



Replacing Failed Memory in the ST2500 M2 Array Module

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Revision History

Version and Date	Description of Changes
51350-00, Rev. A May 2011	Initial release of the document.

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Replacing Failed Memory in the ST2500 M2 Array Module

The controller CRU in the ST2500 M2 array module has both a cache memory DIMM and a cache backup memory device. Use this procedure to replace a failed cache memory DIMM or a failed cache backup memory device in the controller CRU in the ST2500 M2 array module.

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 ST2500 M2 Array Module](#) on page 1.
2. [Replacing a Cache Memory DIMM](#) on page 6.
3. [Replacing a Cache Backup Memory Device](#) on page 7.
4. [Reinstalling the Controller CRU in the ST2500 M2 Array Module](#) on page 8.
5. [Bringing the Controller CRU Online](#) on page 8.

Before you start this procedure, gather antistatic protection and a replacement cache memory DIMM, a replacement cache backup memory device, or both. Also, make sure that the controller air blocker is available.



ATTENTION Possible hardware damage – If you perform this procedure with the power turned on, the equipment can overheat if the controller slot is left open for more than three minutes. To prevent the possibility of overheating, you must insert the controller air blocker into the controller slot when you service the controller.

Removing a Controller CRU from the ST2500 M2 Array Module

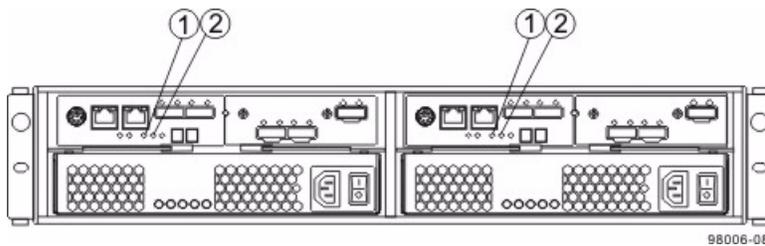


ATTENTION Possible hardware damage – To prevent electrostatic discharge damage to the module, use proper antistatic protection when handling module components.

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 cache memory DIMM or the failed cache backup memory device by checking the Controller Service Action Required LEDs ([Figure 1](#)). Use the Locate function in the storage management software 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 ST2500 M2 Array Module Service Action LEDs



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



ATTENTION Possible 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 cable that is attached to the controller CRU so that you can reconnect each cable correctly after the controller CRU is reinstalled.
6. Record the information from the seven-segment display that is on the rear of the 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 1 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 for the error codes.

Table 2 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 Diagnostic LED is off.

7. Take the appropriate controller offline, and wait for the blue Controller Service Action Allowed LED to come on. Use either the GUI (first bullet) or the command line interface (CLI, second bullet) to take the appropriate controller offline.
 - In the Physical Pane, select the controller, and select **Advanced >> Recovery >> Place Controller >> Offline**.
 - `set controller [(a | b)] availability=offline;`
8. Disconnect the following cables from the controller CRU.
 - Host interface cables
 - Drive interface cables
 - Ethernet cables

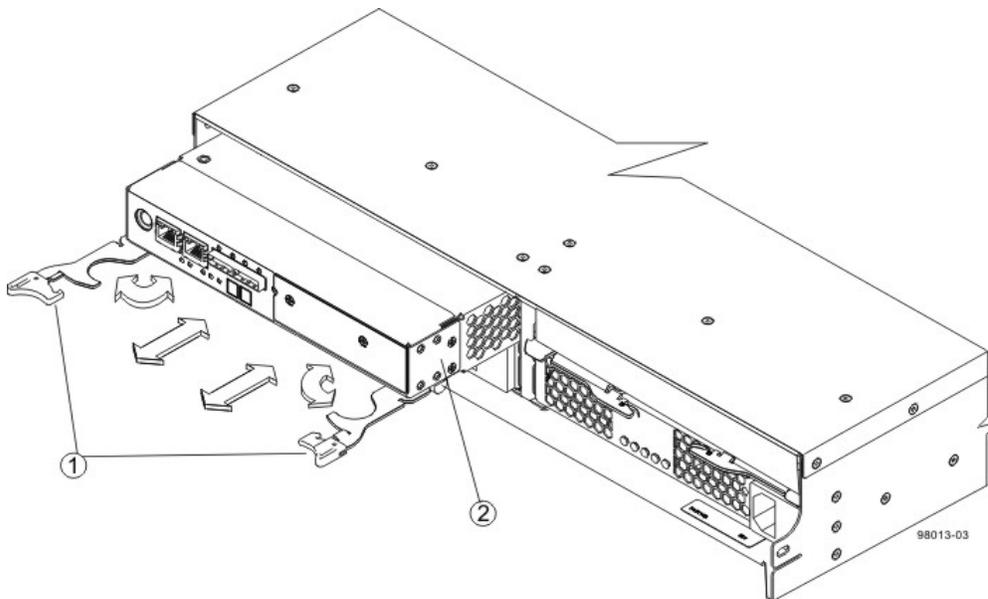
If fiber-optic cables are present, you can lift the two release levers and partially remove the controller CRU. Opening these release levers makes it easier to press down on the fiber-optic cable release tab.



ATTENTION Possible equipment damage – The controller slot cannot remain open for more than three minutes because of the possibility of overheating the equipment. The controller air blocker fills the controller slot so that the equipment will not overheat.

9. Remove the controller CRU (Figure 2).
 - a. Unlock and pull out the release levers to release the controller CRU.
 - b. Using the release levers and your hands, pull the controller CRU out of the array module.
 - c. Set the controller CRU on a flat, static-free surface near the array module. Position the controller CRU so that you can access the top cover.

Figure 2 Removing and Reinstalling Controller CRU



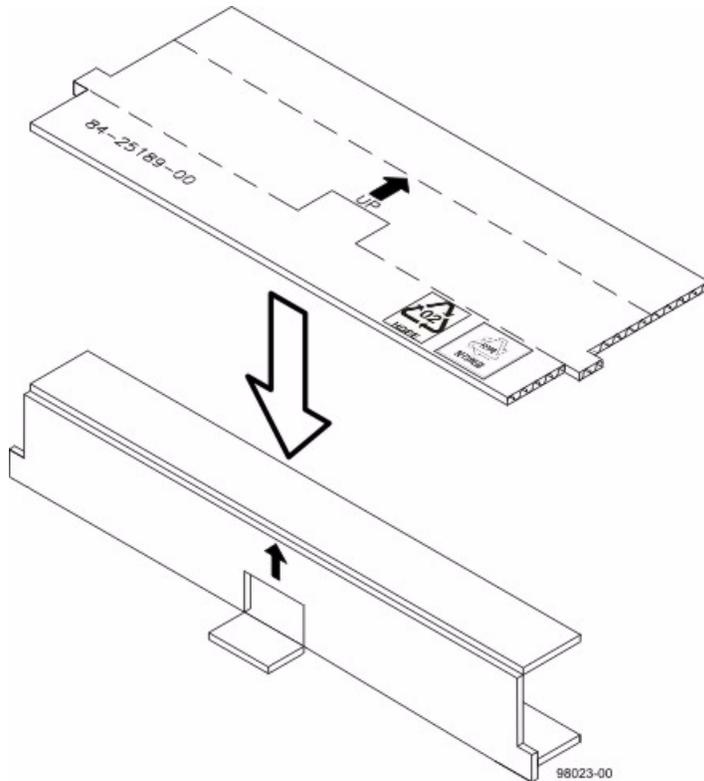
1. Release Levers
2. Controller CRU



NOTE Figure 2 shows controller A being removed. You remove controller B in the same way.

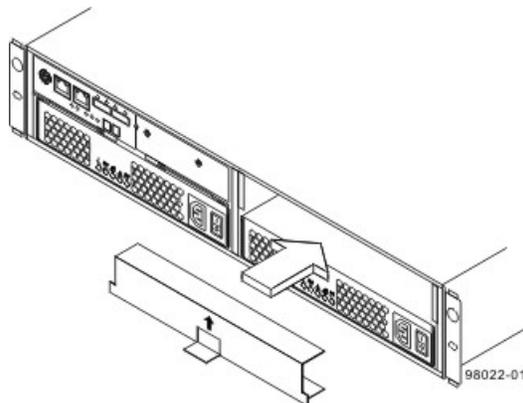
10. Prepare the controller air blocker by removing it from its packaging and folding it inward at right angles so it is ready to insert into the open controller slot ([Figure 3](#)).

Figure 3 Controller Air Blocker

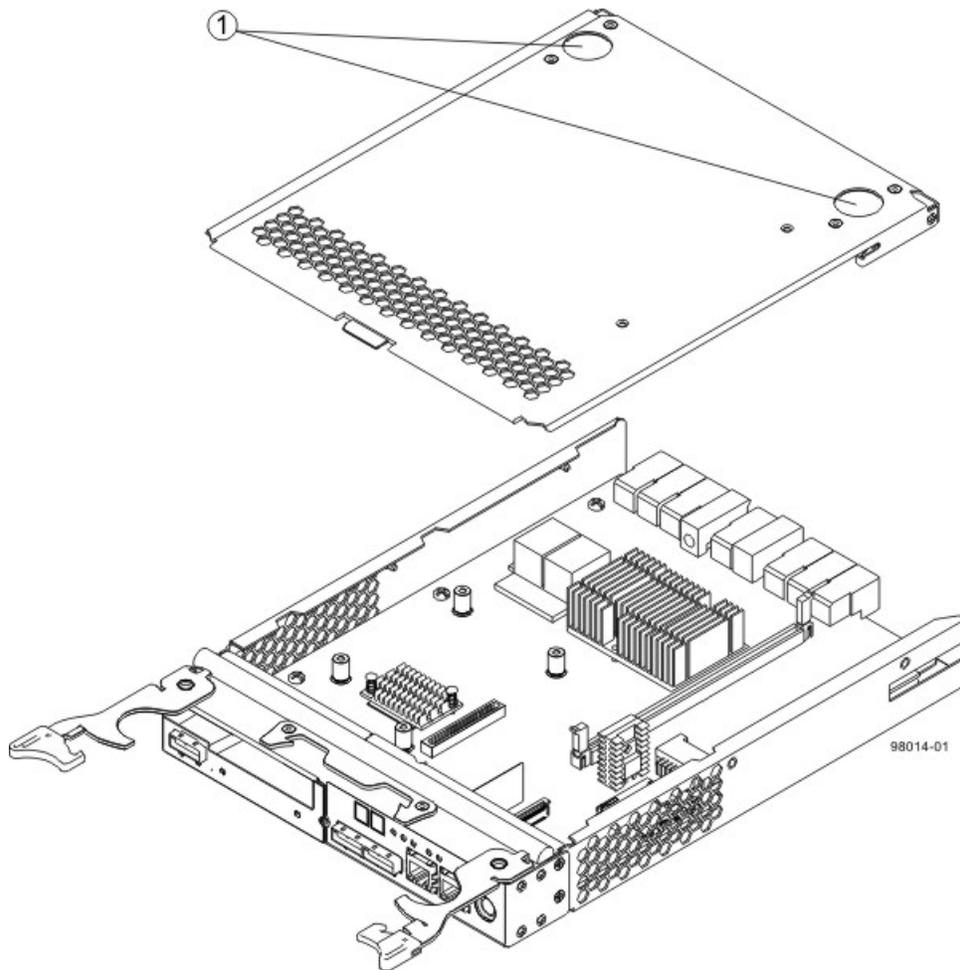


11. Insert the controller air blocker into the open controller slot to make sure the correct airflow is maintained ([Figure 4](#)).

Figure 4 Inserting the Controller Air Blocker into the Open Controller Slot



12. On the controller CRU, press down on both of the top cover latch buttons, and slide the top cover to the rear ([Figure 5](#)).

Figure 5 Controller Cover and Internal Parts

1. Top Cover Latch Buttons

13. Remove the top cover from the controller CRU.

14. Perform one of these actions:

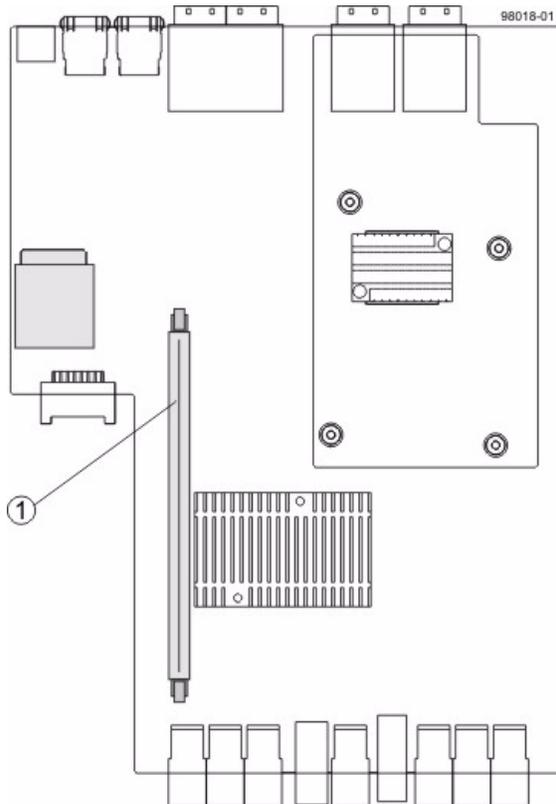
- **You are replacing a failed cache memory DIMM** – Go to [Replacing a Cache Memory DIMM](#) on page 6.
- **You are replacing a failed cache backup memory device** – Go to [Replacing a Cache Backup Memory Device](#) on page 7.

Replacing a Cache Memory DIMM

The replacement cache memory DIMM must be the same capacity as the failed cache memory DIMM.

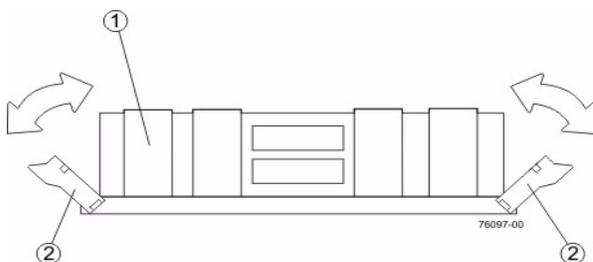
1. Locate the cache memory DIMM that you want to replace as described in step 6 in [Removing a Controller CRU from the ST2500 M2 Array Module](#) on page 1.

Figure 6 Cache Memory DIMM Slot – Top View



1. Cache Memory DIMM Slot
2. Remove the cache memory DIMM from the slot on the controller card ([Figure 7](#)).
 - 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.

Figure 7 Removing a Cache Memory DIMM



1. Cache Memory DIMM
2. Ejector Handles

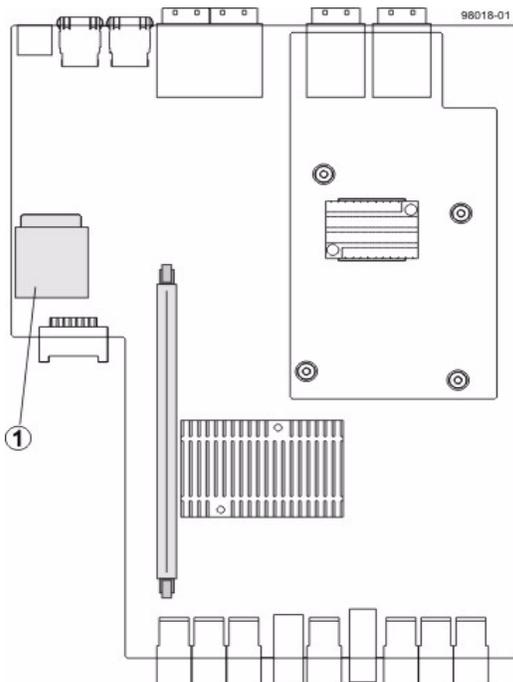
3. Place the cache memory DIMM that you removed you removed on a flat, static-free surface.
4. Install the new cache memory DIMM.
 - a. Align the new cache memory DIMM in the slot.
 - b. Gently push down on the cache memory DIMM to seat the pins into the slot.
The ejector handles rise up as the cache memory DIMM is inserted into the slot. When these ejector handles are in the vertical position, the cache memory DIMM is fully engaged and is locked in place.
5. Perform one of these actions:
 - **You also are replacing the cache backup memory device** – Go to [Replacing a Cache Backup Memory Device](#).
 - **You are not replacing the cache backup memory device** – Go to [Reinstalling the Controller CRU in the ST2500 M2 Array Module](#) on page 8.

Replacing a Cache Backup Memory Device

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 ST2500 M2 Array Module](#) on page 1.

Figure 8 Cache Backup Memory Device – Top View



1. Cache Backup Memory Device
2. Remove the failed cache backup memory device from the controller CRU.
 - a. Release the cache backup memory device by gently pushing the memory farther into the slot. The slot will release the cache backup memory device and push the memory out of the slot.
 - b. Carefully pull the cache backup memory device free from the slot.

3. Install the new cache backup memory device.
 - a. Unwrap the new cache backup memory device.
 - b. Install the new cache backup memory device into the empty slot location by pressing the cache backup memory device into the slot until the memory is fully seated.
4. Go to [Reinstalling the Controller CRU in the ST2500 M2 Array Module](#).

Reinstalling the Controller CRU in the ST2500 M2 Array Module

1. Reinstall the top cover on the controller CRU by sliding it forward until the top cover latch buttons click.
2. Remove the controller air blocker.
3. Slide the controller CRU all of the way into the array module. Rotate the release levers towards the center of the controller CRU to lock the controller CRU into place.
4. Reconnect the following cables to the appropriate ports on both controller CRUs.
 - Host interface cables
 - Drive interface cables
 - Ethernet cables
5. Go to [Bringing the Controller CRU Online](#).

Bringing the Controller CRU Online

1. Bring the controller online.

Use either the GUI (first bullet) or the CLI (second bullet) to bring the controller online.

 - In the Physical Pane, select the controller, and select **Advanced >> Recovery >> Place Controller >> Online**.
 - `set controller [(a | b)] availability=online;`
2. Look at the LEDs on the controller CRU to make sure that the controller is booting correctly.

The LEDs come on and go off intermittently for approximately 60 seconds (possibly longer). After this time, you are able to discover the controller by using the storage management software.
3. 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 5.
 - **Any of the Service Action Required LEDs is on** – Check that the controller CRU has been installed correctly. Reinstall the controller CRU if necessary. Go to step 4.
4. Did this action correct the problem?
 - **Yes** – Go to step 5.
 - **No** – If the problem is not resolved, contact your Sun Customer Care Center representative.
5. Using the LEDs and the storage management software, check the status of all of the modules in the storage array.
6. 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 7.
7. Remove the antistatic protection.
8. Create, save, and print a new storage array profile.

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