Expansion Guide

EonStor CS Family

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Summary

This guide describes the instructions and system limitations for adding an expansion enclosure to an Infortrend EonStor CS storage system without affecting storage operations.

Contents

1. Preface

The purpose of this guide is to instruct you on how to add/expand expansion enclosures to Infortrend storage system without affecting the existing storage operations with minimum downtime.

Infortrend continues to develop the best quality solutions to fulfill customer's expectations and requirements. We periodically release information about hardware and software online. We recommend users to check our official website for the latest news and our customer support for the latest releases of firmware and software. In case of product malfunction or if a feature is not working, contact our technical support team.

2. Audience

This Expansion Guide is intended for Infortrend customers, partners, and employees who install/configure the EonStor CS systems.

3. What is Included in This Guide

This guide contains the following topics:

Expansion constraints: Lists all the principles when connecting multiple expansion enclosures.

Expansion enclosure connections: Explains the cabling connections between the storage system and the expansion enclosure of different generations.

Expansion enclosure online expanding: Illustrates on how to add/expand an expansion enclosure to an operating Infortrend storage system.

Hybrid expansion enclosure connections: Demonstrates the prerequisites before setting up the hybrid expansion enclosure configuration.

4. What You Should Know Before Reading

This Expansion Guide assumes that you are familiar with basic server, storage, and networking concepts, and configurations.

5. EonStor CS Expansion Principle

5.1 EonStor CS Storage System Expansion

EonStor CS supports both scale-out and scale-up expansion, and the system does not need to be turned off during the expansion process. Infortrend Distributed File System (IDFS) is a highly efficient distributed file system that increases performance and capacity by expanding the storage unit based on the disk pool.

5.1.1 Scale-out

Scale-out refers to improving the performance and storage capacity by connecting several storage systems (nodes) together and using the cluster node expansion method to expand the system capacity and computing resources (CPU, memory, and network bandwidth).

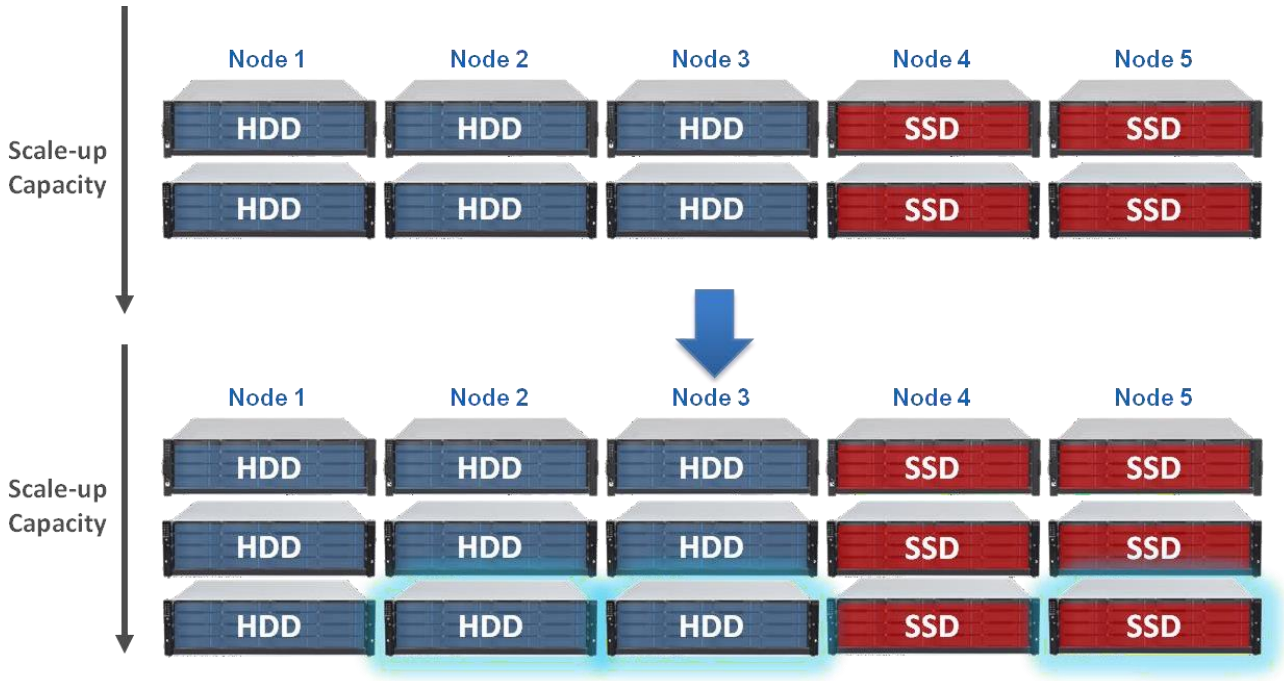
5.1.2 Scale-up

Scale-up refers to the improvement of access efficiency and storage capacity by connecting several expansion enclosures (JBODs) to the disk channel in the back-end of a single storage system (or a storage node). Compared to scale-out expansion, the scale-up expansion provides a cost-effective solution by purchasing expansion enclosures to achieve system performance and storage space improvement. However, the performance and scalability provided by scale-up expansion cannot exceed the limits of the storage node. If there are additional performance requirements, users can only deploy the storage system using scale-out expansion.

5.2 EonStor CS Storage Configuration

The followings are restrictions of storage configuration:

1. The disk slots of EonStor CS must be fully inserted to configure, except for CS 4014U. For CS 4014U, a minimum of 6 drives will be sufficient. Note that NVMe SSDs should be purchased together with the storage appliance.
2. EonStor CS cluster can scale-out up to 144 storage nodes.
3. EonStor CS does not support the expansion enclosure configuration with hybrid form factors. Once you select the form factor of the expansion enclosure, the system will select the expansion enclosure model that can be used by the node. For instance, if EonStor CS HDD node connects the JB 3016 for scale-up expansion, only the JB 3016 can be selected for the expansion enclosure in the future.
4. If one of the storage nodes in the storage pool is connected to the expansion enclosure for scale-up expansion, it is recommended that you balance storage capacity of all nodes in the pool to avoid excessive I/O load on some nodes.



Scale-up Expansion Enclosures must have the same configuration with the nodes

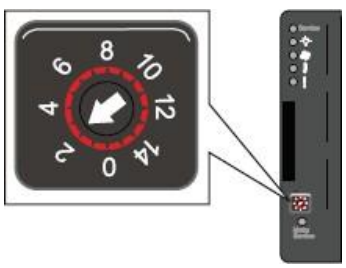
5.3 Maximum Number of Drives/Expansion Enclosures

EonStor CS supports 5 form factors: 2U 14-bay, 2U 25-bay, 3U 16-bay, 4U 24-bay and 4U 60-bay, and there are 3 form factors of JBOD model: 2U 25-bay, 3U 16-bay and 4U 60-bay. The table below shows the corresponding maximum number of drives and supported JBOD model in each form factor of node. For 16-bay and 25-bay form factor of JBOD, each node can support up to 3 JBODs, but each node can only support 1 60-bay JBOD.

Model	Form Factor	Maximum Number of Drives (Per node)	Support JBOD Models
CS G model	3U 16-bay	76	JB 3016 (Up to 3) JB 3060 (Up to 1)
	4U 24-bay	84	
	4U 60-bay	120	JB 3060 (Up to 1)
	2U 14-bay	89	JB 3025B (Up to 3) JB 3016 (Up to 3) JB 3060 (Up to 1)
	2U 25-bay	100	
CS D model	4U 60-bay	90	JB 3060 (Up to 1)

Note: G indicates there is 1 node in the appliance, and D indicates there are 2 nodes in the appliance.

※Note: Before connecting an additional expansion enclosure to an existing storage node, you must use a flat screwdriver to set the ID knob on the expansion enclosure. Please note that each expansion enclosure must be configured with a different ID. To prevent any ID conflict, it is recommended that you set a separate ID for each expansion enclosure before deploying an environment with multiple expansion enclosures.

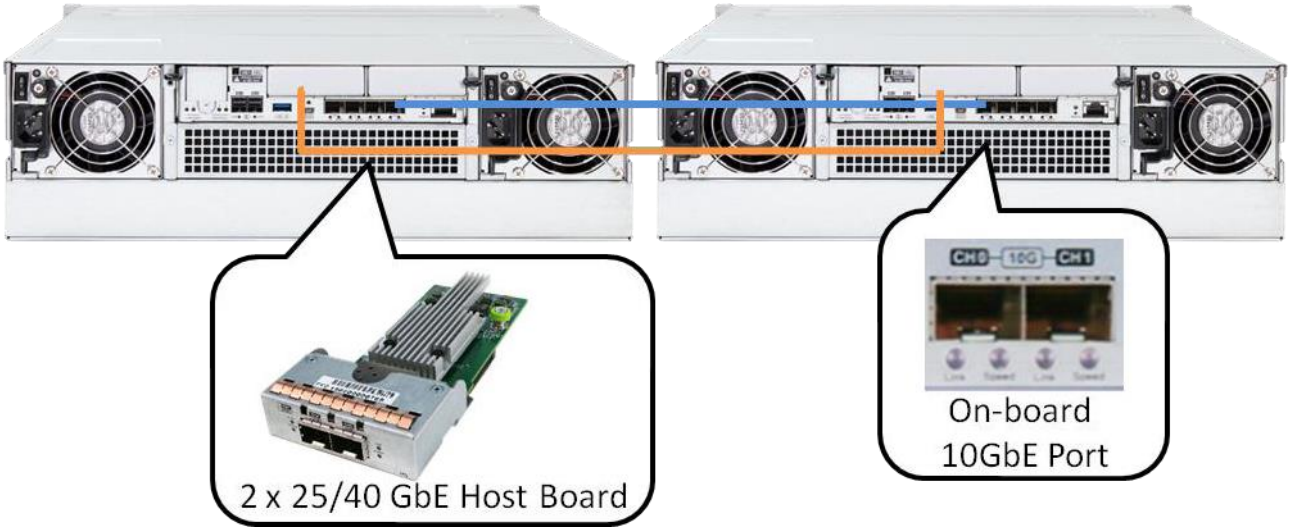


Expansion Enclosure ID Turntable

6. Expansion Enclosure Connection

6.1 Scale-out

EonStor CS can be scale-out expanded with another EonStor CS via an onboard 10GbE (SFP+) channel (blue line) or an installed 25GbE or 40GbE I/O expansion slot (orange line).



EonStor CS scale-out via 10/25/40GbE interface

6.1.1 Scale-out Online Expansion Steps

1. Install the New Node to the Rack

We recommend that you install the node in the rack before installing the hard drives into the node. After the node is assembled into the rack, make sure that the network cable is long enough to connect to the switches.

2. Connect the Network Cables

Connect the EonStor CS node to the switches of internal network and front-end network, so that the new node can communicate with other nodes and clients.

3. Install the Disks to the New Node

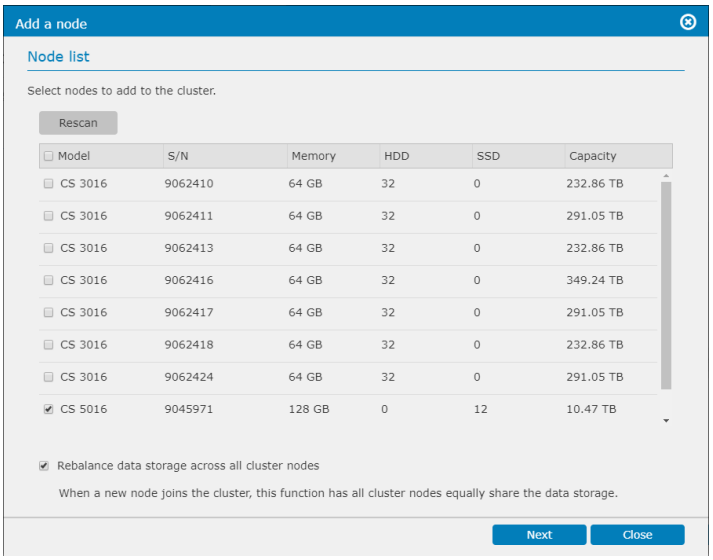
Install the corresponding drive type into the new node before powering it on. Remember the drive slots of the node must be all inserted with drives, and the only exception is CS 4014U which supports 6 drives as minimum number of drives. Otherwise, the node will not be able to configure.

4. Power on the New Node

Power on the node, and check the LED panel, including drive slots. If the LEDs are all green, it means that the system is normal and ready.

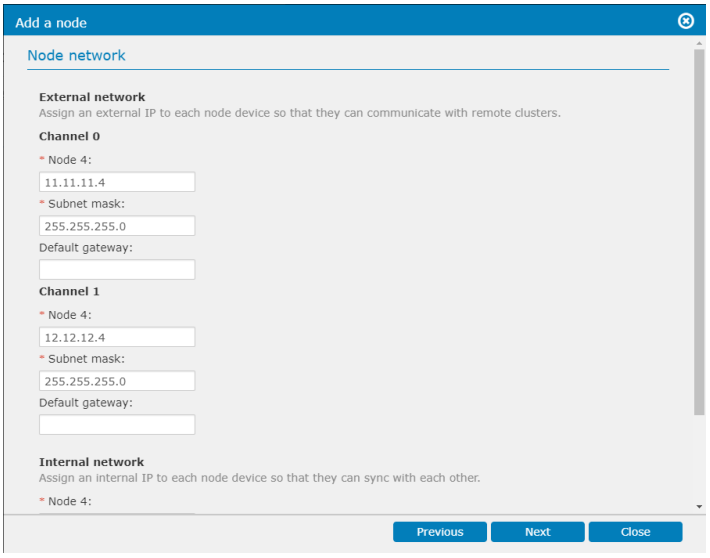
5. Add the New Node to the EonOne

Go to EonOne and click on settings. When you enter the page of adding node, the system will scan the new node automatically. If the node is not found in the list, you can click on Rescan or check the network cable of the new node.



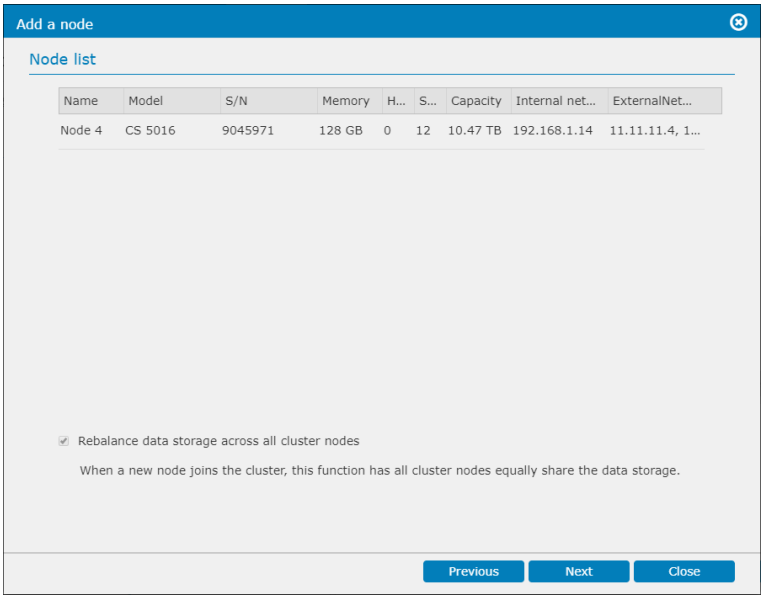
Add Node

Choose the node that you want to add into your system and click “Next”. You can configure the network connection of the node.



Network Configuration

Check the node list. If there is no problem with the node, the node is added to the system successfully. For details, please refer to the software manual.

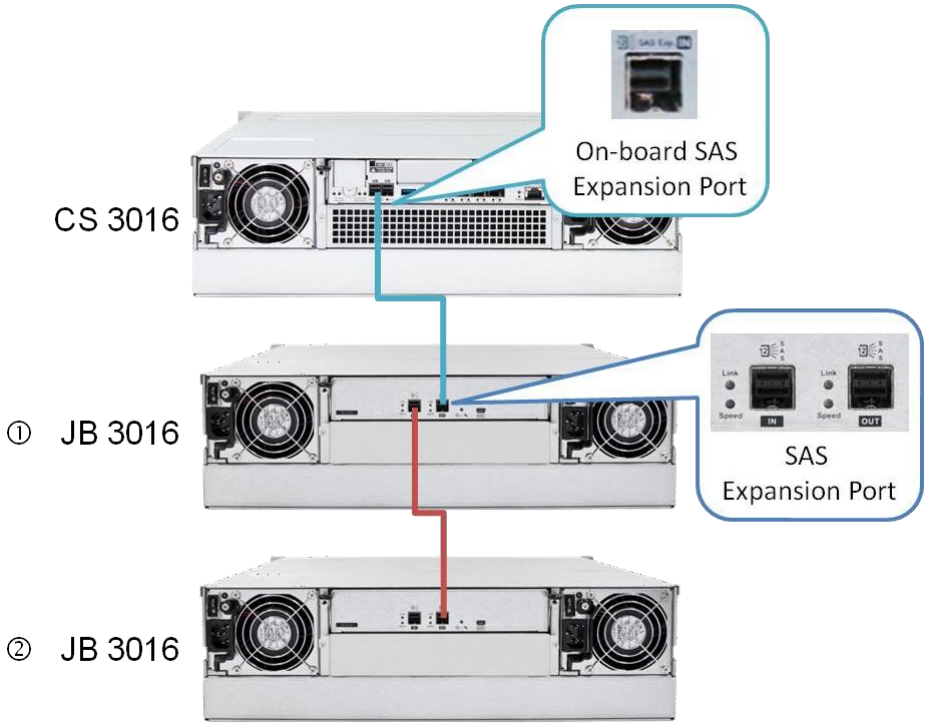


Node List

5.1 Scale-up

EonStor CS can be scale-up expanded via the SAS 12 Gb/s back-end disk channel, and you can use the SAS cable included with the Infortrend expansion enclosure to connect it to the EonStor CS back-end disk channel. The scale-up expansion connects the expansion port (IN) on the back of the EonStor CS to the OUT port on the expansion enclosure. If you want to continue the scale-up expansion, follow the below rules (IN to OUT) to connect down.

1. Storage Controller SAS IN Port → Expansion Enclosure (1) SAS OUT Port (blue line).
2. Expansion Enclosure (1) SAS IN Port → Expansion Enclosure (2) or the last expansion enclosure SAS OUT Port (red line).



EonStor CS SAS 12 Gb/s Expansion Port for Scale-up Expansion

5.1.1 Scale-up Online Expansion Steps

The following steps show how to set up your expansion enclosures properly.

1. Set the Expansion Enclosure ID

The expansion enclosure ID is located on the front panel of the expansion enclosure. The first expansion enclosure ID must be set to 1, the second expansion enclosure ID must be set to 2, and so on. The new expansion enclosure must be connected from the back of the existing last expansion enclosure. Make sure that the expansion enclosure IDs are unique before connecting the expansion enclosures.

2. Install the New Expansion Enclosure to the Rack

We recommend that you install the enclosure in the rack before installing the hard drives into the expansion enclosure. After the expansion enclosure is assembled into the rack, make sure you set the correct expansion ID and that the SAS cable is long enough to connect between SAS ports.

3. Connect the New SAS Cable

Connect the EonStor CS to the expansion enclosure by following the SAS cable connection mentioned in the previous section.

SAS 12 Gb/s Cable

4. Power on the New Expansion Enclosure

Power on the new expansion enclosure and wait for the storage management GUI EonOne to display the new expansion enclosure. Once the new expansion enclosure is successfully added to the system, the storage system should display normally in the management GUI, LED monitor, and other states. Please note that when adding an expansion enclosure, the system will set the "hot add" function, which may cause the host I/O a delay or a pause of about 10-20 seconds. The delay or pause is due to the operating system, drivers, and other factors.

5. Install the Disks to the New Expansion Enclosure

We recommend that you install the disk into the new expansion enclosure after the storage system has successfully identified the newly added expansion enclosure. Check the disk status in EonOne and once the new disks are displayed on the GUI, you can use them in your storage resources. For details, please refer to the software manual.

6. Add Expansion Enclosure

Once you can see the information of expansion enclosure, you will need to click “Add an enclosure” to add expansion enclosure to the node. For details, please refer to the software manual.

7. Legal Disclaimer and Information

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8. Contact Information

Website

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Customer Support

Contact your system vendor or visit the following support site.

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