



Expansion Enclosure Guide EonStor DS/GS U.2 Family

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Abstract:

This guide contains instructions and system limitations for adding expansion enclosures to Infortrend storage system without affecting its existing storage operations.

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Introduction

Infortrend storage systems are made of high quality and durable components based on a high-scalable hardware design, providing support in terms of scalability and upgradeability. You also have the option to expand your storage system's capacity with Infortrend's expansion enclosures in different form factors, allowing you more storage and provide quicker and more efficient storage services without downtime.

The sections in this chapter list the expansion rules that you must follow when configuring the expansion enclosures with SAS 12 Gb/s drive-side models.

Overview of Maximum Drives

Infortrend provides various form factors that you can select for storage systems and expansion enclosures. The maximum number of drives can be calculated based on the different models. Infortrend always uses SAS expansion technology to implement massive drive scalability. Most of the products have onboard SAS ports to connect expansion enclosures and some models support SAS expansion board to connect more expansion systems.

Take a look at the table below for Infortrend's products, the maximum number of drives, and their supported interfaces:

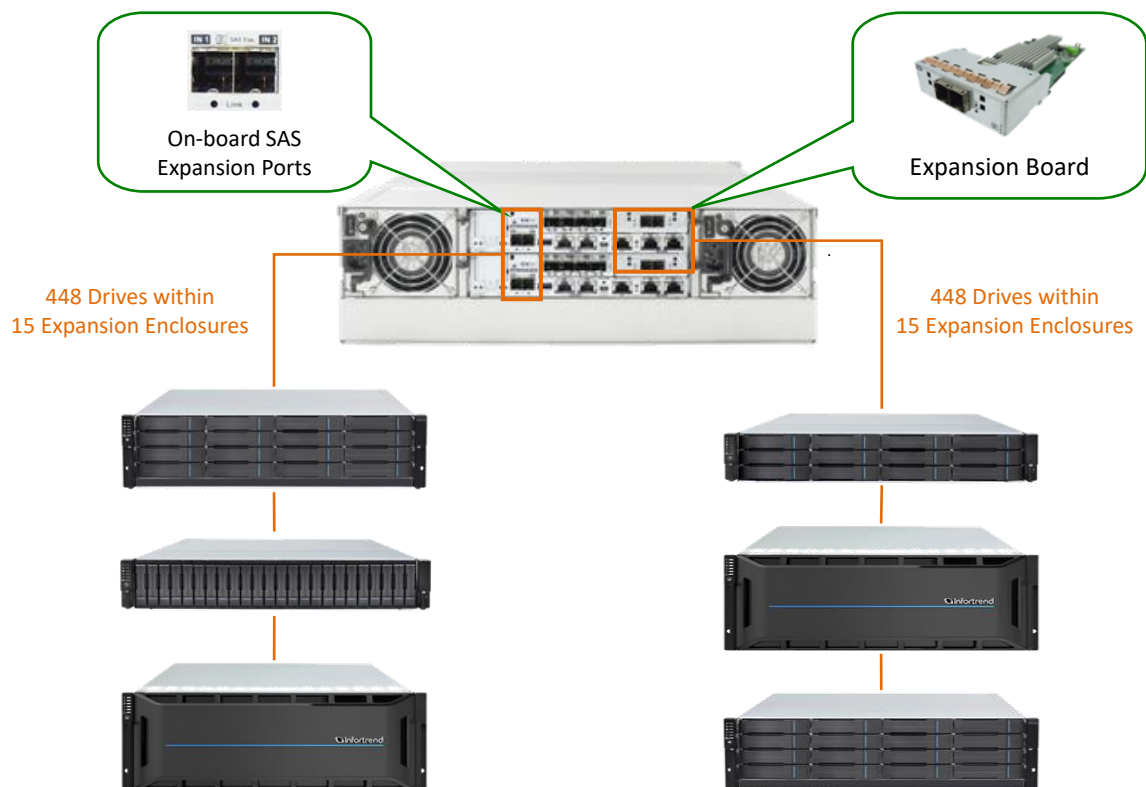
All-Flash U.2 Interface	On-board SAS Ports	SAS Expansion Board	Maximum Drives
EonStor DS U.2 Family	N/A	448 within 15 mixed expansion enclosures (JB3024B/JB3060)	448
EonStor GS 2024U/ 3024U EonStor GSe 2024U/ 3024U	N/A	896 within 15 mixed expansion enclosures (JB3012/JB3016/JB3024B/JB3025B/JB3060L)	896
EonStor GS 3025U/ 4025UT	N/A	896 within 15 mixed expansion enclosures (JB3012/JB3016/JB3024B/JB3025B/JB3060L)	896
EonStor GS 3024UT/ 4024U EonStor GSe 3024UT/ 4024U	N/A	896 within 15 mixed expansion enclosures (JB3024B/JB3060L)	896

Table 1: Maximum Drives of Current Models

Hybrid Expansion Enclosures

Infortrend allows All-Flash U.2 models to support hybrid expansion enclosure connections. The onboard SAS expansion port (either dual or single port) supports up to **448** drives for each expansion chain, which is limited by the SAS chip used. Infortrend also offers SAS 12 Gb/s expansion board for some models, which uses the same SAS chip as the onboard expansion ports. You can use twice the supported number of drives of up to **896** by cascading the second expansion chain via the expansion host boards. Do note that not every model supports hybrid expansion enclosures configuration.

For the supported number of drives, see section [Overview of Maximum Drives](#).



● *Figure 1: Hybrid Expansion Enclosures*

Expansion Enclosure Number

Before setting up an extra expansion enclosure to an existing configuration, you must set the rotary ID switch using a flat-blade screwdriver. Do note that each expansion enclosure must have a unique ID within an expansion chain. Currently, the expansion enclosure's rotary ID switch is numbered from 1 to 15, which means you can only connect up to 15 expansion enclosures per expansion chain.

IMPORTANT!

To prevent any ID conflicts, ensure that you set a unique ID to each expansion enclosure when connecting in a multi-array environment.



Figure 2: Expansion Enclosures ID switch

Expansion Enclosure Connections

The sections in this chapter discuss the connections between expansions and storage systems with SAS 12 Gb/s technologies. For Infortrend storage systems with SAS 12 Gb/s drive-side, the onboard SAS expansion ports are marked as **IN**.

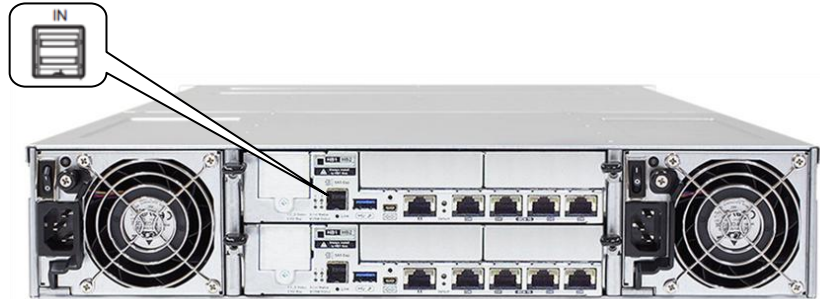


Figure3: SAS 12 Gb/s Storage System Onboard Expansion Port

For any type of expansion enclosure, connect a SAS cable (blue) from the primary controller's SAS expansion port of the storage system to the primary controller's **OUT** SAS port of the first expansion enclosure.

To configure the redundant paths in two daisy-chain topology, connect a SAS cable (orange) from the second controller's SAS expansion port of the storage system to the second controller's SAS **OUT** port of the last expansion enclosure. Basic connection rule when connecting systems in this connection type is **IN to OUT**, from the last expansion enclosure to the first expansion enclosure.

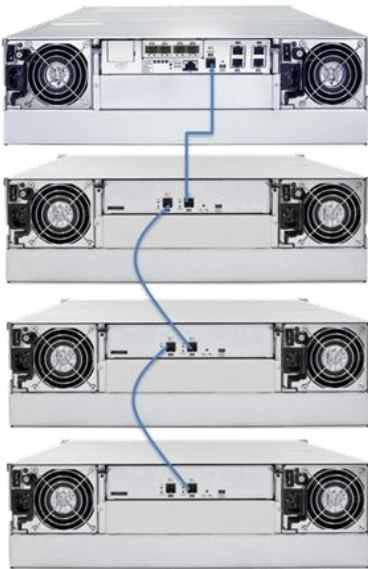


Figure 4: Connecting single-controller expansions using the onboard SAS 12 Gb/s expansion ports .

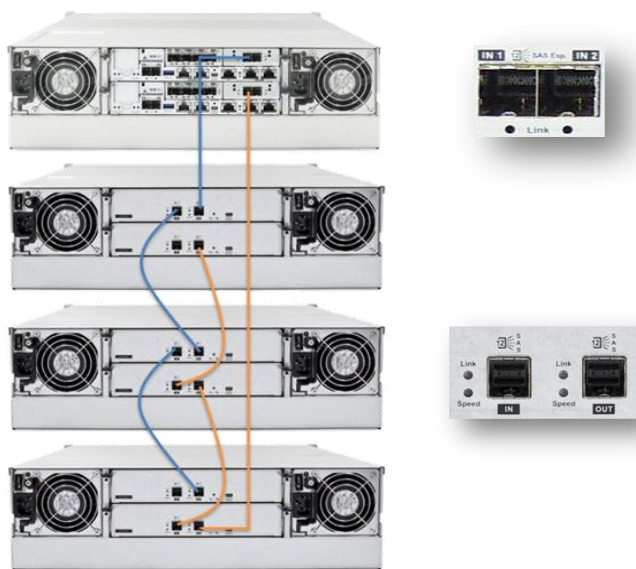


Figure 5: Connecting dual-controller expansions using host board's SAS 12Gb/s expansion ports.

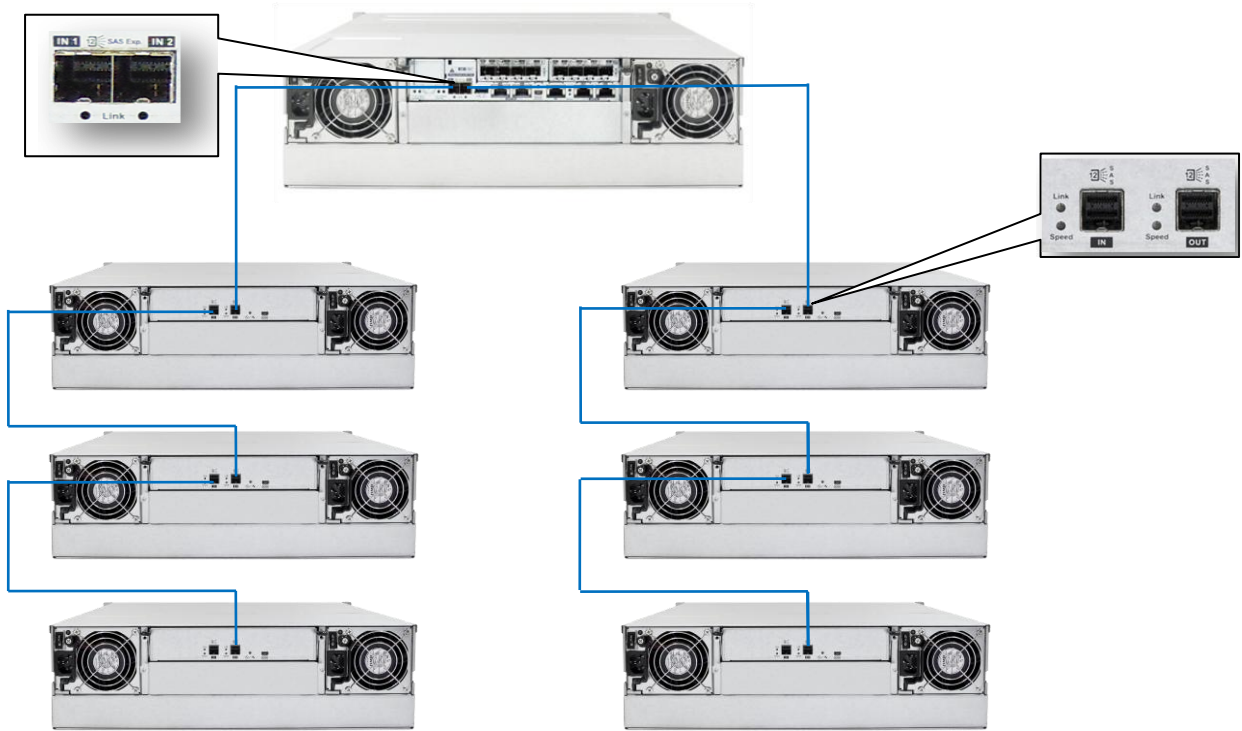


Figure 6: Connecting single-controller expansions using the onboard SAS 12Gb/s expansion ports

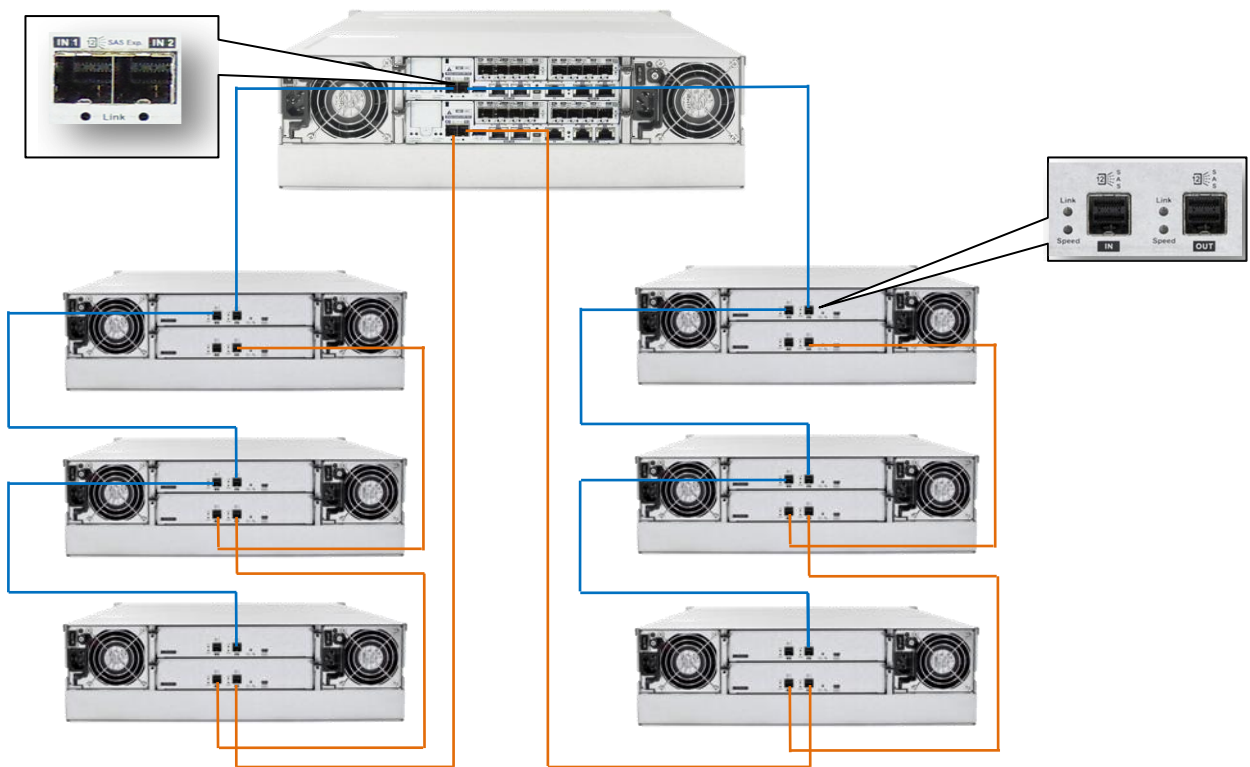


Figure 7: Connecting dual-controller expansions using the onboard SAS 12Gb/s expansion ports

Expansion Enclosure On-line Expanding

This chapter details the steps of adding expansion enclosures to an already present storage system setup.

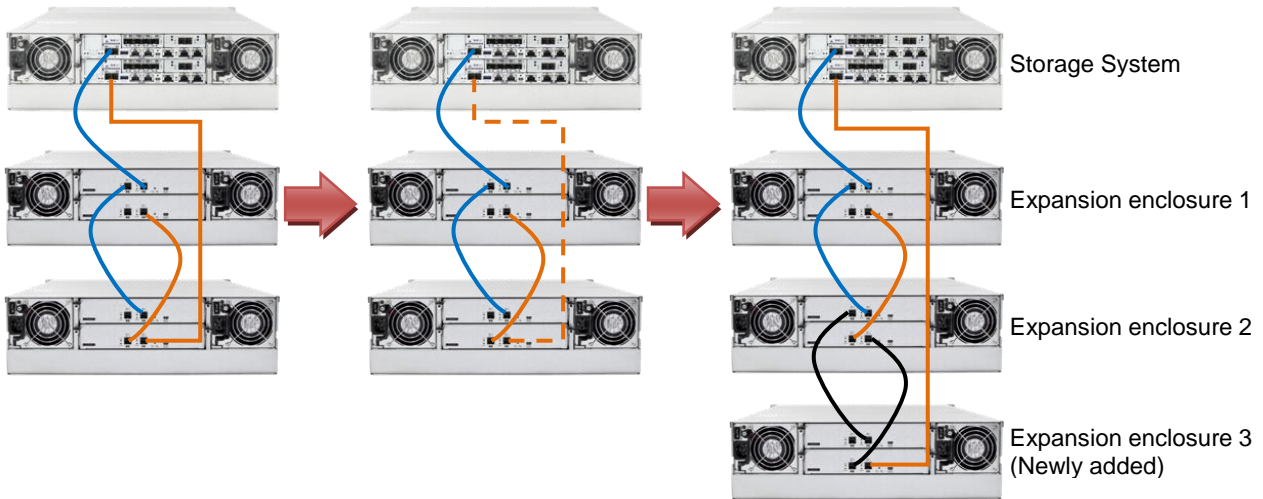


Figure8: Adding an expansion enclosure

1. Setting the expansion enclosure ID

The expansion enclosure ID is located at the front panel of the expansion enclosure. When setting expansion IDs, always set them in order: Set the first expansion to 1, the second expansion ID in 2, and so on. The newly-added expansion enclosures must be connected after the current setup's last expansion enclosure. Do take note that the enclosure IDs must be different from each other.



Figure9: Expansion enclosure ID

2. Installing the newly-added expansion enclosure

Due to the expansion enclosure's heavy weight, we recommend you to install the hard drives to the expansion enclosure after the enclosure is already installed to the rack. After the ID assignment and installation of the expansion enclosures to the rack, you can now connect the added expansion enclosures to the current system assembly via SAS cables.

In connecting the newly-added enclosures, ensure that the SAS cables are long enough to reach between SAS ports. The longest cable is used to connect the storage system and the last expansion enclosure. In some cases, the expansion enclosures are not directly installed on top or bottom of the storage system, so the cabling routes may vary. In most cases, at least one long SAS cable is required.

3. Reconnecting the redundant SAS path (for redundant models only)

Unplug the SAS cable from the current last expansion controller (see dotted orange connection in Figure 8), then connect it to the SAS port of newly-added last expansion's second controller (see longest orange cable connection in Figure 8). A longer SAS cable may be required.

This step involves disconnecting one of the SAS cables, so critical events on storage system such as reports of drive-side redundant path failure are expected. You will get notification events from the management GUI, LCD panel, LEDs, and other means of notification alerts.

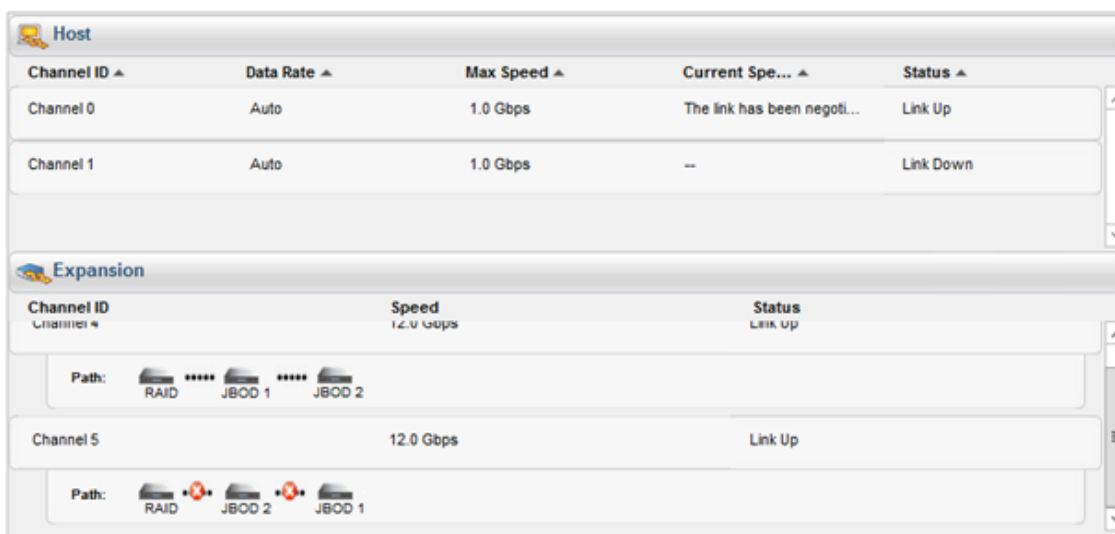


Figure10: Redundant path failure of expansion enclosures in SANWatch

4. Connecting new SAS cable

Connect new SAS cables (see black connection) from the current last expansion to the newly-added expansion enclosure. Ensure to follow the SAS connection's **IN to OUT** rule described in [Expansion Enclosure Connections](#).

NOTE:

The sample diagram is only for SAS 12 Gb/s storage system.

5. Turning on the newly-added expansion enclosure

Press the power button to turn on the expansion enclosure, then wait for the storage management GUI to display the additional expansion enclosure. Once the added subsystem is successfully working with the system assembly, the storage system's status on the management, GUI, LCD panel, LED panel, and other status features are back to normal.

Do take note that adding a newly-added expansion enclosure also sets the Hot-Add feature, which may cause delay or pause for about 10-20 seconds on the host I/O. The delay/pause time may vary depending on the operating system, drivers, and other factors.

6. Installing the newly added drives

We recommend you to install the drives into the newly-added expansion enclosure after the enclosure is successfully recognized by the storage system. After installing the drives to the enclosure, check the drives' status in the storage management GUI. Once the drives appeared on the GUI, you can already use them in storage provisioning. For more details, refer to the software manual.

IMPORTANT!

If SANWatch or Embedded RAIDWatch is used as a management tool for DS family, you must reload the mentioned management tool after connecting the new expansion enclosure. If the management tool does not display the newly-added enclosures, click **Data Reload** from the upper-right corner of the GUI to refresh the screen.



Figure11: Data Reload button on Embedded RAIDWatch
