IBM System Storage DS4800 Controller Cache Upgrade Kit Instructions

Getting started

The IBM® System Storage™ DS4800 Controller Cache Upgrade Kit enables you to upgrade the DS4800 controller memory cache either in the DS4800 storage subsystem models 82A/H to 4 GB of memory cache per controller or in the DS4800 storage subsystem models 82A/H and 84A/H to 8 GB of cache memory per controller. There are three DS4800 controller cache upgrade options that are available from IBM:

- DS4800 Model 82A/H Cache upgrade to 8 GB. This option upgrades the DS4800 controllers with 2 GB of cache memory per controller to DS4800 controllers with 4 GB of cache memory per controller.
- DS4800 Model 82A/H Cache upgrade to 16 GB. This option upgrades the DS4800 controllers with 2 GB of cache memory per controller to DS4800 controllers with 8 GB of cache memory per controller.
- DS4800 Model 84A/H Cache upgrade to 16 GB. This option upgrades the DS4800 controllers with 4 GB of cache memory per controller to DS4800 controllers with 8 GB of cache memory per controller.

Important:
- The machine type and model for the DS4800 are printed on the product label affixed to the DS4800 storage subsystem chassis. As a result, the label that identifies this information does not change when you perform a DS4800 controller upgrade. However, after you upgrade the controller cache, the DS4800 storage subsystem functions as and is treated as the DS4800 model with the cache memory to which you have upgraded. If you perform a future controller replacement, ensure that you identify the correct controller part number for your DS4800 and mention that you have previously upgraded the DS4800 storage subsystem controllers.
- Whenever you add options to your DS4800 storage subsystem, be sure to update the MAC information in Appendix A of the *DS4800 Storage Subsystem Installation, User's, and Maintenance Guide*.

Attention: Do not dispose of the DS4800 controller CRUs that you replace with the controller CRUs in this upgrade kit. If separate return processing instructions for the DS4800 controller CRUs you replace are included with this upgrade kit, follow the instructions to return the replaced controllers.

The DS4800 Model 82A/H Cache upgrade to 8 GB Upgrade Kit contains the following:
- Two controllers with 4 GB of cache per controller (Part Number: 22R4269)
- *DS4800 Controller Cache Upgrade Kit Instructions*
- *DS4800 Controller Label Kit and Installation Instructions*

The DS4800 Model 82A/H Cache upgrade to 16 GB and the DS4800 Model 84A/H Cache upgrade to 16 GB Upgrade Kit contain the following:
- Two controllers with 8 GB of cache per controller (Part Number: 39M5873)
- *DS4800 Controller Cache Upgrade Kit Instructions*
- *DS4800 Controller Label Kit and Installation Instructions*

Before you upgrade the controller cache in your existing DS4800 storage subsystems, perform the following steps:

1. Save the DS4800 storage subsystem profile. Store the profile in a different location than the disks that are attached to the DS4800 storage subsystem to be upgraded. Also, save the configuration of the setup, including the topology and logical drives to logical unit number (LUN) mapping. Refer to the online help in the Subsystem Management window for instructions on how to save the subsystem profile and configuration information.

2. Perform a full system backup.

3. Upgrade the DS Storage Manager client host software to DS Storage Manager version 9.15 or later and the DS4800 storage subsystem controller firmware to version 06.15.xx.xx or higher.

4. Upgrade the DS4000™ drive expansion enclosure ESM firmware version of the existing DS4000 drive expansion enclosures to the latest levels that are posted on the IBM System Storage Disk Storage Systems Web site:

   www.ibm.com/systems/support/storage/disk

5. Verify that both of the DS4800 storage subsystem power supply fan units are plugged in, powered on, and in optimal state. Use the DS Storage Manager client host software to verify that the DS4800 storage subsystem is in optimal state.

6. If the DS4800 host ports are connected to a FC switch, use the switch monitor tool to make sure that the DS4800 host ports and the server FC host bus adapter (HBA) ports are operating optimally. No unexpected port log-out and log-in events should be reported. If there are any, make sure that the cause or causes of these events are corrected before starting the DS4800 controller cache upgrade.

7. Verify that the premium feature keys are available. Also, locate all premium feature and entitlement proofs of purchase and ensure that they can be accessed when needed.

8. Have the *DS4800 Storage Subsystem Installation, User's, and Maintenance Guide* available for reference. This upgrade procedure may refer to specific sections in the *DS4800 Storage Subsystem Installation, User's, and Maintenance Guide*. A hard copy of this guide was included in the original DS4800 shipment. The guide is also available in PDF format on the IBM System Storage Disk Storage Systems Web site:

   www.ibm.com/systems/support/storage/disk

9. If you use out-of-band (direct) management and assign IP addresses to the DS4800 controllers using Dynamic Host Configuration Protocol (DHCP) based on the DS4800 controller MAC addresses, you must upgrade your DHCP server with the new MAC addresses for the replacement DS4800 controllers in the upgrade kit.

Upgrade procedure

Attention: Do not attempt to upgrade the controllers by powering down the DS4800 first. Doing so could result in a lost configuration after the DS4800 is powered back on if the firmware levels of the controllers do not match exactly.

To perform an upgrade, do the following steps.

1. Perform all of the prerequisite tasks. See "Upgrade preparations requirements" on page 2.

2. Make sure that both power supply-fan CRUs are plugged-in, powered on, and optimal. Verify the status of the power supply-fan CRUs status using the LEDs on the CRUs and the DS4800 Subsystem Management window in the DS Storage Manager client program. Make sure that there are not any Needs Attention LEDs lit and the status of the DS4800 storage subsystem is displayed as Optimal in the DS4800 Subsystem Management window.

Important Do not proceed with the upgrade procedure if both power supply-fan CRUs are not optimal.

3. Upgrade the DS4800 storage subsystem controller firmware and NVSRAM with the latest version from the IBM System Storage Disk Storage Systems Web site:

   www.ibm.com/systems/support/storage/disk

   Check the readme file for any prerequisites that need to be performed—such as whether a certain version of ESM firmware or hard drive firmware is required—before applying the firmware and NVSRAM upgrade.

4. In the DS4800 Subsystem Management window, place controller B to Offline state. Wait a few minutes and verify the Needs Attention and the Service Action Allowed LEDs on the controller B CRU are lit. If the Service Action Allowed LED is not lit, it means that there is another component failure in the DS4800 storage subsystem and removing the controller B CRU from the DS4800 chassis might cause the DS4800 to be powered down. Use the Recovery Guru menu icon in the DS4800 Subsystem Management window to correct any errors or faults before proceeding to the next step. Call IBM Support if needed.

5. Put on antistatic protection.

6. Disconnect all attached interface cables from controller B (bottom controller), including the SFP modules. Ensure that you label all cables so that you can reconnect them correctly to the new controller. Figure 1 shows the location of the connectors on the back of a controller.
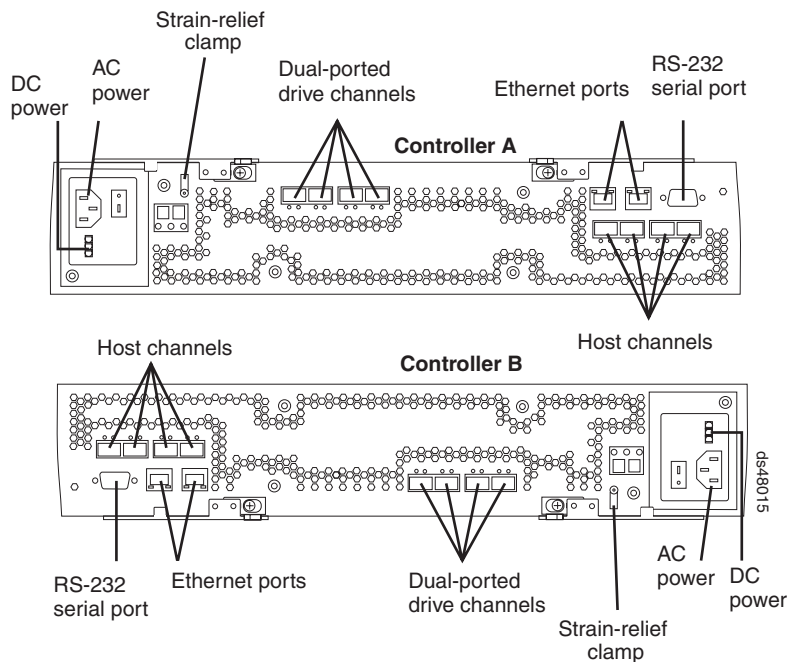

Figure 1. Controller connections

7. Use the following procedure to remove the SFPs:

   Statement 3:

CAUTION:
When laser products (such as CD-ROMs, DVD drives, fiber optic devices, or transmitters) are installed, note the following:

- **Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.**

- **Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.**

DANGER

> **Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following.**
>
> **Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.**

a. Remove the LC-LC fibre channel cable from the SFP module.

b. Unlock the SFP module latch:

- For SFP modules that contain plastic tabs, unlock the SFP module latch by pulling the plastic tab outward 10°, as shown in Figure 2.
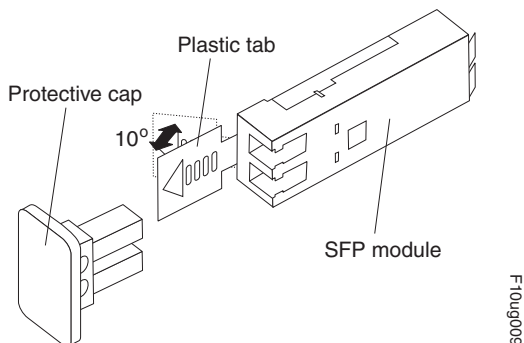

Figure 2. Unlocking the SFP module latch - plastic variety

- For SFP modules that contain wire tabs, unlock the SFP module latch by pulling the wire latch outward 90°, as shown in Figure 3.
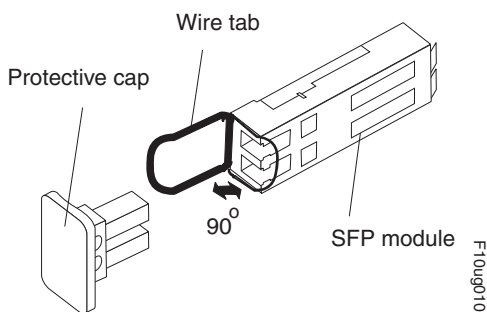

Figure 3. Unlocking the SFP module latch - wire variety

    c. With the SFP latch in the unlocked position, extract the SFP module.

- For SFP modules that contain plastic tabs, slide the SFP module out of the port.
- For SFP modules that contain wire tabs, grasp the wire latch and pull the SFP module out of the port.

    d. Replace the protective cap on the SFP module.

    e. Place the SFP module into a static-protective package.

    f. Replace the protective cap on the port.

8. Remove the strain-relief nut and cable strain-relief clamp from the RAID controller.

9. Unplug the power cord from the electrical outlet and then disconnect the power cord from the AC power connector on controller B (bottom controller).

10. Release the controller levers and remove controller B (bottom controller) from the DS4800 chassis. Figure 4 shows the controller sliding from the storage subsystem chassis. Refer to "Releasing a component lever" in the *DS4800 Storage Subsystem Installation, User's, and Maintenance Guide* for more information on unlatching and removing the controller from the DS4800 chassis.
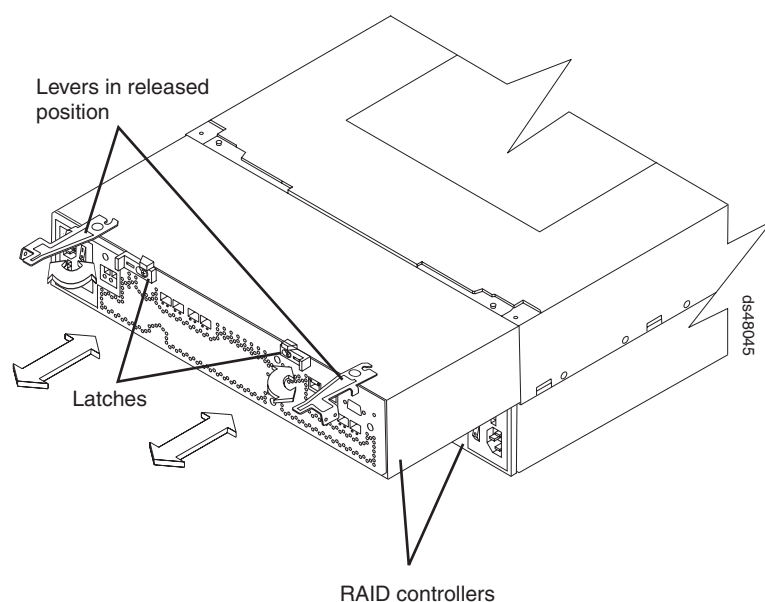

Figure 4. Removing a controller from the DS4800

11. Unpack the new controller. Save all packing materials in the event you need to return the replaced controller.

12. Using the provided label placement instructions and the controller label kit, apply the controller labels for host channels, drive channels, power inputs, and numeric display to the replacement controller. Make sure that you use the correct labels for the controller that you replaced. (Note that controller A is the top controller, controller B is the bottom controller). Ensure the labels are aligned properly and do not cover any ports or LEDs.

13. Install the new DS4800 controller in the storage subsystem.

    a. Carefully position the controller at the back of the storage subsystem chassis. Ensure that the controller can slide into the storage subsystem chassis without obstruction.

    b. With the left and right levers rotated out perpendicular to the face of the controller, slide the back of the controller into the appropriate slot.

    c. Push on both sides of the controller so that it slides into the slot evenly. Stop inserting the controller when it is about 1 inch from being fully inserted into the slot. With the controller not fully inserted in the slot, attach all the SFPs and cables that you disconnected from the controller in step 6 on page 3.

1) Replace the SFPs into the appropriate ports. See "Installing SFP modules" in the *DS4800 Storage Subsystem Installation, User's, and Maintenance Guide*.

   2) Reconnect all cables, including all host and drive channel cables and secondary cables (such as Ethernet connections).

   d. Holding both levers, slowly push the controller until the notches in both the left and right levers are aligned with the pins on the DS4800 enclosure so that the controller is pulled evenly into the DS4800 storage subsystem chassis, ensuring full electrical connection contact on all interface pins.

   Attention: Verify that the controller does not snag any other DS4800 cables when you slide it into the controller bay.

   e. Press the controller fully into the slot, engaging the pins on the enclosure.

   f. Hold open both latches and push both left and right levers simultaneously to the closed position. Release the latches. When you release the latches, you should hear both latches snap over the levers, indicating that the component is locked in place.

14. Wrap the strain-relief clamp around the power cord approximately 20 cm (8 in.) from the controller connection end. Leave some slack between the clamp and the controller end of the power cord. Replace the strain-relief nut and tighten it securely to secure the clamp to the controller.

15. If you use out-of-band (direct) management and assign IP addresses to the DS4800 controllers using Dynamic Host Configuration Protocol (DHCP) based on the DS4800 controller MAC addresses, you must upgrade your DHCP server with the new MAC addresses for the replacement DS4800 controllers in the upgrade kit. You can find the MAC addresses on the controller near the Ethernet ports. Figure 5 shows the location of the MAC address labels.
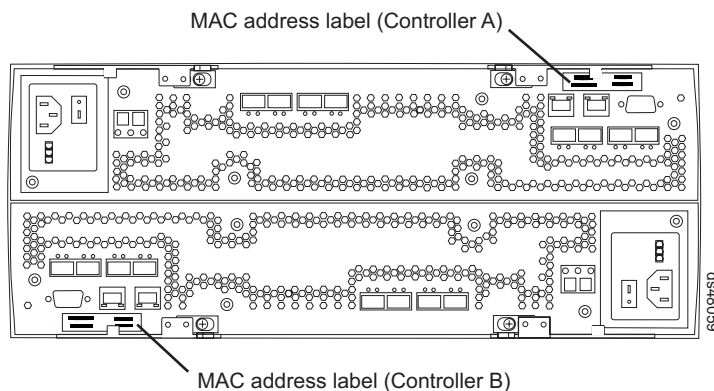
MAC address label (Controller A)

MAC address label (Controller B)

Figure 5. MAC address labels on DS4800 RAID controllers

Make sure that the DHCP record changes are in effect.

16. Connect the power cord to the bottom controller AC power connector. Plug the power cord into a properly grounded electrical outlet. Flip the power switch to the on position if required.

17. The newly inserted controller will be in offline state with the controller Needs Attention and Service Action Allowed LEDs lit. Refer to the DS Storage Manager client program online help for instructions on bringing the controller online. For example, in the DS Storage Manager client Subsystem Management Window, select the offline controller and click **Advanced > Recovery > Place controller online**.

18. Wait up to 10 minutes for the DS4800 controller to be online and the DS Storage Manager client software to recognize the new controller. (The amount of time it takes depends on the number of drives in the configuration, the I/O loads to the DS4800 subsystem, and whether the new controller's firmware and NVSRAM are automatically synchronized with old controller's firmware and NVSRAM.)

19. Verify the state of the LEDs on the newly inserted controller. See "RAID controller LEDs" in the *DS4800 Storage Subsystem Installation, User's, and Maintenance Guide*. Also verify the LEDs status of the power supply-fans CRUs. There should be no Needs Attention LEDs lit. The Batteries Charging

LEDs will be flashing. Make sure that the Needs Attention and Service Action Allowed LEDs on the controller are not lit, and the new controller numeric display LEDs display the same numeric value (DS4800 enclosure ID) as the existing (old) controller numeric display LEDs. This value is normally set to 85 unless it has been changed.

20. Use the DS Storage Manager client Subsystem Management Window to check the status of all components in the storage subsystem.
    - If the new controller is online and the DS Storage Manager client Subsystem Management Window indicates normal operation, go to step 23.

      Important: Do not go to step 23 if the new controller is not online.
    - If the new controllers are online and the DS Storage Manager client Subsystem Management Window indicates a problem status, go to "Troubleshooting the storage subsystem" in the *DS4800 Storage Subsystem Installation, User's, and Maintenance Guide*.
    - If the new controller is offline, go to step 17 on page 6. If the problem persists, call IBM Support for assistance.

21. If the fibre channel (FC) switch zoning is configured with the DS4800 controller WWNN, make modifications to FC switch zone tables to reflect the WWNN of the new controller before they can be seen by the fibre channel host bus adapters (HBAs) in the host servers. Ensure that the new FC switch zone tables are activated before proceeding to step 22.

22. Use the DS Storage Manager client Subsystem Management Window to perform Logical Drives Redistributing. If the logical drives do not redistribute between the controllers, do not proceed with controller A replacement. Determine why the logical drives did not redistribute. For example, this might include verifying that controller B is online and optimal, verifying fibre channel cabling between the host servers and controller B are connected, and verifying fibre channel switch zoning is updated. Contact IBM Support if necessary.

23. Wait approximately 5 minutes after the successful completion of the logical drives redistributing and repeat steps 4 on page 3 through 22 to upgrade controller A (top controller).

    Important: Do not perform this step if controller B is not in optimal state and step 22 was not completed successfully. Otherwise, loss of data access might occur.

24. Remove the antistatic protection.

25. Use the DS Storage Manager client software to print a new storage subsystem profile.

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