IBM System Storage DS4800 Storage Subsystem Installation and Cabling Overview

Table 1 summarizes the steps required to correctly install, cable, and power on your IBM® System Storage™ DS4800 storage subsystem. Unless otherwise stated, all the following tasks are detailed in the sections referenced in the *IBM System Storage DS4800 Storage Subsystem Installation, User's, and Maintenance Guide*. Review the multilingual *IBM Safety Information* document and read all safety information in the *IBM System Storage DS4800 Storage Subsystem Installation, User's, and Maintenance Guide* before you begin the installation.

Attention: Before powering on the DS4800, the storage subsystem must be cabled to at least one storage expansion enclosure populated with at least two drives. If at least two drives are not installed in each attached enclosure when you power on the DS4800, your standard storage partition key will be lost and must be regenerated. In addition, the resulting insufficient load to the enclosure power supplies might cause them to intermittently appear as failed, falsely indicating the power supplies are bad. All drives in the connected enclosure or enclosures must contain no prior configuration data.

Table 1. Installation tasks

	Task	Detailed description in section entitled
1	Review the DS4800 installation recommendations and requirements.	"Preparing for installation" in Chapter 2 "Handling static-sensitive devices" in Chapter 2
2	Fold down and open the sides of the shipping box. Without removing the DS4800 from the box, you can remove the DS4800 rack mounting rails and hardware from the box. Install the support rails in the rack cabinet.	"Installing the support rails" in Chapter 2
3	Before removing the DS4800 from the shipping box, remove the components to lighten the unit.	"Removing the components" in Chapter 2
4	Record the serial number, machine type, model number, and RAID controller MAC addresses for your DS4800.	Appendix B, "Records,"
5	Install and secure the DS4800 chassis in the rack cabinet.	"Installing the DS4800 on the support rails" in Chapter 2
6	Replace the components in the installed DS4800 chassis.	"Replacing the components" in Chapter 2
7	Install in the rack cabinet the DS4000 storage expansion enclosures you will cable to the DS4800.	Installation, User's, and Maintenance Guide for your DS4000 storage expansion enclosure.
8	Use SFP modules and FC cables to cable the DS4800 to at least one DS4000 storage expansion enclosure.	"Connecting storage expansion enclosures" in Chapter 3

Table 1. Installation tasks (continued)

	Task	Detailed description in section entitled
9	(If applicable) After you cable the DS4000 storage expansion enclosures, set the enclosure IDs of any storage expansion enclosures in the DS4800 configuration that require their enclosure IDs to be manually set. Ensure that all enclosures, including the DS4800 Storage Subsystem, have a unique drive enclosure ID, including a unique value in the singles digit (x1). For example, enclosure IDs for EXP710 storage expansion enclosures must be set manually while enclosure IDs for EXP810 storage expansion enclosures are automatically set by the controller.	"Storage expansion enclosure settings" in Chapter 3
10	For out-of-band management: Cable the DS4800 Ethernet ports to either the management workstation or to the hosts.	"Connecting secondary interface cables" in Chapter 3
	For in-band management: Cable the DS4800 host channels to the FC HBAs in either the hosts or the FC switch that connects to the host FC HBAs.	"Connecting hosts to the DS4800" in Chapter 3
11	Connect the power cables for the DS4800.	"Connecting the power cables" in Chapter 3
12	Power on the attached storage expansion enclosures and the DS4800 storage subsystem.	"Turning on the storage subsystem" in Chapter 4
13	Review the controller firmware, ESM and storage manager host software requirements. Obtain the required code if needed.	"Firmware requirements" in Chapter 4
14	Install the DS4000 Storage Manager 9.19 host software on the management workstation (for out-of-band management) or on the host (for in-band management). Use the DS4000 Storage Manager software to verify the configuration.	*IBM DS4000 Storage Manager 9 Installation and Support Guide* for your operating system.
15	Review and perform the DS4000 Health Check process.	"Performing the DS4000 Health Check process" in Chapter 4

The following illustrations and instructions provide a very brief overview of the cabling tasks required after you install the DS4800 in a rack cabinet. Review the following sections and then follow the instructions provided in the *IBM System Storage DS4800 Storage Subsystem Installation, User's, and Maintenance Guide*.
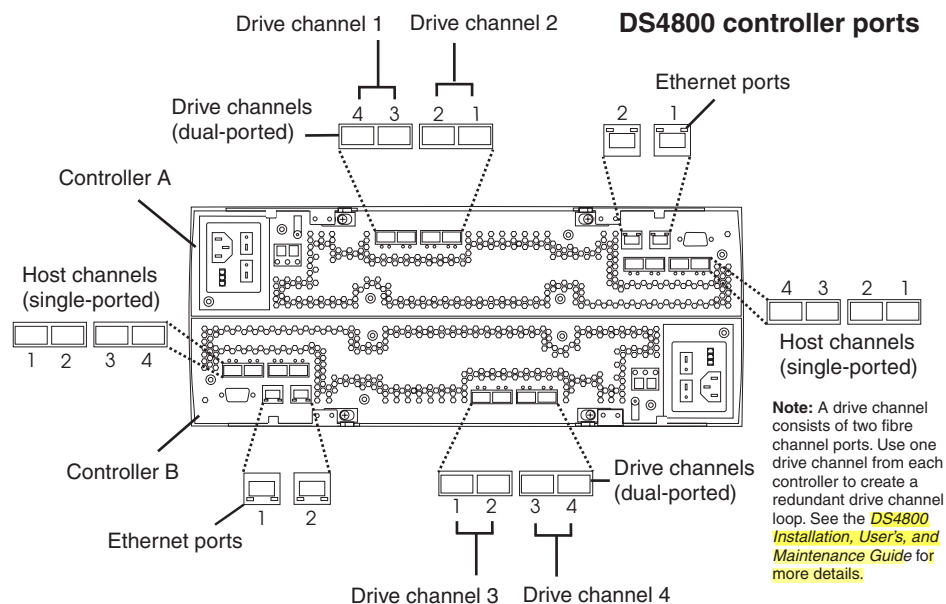
Figure 1. DS4800 controller ports

Installing Small Form-Factor Pluggable (SFP) modules and fibre channel cables

Statement 3:

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.

All host and drive cabling connections require you to use SFP modules in the DS4800 host and drive channels used by the cabling connections. The SFP module housing and fibre channel cable have integrated guide keys that prevent you from inserting these devices incorrectly. Insert SFP modules into ports with minimal pressure so that you do not damage either the SFP module or the port. You can insert an SFP module into an active port without affecting the operational loop performance. You must connect the fibre channel cable to the SFP module after you insert the SFP module into the port.

Attention: To avoid damage to your fibre-optic cables:
- Do not route the cable along a folding cable-management arm.
- Route the cable away from places where it can be damaged by other devices in the cabinet.
- For devices on slide rails, leave enough slack in the cable so that it does not bend to a diameter of less than 76 mm (3 in.) or a radius less than 38 mm (1.5 in.) when extended or become pinched when retracted.
- Do not use plastic cable ties in place of the provided cable straps.
- Do not put excess weight on the cable at the connection point. Be sure that the cable is well supported.

To install an SFP module and fibre channel cable:

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1. Remove the protective caps from the SFP module and from the fibre channel cable. Do not touch the exposed fibre-optic cable.
2. Insert the SFP module into a DS4800 controller port.
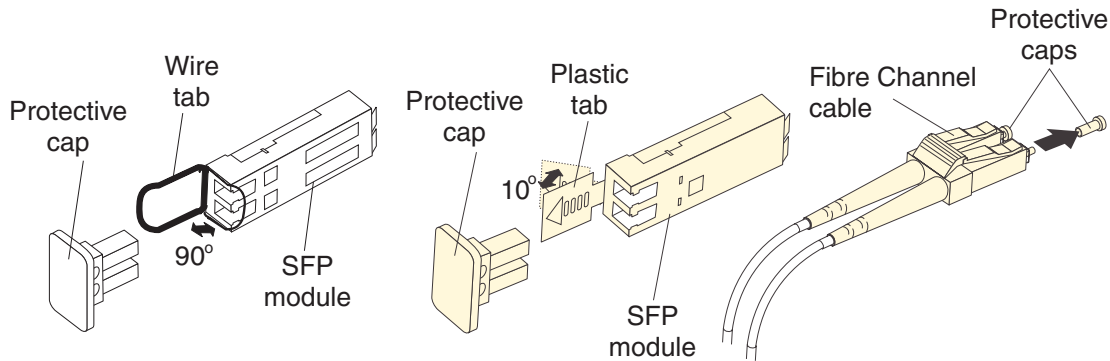3. Connect the fibre channel cable to the SFP module.

Figure 2. Connecting fibre channel to the SFP module

Redundant drive-side fibre channel cabling

Attention: Before powering on the DS4800, the storage subsystem must be cabled to at least one storage expansion enclosure populated with at least two drives. All drives in the connected enclosure or enclosures must contain no prior configuration data.

The *IBM System Storage DS4800 Storage Subsystem Installation, User's, and Maintenance Guide* describes the importance of redundant cabling and provides redundant cabling diagrams for connecting DS4000 storage expansion enclosures to your DS4800. Refer to "Connecting storage expansion enclosures to the DS4800" in chapter 3, which provides diagrams of recommended topologies for single and multiple storage expansion enclosures. To ensure the optimal drive channel performance, please review the instructions, and particularly the Attention information, before starting to cable the storage expansion enclosures to the DS4800.

shows the recommended redundant cabling topology for attaching a single DS4000 EXP710 to the DS4800 storage subsystem. The topology shown uses ports from drive channels 1 (on controller A) and 3 (on controller B) to achieve a redundant connection to the DS4000 storage expansion enclosure.
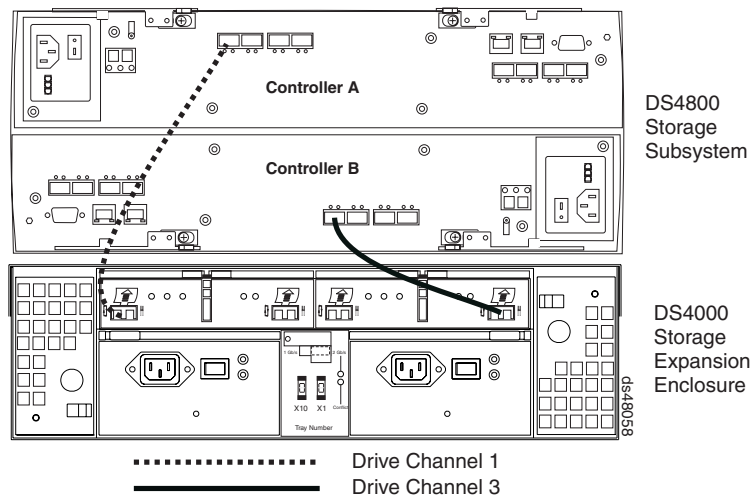
Figure 3. Recommended cabling for a single EXP710 to the DS4800

shows the recommended redundant cabling topology for attaching multiple DS4000 EXP710s to the DS4800. The topology shown uses ports from drive channels 1 (on controller A) and 3 (on controller B) to achieve a redundant connection to the DS4000 storage expansion enclosure.
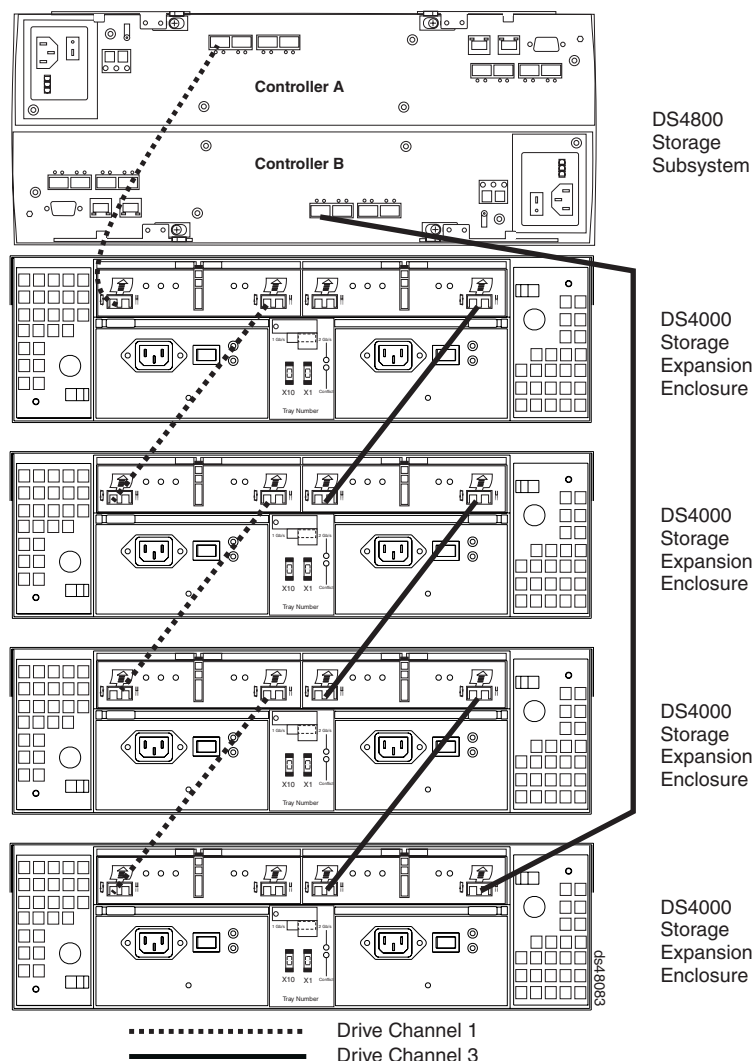
Figure 4. Recommended cabling for multiple EXP710s to the DS4800

Note: For specific cabling instructions for connecting all *supported* storage expansion enclosures to the DS4800, see "Connecting storage expansion enclosures to the DS4800" in chapter 3 in the *IBM System Storage DS4800 Storage Subsystem Installation, User's, and Maintenance Guide*.

DS4000 storage expansion enclosure support

The DS4800 supports a maximum of 224 drives in two redundant drive channel pairs. The DS4800 storage subsystem enables you to mix certain storage expansion enclosure models in the same configuration. In some cases, to intermix storage expansion enclosure models you must meet additional requirements, such as firmware updates or grouping restrictions. To intermix fibre channel and SATA drives, you must purchase the FC/SATA Enclosure Intermix premium feature. Refer to the *IBM System Storage DS4000 Hard Drive and Storage Expansion Enclosure Installation and Migration Guide* for complete information on enclosure support and intermixing requirements for the DS4800 storage subsystem.

Redundant host-side fibre channel cabling

The DS4800 supports redundant connections to up to four hosts. To ensure full protection against the loss of any one fibre channel path from the host servers to the DS4800 storage subsystem, always use redundant host connections by connecting each host to the appropriate single-ported host channels on both RAID controllers A and B.

1. To connect the first host server to the DS4800, connect one host server FC host adapter to host channel 1 of controller A (top), and connect the other host server FC host adapter to host channel 1 of controller B (bottom).

2. To connect additional redundant hosts, connect the two host server FC host adapters to the next host channels on each controller (A and B), as shown in Figure 5.
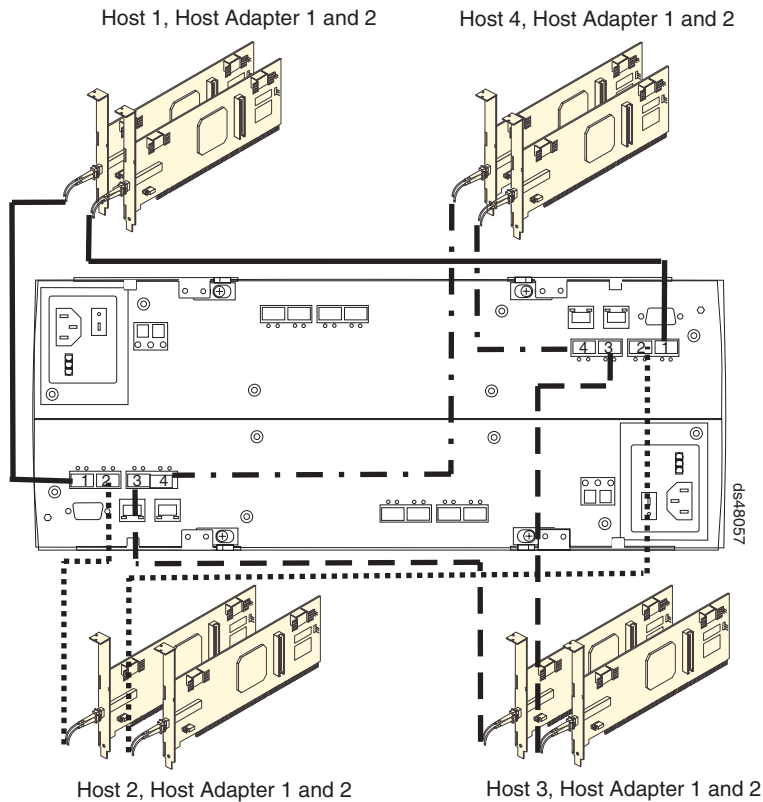
Host 1, Host Adapter 1 and 2   Host 4, Host Adapter 1 and 2

Host 2, Host Adapter 1 and 2   Host 3, Host Adapter 1 and 2

Figure 5. Redundant host-side fibre channel cabling topology

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