Cabling Mixed-Speed Enclosure Chains

This procedure describes how to connect 6 Gb and 12 Gb enclosures in the same chain. You can combine mixed-speed enclosures in one chain in the following configurations:

- Chains with 12-drive and 24-drive enclosures: SC200, SC220, SC400, SC420, and SC420F expansion enclosures.
- Chains with 80-drive and 60-drive enclosures: SC280 and SC460 expansion enclosures.

NOTE: You cannot combine 12-and 24-drive enclosures with 60-and 80-drive enclosures in the same chain.

Topics:

- SAS Enclosures
- Add an Enclosure to a 2U Chain
- Add an Enclosure to a 4U/5U Chain
- Manage Unassigned Disks

SAS Enclosures

The enclosure speeds and model numbers described in this procedure are:

- 6 Gb SAS (2U) – SC200 and SC220
- 12 Gb SAS (2U) – SC400, SC420, and SC420F
- 6 Gb SAS (5U) – SC280
- 12 Gb SAS (4U) – SC460

Cables Required for Adding Enclosures into Mixed Chains

<table>
<thead>
<tr>
<th>Storage Controller</th>
<th>Enclosure → Enclosure Cables</th>
<th>Enclosure → Controller Cables</th>
<th>Total cables</th>
</tr>
</thead>
</table>

* If the SAS I/O Card in the SC8000 is an LSI SAS 9201, two mini SAS to Mini SAS HD cables are needed instead.
Add an Enclosure to a 2U Chain

This section describes how to add a 6 Gb or 12 Gb 2U enclosure into an existing chain.

- Adding a 12 Gb SAS Enclosure to a 6 Gb Chain
- Adding a 6 Gb SAS Enclosure to a 12 Gb Chain

Check the Disk Count before Adding an Enclosure

Use the Storage Manager Client to determine the number of drives that are currently accessible to the Storage Center.

1. Connect to the Storage Center using the Storage Manager Client.
2. Select the Storage tab.
3. In the Storage tab navigation pane, select the Disks node.
4. On the Disks tab, record the number of drives that are accessible by the Storage Center.
   Compare this value to the number of drives accessible by the Storage Center after adding an enclosure to the controller.

Adding a 12 Gb SAS Enclosure to a 6 Gb SAS Chain

Follow this procedure to add an SC400 series expansion enclosure to a system that has 6 Gb SC200 series expansion enclosures.

Add the 12 Gb Expansion Enclosure to the A-Side

Connect the expansion enclosure to one-side of the chain at a time to maintain drive availability.

Prerequisite
Install the new expansion enclosure in the rack as described in the SC400, SC420, and SC420F Getting Started Guide.

About this task

NOTE: In an SC4020 storage system, the top storage controller is storage controller 1 and the bottom storage controller is storage controller 2.

Steps
1. Remove the A side SAS cable (shown by dashed orange line) between the last expansion enclosure in the chain and storage controller 2. The B-side SAS cables continues to carry I/O while the A-side is disconnected.
Figure 1. Disconnect the A-Side Chain

1. Expansion enclosure 1 (SC2x0)
2. Expansion enclosure 2 (SC4x0)
3. Remove SAS cable connected to storage controller 2

2. Connect a SAS cable (Mini SAS → Mini SAS HD) from expansion enclosure 1, top EMM, port B to expansion enclosure 2, top EMM port 1.
3. Connect a SAS cable from expansion enclosure 2, top EMM, port 2 to the port on storage controller 2 from which the original cable was removed.
   - Use a Mini SAS HD → Mini SAS cable to connect to an SC4020 storage controller
   - Use a Mini SAS HD → Mini SAS HD cable to connect to an SC8000 storage controller

Figure 2. Connect the A-Side-Chain

1. Expansion enclosure 1 (SC2x0)
2. Expansion enclosure 2 (SC4x0)
3. Add new SAS cable between the expansion enclosures
4. Add new SAS cable between the expansion enclosure and storage controller 2
Add the 12 Gb Expansion Enclosure to the B-Side

Connect the expansion enclosures to one side of the chain at a time to maintain drive availability.

About this task

NOTE: In an SC4020 storage system, the top storage controller is storage controller 1 and the bottom storage controller is storage controller 2.

Steps

1. Remove the A-side cable (shown by dashed blue line) between the last expansion enclosure in the chain and storage controller 1. The A-side cable continues to carry I/O while the B-side is disconnected.

2. Connect a SAS cable (Mini SAS → Mini SAS HD) from expansion enclosure 1, bottom EMM, port B to expansion enclosure 2, bottom EMM port 1.

3. Connect a cable from expansion enclosure 2, bottom EMM, port 2 to the port on storage controller 1 from which the original cable was removed.
   - Use a Mini SAS HD → Mini SAS cable to connect to an SC4020 storage controller
   - Use a Mini SAS HD → Mini SAS HD cable to connect to an SC8000 storage controller
Figure 4. Connect the B-Side Chain

1. Expansion enclosure 1 (SC2x0)
2. Expansion enclosure 2 (SC4x0)
3. Add new SAS cable between the expansion enclosures
4. Add new SAS cable between the expansion enclosure and storage controller 1

4. Manage the disks in the new enclosure as described in Manage Unassigned Disks.
Adding a 6 Gb SAS Enclosure to a 12 Gb SAS Chain

Follow this procedure to add an SC200 series expansion enclosure to a system that has 12Gb SC400 series expansion enclosures.

Add the 6 Gb Expansion Enclosure to the A-Side

Connect the expansion enclosure to one-side of the chain at a time to maintain drive availability.

**Prerequisite**
Install the 6 Gb expansion enclosure in the rack as described in the SC200/SC220 Getting Started Guide.

**About this task**

1. **NOTE:** In an SCv3000 series, SC5020 series, and SC7020 series storage system, the top storage controller is storage controller 1 and the bottom storage controller is storage controller 2.

**Steps**

1. Remove the A side SAS cable (shown by dashed orange line) between the last expansion enclosure in the chain and storage controller 2. The B-side SAS cables continues to carry I/O while the A-side is disconnected.

2. Connect a SAS cable (Mini SAS HD → Mini SAS ) from expansion enclosure 1, top EMM, port 2 to expansion enclosure 2, top EMM port A.

3. Connect a SAS cable (Mini SAS → Mini SAS HD) from expansion enclosure 2, top EMM, port B to the port on storage controller 2 from which the original cable was removed.
Add the 6 Gb Expansion Enclosure to the B-Side

Connect the expansion enclosures to one side of the chain at a time to maintain drive availability.

About this task

**NOTE:** In an SCv3000 series, SC5020 series, and SC7020 series storage system, the top storage controller is storage controller 1 and the bottom storage controller is storage controller 2.

Steps

1. Remove the A-side cable (shown by dashed blue line) between the last expansion enclosure in the chain and storage controller 1. The A-side cable continues to carry I/O while the B-side is disconnected.
3 Remove the SAS cable connected to storage controller 1

2 Connect a SAS cable (Mini SAS HD → Mini SAS) from expansion enclosure 1, bottom EMM, port 2 to expansion enclosure 2, bottom EMM port A.

3 Connect a SAS cable (Mini SAS → Mini SAS HD) from expansion enclosure 2, bottom EMM, port B to the port on storage controller 1 from which the original cable was removed.

Figure 8. Connect the B-Side Chain

1 Expansion enclosure 1 (SC4x0)  2 Expansion enclosure 2 (SC2x0)
3 Add new SAS cable between the expansion enclosures  4 Add new SAS cable between the expansion enclosure and storage controller 1

4 Manage the disks in the new enclosure as described in Manage Unassigned Disks.
Add an Enclosure to a 4U/5U Chain

This section describes how to add a 6 Gb (5U) or 12 Gb (4U) enclosure into an existing chain. A Storage Center supports two enclosures containing 60 or more disks.

- Adding a 12 Gb SAS Enclosure to a 6 Gb SAS Chain (4U/5U)
- Adding a 6 Gb SAS Enclosure to a 12 Gb SAS Chain (4U/5U)

Check the Disk Count before Adding an Enclosure

Use the Storage Manager Client to determine the number of drives that are currently accessible to the Storage Center.

1. Connect to the Storage Center using the Storage Manager Client.
2. Select the Storage tab.
3. In the Storage tab navigation pane, select the Disks node.
4. On the Disks tab, record the number of drives that are accessible by the Storage Center.
   Compare this value to the number of drives accessible by the Storage Center after adding an enclosure to the controller.

Adding a 12 Gb SAS Enclosure to a 6 Gb SAS Chain

Follow this procedure to add an SC460 expansion enclosure to a system that has one 6 Gb SC280 expansion enclosure.

Add the 12 Gb Expansion Enclosure to the A-Side

Connect the expansion enclosure to one side of the chain at a time to maintain drive availability.

Prerequisite
Install the new expansion enclosure in the rack as described in the SC460 Getting Started Guide.

About this task

NOTE: In an SC4020 storage system, the top storage controller is storage controller 1 and the bottom storage controller is storage controller 2.

Steps
1. Remove the A side SAS cable connected between the SC280 left EMM port B and controller 2. The B-side SAS cables continue to carry I/O while the A-side is disconnected.
Figure 9. Disconnecting the A-Side Chain

1. Expansion enclosure 1 (SC280)
2. Expansion enclosure 2 (SC460)
3. Remove cable connected to controller

2. Connect a SAS cable (Mini SAS → Mini SAS HD) from the SC460 left EMM port 3 to the SC280 left EMM port B.
   - Use a Mini SAS HD → Mini SAS cable to connect to an SC4020 storage controller
   - Use a Mini SAS HD → Mini SAS HD cable to connect to an SC8000 storage controller
Figure 10. Connect the A-Side Chain

1. Expansion enclosure 1 (SC280)  
2. Expansion enclosure 2 (SC460)  
3. Connect SAS cable from SC280 to SC460

Add the 12 Gb Expansion Enclosure to the B-Side

Connect the expansion enclosures to one side of the chain at a time to maintain drive availability.

About this task

NOTE: In an SC4020 storage system, the top storage controller is storage controller 1 and the bottom storage controller is storage controller 2.

Steps

1. Remove the B-side cable connected between the SC280 left EMM port B and controller 1. The A-side cable continues to carry I/O while the B-side is disconnected.
Figure 11. Disconnect the B-Side Chain

1. Expansion enclosure 1 (SC280)
2. Expansion enclosure 2 (SC460)
3. Remove the SAS cable connected between port B and the controller

2. Connect a SAS cable (Mini SAS → Mini SAS HD) from the SC280 right EMM port A to the SC460 right EMM port 1.
3. Connect a SAS cable from the SC460 right EMM port 3 to controller 1 port 2 (or port B).
   - Use a Mini SAS HD → Mini SAS cable to connect to an SC4020 storage controller
   - Use a Mini SAS HD → Mini SAS HD cable to connect to an SC8000 storage controller
Adding a 6 Gb SAS Enclosure to a 12 Gb SAS Chain

Follow this procedure to add an SC280 expansion enclosure to a system that has one 12Gb SC460 expansion enclosure.

Add the 6 Gb Expansion Enclosure to the A-Side

Connect the expansion enclosure to one side of the chain at a time to maintain drive availability.

**Prerequisite**
Install the 6 Gb expansion enclosure in the rack as described in the SC280 Getting Started Guide.

About this task

**NOTE:** In an SCv3000 series, SC5020 series, and SC7020 series storage system, the top storage controller is storage controller 1 and the bottom storage controller is storage controller 2.

**Steps**

1. Remove the A side SAS cable (shown by dashed orange line) between the SC460 left EMM port 3 enclosure and storage controller 2. The B-side SAS cables continues to carry I/O while the A-side is disconnected.
Figure 13. Disconnect the A-Side Chain

1. Expansion enclosure 1 (SC460)  
2. Expansion enclosure 2 (SC280)  
3. Remove SAS cable connected to storage controller 2

2. Connect a SAS cable (Mini SAS → Mini SAS HD) from the SC460 left EMM port 3 to the SC280 left EMM port A

Figure 14. Connect the A-Side-Chain

1. Expansion enclosure 1 (SC460)  
2. Expansion enclosure 2 (SC280)  
3. Add new SAS cable between the expansion enclosures

Add the 6 Gb Expansion Enclosure to the B-Side

Connect the expansion enclosures to one side of the chain at a time to maintain drive availability.

About this task

**NOTE:** In an SCv3000 series, SC5020 series, and SC7020 series storage system, the top storage controller is storage controller 1 and the bottom storage controller is storage controller 2.
**Steps**

1. Remove the B-side cable (shown by dashed blue line) between the SC460 right EMM port 3 and storage controller 1. The A-side cable continues to carry I/O while the B-side is disconnected.

![Diagram of Disconnecting the B-Side Cable](image)

**Figure 15. Disconnect the B-Side Chain**

1. Expansion enclosure 1 (SC460)
2. Expansion enclosure 2 (SC2x0)
3. Remove the SAS cable connected to storage controller 1

2. Connect a SAS cable (Mini SAS HD → Mini SAS) from the SC460 right EMM, port 3 to the SC280 right EMM port A.

3. Connect a SAS cable (Mini SAS → Mini SAS HD) from the SC280 right EMM, port C to the port on storage controller 1 from which the original cable was removed.

![Diagram of Connecting the B-Side Cable](image)

**Figure 16. Connect the B-Side Chain**

1. Expansion enclosure 1 (SC460)
2. Expansion enclosure 2 (SC280)
3. Add new SAS cable between the expansion enclosures
4. Add new SAS cable between the expansion enclosure and storage controller 1

4. Manage the disks in the new enclosure as described in Manage Unassigned Disks.
Manage Unassigned Disks

Manage Unassigned Disks assigns disks to an existing disk folder. A RAID rebalance is required to complete managing disks.

1. If the Storage Manager Client is connected to a Data Collector, select a Storage Center from the Storage view.
2. Click the Storage tab.
3. In the Storage tab navigation pane, expand Disks, then select an unassigned disk folder. The Disk Folder view is displayed.
4. Click Manage Unassigned Disks.
   The Manage Unassigned Disks dialog box opens.
5. From the Disk Folder drop-down menu, select a disk folder.
6. In the Unassigned Disks pane, select the disks to be assigned.
7. To schedule a RAID rebalance select one of the following options:
   - To start a RAID rebalance after creating the disk folder, select Perform RAID rebalance immediately.
   - To schedule a RAID rebalance for a later time, select Schedule RAID rebalance then select a date and time.
8. To skip the RAID rebalance, select I will start RAID rebalance later.

   **NOTE:** To use all available space, perform a RAID rebalance.
9. Click OK.