Replacing Failed Memory in the 6580/6780 Controller Module

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Revision History

Version and Date	Description of Changes
51355-00, Rev. A, May 2011	Initial release of the document.

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Replacing Failed Memory in the 6580/6780 Controller CRU

The 6580/6780 controller CRU has both cache memory DIMMs and cache backup memory devices. Use this procedure to replace a failed cache memory DIMM or a failed cache backup memory device in the 6580/6780 controller CRU.

This kit instruction assumes that you are replacing memory in the controller CRU because you have received event messages indicating that the memory in the controller CRU is insufficient. Before performing the steps in this instruction, run the Recovery Guru to make sure that you do not have any other issues with your storage array.

This procedure describes how to perform the following tasks:

1. Removing a Controller CRU from the 6580/6780 Controller Module on page 3.
2. Replacing a Cache Memory DIMM in the 6580/6780 Controller CRU on page 8.
3. Replacing a Cache Backup Memory Device in the 6580/6780 Controller CRU on page 9.
4. Reinstalling the Controller CRU in the 6580/6780 Controller Module on page 10.

Before you start this procedure, gather antistatic protection and replacement cache memory DIMMs, replacement cache backup memory devices, or both.

> ⚠️ **ATTENTION** If you perform this procedure with the power turned on, you must complete it within 15 minutes to prevent the possibility of overheating the equipment.

Removing a Controller CRU from the 6580/6780 Controller Module

> ⚠️ **ATTENTION Possible hardware damage** – To prevent electrostatic discharge damage to the module, use proper antistatic protection when handling module components.

1. If possible, use the storage management software to create, save, and print a new storage array profile.
2. Did the Recovery Guru direct you to replace a failed cache memory DIMM or a failed cache backup memory device in the controller CRU?
   — **Yes** – Go to step 3.
   — **No** – Run the Recovery Guru to identify the failed component, and go to step 3.
3. Put on antistatic protection.
4. Locate the controller CRU in which you want to replace the failed memory by checking the Controller Service Action Required LEDs (Figure 1). Use the locate function in the storage management software GUI to turn on the Locate LED.

   If a fault is detected, the amber Controller Service Action Required LED is on. If you can safely remove the controller CRU, the blue Controller Service Action Allowed LED is on.

Figure 1   Controller Service Action LEDs
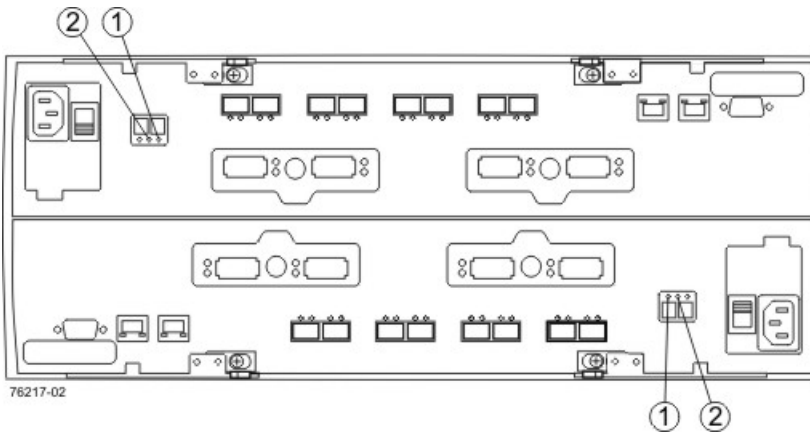
1.   Controller Service Action Allowed LED (Blue)

2.   Controller Service Action Required LED (Amber)

⚠ **ATTENTION Potential degraded performance** – To prevent degraded performance, do not twist, fold, pinch, or step on the fiber-optic cables. Do not bend the fiber-optic cables tighter than a 5-cm (2-in.) radius.

5.   Label each host interface cable, drive interface cable, and Ethernet cable that is attached to the controller CRU so that you can reconnect the cables correctly after the controller CRU is reinstalled.

6.   Record the information from the seven-segment display on the rear of the controller.

The seven-segment display flashes a sequence of codes. Diagnostic codes are in the form of L*x*, where *x* is a hexadecimal digit, and they indicate controller state information. The definitions for L*x* diagnostic codes are listed in the following table.

Table 1 Numeric Display Diagnostic Codes

Value	Controller State	Description	SANtricity ES Storage Manager View
L0	Suspend	Mismatched controller types	Needs Attention condition for a board type mismatch
L1	Suspend	Missing interconnect-battery CRU	Needs Attention condition for a missing interconnect-battery CRU
L2	Suspend	Persistent memory errors	Needs Attention condition for an offline controller CRU
L3	Suspend	Persistent hardware errors	Needs Attention condition for an offline controller CRU
L4	Suspend	Persistent data-protection errors	Needs Attention condition for an offline controller CRU
88	Reset	The controller is held in reset by an alternate controller	

— **If you are replacing a failed cache memory DIMM** – The seven-segment display provides a code that identifies the slot of the unresponsive cache memory DIMM. The code is `DE+L2+Dash+CF+Cx+Blank-`. The characters of the code appear sequentially in the seven-segment display. The following table lists the definitions for the fault codes.

Table 2 Cache Memory DIMM Fault Codes

Code	Description
DE	A diagnostic error has occurred.
L2	A lock-down code for persistent memory errors appears.
Dash	Category delimiter. All segments are off except for the middle segments, and the Diagnostics LED is on.
CF	A component failure has occurred.
Cx	Cache memory DIMM (x is the location of the cache memory slot).
Blank-	An end-of-sequence delimiter appears. All segments are off, and the Diagnostic LED is off.

— **If you are replacing a failed cache backup memory device** – The seven-segment display provides a code that identifies the slot of an unresponsive cache backup memory device. The code is `OS+CF+Fx+Blank-`. The characters of the code appear sequentially in the seven-segment display. The following table lists the definitions of the codes.

**Table 3 Display Error Code Definitions**

Code	Description
OS	Operational state.
CF	A component failure has occurred.
Fx	Cache backup memory device (x is the location of the cache backup memory device).
Blank-	An end-of-sequence delimiter appears. All segments are off, and the Diagnostics LED is off.

7. Take the controller offline, and, if necessary, wait for the Controller Service Action Allowed LED to come on.

   Use the following command line interface (CLI) command to take the controller offline.

   ```
   set controller [a|b] availability=offline;
   ```

8. Turn off the Power switch on the controller CRU in which you are replacing a failed cache memory DIMM or a failed cache backup memory device.

9. Unplug the power cord from the controller CRU, and set the power cord aside.

10. Disconnect all of the following cables from the controller CRU.

    — Host interface cables
    — Drive interface cables
    — Ethernet cables

11. Remove the controller CRU (Figure 2).

    a.   Unlock and rotate the release handles out to release the controller CRU.

    b.   Using the release handles and your hands, pull the controller CRU out of the controller module.

    c.   Set the controller CRU on a flat, static-free surface with the thumbscrews that secure the top cover to the CRU facing up.
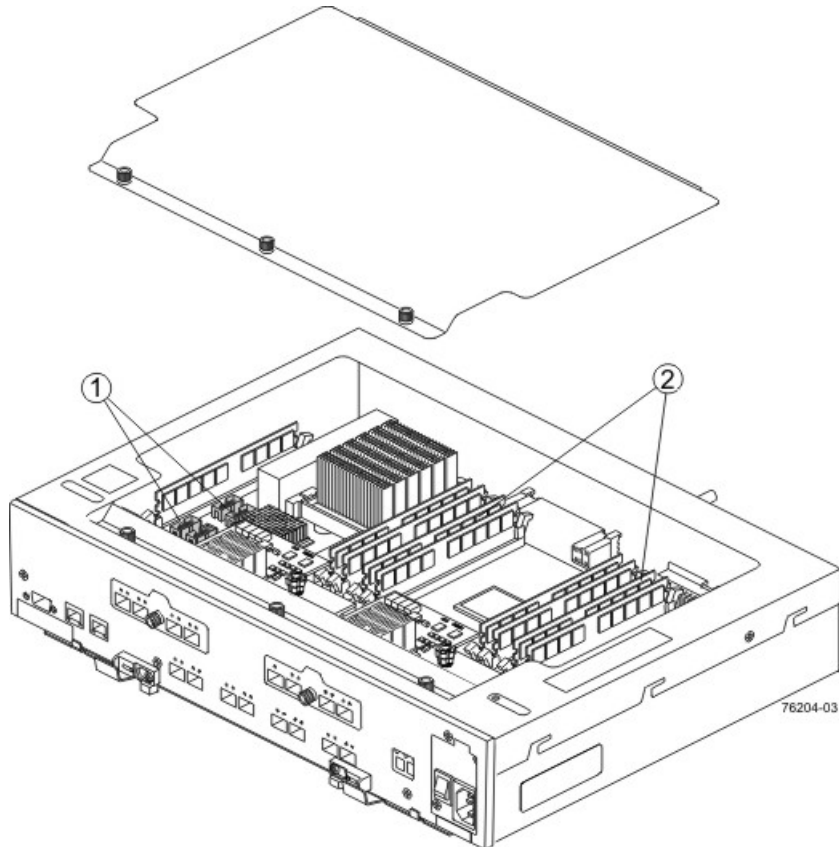
Figure 2 Removing a Controller CRU
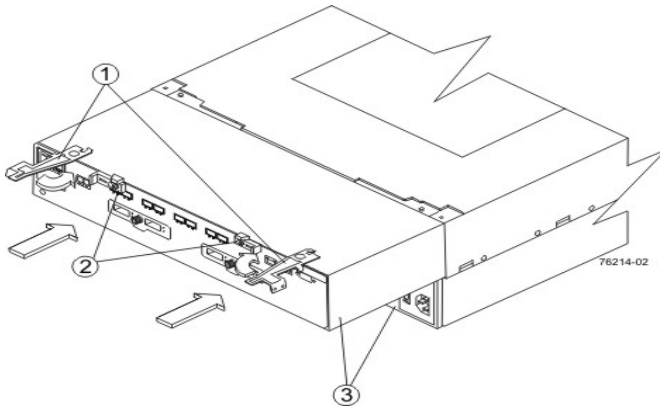
1.   Release Handles

2.   Locking Mechanisms

3.   Controller CRU

12. Remove the top cover from the controller CRU (Figure 3).

    a. Loosen the thumbscrews that secure the cover to the controller CRU.

    b. Lift the cover off of the controller CRU.

Figure 3 Controller Top Cover, Internal Parts, and Faceplate

    1. Cache Backup Memory Device Slot Locations

    2. Cache Memory DIMM Slot Locations

13. Perform one of these actions:

    — **You are replacing a failed cache memory DIMM** – Go to Replacing a Cache Memory DIMM in the 6580/6780 Controller CRU on page 8.

    — **You are replacing a failed cache backup memory device** – Go to Replacing a Cache Backup Memory Device in the 6580/6780 Controller CRU on page 9.

Replacing a Cache Memory DIMM in the 6580/6780 Controller CRU

Replacement cache memory DIMMs must be the same capacity as the failed cache memory DIMM.

1. Locate the cache memory DIMM that you want to replace as described in step 6 in Removing a Controller CRU from the 6580/6780 Controller Module on page 3.

Figure 4   Cache Memory DIMM Locations in the 6580/6780 Controller CRU
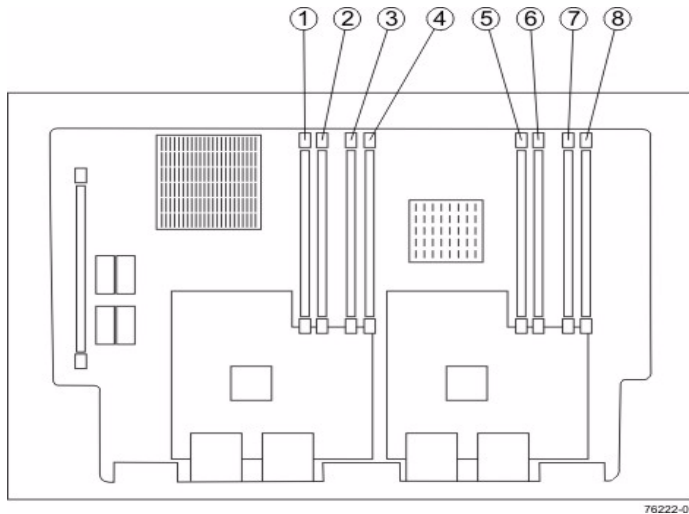
1. Cache Memory DIMM Slot 1
2. Cache Memory DIMM Slot 2
3. Cache Memory DIMM Slot 3
4. Cache Memory DIMM Slot 4
5. Cache Memory DIMM Slot 5
6. Cache Memory DIMM Slot 6
7. Cache Memory DIMM Slot 7
8. Cache Memory DIMM Slot 8

2. Remove the cache memory DIMM (Figure 5).

    a. Pull back on each ejector handle to disengage the cache memory DIMM pins from the slot on the controller card.
    b. Lift the cache memory DIMM out of the slot.
    c. Place the cache memory DIMM that you removed on an a flat, static-free surface.

Figure 5 Removing a Cache Memory DIMM
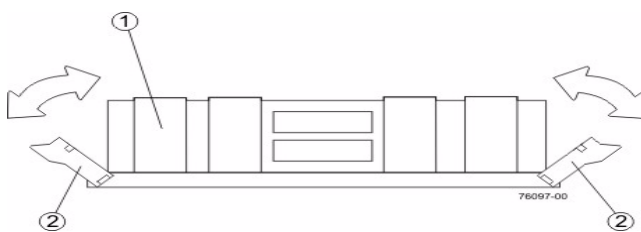

1. Cache Memory DIMM
2. Ejector Handles

3. Install the new cache memory DIMM.

    a. Align the new cache memory DIMM in the slot.

    b. Gently push down on the cache memory DIMM to seat the pins into the slot.

       The ejector handles rise up as the cache memory DIMM is inserted into the slot. When these handles are in the vertical position, the cache memory DIMM is fully engaged and is locked in place.

4. Perform one of these actions:

    — **You also are replacing a cache backup memory device** – Go to Replacing a Cache Backup Memory Device in the 6580/6780 Controller CRU.

    — **You are not replacing a cache backup memory device** – Go to Reinstalling the Controller CRU in the 6580/6780 Controller Module on page 10.

Replacing a Cache Backup Memory Device in the 6580/6780 Controller CRU

The cache backup memory device provides a backup for the cache memory DIMM. The replacement cache backup memory device must be the same capacity as the failed cache backup memory device.

1. Locate the cache backup memory device that you want to replace as described in step 6 in Removing a Controller CRU from the 6580/6780 Controller Module on page 3.

Figure 6 Cache Backup Memory Device Locations in the 6580/6780 Controller Module
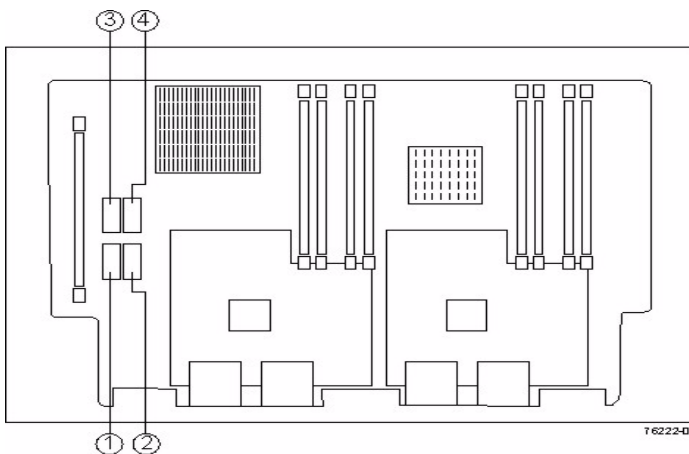
    1.   Cache Backup Memory Device Slot 1

    2.   Cache Backup Memory Device Slot 2

    3.   Cache Backup Memory Device Slot 3

    4.   Cache Backup Memory Device Slot 4

2. Remove the failed cache backup memory device from the connector on the controller card.

    a. Gently pull back on the latch that secures one edge of the cache backup memory device to the connector on the controller card.

    b. Lift the cache backup memory device from the connector.

3. Install the new cache backup memory device.

    a. Carefully align the cache backup memory device with the connector on the controller card so that the pins will not bend when you install the cache backup memory device.

    b. Install the cache backup memory device into the same socket location by gently pressing down on the cache backup memory device until it snaps into place.

4. Go to Reinstalling the Controller CRU in the 6580/6780 Controller Module on page 10.

Reinstalling the Controller CRU in the 6580/6780 Controller Module

1. Reinstall the top cover, and tighten all of the thumbscrews that secure the top cover.

2. Slide the controller CRU all of the way into the controller module. Rotate the release handles in to lock the controller CRU into place.

3. Reconnect all of the following cables to the appropriate ports on the controller CRU.

   — Ethernet cables
   — Host interface cables
   — Drive interface cables

4. Plug the power cord into the controller CRU.

5. Turn on the Power switch on the controller CRU.

6. Bring the controller online using the following CLI command.

   ```
   set controller [a|b] availability=online;
   ```

7. Look at the LEDs on the controller CRU to make sure that the controller is rebooting correctly (Figure 7).

Figure 7 Controller Service Action LEDs
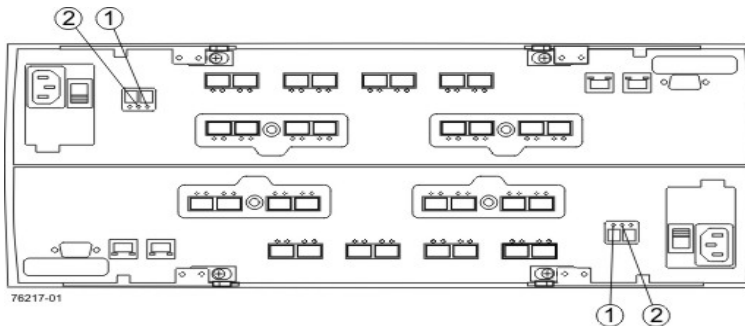
1. Controller Service Action Allowed LED (Blue)
2. Controller Service Action Required LED (Amber)

The LEDs come on and go off intermittently for approximately 60 seconds (possibly longer).

8. Based on the LED status, perform one of these actions:

   — **All of the Service Action Required LEDs are off, and the Array Management Window indicates an Optimal status** – Go to step 10.
   — **Any of the Service Action Required LEDs on the controller module are on** – Check that the controller CRU has been installed correctly. Reinstall the controller CRU if necessary. Go to step 9.

9. Did this action correct the problem?

   — **Yes** – Go to step 10.
   — **No** – If the problem is not resolved, contact your Sun Customer Care Center representative.

10. Using the LEDs and the storage management software, check the status of the modules in the storage array.

11. Does any component have a Needs Attention status?

   — **Yes** – Click the **Recovery Guru** toolbar button in the Array Management Window, and complete the recovery procedure. If the problem is not resolved, contact your Sun Customer Care Center representative.
   — **No** – Go to step 12.

12. Remove the antistatic protection.

13. Create, save, and print a new storage array profile.

Please
Recycle

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