

IBM TotalStorage DS4000 Fibre Channel and Serial ATA Intermix Premium Feature Installation Overview



Note: For the most current information on the DS4000 Fibre Channel and Serial ATA (FC/SATA) Enclosure Intermix premium feature, see the IBM® TotalStorage® Support Web site:

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

The DS4000 FC/SATA Intermix premium feature supports the concurrent attachment of Fibre Channel and SATA storage expansion enclosures to a single DS4000 controller configuration. With this premium feature, you can create and manage distinct arrays that are built from either Fibre Channel disks or SATA disks and allocate logical drives to the appropriate applications using a single DS4000 Storage Subsystem.

- | The TotalStorage DS4500, DS4400, and DS4300 with Standard/Base or Turbo options storage subsystems with this premium feature can support the attachment of DS4000 EXP700 and EXP710 Fibre Channel Disk Expansion enclosures and DS4000 EXP100 Serial ATA Disk Expansion enclosures concurrently. The
- | TotalStorage DS4800 with this premium feature supports the attachment of DS4000 EXP710 Fibre Channel
- | and EXP100 SATA drive expansion enclosures concurrently. Please contact IBM for information regarding future DS4000 Storage Subsystem support.

The FC/SATA Intermix premium feature requires that you upgrade the DS4500, DS4400, or DS4300 Turbo Storage Subsystems to DS4000 Storage Manager version 9.10 or later (controller firmware level 6.10.10.xx or later) in the upgrade sequence in these instructions. The DS4800 is shipped with controller firmware version 06.14.xx.xx or later and the required DS4000 storage manager version 9.14 or later, so no upgrades would be required for the DS4800.

The FC/SATA Intermix Option installation kit includes the following items:

- This publication, the *IBM TotalStorage DS4000 Fibre Channel and Serial ATA Intermix Premium Feature Installation Overview*
- The DS4000 FC/SATA Intermix premium feature entitlement document
- The DS4000 FC/SATA Intermix premium feature activation document, which includes the feature activation code and the instructions about how to generate the key file
- The DS4000 Storage Server NVSRAM Support for DS4000 FC/SATA Enclosure Intermix CD

Note: The NVSRAM file in this CD is for the DS4000 Storage Subsystems with controller firmware version 06.10.xx.xx only. Do not use this NVSRAM file if the DS4000 Storage Subsystems have controller firmware version 06.12.xx.xx or later installed. Use the NVSRAM files that are packaged with the version 06.12.xx.xx or later DS4000 Storage Subsystem controller firmware packages instead.

The FC/SATA Intermix premium feature installation

To use the FC/SATA Intermix premium feature upgrade, perform the following steps:

1. Purchase an IBM TotalStorage DS4000 Fibre Channel/SATA Intermix entitlement. Contact your IBM reseller or representative for additional information.
2. Upgrade your DS4000 ESM firmware to the level that is compatible with each particular enclosure type.

Attention: You should perform any ESM code upgrades that are required before you perform any other code upgrades.

Table 1 indicates which ESM firmware levels are compatible with each enclosure type:

Table 1. ESM firmware levels by storage expansion enclosure type

Storage expansion enclosure type	ESM firmware level
DS4000 EXP100	9554 (See note a below)
DS4000 EXP700	9326 or later (See notes b and c below)
DS4000 EXP710	9627 or later (See note d below)

Notes:

- a. You must upgrade the EXP100 ESM firmware to version 9554 first on those DS4000 Storage Subsystems on which the controller firmware version 05.41.1x.xx is installed. The EXP100 ESM firmware cannot be upgraded to version 9554 on those DS4000 Storage Subsystems on which other versions of controller firmware are installed.
- b. You must upgrade the EXP700 ESM firmware to version 9326 before you upgrade the DS4000 Storage Subsystem controller firmware to version 06.1x.xx.xx.
- c. The DS4800 Storage Subsystem does not support DS4000 EXP700 drive expansion enclosures.
- d. The EXP710 ESM firmware must be at version 9629 or later for DS4800 configurations.
3. If necessary, upgrade your host software to DS4000 Storage Manager version 9.10 or later. You can download upgrades for the applicable DS4000 Storage Subsystem over the Internet from the IBM DS4000 Storage Manager Support Web site. Refer to the Storage Manager Installation and Support Guide for your operating system.
4. Upgrade your DS4000 Storage Subsystem controller firmware to version 06.10.10.xx or later to use with DS4000 Storage Manager host software version 9.10 or later. IBM recommends the controller firmware version 06.12.xx.xx and later for the DS4300, DS4400 and DS4500 Storage Subsystems and 06.14.xx.xx and later for DS4800 Storage Subsystems. For more information, refer to the IBM DS4000 Storage Manager Installation and Support Guide for the appropriate operating system of the host computer on which the DS4000 storage manager host software will be installed or upgraded.
The latest versions of the DS4000 Storage Subsystem controller firmware and the host software are available for download over the Internet from the DS4000 TotalStorage Support Web page:
www.ibm.com/servers/storage/support/disk/
5. Upgrade your DS4000 Storage Subsystem controller NVSRAM to the appropriate version of NVSRAM files based on the controller firmware version as indicated below.
Attention: To verify the DS4000 Storage Subsystem controller firmware version, right-click the controller icon in the Subsystem Management window of the DS4000 Storage Subsystem that you are working on. Select **Properties** in the pull-down list and, when the Properties window opens, look for the value on the right of the Firmware Version field.
If the installed controller firmware is of version 06.10.xx.xx
To implement the FC/SATA Intermix feature, download the appropriate NVSRAM file from the *DS4000 Storage Server NVSRAM Support for DS4000 FC/SATA Enclosure Intermix* CD that is associated with your host operating system. The filenames of the NVSRAM files that enable

| the FC/SATA intermix premium feature have an "I" character prefix (for example,
| I1742F900R910V04.dlp). The appropriate NVSRAM file for a given storage subsystem can be
| found in one of the following directories:

- | • \NVSRAM\DS4300_FASTT600turbo
- | • \NVSRAM\DS4400_FASTT700
- | • \NVSRAM\DS4500_FASTT900

| **Notes:**

- | a. The controller firmware of the DS4300 Storage Subsystem with Standard/Base option must
| be at 06.12.xx.xx or later in order to support the DS4000 FC/SATA Intermix premium
| feature.
- | b. The DS4800 Storage Subsystems are released with controller firmware version 06.14.xx.xx.
| There are no previous versions of controller firmware for it.

| **If the installed controller firmware is of version 06.12.xx.xx or later**

| **Attention:** Do not use the NVSRAM file in the DS4000 Storage Server NVSRAM Support for
| DS4000 FC/SATA Enclosure Intermix CD. Install the appropriate NVSRAM for your DS4000
| Storage Subsystem that is packaged with the controller firmware that you installed in the
| DS4000 Storage Subsystem in step 4 on page 2 above.

| The DS4000 FC/SATA Intermix premium feature is entitled and requires the use of a feature
| key to enable the option. To obtain the feature key identifier, you need a feature activation
| code, which is printed on the IBM premium feature activation card. You also need your
| controller unit IBM serial number, which is printed on the label on the back of your DS4000
| Storage Subsystem. Follow the instructions in the FC/SATA intermix premium feature
| activation card for instructions about how to generate the required feature key and enable the
| FC/SATA intermix premium feature.

| **Attention:**

For DS4000 Storage Subsystems with controller firmware version 06.10.xx.xx installed, the FC/SATA Intermix premium feature is activated when you download the NVSRAM file. Nonetheless, you MUST generate the premium feature key and retain it because you will need it to activate the FC/SATA Intermix premium feature when the controller firmware is upgraded to version 06.12.xx.xx or higher.

If you try to use the premium feature activation key with controller firmware version 06.10.xx.xx, you will get an error message that the Premium Feature that you are attempting to enable with this feature key file is not supported on the current configuration of this subsystem.

For the DS4000 Storage Subsystems with the controller firmware version 06.12.xx.xx or later installed, you must generate the premium feature key file to enable the FC/SATA intermix feature. You cannot use the NVSRAM files included in the DS4000 FC/SATA Enclosure Intermix CD.

For more information about how to enable the premium feature or the feature key, read the activation instructions or contact your IBM representative.

Restrictions

Important: When you add drive expansion enclosures of different types, if the grouping of the enclosure types forces the new enclosures to be cabled in the middle of the drive loop, it is strongly recommended that you power down the configuration or schedule your installations during offpeak I/O periods. You can use the performance monitor function in the DS4000 Storage Manager Subsystem Management window to determine offpeak I/O periods.

If you cannot power down the configuration to install a new enclosure in the middle of the loop, you must use the DS4000 Storage Manager Subsystem Management window to verify that the interrupted drive loop is up and optimal before you modify the other drive loop. This minimizes the chance that arrays will fail because of cabling errors.

Therefore, it is also important to plan for additions to the configuration prior to your initial installation. It is also best practice to take these same precautions when you add new enclosures to either end of the redundant drive loop.

For more information, see the *IBM TotalStorage DS4000 Hard Drive and Storage Expansion Enclosure Installation and Migration Guide*.

The following restrictions apply to the use of the DS4000 FC/SATA Intermix premium feature:

Compatible storage subsystems

Only the following DS4000 Storage Subsystems support the FC/SATA Intermix premium feature:

- DS4300 Standard/Base or Turbo
- DS4400
- DS4500
- DS4800

Contact IBM for information regarding future DS4000 Storage Subsystem support.

Grouping DS4000 storage expansion enclosures in a redundant drive loop

Attention:

Configurations that do not follow the DS4000 storage expansion enclosures grouping restriction are not supported.

You must group like DS4000 storage expansion enclosure types in adjacent positions on the Fibre Channel loop when they are intermixed in a DS4000 Storage Subsystem redundant drive loop configuration. Figure 1 on page 5 shows two ways to group your expansion enclosures.

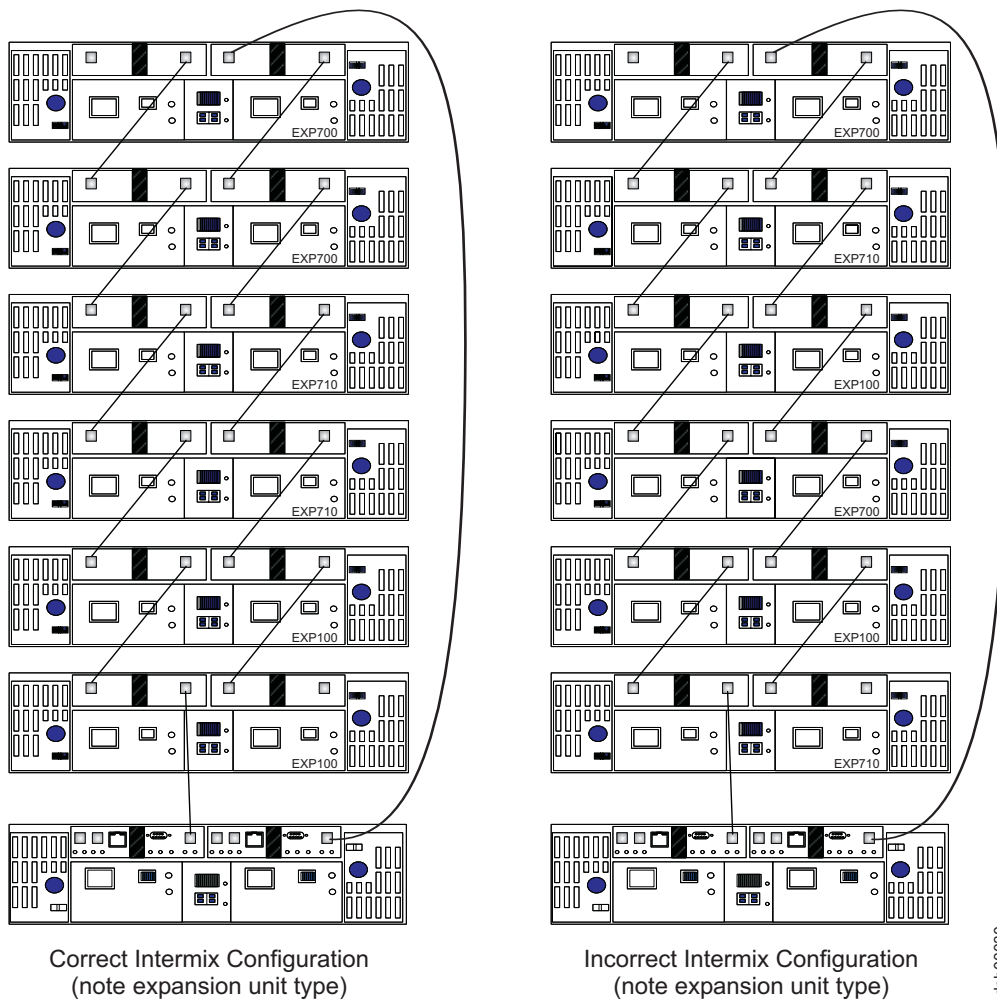


Figure 1. Correct and incorrect ways to group DS4000 storage expansion enclosures in a redundant drive loop

You must group like enclosure types together, regardless of type, as the configuration on the left shows. In the configuration on the left, the EXP700s are grouped together at the top of the loop, followed by the EXP710s, which are grouped together at the middle of the loop, followed by the EXP100s, which are grouped together closest to the controller. The storage expansion enclosure types are indicated in the lower right corner of each enclosure.

In the configuration on the right, the enclosures are cabled in a random order and are not grouped by type. IBM does not support DS4000 Storage Subsystem configurations when they are cabled in this way.

Attention:

For the purposes of the storage expansion enclosures grouping restriction, note the following considerations:

- All models of the EXP100 are considered to be the same from a grouping perspective. For example, the EXP100 1710-10X, 1710-10U, and the 1724-1XP are considered like enclosure types and must be grouped together.
- All models of the EXP700 are considered to be the same from a grouping perspective. For example, the EXP700 1740-1RU, and the 1740-1RX are considered like enclosure types and must be grouped together.
- After the EXP700 has been upgraded with the EXP710 ESM firmware, it is considered an EXP710, regardless of the machine type and model.

For more information, see the *IBM TotalStorage DS4000 Hard Drive and Storage Expansion Enclosure Installation and Migration Guide*.

Cannot mix drive types

Arrays must consist exclusively of either Fibre Channel or SATA drives. You cannot mix drive types in an array.

You cannot mix Fibre Channel and SATA drives in the same DS4000 Storage Subsystem or storage expansion enclosure. Table 2 lists the drive types and their corresponding DS4000 Storage Subsystems and storage expansion enclosures.

Table 2. Drive types and their corresponding DS4000 Storage Subsystems and storage expansion enclosures

Drive type	Storage subsystem type	Storage expansion enclosure type
SATA	DS4100	DS4000 EXP100
Fibre Channel	DS4300 Standard/Base or Turbo DS4400 DS4500 DS4800	DS4000 EXP700 DS4000 EXP710

Cannot intermix drive types for hot spares

SATA drives can function as hot spares for SATA drives only.

Fibre Channel drives can function as hot spares for Fibre Channel drives only.

DS4300 Standard/Base or Turbo intermix configuration restrictions

In DS4300 intermix configurations, if the FC/SATA Intermix premium feature is enabled and the correct NVSRAM is installed, the maximum number of expansion enclosures in a drive loop is limited to seven, whether or not there are drives in the DS4300 Storage Subsystem drive slots.

Product updates

Important

In order to keep your system up to date with the latest firmware and other product updates, use the information below to register and use the **My support** web site.

Download the latest versions of the DS4000 Storage Manager host software, DS4000 storage server controller firmware, DS4000 drive expansion enclosure ESM firmware, and drive firmware at the time of the initial installation and when product updates become available.

To be notified of important product updates, you must first register at the IBM Support and Download Web site:

www-1.ibm.com/servers/storage/support/disk/index.html

In the **Additional Support** section of the Web page, click **My support**. On the next page, if you have not already done so, register to use the site by clicking **register now**.

Perform the following steps to receive product updates:

1. After you have registered, type your user ID and password to log into the site. The **My support** page opens.
2. Click **Add products**. A pull-down menu displays.
3. In the pull-down menu, select **Storage**. Another pull-down menu displays.
4. In the new pull-down menu, and in the subsequent pull-down menus that display, select the following topics:
 - **Computer Storage**
 - **Disk Storage Systems**
 - **TotalStorage DS4000 Midrange Disk Systems & FASTT Stor Svrs**

Note: During this process a check list displays. Do not check any of the items in the check list until you complete the selections in the pull-down menus.

5. When you finish selecting the menu topics, place a check in the box for the machine type of your DS4000 series product, as well as any other attached DS4000 series product(s) for which you would like to receive information, then click **Add products**. The **My support** page opens again.
6. On the **My support** page, click the **Edit profile** tab, then click **Subscribe to email**. A pull-down menu displays.
7. In the pull-down menu, select **Storage**. A check list displays.
8. Place a check in each of the following boxes:
 - a. **Please send these documents by weekly email**
 - b. **Downloads and drivers**
 - c. **Flashes**and any other topics that you may be interested in, and then click **Update**.
9. Click **Sign out** to log out of My Support.

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