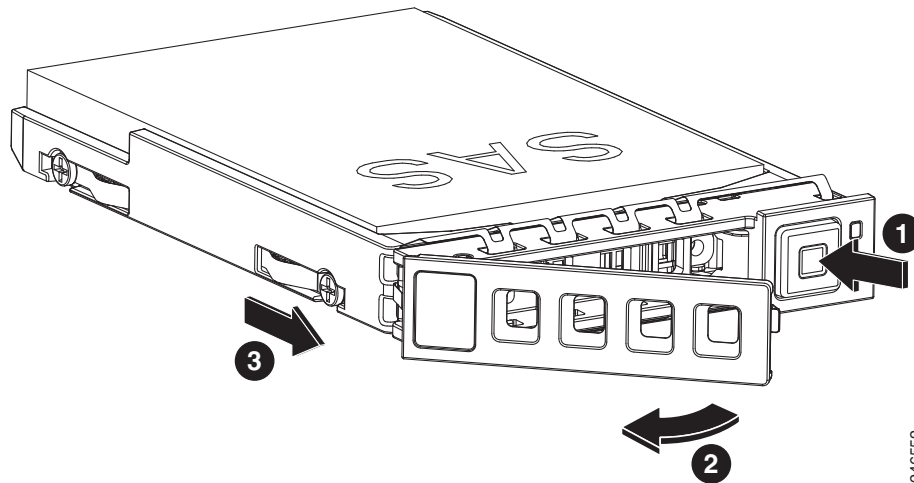
Step 3   After waiting 5 seconds, pull the handle to remove the drive assembly from the bay.

Step 4   Within one minute, insert the new drive into the same slot by aligning the replacement drive assembly with guide rails in the bay and sliding the drive assembly into the bay until it stops. Make sure that the drive is properly seated in the bay.

Step 5   Close the drive handle.

Step 6   Check the hard disk drive status LED after the system has booted to verify that the hard disk drive is operating correctly. If the amber hard disk drive status LED for a drive is lit continuously, that drive is faulty and must be replaced. If the green hard disk drive activity LED is flashing, the drive is being accessed.

Step 7   Wait 1 minute and then verify that the replaced disk drive is in the Rebuilding state by using the **show disks details** command in EXEC mode.

> **Note**   The system automatically starts the rebuild operation when it detects the removal and reinsertion of a drive that is part of the logical RAID drive.

Step 8   Wait until the rebuild operation is complete. A disk rebuild operation may take several hours. You can check if the rebuild operation is complete by using the **show disk details** command in EXEC mode. The physical drive state will be Online and the RAID logical drive state will be Okay after the rebuild operation is completed.

Step 9   Use the **show disk tech** command in EXEC mode to verify that the firmware and BIOS information is correct for both hard drives.

If you have multiple disk failures and your RAID-1 logical status is Offline, you must recreate the RAID-1 array. For more information on disk removal and replacement procedures, see the *Cisco Wide Area Application Services Configuration Guide* chapter named "Maintaining Your WAAS System."

Replacing a Fan

The WAVE appliance supports six fan assemblies that are hot-swappable.

Fan assemblies can only be inserted in one orientation.

Note   Fan assemblies must be inserted and can only function with the surface marked "TOP" facing up.

⚠
Caution   To maintain proper system cooling, do not operate the appliance for more than 1 minute without a fan installed in each bay.

To replace a fan assembly, follow these steps:

Step 1   Review the information in the Safety Warnings and Cautions and Safety Guidelines sections in Chapter 2, "Preparing to Install the WAVE-594 and WAVE-694."

Step 2   Disengage the fan latch and pull the fan out by the handle (see Figure 4-3).

Figure 4-3   *Fan Assembly*
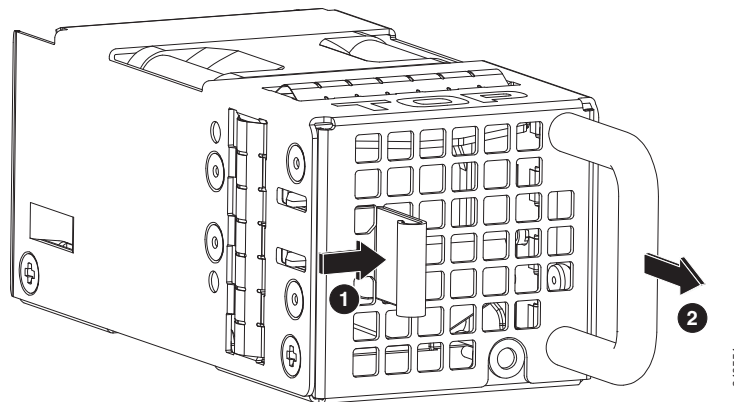
Step 3   Within one minute, insert the new fan with the surface marked "TOP" facing up and verify that the latch is engaged.

Step 4   Check the power LED to verify that the new fan is receiving power.

Note   If a fan alarm occurs and you power down the WAVE appliance to replace the fan, you must use the **clear bmc event-log** global configuration command and then reboot to clear the alarm.

Replacing a Power Supply

The WAVE appliance supports two power supply assemblies that are hot-swap capable.

Power supply assemblies can only be inserted in one orientation.

Note   Power supply assemblies must be inserted and can only function with the surface marked "TOP" facing up.

⚠

Caution   To maintain proper system cooling, do not operate the appliance for more than 1 minute without either a power supply or a filler panel installed in each bay.

To replace a power supply assembly, follow these steps:

Step 1   Review the information in the Safety Warnings and Cautions and Safety Guidelines sections in Chapter 2, "Preparing to Install the WAVE-594 and WAVE-694."
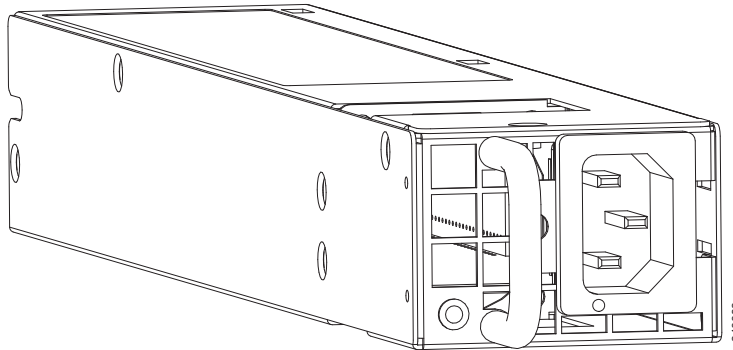
Step 2   Remove the power cord from the power supply.

✎

Note   When more than one power supply assembly is present, load-sharing is supported. If one loses power, the second power supply takes over.

Step 3   Disengage the latch and pull the power supply out by the handle. (See Figure 4-4.)

Figure 4-4   *Power Supply Assembly*

Step 4   Within one minute, insert the new power supply with the surface marked "TOP" facing up and verify that the latch is engaged.

Step 5   Insert the power cord into the replacement power supply.

Step 6   Check the power LED to verify that the new power supply is receiving power.

✎

Note   If a power supply alarm occurs and you power down the WAVE appliance to replace the power supply, you must use the **clear bmc event-log** global configuration command and then reboot to clear the alarm.

Installing Memory

This section provides basic instructions for installing memory in your WAVE-594 and WAVE-694.

This section contains the following topics:

- Removing the Cover
- Installing Memory Modules

Removing the Cover

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

⚠️
Caution   To reduce the risk of personal injury from hot surfaces, allow the drives and the internal system components to cool before touching them.

⚠️
Caution   Do not operate the WAVE appliance with the access panel open or removed. Operating the WAVE appliance in this manner results in improper airflow and improper cooling that can lead to thermal damage.

To remove the appliance cover, follow these steps:

Step 1   Review the information in the Safety Warnings and Cautions and Safety Guidelines sections in Chapter 2, "Preparing to Install the WAVE-594 and WAVE-694."

Step 2   Power off the appliance and all attached devices and disconnect all external cables and power cords.

Step 3   Remove the WAVE appliance from the rack.

Step 4   Loosen the screw on the top that secures the access panel to the WAVE appliance.

Step 5   Slide the access panel toward the front of the WAVE appliance, then lift it from the WAVE appliance.

Installing Memory Modules

The WAVE-594 appliance supports either 8 GB or 12 GB of memory using 2-GB RDIMM memory modules. The WAVE-694 appliance supports either 16 GB or 24 GB of memory using 4-GB RDIMM memory modules.

Observe the following guidelines when installing additional memory:

- Use only Cisco memory upgrades in your appliance.
- BIOS detects the DIMM population and sets the system to dual-bank interleaved mode (DIMMs installed in both banks with equal bank capacities).

Figure 4-5 shows the memory slot mapping on the system board.

Figure 4-5   *Memory Slot Mapping*
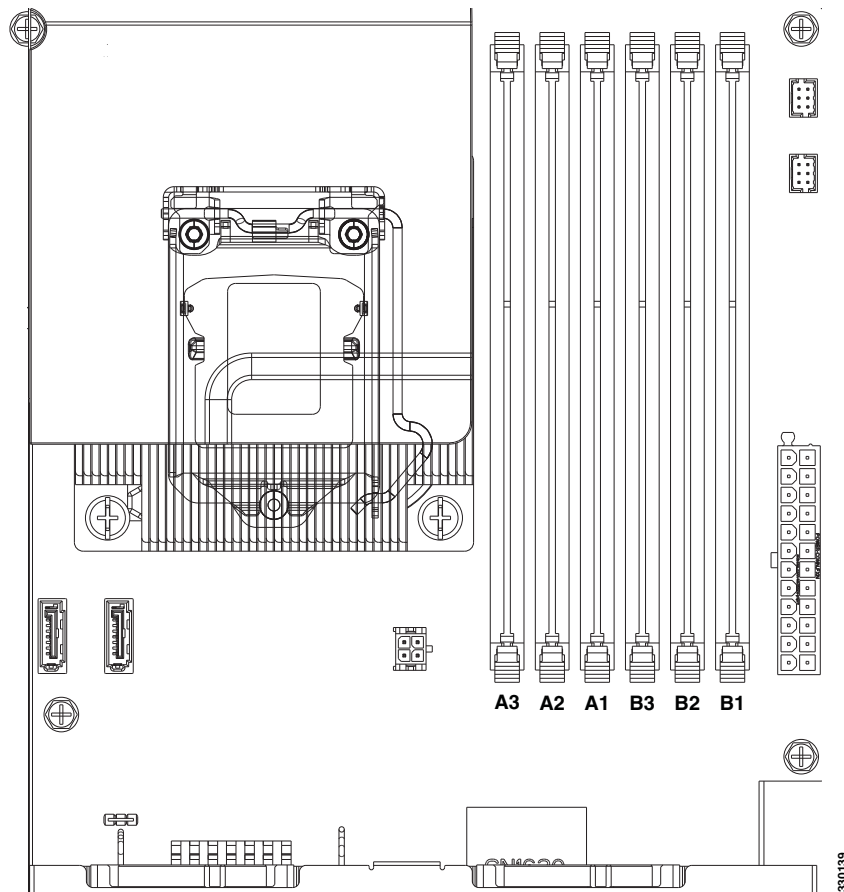

Table 4-1 and Table 4-2 list the RDIMM configurations available for the WAVE-594 and WAVE-694 appliance.

Table 4-1   *WAVE-594 RDIMM Configurations*

	Slot A3	Slot A2	Slot A1	Slot B3	Slot B2	Slot B1
8 GB Memory	—	2-GB	2-GB	—	2-GB	2-GB
12 GB Memory	2-GB	2-GB	2-GB	2-GB	2-GB	2-GB

Table 4-2   *WAVE-694 RDIMM Configurations*

	Slot A3	Slot A2	Slot A1	Slot B3	Slot B2	Slot B1
16 GB Memory	—	4-GB	4-GB	—	4-GB	4-GB
24 GB Memory	4-GB	4-GB	4-GB	4-GB	4-GB	4-GB

To install a Cisco memory upgrade on the WAVE-594 from 8 GB to 12 GB or on the WAVE-694 from 16 GB to 24 GB, follow these steps:

Step 1 Power down the WAVE appliance.

Step 2 Remove the WAVE appliance from the rack.

Step 3 Remove the primary access panel (See Removing the Cover).

Step 4 Open the DIMM slot latches for slots A1, A2, B1, and B2 and remove the existing memory modules.

✎
Note All existing memory must be removed and replaced by the RDIMMS contained in the Cisco upgrade kit.

Step 5 Open the DIMM slot latches for slots A3 and B3.

Step 6 To upgrade from 8 GB to 12 GB on a WAVE-594, install a 2-GB RDIMM memory module into all six slots. (See Figure 4-6.)

To upgrade from 16 GB to 24 GB on a WAVE-694, install a 4-GB RDIMM memory module into all six slots. (See Figure 4-6.)

Figure 4-6   Installing an RDIMM
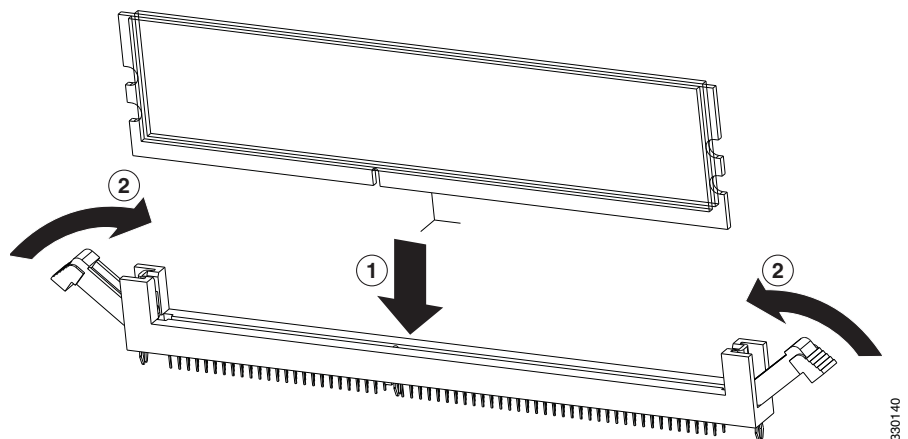
Step 7 Check to make sure that the DIMM latches are fully engaged in the notches.

Step 8 Install the access panel.

   a. Lower the access panel onto the WAVE appliance and then slide the access panel toward the back of the WAVE appliance.

   b. Tighten the screw on the top that secures the access panel to the WAVE appliance.

Step 9 Install the WAVE appliance into the rack.

For complete rack installation and removal instructions, see Chapter 3, "Installing the WAVE-594 and WAVE-694."

⚠
Caution Install the appliance only in a rack cabinet with perforated doors.

⚠

Caution   Do not leave open spaces above or below an installed appliance in the rack cabinet. To help prevent damage to appliance components, always install a filler panel to cover the open space and to help ensure proper air circulation. See the documentation that comes with your rack cabinet for more information.

Step 10   Connect the cables and power cords. For information on connecting cables and power cords, see Rack Mounting and Cabling the WAVE-594 and WAVE-694 in Chapter 3, "Installing the Wave-594 and WAVE-694.

Step 11   Reboot the WAVE appliance.

Step 12   Use the **show memory** EXEC mode command to verify that the memory you installed is recognized by the WAVE appliance.

Step 13   Repartition the disks, using the **disk delete-data-partitions** command, and reload.

✎

Note   Repartitioning the disks deletes all data, including all virtual blades on the hardware.

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Note   Repartitioning the disks is required after adding memory to reset the DRE space allocation.