

NetCache™ Appliance

C3100/C6100 Series Field Service Guide

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Preface

About this guide

This guide describes the field service procedures for replacing, upgrading, and maintaining NetCache™ appliance hardware units in the C3100/C6100 series.

Use this guide after you familiarize yourself with the system hardware by reading the following guides.

Note

A current version of the following guides is available at the NetApp on the Web (NOW) Web site at <http://now.netapp.com>.

Reference document...	Provides information about...
<i>NetCache Appliance Administration Guide</i>	How to operate and manage your NetCache appliance.
<i>C3100/C6100 Hardware Guide</i>	Initial system installation.

This guide does not provide information about disk shelves. For disk shelf information, see the hardware guide for the disk shelf that is part of your system.

Audience

This guide is for qualified system administrators and service personnel who are familiar with NetCache appliances. The procedures in this guide describe replacement, upgrade, and maintenance tasks for personnel with the following skills and experience:

- ◆ Working familiarity with small computer system hardware and operation
- ◆ Basic understanding of common networking concepts and practices
- ◆ Working familiarity with accepted tools and procedures for installing and operating sensitive electronic equipment

Terminology

In this guide, the following terminology is used:

- ◆ *Appliance* refers to C3100/C6100 series NetCache appliances
- ◆ *Disk shelf* refers to any NetApp® Fibre Channel disk shelf
- ◆ *Expansion adapters* used in C3100/C6100 series NetCache appliances refers to the following:
 - ❖ NVRAM adapter
 - ❖ FC-AL adapter
 - ❖ Network interface cards (NICs)

Note

See the *System Configuration Guide* at <http://now.netapp.com> for a current version of the list of expansion adapters that you can use with your NetCache appliance.

Special messages

This guide contains special messages that are described as follows:

Note

A note contains important information that helps you install or operate the system efficiently.

Caution

A caution contains instructions that you must follow to avoid damage to the equipment, a system crash, or loss of data.

WARNING

A warning contains instructions that you must follow to avoid personal injury.

Safety Information

Safety rules

You must follow these safety rules when working with this equipment:

WARNING

Failure to follow the directions contained in the following statements could result in bodily harm or loss of life.

- ◆ When installing disk shelves and a filer or NetCache™ appliance into a movable cabinet or rack, install the equipment from the bottom up for best stability.
- ◆ DC-based systems must be installed in a restricted access location.
- ◆ To reduce the risk of personal injury from hot surfaces, allow the internal components time to cool before touching them or installing options.
- ◆ To reduce the risk of personal injury or damage to the equipment, ensure that the equipment is properly supported or braced when installing options.
- ◆ This equipment is designed for connection to a grounded outlet. The grounding type plug is an important safety feature. To avoid the risk of electrical shock or damage to the equipment, do not disable this feature.
- ◆ This equipment is furnished with one or more replaceable batteries. There is danger of explosion if the battery is incorrectly replaced. Replace the battery only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Warning for units with two power supplies

Your filer, NetCache appliance, or disk shelf has two power supplies. If you need to turn the unit off, heed the following warning:

WARNING

This unit has more than one power supply cord. To reduce the risk of electrical shock, disconnect all power supply cords before servicing.

AVERTISSEMENT

Cet appareil comporte plus d'un cordon d'alimentation. Afin de prévenir les chocs électriques, débrancher tous les cordons d'alimentation avant d'effectuer le dépannage.

ACHTUNG

Dieses Gerät besitzt zwei Netzanschlussleitungen. Vor Wartung alle Anschlüsse vom Netz trennen.

About this chapter This chapter identifies the field-replaceable units in the C3100/C6100 series of NetCache appliances. It also lists the tools and equipment you need to replace components.

Topics in this chapter This chapter provides information about the following topics:

- ◆ “[Overview of the field-replaceable units](#)” on page 2
- ◆ “[Required tools and equipment](#)” on page 5

Overview of the field-replaceable units

About field-replaceable units

The C3100/C6100 series is designed for easy access so that you can remove and install units in the field. The units are accessible from the front or back panel. You must purchase all field-replaceable units from Network Appliance or an authorized reseller.

Units that you can individually replace

You can replace the following units in the C3100/C6100 series in the field:

- ◆ Expansion adapters
 - ❖ NVRAM III (nonvolatile random access memory) adapter
 - ❖ FC-AL adapters for Fibre Channel disk shelves
 - ❖ Network interface cards (NICs)
- ◆ Motherboard with or without DIMMs and lithium battery
- ◆ DIMMs
 - ❖ NVRAM III DIMM
 - ❖ Motherboard DIMMs
- ◆ Batteries
 - ❖ NVRAM lead-acid battery
 - ❖ Motherboard lithium battery
- ◆ CPU cooler fan
- ◆ 3.5-inch diskette drive subassembly
- ◆ Power supplies
- ◆ Chassis fan subassembly
- ◆ LED/LCD subassembly
- ◆ appliance bezel

Units that you cannot individually replace

Replacement of the onboard 10Base-T/100Base-TX Ethernet interface on the motherboard requires replacement of the motherboard.

Units that you can optionally add

You can optionally add the following units to the C3100/C6100 series in the field:

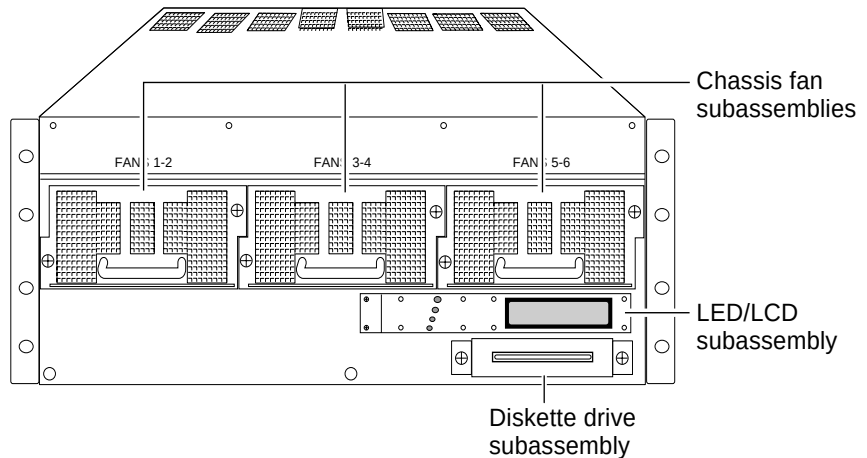
- ◆ Additional FC-AL adapters for Fibre Channel disk storage
- ◆ Additional NICs

Units accessible from the appliance front

A plastic bezel covers the front panel of the appliance. You can remove the bezel to gain access to the following units in the appliance:

- ◆ Fan subassemblies
- ◆ LED/LCD subassembly
- ◆ Diskette drive subassembly

The following figure shows the replaceable units accessible from the front panel of the C3100/C6100 series.



Units accessible from the appliance rear

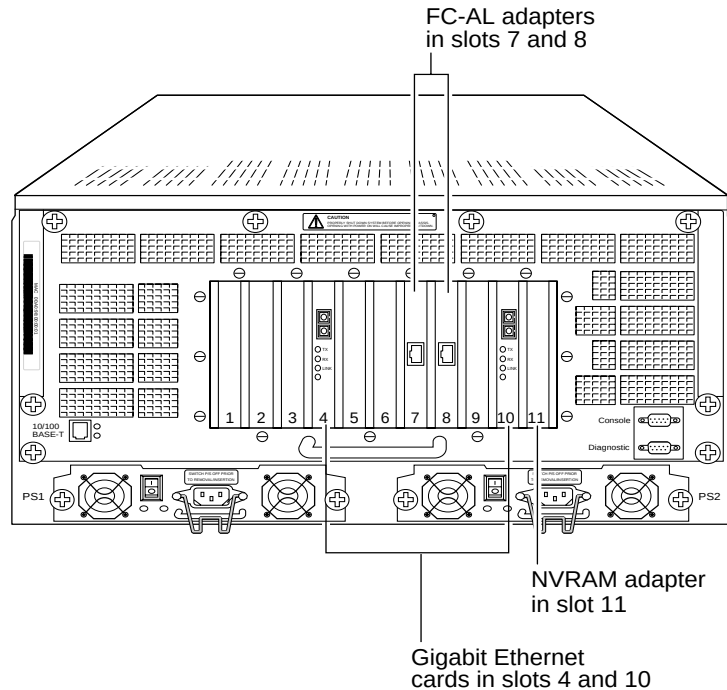
The following units are accessible from the rear of the appliance:

- ◆ Power supplies
- ◆ PCB carrier, a slide-mounted tray that serves as the mounting base for the motherboard

You can pull out the PCB carrier from the chassis for access to the motherboard and the expansion adapters. The following figure shows the units accessible from the back of the C6100 with an AC power supply.

Note

The C3100 supports only one FC-AL adapter, which connects to slot 8.



Required tools and equipment

Required tools and equipment

To replace components, you need the following tools and equipment:

- ◆ Phillips screwdrivers (#0, #1, and #2)
- ◆ 3/16-inch socket wrench
- ◆ Antistatic wrist strap and grounding leash
- ◆ Antistatic bag

Caution

The C3100/C6100 series uses electronic components that are sensitive to static electricity. Static discharge from your clothing or other fixtures around you can damage these components. Wear an antistatic wrist strap and grounding leash to free yourself of static electricity before touching any electronic components.

If you are adding expansion adapters to your C3100/C6100 series, check for information about expansion adapter slot assignments in the System Configuration Guide at <http://now.netapp.com>.

About this chapter

This chapter provides the necessary procedures for replacing units in the PCB carrier.

Topics in this chapter

This chapter provides information about the following topics:

- ◆ [“Opening the PCB carrier”](#) on page 8
- ◆ [“Removing the PCB carrier”](#) on page 10
- ◆ [“Replacing the motherboard”](#) on page 12
- ◆ [“Replacing SDRAM DIMMs on the motherboard”](#) on page 16
- ◆ [“Installing or replacing expansion adapters”](#) on page 19
- ◆ [“Replacing the NVRAM III battery”](#) on page 27
- ◆ [“Replacing the CPU fan and heat sink”](#) on page 31
- ◆ [“Replacing the motherboard lithium battery”](#) on page 33
- ◆ [“Closing the PCB carrier”](#) on page 35

Opening the PCB carrier

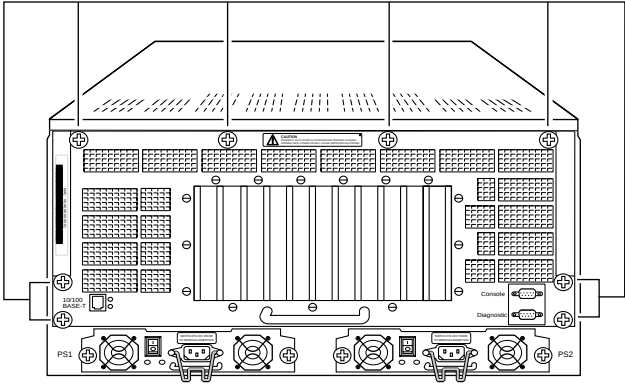
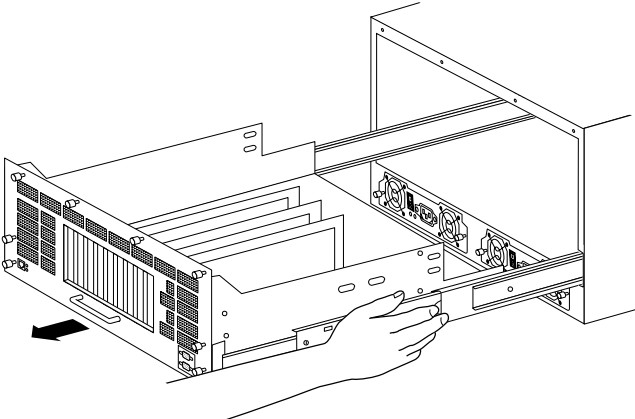
Reasons to open the PCB carrier

You might need to open the PCB carrier to gain access to the motherboard, expansion adapters, and other field-replaceable units in your C3100/C6100.

Opening the PCB carrier

To open the PCB carrier, complete the following steps.

Step	Action
1	From the NetCache Manager home page, select the Maintenance tab > System Control > Halt/Reboot. Caution_____ Always shut down your NetCache appliance properly before opening the PCB carrier. Opening the PCB carrier without first shutting down your NetCache appliance causes the system to shut down improperly. For information about shutting down the system properly, see the <i>NetCache Appliance Administration Guide</i>. _____
2	Select Halt NetCache.
3	Verify that the LCD display at the front of your NetCache appliance displays the following message: Halted
4	Turn off and unplug the power to your NetCache appliance and, if applicable, to your disk shelves.
5	Wear the antistatic wrist strap and attach the grounding leash to the NetCache appliance chassis.

Step	Action
6	Using a #1 or #2 Phillips screwdriver, loosen the eight thumbscrews on the back panel of the PCB carrier. Thumbscrews  The diagram shows the back panel of the PCB carrier. It features a central vertical section with five vertical slots. On either side of this central section are two large rectangular areas, each containing a grid of small squares representing components. At the top, there are two trapezoidal sections. The bottom edge of the panel has several connectors and labels: 'PS1' on the left, 'Console' and 'Diagnosis' on the right, and 'PS2' on the far right. Eight thumbscrews are indicated by circles with a cross inside, located along the top and bottom edges of the central and side sections.
7	Carefully pull the PCB carrier out of the chassis until the carrier tabs click to lock the slide rails in place. The PCB carrier has a travel distance of approximately 19 inches (48.26 centimeters). WARNING _____ Use caution when servicing components in the chassis. There is danger of electric shock from hazardous energy on the backplane. _____  The diagram illustrates the PCB carrier being pulled out of the chassis. A hand is shown at the bottom right, pulling the carrier forward. The carrier is a long, rectangular unit with a grid of components on its front face. It is being pulled out of a chassis that has a large open front panel. The carrier is shown at an angle, indicating its movement. A black arrow points to the left, indicating the direction of travel.

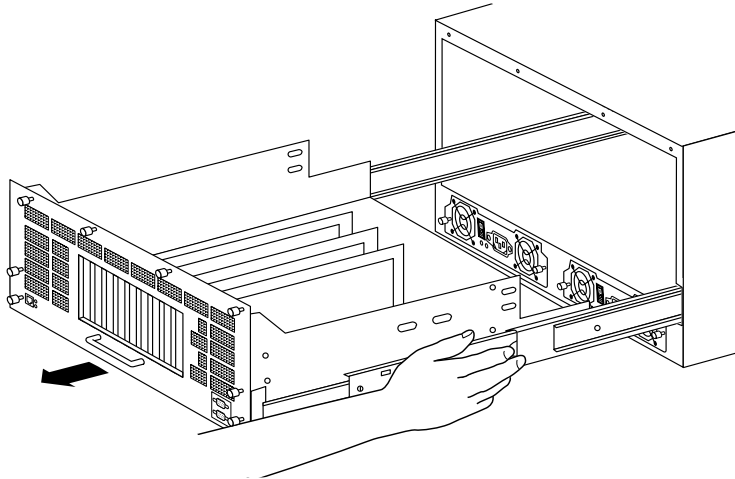
Removing the PCB carrier

Reasons to remove the PCB carrier

You can remove the PCB carrier from the NetCache appliance to make maneuvering easier when replacing units.

Removing the PCB carrier

To remove the PCB carrier from the C3100/C6100 series, complete the following steps.

Step	Action
1	Open the PCB carrier. Follow the procedure in “Opening the PCB carrier” on page 8.
2	Press inward on the carrier tabs on each slide rail while pulling the PCB carrier out of the chassis. 
3	Support the PCB carrier with both hands and set it aside.

Step	Action	
4	If you are...	Then...
	Replacing the motherboard	Disconnect all cables connected to the ports on the back of the PCB carrier and go to “Replacing the motherboard” on page 12.
	Not replacing the motherboard, but you are replacing units on it	Go to the appropriate procedure for the unit you are replacing: ◆ “Replacing SDRAM DIMMs on the motherboard” on page 16 ◆ “Installing or replacing expansion adapters” on page 19 ◆ “Replacing the NVRAM III battery” on page 27 ◆ “Replacing the CPU fan and heat sink” on page 31 ◆ “Replacing the motherboard lithium battery” on page 33

Replacing the motherboard

About replacing the motherboard

Replacing the motherboard consists of the following procedures:

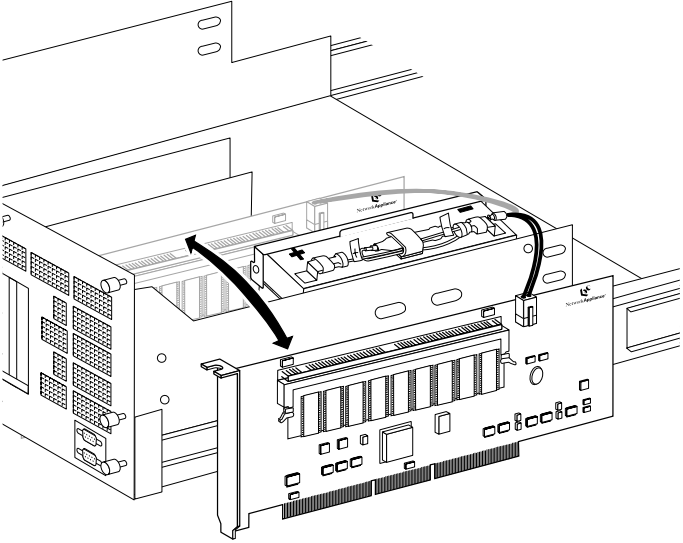
- ◆ “[Removing the motherboard](#)” on page 12
- ◆ “[Installing the motherboard](#)” on page 14

Removing the motherboard

To remove the motherboard, complete the following steps.

Caution—————
To prevent shorting the NVRAM III battery, you must perform this procedure on a nonconductive surface. Shorting the NVRAM III battery causes data loss.

Step	Action
1	Open the PCB carrier by following Steps 2 through 7 of the procedure described in “Opening the PCB carrier” on page 8. Note————— If any motherboard failure occurs, your C3100/C6100 performs a “dirty shutdown,” which makes it impossible for you to perform the clean shutdown recommended in step 1. However, your data from the last transaction is still buffered in the battery-backed memory on the NVRAM III adapter.
2	Remove the PCB carrier by following Steps 2 through 4 of the procedure described in “Removing the PCB carrier” on page 10.
3	Using the #0 or #1 Phillips screwdriver, remove all adapters except the NVRAM III adapter from the expansion slots on the motherboard by following Steps 2 through 6 of the procedure described in “Removing an existing expansion adapter” on page 20. Set the screws and adapters aside for later use.
4	Using a #0 or #1 Phillips screwdriver, remove the screws securing the NVRAM III adapter to the PCB carrier. Set the screws aside for later use.

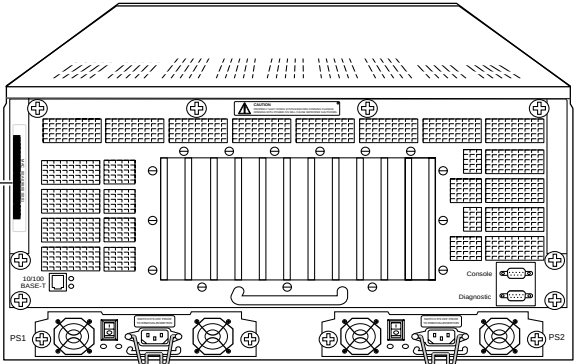
Step	Action
5	Lift the NVRAM III adapter out of the expansion slot and carefully lay it over the side of your C3100/C6100. This allows easy access for the removal of the NVRAM III battery. Caution_____ If a dirty shutdown occurred, do not disconnect the NVRAM III battery wire from the NVRAM III adapter. This disconnection causes data loss. _____ 
6	Using a #0 or #1 Phillips screwdriver, loosen the two thumbscrews securing the NVRAM III battery carrier to the C3100/C6100 chassis.
7	Lift the NVRAM III battery out of the PCB carrier and place the battery and the still-connected NVRAM III adapter on the nonconductive surface.
8	If the replacement motherboard does not already have SDRAM DIMMs installed, remove all of them by following Steps 2 through 5 of the procedure described in “Removing an SDRAM DIMM” on page 16. Set the DIMMs aside for later use.

Step	Action
9	Using a 3/16-inch socket wrench, remove the four screws on the back of the chassis that secure the Console and Diagnostic ports to the chassis.
10	Using a #2 Phillips screwdriver, remove the 11 screws securing the motherboard to the PCB carrier.
11	Lift the motherboard and slide it out of the PCB carrier.

Installing the motherboard

To install the motherboard, complete the following steps.

Step	Action
1	Slide the replacement motherboard into the PCB carrier and, using a #2 Phillips screwdriver, secure the motherboard to the PCB carrier with the 11 screws.
2	If the replacement motherboard does not already have SDRAM DIMMs installed, reinstall all SDRAM DIMMs as follows: 1. Locate the DIMM slot for the DIMM you are installing. 2. Hold the DIMM by its top corners to avoid damaging the components. 3. Insert the DIMM straight into the slot. The DIMM fits tightly in the slot, but should go in easily. If not, realign the DIMM with the slot and try again. Caution_____ Visually inspect the DIMM to verify that it is evenly aligned and fully inserted into the slot; otherwise, the edge connector on the DIMM does not make complete contact with the slot. _____ 4. Push carefully, but firmly on the top edge of the DIMM until the latches snap into place.

Step	Action
3	Without disconnecting the wire from the NVRAM III adapter, reinstall the NVRAM III battery into its place on the PCB carrier. Note— Maintaining the connection between the NVRAM III adapter and the NVRAM III battery is necessary only if a dirty shutdown occurred.
4	Tighten the two thumbscrews securing the NVRAM III battery carrier to the PCB carrier.
5	Carefully turn over the still-connected NVRAM III adapter that is outside of the C3100/C6100 and reinstall it in the expansion slot.
6	Using the #0 or #1 Phillips screwdriver, secure the NVRAM III adapter to the PCB carrier.
7	Reinstall all other adapters into the expansion slots on the motherboard by following Steps 3 through 6 of the procedure described in “ Installing an expansion adapter ” on page 22.
8	Using a 3/16 inch socket wrench, connect all the screwlocks to the PCB carrier.
9	Paste the MAC (Media Access Control) address label provided with the replacement motherboard on the PCB carrier, as shown. The following illustration is of a C6100.  Paste MAC address label here.
10	Go to “ Closing the PCB carrier ” on page 35.

Replacing SDRAM DIMMs on the motherboard

About replacing SDRAM DIMMs

This section provides the supported memory configurations for the C3100/C6100 series and the procedures for replacing the SDRAM DIMMs on the motherboard. Replacing the SDRAM DIMMs on the motherboard consists of the following procedures:

- ◆ “[Removing an SDRAM DIMM](#)” on page 16
- ◆ “[Installing an SDRAM DIMM](#)” on page 17

Supported memory configurations

The C6100 series supports a 3-GB memory configuration (3.3V, unbuffered, 6x512 MB SDRAM DIMMs). The SDRAM DIMMs are installed into six DIMM slots (J40, J41, J42, J43, J44, and J45).

The C3100 supports 1-GB memory configuration (3.3V, unbuffered, 2x512 MB SDRAM DIMMs). The SDRAM DIMMs are installed into two DIMM slots (J40 and J43).

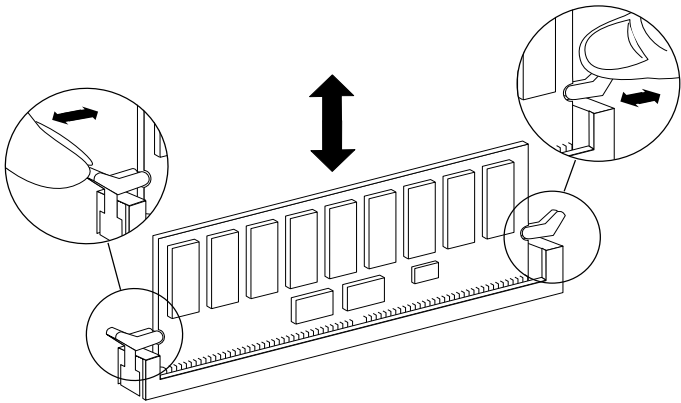
Caution_____

All DIMMs must be listed on the Network Appliance Approved Parts List. Contact Network Appliance Sales to obtain this list. Unapproved DIMMs have not been tested for reliability and might cause system downtime.

Removing an SDRAM DIMM

To remove an SDRAM DIMM, complete the following steps.

Step	Action
1	Open the PCB carrier. Follow the procedure in “Opening the PCB carrier” on page 8. Caution_____ Be sure to wear the antistatic wrist strap and attach the grounding leash to the C3100/C6100 chassis. _____
2	Locate the DIMM that you want to remove.

Step	Action
3	Push apart the latches on either side of the DIMM to release the DIMM from its slot, as shown. 
4	Pull the DIMM out of the slot.
5	Set the DIMM aside in an antistatic bag.

Installing an SDRAM DIMM

To install the SDRAM DIMM, complete the following steps.

Step	Action
1	Locate the DIMM slot for the DIMM you are installing.
2	Hold the DIMM by its top corners to avoid damaging the components.
3	Insert the DIMM straight into the slot. The DIMM fits tightly in the slot, but should go in easily. If not, realign the DIMM with the slot and try again. Caution— Visually inspect the DIMM to verify that it is evenly aligned and fully inserted into the slot; otherwise, the edge connector on the DIMM does not make complete contact with the slot.

Step	Action
4	Push carefully but firmly on the top edge of the DIMM until the latches snap into place.
5	Go to “ Closing the PCB carrier ” on page 35.

Installing or replacing expansion adapters

About installing or replacing expansion adapters

This section describes the steps involved in replacing an expansion adapter or installing a new expansion adapter. Replacing an expansion adapter consists of the following procedures:

- ◆ “[Removing an existing expansion adapter](#)” on page 20
- ◆ “[Installing an expansion adapter](#)” on page 22

Additional procedures: The NVRAM adapter is the only adapter that might require the following additional procedures:

- ◆ “[Removing the NVRAM III DIMM](#)” on page 25
- ◆ “[Installing the NVRAM III DIMM](#)” on page 26

Expansion adapters used

The C3100/C6100 series NetCache appliances use the following expansion adapters:

- ◆ NVRAM adapter
- ◆ Fibre Channel adapters
- ◆ NICs

Note

The *C3100/C6100 Series Hardware Guide* lists the supported network interface cards.

Slot assignments for expansion adapters

If you are adding expansion adapters to your C3100/C6100 series NetCache appliance, the *System Configuration Guide* at <http://now.netapp.com> provides current configuration information for the following information:

- ◆ Expansion slots that are available on your C3100/C6100
- ◆ Supported adapters
- ◆ Expansion slot assignments

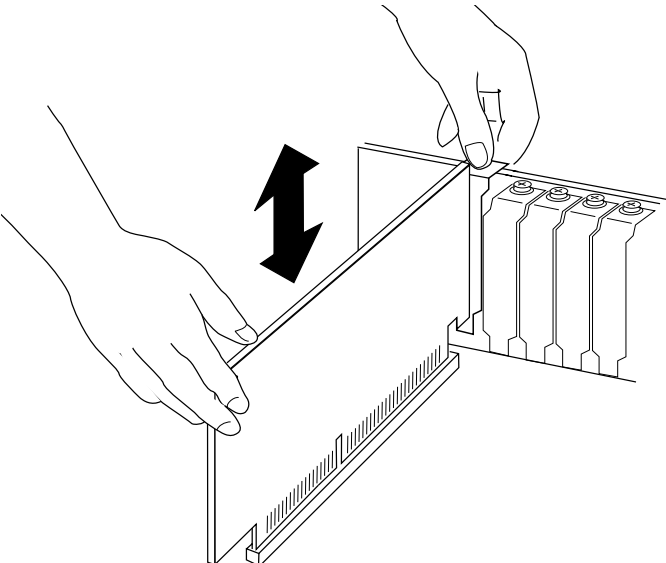
Caution

Install only supported expansion adapters in the assigned expansion slots. To ensure compatibility, performance, and reliability, you must obtain expansion adapters for your C3100/C6100 from Network Appliance or an authorized reseller.

Removing an existing expansion adapter

To remove an existing expansion adapter, complete the following steps.

Step	Action	
1	Open the PCB carrier. Follow the procedure in “Opening the PCB carrier” on page 8.	
2	Note which cables (if any) are connected to the connectors on the faceplate of the expansion adapter before disconnecting the cables.	
3	If you are replacing...	Then...
	The NVRAM adapter or replacing the DIMM on the NVRAM adapter	Unplug the electrical wires from the J1 connector on the NVRAM adapter. See the figure in “Replacing the NVRAM III battery” on page 27. Caution If you did not perform a clean shutdown using the <code>halt</code> command, disconnecting the NVRAM battery from the NVRAM III adapter results in data loss.
	The FC-AL adapter for disk storage	Press the latches on both sides of the HSSDC port of the GBIC module and remove the module. This enables you to remove the adapter without difficulty.
4	Remove the screw holding the expansion adapter faceplate to the back panel bracket and save it for reinstalling the adapter.	

Step	Action	
5	Pull upward on the top edge of the expansion adapter and lift it out of the chassis, as shown. 	
6	If the expansion adapter you removed is an FC-AL adapter, plug the GBIC module of the adapter back into the socket.	
7	If you are...	Then...
	Not installing a replacement expansion adapter	Install a slot cover using the screw you saved in Step 4.
	Installing a replacement expansion adapter	Go to “Installing an expansion adapter” on page 22.
	Replacing the DIMM on the NVRAM adapter	Go to “Replacing the NVRAM III DIMM” on page 24.

Installing an expansion adapter

To install an expansion adapter, complete the following steps.

Step	Action	
1	If you are...	Then...
	Installing any new adapter	Take the adapter out of the antistatic bag and discard the bag.
	Installing a replacement adapter	Take the replacement adapter out of the antistatic bag and place the used adapter into that bag.
2	If you are...	Then...
	Replacing or reinstalling an NVRAM III adapter	Plug the electrical wires from the NVRAM III battery to the connector on the NVRAM III adapter.
	Replacing an FC-AL adapter	1. Press the latches on both sides of the HSSDC port of the GBIC module and remove the module. 2. Go to Step 3.
	Reinstalling all other adapters	Go to Step 3. You reinstall adapters when you replace the motherboard.
3	Holding the adapter by its top edge, with the faceplate near the back of the machine, lower the adapter into the slot until its connector edge meets the grooves in the expansion slot. The faceplate of the adapter should be in position against the back panel and should cover the endplate slot on the back panel.	
4	Press carefully on the top edge of the adapter until the edge connector is seated in the expansion slot.	
5	Replace the faceplate screw to secure the adapter to the back panel.	
6	If the expansion adapter you replaced is an FC-AL adapter, plug the GBIC module of the adapter back into the socket.	

Step	Action
7	Reconnect the cables to the external connectors on the replacement expansion adapter.
8	Go to “ Closing the PCB carrier ” on page 35.

Replacing the NVRAM III DIMM

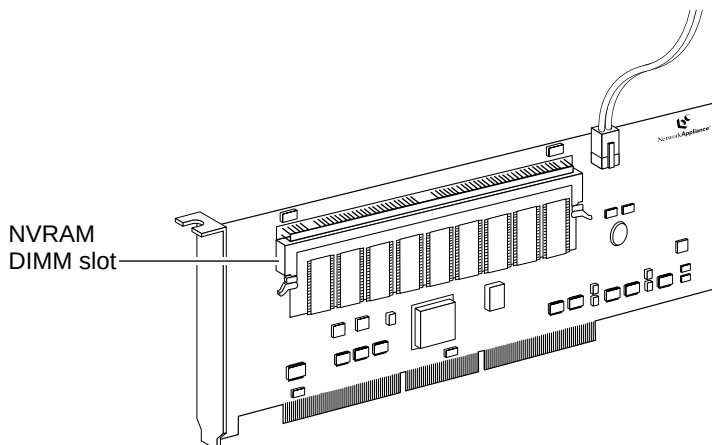
About replacing the NVRAM III DIMM

Replacing the NVRAM DIMM consists of the following procedures:

- ◆ “[Removing the NVRAM III DIMM](#)” on page 25
- ◆ “[Installing the NVRAM III DIMM](#)” on page 26

Location of the NVRAM III DIMM slot

The following figure shows the location of the NVRAM DIMM slot on the NVRAM III adapter.

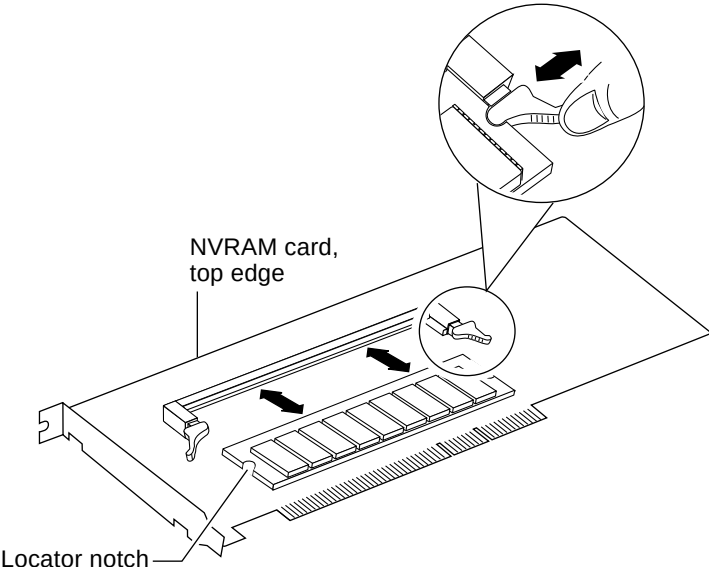


**Removing the
NVRAM III DIMM**

To remove the NVRAM III DIMM, complete the following steps.

Note_____

This procedure assumes that you have already removed the NVRAM III adapter, as described in “[Removing an existing expansion adapter](#)” on page 20.

Step	Action
1	Push apart the latches on both sides of the DIMM with your index fingers. 
2	Place the DIMM in an antistatic bag.

Installing the NVRAM III DIMM

To install the NVRAM III DIMM, complete the following steps.

Step	Action
1	Hold the DIMM at the top corners to avoid damaging the components or the edge connector.
2	Align the DIMM over the slot and then tilt the top edge of the DIMM at a slight angle away from the top edge of the NVRAM adapter.
3	Insert the DIMM into the slot. The DIMM should slide into the slot easily if you wiggle the DIMM into position. If not, realign the DIMM with the slot and try again.
4	Push the DIMM into the slot until the mounting tabs close over the DIMM to lock it in place. Caution _____ Visually inspect the DIMM to verify that it is evenly aligned and fully inserted into the slot; otherwise, the DIMM could bend or break when pushed to the locked position. _____
5	Return to “ Installing an expansion adapter ” on page 22 to complete the installation.

Replacing the NVRAM III battery

About replacing the NVRAM III battery

The NVRAM III adapter has one detached, sealed, lead-acid battery that is recharged whenever the system is turned on and operating normally. If the battery continues to read low after 24 hours of normal system operation, you must replace the battery or the NVRAM III adapter.

Note

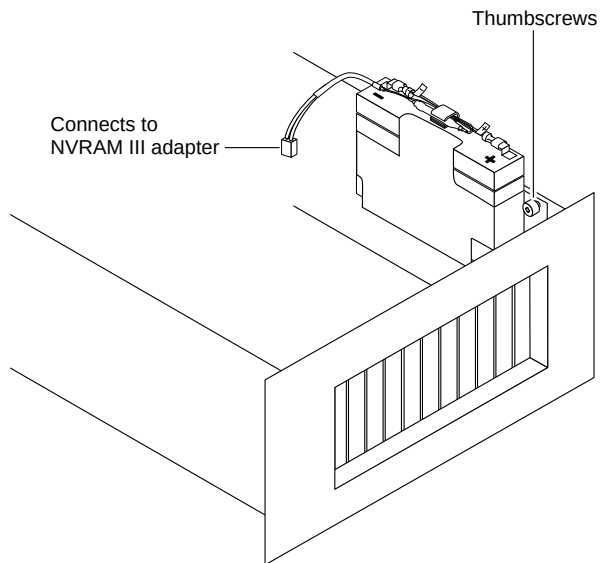
The NVRAM III adapter in the C3100/C6100 series is different from the NVRAM adapter in other models of NetCache appliances. It is not interchangeable with NVRAM adapters from other models of NetCache appliances.

Replacing the NVRAM III battery consists of the following procedures:

- ◆ [“Removing the NVRAM III battery”](#) on page 28
- ◆ [“Installing the NVRAM III battery”](#) on page 30

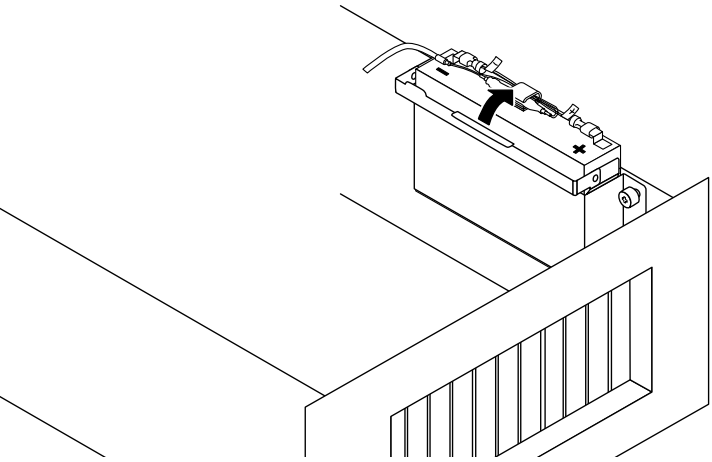
Location of the NVRAM III battery

The following figure shows the battery location.



Removing the NVRAM III battery

To remove the NVRAM III battery, complete the following steps.

Step	Action
1	Open the PCB carrier. Follow the procedure in “Opening the PCB carrier” on page 8. Caution——— Be sure to wear the antistatic wrist strap and attach the grounding leash to the C3100/C6100 chassis.
2	Unplug the electrical wires from the connector on the NVRAM III adapter. Caution——— If you did not perform a clean shutdown using the <code>halt</code> command, disconnecting the NVRAM battery from the NVRAM III adapter results in data loss.
3	Flip the retaining clip on the battery carrier down. WARNING——— If the battery is leaking, follow the procedure in “Handling a leaking NVRAM III battery” on page 29. 
4	Remove the battery from the battery carrier in the chassis and set it aside.

**Handling a leaking
NVRAM III battery**

The hazardous components of the NVRAM III battery are lead, sulphuric acid, fiberglass, and polystyrene.

To handle a leaking NVRAM III battery, complete the following steps.

Caution_____

Perform this procedure after you remove the battery from the NetCache appliance.

Step	Action	
1	Neutralize the leaking substance with bicarbonate (baking soda), sodium carbon (soda ash), or calcium oxide (lime).	
2	Flush the neutralized substance with water into the sewage system. WARNING _____ Do not flush or pour the unneutralized substance into the sewage system.	
3	If the unneutralized substance...	Then...
	Has made contact with the skin and the contact area is large, or if blisters form	Flush the affected area with water and see a physician.
	Has made contact the your eye	Call a physician immediately and flush the eye with water until the physician arrives.
	Is ingested	Call a physician. If the patient is still conscious, also flush the patient’s mouth with water and have the patient drink milk or sodium bicarbonate solution.

Installing the NVRAM III battery

To install the NVRAM III battery, complete the following steps.

WARNING

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

AVERTISSEMENT

Il y a danger d'explosion s'il y a remplacement incorrect de la pile. Remplacer la pile seulement avec une pile du même type ou d'un type équivalent recommandé par le fabricant. Mettre au rebut les piles usagées selon les instructions du fabricant.

ACHTUNG

Explosionsgefahr bei unsachgemäßem Austausch der Batterie. Die Batterien nur durch denselben oder einen vom Hersteller empfohlenen gleichwertigen Typ ersetzen. Gebrauchter Batterien nach Angaben des Herstellers loswerden.

Step	Action
1	Secure the NVRAM III battery carrier to the C3100/C6100 chassis by tightening the thumbscrews.
2	Plug the electrical wires into the J1 connector on the NVRAM III adapter.
3	Go to “ Closing the PCB carrier ” on page 35.

Replacing the CPU fan and heat sink

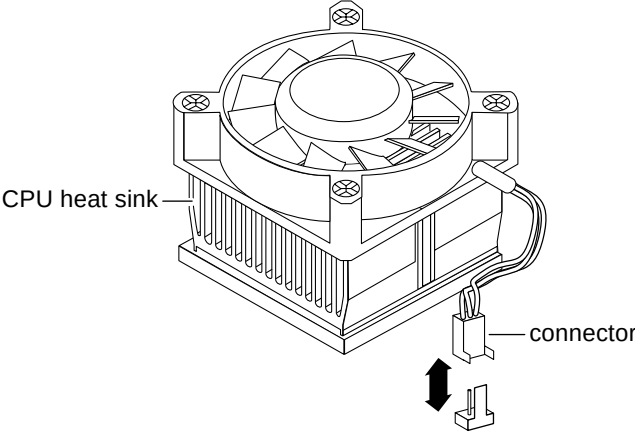
About replacing the CPU fan and heat sink

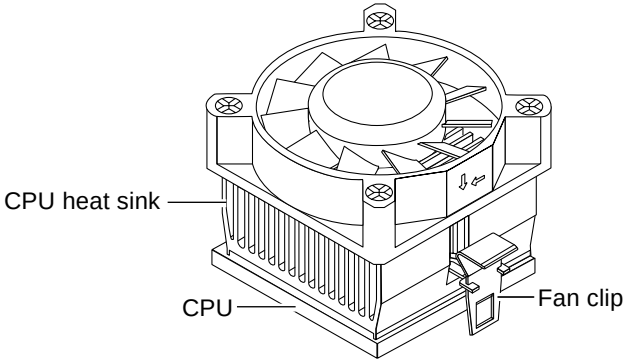
Replacing the CPU fan and heat sink consists of the following procedures:

- ◆ “[Removing the CPU fan and heat sink](#)” on page 31
- ◆ “[Installing the CPU fan and heat sink](#)” on page 32

Removing the CPU fan and heat sink

To remove the CPU fan and heat sink, complete the following steps.

Step	Action
1	Open the PCB carrier. Follow the procedure in “ Opening the PCB carrier ” on page 8.
2	Unplug the fan power connector from the three-pin header on the motherboard, as shown. 

Step	Action
3	Release the clip that secures the fan and heat sink to the motherboard. 
4	Lift the CPU fan and heat sink from the motherboard and set it aside.

Installing the CPU fan and heat sink

To install a replacement CPU fan and heat sink, complete the following steps.

Step	Action
1	Place the heat sink with clip and the CPU fan onto the top of the CPU, making sure that the clip lines up with the hook of the attachment base on the motherboard.
2	Flip down the clip securing the CPU fan and heat sink to the motherboard.
3	Plug the CPU fan cable connector into the three-pin header on the motherboard. The connectors are keyed so that they can fit together only one way.
4	Go to “Closing the PCB carrier” on page 35.

Replacing the motherboard lithium battery

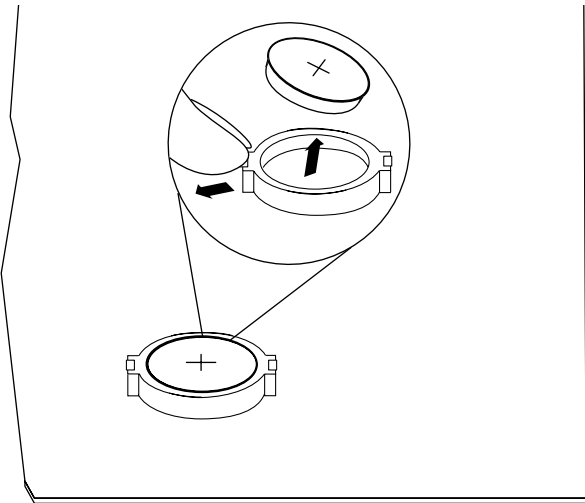
About replacing the motherboard lithium battery

Replacing the 3.3V lithium battery on the motherboard consists of the following procedures:

- ◆ “[Removing the motherboard lithium battery](#)” on page 33
- ◆ “[Installing the motherboard lithium battery](#)” on page 34

Removing the motherboard lithium battery

To remove the motherboard lithium battery, complete the following steps.

Step	Action
1	Open the PCB carrier. Follow the procedure in “Opening the PCB carrier” on page 8. Caution_____ Be sure to wear the antistatic wrist strap and attach the grounding leash to the C3100/C6100 chassis. _____
2	Lift up the battery toward the open side of the battery holder, as shown. 

Installing the motherboard lithium battery

To install the motherboard lithium battery, complete the following steps.

WARNING

Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

AVERTISSEMENT

Il y a danger d'explosion s'il y a remplacement incorrect de la pile. Remplacer la pile seulement avec une pile du même type ou d'un type équivalent recommandé par le fabricant. Mettre au rebut les piles usagées selon les instructions du fabricant.

ACHTUNG

Explosionsgefahr bei unsachgemäßem Austausch der Batterie. Die Batterien nur durch denselben oder einen vom Hersteller empfohlenen gleichwertigen Typ ersetzen. Gebrauchter Batterien nach Angaben des Herstellers loswerden.

Step	Action
1	Turn the battery so that the positive side is up (marked with a "+").
2	Push the battery through the open side of the battery holder so that it sits flush inside the battery holder.
3	Go to " Closing the PCB carrier " on page 35.

Closing the PCB carrier

Closing the PCB carrier

To close the PCB carrier, complete the following steps.

Step	Action
1	If you removed the PCB carrier, insert the carrier slide rails evenly and slowly into the chassis slide rails using both hands to support the PCB carrier. There should be no resistance. Caution— The carrier slide rails must align with the ball bearings along the cabinet slide rails; otherwise the PCB carrier does not go in and the slide rails could be bent permanently.
2	Carefully push the PCB carrier into the chassis. If the PCB carrier is locked in position, press inward on the carrier tabs on each carrier slide rail while pushing the PCB carrier into the chassis.
3	Tighten and then torque the eight thumbscrews on the back panel of the PCB carrier 8 to 10 in.-lbs. to prevent access without a tool.
4	Reconnect any adapter cables that you removed to the ports on the back panel of your C3100/C6100.
5	Reconnect the power to your C3100/C6100 and disk shelves.
6	Turn on your disk shelves and C3100/C6100.

About this chapter This chapter provides the procedures for replacing various different subassemblies within the NetCache appliance.

Topics in this chapter This chapter provides information about the following topics:

- ◆ “[Replacing the chassis fan subassembly](#)” on page 38
- ◆ “[Replacing the power supply](#)” on page 41
- ◆ “[Replacing the LED/LCD subassembly](#)” on page 45
- ◆ “[Replacing the diskette drive subassembly](#)” on page 48

Replacing the chassis fan subassembly

About replacing chassis fan subassemblies

Replacing a chassis fan subassembly consists of the following procedures:

- ◆ “[Removing a chassis fan subassembly](#)” on page 39
- ◆ “[Installing a chassis fan subassembly](#)” on page 40

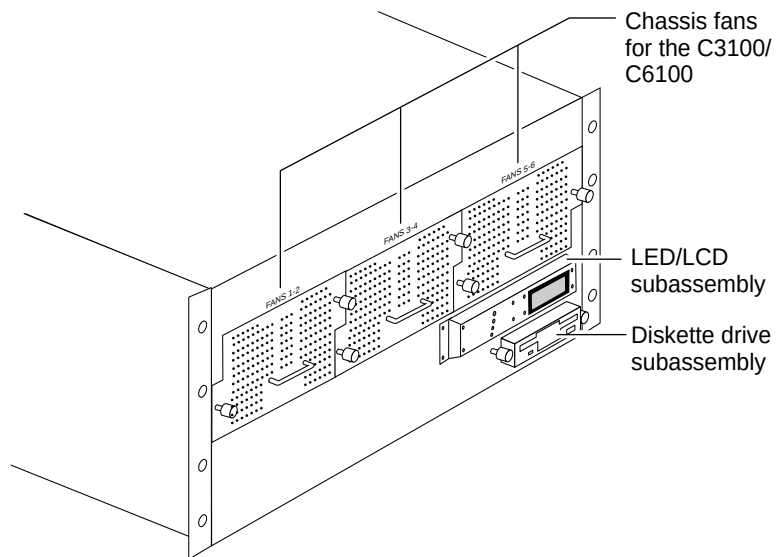
There are three chassis fan subassemblies on the C3100/C6100 NetCache appliance. Each chassis fan subassembly has two fans. The chassis fans are secured to the front of the chassis.

Note

To maintain UL, CSA, and TUV safety certifications, you must obtain replacement chassis fan subassemblies from Network Appliance. Using unapproved replacement chassis fans voids the safety certifications.

Location of the chassis fan subassembly

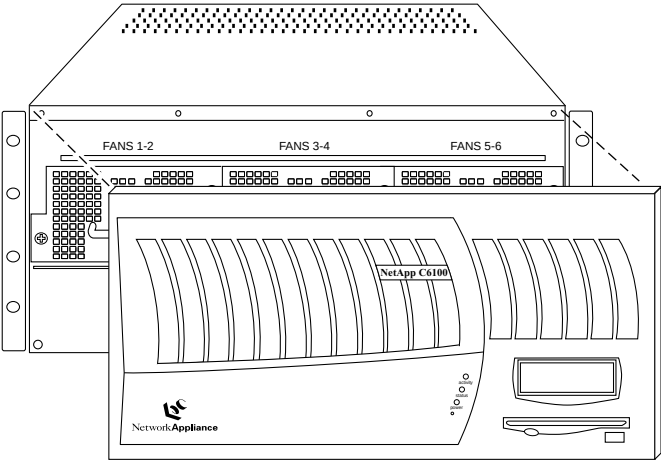
The following figure shows the chassis fan subassembly locations. The sheet metal above the chassis fan subassemblies is silk-screened with the labels Fans 1-2, Fans 3-4, and Fans 5-6.



Removing a chassis fan subassembly

To remove a chassis fan subassembly, complete the following steps.

Note Because the three chassis fan subassemblies are hot swappable, there is no need to shut down the NetCache appliance.

Step	Action
1	From the console, note the identification of the fan subassembly that failed.
2	Pull the bezel straight off the front panel of your NetCache appliance by using the grooves on the left and right edges of the bezel. 
3	Using a #1 Phillips screwdriver, loosen the thumbscrews on the chassis fan subassembly that failed.
4	Using the handle, pull the fan subassembly straight out of the NetCache appliance chassis. WARNING Use caution when servicing components in the chassis. There is danger of electric shock from hazardous energy on the backplane.
5	Set the fan subassembly aside.

Installing a chassis fan subassembly

To install the chassis fan subassembly, complete the following steps.

Step	Action
1	Using the handle, slide the chassis fan subassembly straight into the NetCache appliance chassis.
2	Tighten and then torque the chassis fan thumbscrews 8 to 10 in.-lbs.
3	Align the pins on the bezel with the holes on the front panel of the NetCache appliance, and then push the bezel straight onto the front panel.

Replacing the power supply

About replacing the power supply

Replacing the power supply consists of the following procedures:

- ◆ “[Removing a power supply](#)” on page 41
- ◆ “[Installing a power supply](#)” on page 43

Caution

The power supply in the C3100/C6100 NetCache appliance is different from the power supplies in the C700 series of NetCache appliances. These power supplies are not interchangeable.

Power supply compatibility

Be aware of the following caution regarding the compatibility between the two power supplies in the NetCache appliance.

Caution

When replacing a power supply, be sure not to mix two different power supplies. The two power supplies in your C3100/C6100 must have the same part number.

Removing a power supply

To remove a power supply, complete the following steps.

WARNING

To avoid an energy hazard, you must disconnect the power supply before removing it from the C3100/C6100.

Note

Because you have two power supplies that are hot swappable, there is no need to shut down the NetCache appliance.

Step	Action	
1	Identify the failed power supply from console or LCD screen. Note _____ The power supply identifiers, PS1 and PS2, are silk-screened onto the NetCache appliance chassis.	
2	Turn off the power switch and disconnect the power to the failed power supply on your NetCache appliance.	
3	If you have...	Then...
	AC power supplies	Lift up the clip lock and unplug the power cord from the appliance power supply.
	DC power supplies	1. Turn off the power at the DC power source for this power supply. 2. Remove the cover from the power supply terminal block and set it aside. 3. Using a #2 Phillips screwdriver, remove and save the screws securing the connections to the power supply in the following order: ❖ For positive ground installations: first negative (-), then positive (+), then ground ($\perp$) ❖ For negative ground installations: first positive (+), then negative (-), then ground ($\perp$)
4	Loosen the power supply thumbscrews by turning each thumbscrew counterclockwise.	
5	Pull the power supply out of the power supply bay. WARNING _____ The power supply is heavy. Support the bottom of the unit while removing the unit from its bay.	
6	Set the power supply aside.	

Installing a power supply

To install a power supply, complete the following steps.

Step	Action	
1	Verify that the switch on the power supply is turned off.	
2	Push the power supply slowly and firmly into the bay until the power supply is firmly seated.	
3	Secure the power supply by turning the thumbscrew clockwise until it stops.	
4	If you have...	Then...
	AC power supplies	Plug the power cord into the power cord receptacle on the power supply and secure it with the clip lock.
	DC power supplies	1. Using a #2 Phillips screwdriver and the screws you saved, secure the ground ($\pm$), positive (+), and negative (–) connectors to the power supply, as described in “DC power supply connections” on page 44. 2. Cover the power supply terminal block with the cover that you set aside.
5	Turn on the power to the new power supply in your NetCache appliance.	

DC power supply connections

You can use this power supply in both positive and negative ground installations. For example, the DC power system in telephone central offices (telco facilities) typically uses a positive ground and negative power source (–48V).

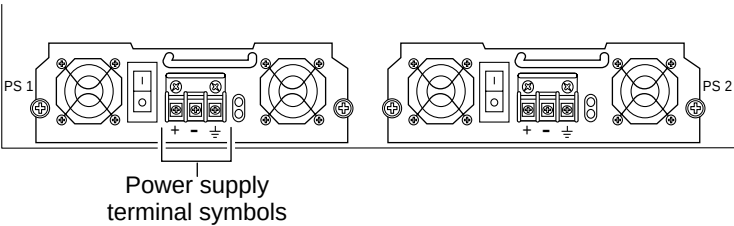
For positive ground systems: Connect the power supply terminals as described in the following table in the order listed.

Power supply terminal	to	DC bus terminal
Ground ($\perp$)	→	System ground ($\perp$)
Positive (+)	→	+ terminal of the 48V power source
Negative (–)	→	– terminal of the 48V power source

For negative ground systems: Connect the power supply terminals as described in the following table in the order listed.

Power supply terminal	to	DC bus terminal
Ground ($\perp$)	→	System ground ($\perp$)
Negative (–)	→	– terminal of the 48V power source
Positive (+)	→	+ terminal of the 48V power source

The following illustration shows the two DC power supplies. The labels for the positive (+), negative (–), and ground ($\perp$) terminals are below the terminals.



Replacing the LED/LCD subassembly

About replacing the LED/LCD subassembly

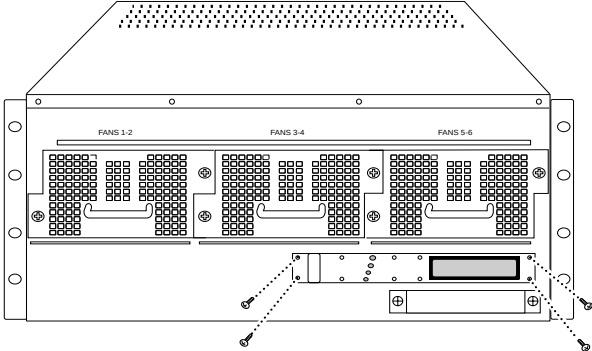
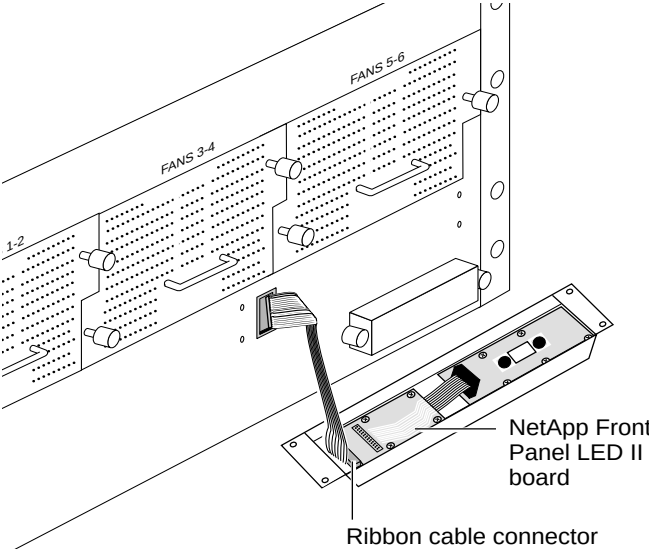
Replacing the LED/LCD subassembly consists of the following procedures:

- ◆ “[Removing the LED/LCD subassembly](#)” on page 45
- ◆ “[Installing the LED/LCD subassembly](#)” on page 47

Removing the LED/LCD subassembly

To remove the LED/LCD subassembly, complete the following steps.

Step	Action
1	From the NetCache Manager home page, select the Maintenance tab > System Control > Halt/Reboot.
2	Select Halt NetCache.
3	Verify that the LCD display at the front of your NetCache appliance displays the following message: Halted
4	Turn off and unplug the power to your NetCache appliance and, if applicable, to your disk shelves.
5	Pull the bezel straight off the front panel of your NetCache appliance by using the grooves on the left and right edges of the bezel.
6	Wear the antistatic wrist strap and attach the grounding leash to the NetCache appliance chassis.

Step	Action
7	Use a #1 Phillips screwdriver to remove the four panhead screws that fasten the LED/LCD subassembly to the front panel of the chassis. Save the screws for reinstalling the replacement unit. 
8	Carefully pull the LED/LCD subassembly and the attached cable from the hole in the chassis front panel. 
9	Unplug the LED ribbon cable from the JP1 connector on the LED/LCD subassembly.
10	Set the LED/LCD subassembly aside.

Installing the LED/LCD subassembly

To install the LED/LCD subassembly, complete the following steps.

Step	Action
1	Plug the LED ribbon cable into the JP1 connector of the LED/LCD subassembly.
2	Feed the cable back into the chassis as you push the LED/LCD subassembly against the chassis front panel.
3	Insert and tighten the four panhead screws to secure the LED/LCD subassembly to the chassis front panel.
4	Align the pins on the bezel with the holes on the front panel of your NetCache appliance, and then push the bezel straight onto the front panel.
5	Plug the AC power cord into the AC power cord receptacle on the power supply and secure it with the clip lock.
6	Turn on your NetCache appliance.

Replacing the diskette drive subassembly

About replacing the diskette drive subassembly

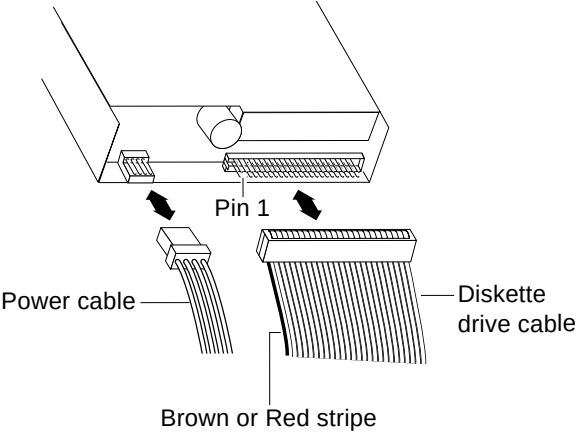
Replacing the diskette drive subassembly consists of the following procedures:

- ◆ “[Removing the diskette drive subassembly](#)” on page 48
- ◆ “[Installing the diskette drive subassembly](#)” on page 49

Removing the diskette drive subassembly

To remove the diskette drive subassembly, complete the following steps.

Step	Action
1	From the NetCache Manager home page, select the Maintenance tab > System Control > Halt/Reboot.
2	Select Halt NetCache.
3	Verify that the LCD display at the front of your NetCache appliance displays the following message: Halted
4	Turn off and unplug the power to your NetCache appliance and disk shelves.
5	Pull the bezel straight off the front panel of your NetCache appliance by using the grooves on the left and right edges of the bezel.
6	Wear the antistatic wrist strap and attach the grounding leash to the NetCache appliance chassis.
7	Loosen the two thumbscrews on the diskette drive subassembly.
8	Pull the diskette drive subassembly out of the drive bay.

Step	Action
9	Unplug the diskette drive cable connector from the data connector on the back of the diskette drive.  Power cable Pin 1 Brown or Red stripe Diskette drive cable
10	Unplug the power cable connector from the power connector on the back of the diskette drive.

Installing the diskette drive subassembly

To install the diskette drive subassembly, complete the following steps.

Step	Action
1	Plug the diskette drive cable connector into the data connector on the back of the diskette drive. The red stripe on the ribbon cable aligns with pin 1 on the connector.
2	Plug the power cable connector into the power connector on the back of the diskette drive.
3	Turn the replacement diskette drive subassembly so that its rails align with the grooves in the drive bay.
4	Slide the diskette drive subassembly into the drive bay.
5	Tighten the two thumbscrews to secure the diskette drive subassembly to the chassis.

Step	Action
6	Align the pins on the bezel with the holes on the front panel of the NetCache appliance, and then push the bezel straight onto the front panel.
7	Plug the AC power cord into the AC power cord receptacle on the power supply and secure it with the clip lock.
8	Turn on your NetCache appliance.

About this appendix This appendix lists the regulatory notices you need to be aware of when installing and operating your Network Appliance equipment.

Regulatory notices

FCC notices (U.S. only)

Network Appliance devices are designed for a CFR 47 (Code Federal Regulations) Part 15 Class A environment.

The FCC and Network Appliance guarantee the user's rights to operate this equipment only if the user complies with the following rules and regulations:

- ◆ Install and operate this equipment in accordance with the specifications and instructions in this guide.
- ◆ Modify this equipment only in the ways specified by Network Appliance.
- ◆ Use shielded cables with metallic RFI/EMI connector hoods to maintain compliance with applicable emissions standards.
- ◆ If the system has nine or more Fibre Channel disk shelves, install the system in two or three NetApp System Cabinets to maintain performance within Part 15 of CFR 47 regulations.

Compliance with Part 15 of CFR 47

This equipment has been tested and found compliant with Part 15 of the CFR 47 rules for Class A digital devices. These rules are designed to provide reasonable protection from interference to electronics equipment operated in a commercial environment.

Operation of this device is subject to the following two conditions:

- ◆ This device cannot cause harmful interference.
- ◆ This device must accept any interference received, including interference that may cause undesired operation.

Compliance with ICES-003

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A conforme à la norme NMB-003 du Canada.

Compliance with EN regulations

Marking by the symbol  indicates compliance of this Network Appliance device to the EMC Directive and the Low Voltage Directive of the European Union. Such marking is indicative that this Network Appliance device meets the technical standards listed in "Declaration of Conformity," later in this appendix.

Caution

This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

**Bureau of
Standards,
Metrology, and
Inspections notice
(BSMI, Taiwan only)**

警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Translation of the BSMI notice:

Warning: This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

Declaration of Conformity

**Network Appliance, Inc.,
495 East Java Drive
Sunnyvale, California, 94089, U.S.A.,**

declare under our sole responsibility that the products

Type of equipment	Description	Model number	Year of manufacture
Network caching appliance	NetCache appliance C3100/C6100 Series	C3100 and C6100	2000 and 2001

to which this declaration relates conform to the following standards:

EN 60950:1992, with A1-A4, A11, Information Technology Equipment (Safety)

EN 55022:1998, Emissions Requirements for Information Technology Equipment

EN 50024:1998, Immunity Requirements for Information Technology Equipment

EN 60825-1, Safety of Laser/LED Equipment

IEC 1000-3-2:1995 Limits for Harmonic Current Emissions

IEC 1000-3-3:1994 Limitation of Voltage Fluctuations and Flicker in Low-Voltage Supply Systems

following the provisions of the directives listed below:

73/23/EEC, Low Voltage Directive (Product Safety)

89/336/EEC, Electromagnetic Compatibility Directive

Part number: 210-00126

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