FlashArray//M and //XR1 Cabling Guide

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Conventions and Guidelines

The following symbols appear in Pure Storage documentation and might also be on the equipment.

Symbol	Meaning
	Best practice
	Supplementary instruction
	Potential for injury, physical damage, loss of data, or array configuration information
	Important information

Safety and Handling Guidelines

- If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment might be impaired.
- Avoid contact with backplane components and connectors.
- Disconnect all power cords before moving the chassis and shelves or performing any powered-off service operation.
- Install replacement Flash Modules, SSDs, and other field replaceable units within two minutes of removing a faulty component. This ensures that maximum drive temperatures are not exceeded.
- Verify that rack electrical distribution systems meet all safety requirements of UL 60950-1 and IEC 60950-1 when fully populated, and that they provide adequate 100-240V 50-60Hz AC power, over-current protection, and electrical ground for all installed equipment.
- If you use bifurcated ("Y") power cords, connect them to a 200-240V external power supply.
- Verify that all electrical connections are grounded before powering on.
- Do not open chassis or shelf enclosures, or any component such as a PCM, IOM, or Flash Module, unless you are a qualified service representative performing a service procedure in accordance with instructions published by Pure Storage.
- Do not use the handles on the controller, PSU, or storage shelf PCM handles to lift a chassis. Use chassis lift handles to lift a chassis.
- When servicing rack-mounted equipment, extend only one chassis at a time.
- Do not replace batteries due to risk of explosion if handled incorrectly. Dispose of batteries according to battery manufacturers' instructions.
- Do not insert anything into any FlashArray connector except as specified in installation or repair instructions.
- Ensure that all components, including PSMs, PSUs, and blank panels are in place before powering on or operating an array.
- Leave failed components (e.g., PSUs, SSDs, etc.) in place until replacements are available.

Preparation for Installation and Service

- Storage shelves weigh up to 20 kg (44 lbs.) each. Make arrangements for safe lifting during installation.
- Make sure that the rack can support the total weight of all installed equipment (including cables and rails), and that the total weight is within the floor loading limit.
- Verify that front and rear rack mounting posts are between 61 and 91 cm (24-36 in.) apart, and that you have 2 RU of vertical rack space for each storage shelf.
- Verify that the installation environment
  - Is within the operating temperature range of 5-35°C when the rack is fully populated.
  - Does not have airflow ducts aimed directly at any FlashArray chassis, controller, or shelf.
- Have a local console (VGA monitor and USB keyboard or a computer with terminal emulation capability) available in case it is required for software configuration or diagnosis.
- Before you unpack the equipment, inspect packages for shipping damage. If damage is apparent, photograph it and contact Pure Storage Technical Support for advice before proceeding.
- Save cartons and packing material in case return shipment to Pure Storage is necessary.
- Return all replaced and unused parts and supplies to Pure Storage.
- Save all tools in FlashArray kits for future use.

Introduction

This document supplements the FlashArray//M and FlashArray//XR1 Quick Installation Guides by providing detailed cabling instructions. The procedures in the guide describe how to connect SAS, Ethernet, management, host, and replication cables.

Step 1. Cabling FlashArray//M or //XR1 to Storage Shelves

Connect cables from FlashArray//M or //XR1 to all storage shelves using the step-by-step instructions in the appropriate subsection below.

- Make sure to match the labels on the FlashArray//M or //XR1 cables with the labels on the storage shelf IOM ports.
- Connect individual cables in a pair in the order suggested in the **Order** column.
- Pull each connector gently to make sure the latch is engaged.

Cabling a FlashArray//M or //XR1 With Up to Four Storage Shelves (All 12G)

Perform the following steps to cable a FlashArray//M or //XR1 with up to four 12G storage shelves. See Figure 1 for the completed cabling configuration.

Step	Pair Type	Color (Figure 1)	Order	Connect from Device	Connect from Port	Connect from Label	Connect to Device	Connect to Port	Connect to Label	Available Cable Pair Lengths
For all arrays										
1	HL		1	CT0	SAS0		SH0	SAS3		1m (in Accessory Kit) 3m (80-0380-00) 5m (80-0378-00)
			2	CT0	SAS2		SH0	SAS0		
2	IR		3	CT1	SAS1		SH0	SAS2		1m (in Accessory Kit) 3m (80-0381-00) 5m (80-0379-00)
			4	CT1	SAS3		SH0	SAS5		
For arrays with two or more shelves										
3	HL		5	CT1	SAS0		SH1	SAS3		1m (in Accessory Kit) 3m (80-0380-00) 5m (80-0378-00)
			6	CT1	SAS2		SH1	SAS0		
4	IR		7	CT0	SAS1		SH1	SAS2		1m (in Accessory Kit) 3m (80-0381-00) 5m (80-0379-00)
			8	CT0	SAS3		SH1	SAS5		
For arrays with three or more shelves										
5	CR		9	SH0	SAS1		SH2	SAS2		1m (in Accessory Kit) 3m (80-0329-00) 5m (80-0330-00)
			10	SH0	SAS4		SH2	SAS5		
For arrays with four shelves										
6	CR		11	SH1	SAS1		SH3	SAS2		1m (in Accessory Kit) 3m (80-0329-00) 5m (80-0330-00)
			12	SH1	SAS4		SH3	SAS5		

Step 1. Cabling FlashArray//M or //XR1 to Storage Shelves (Cont'd)

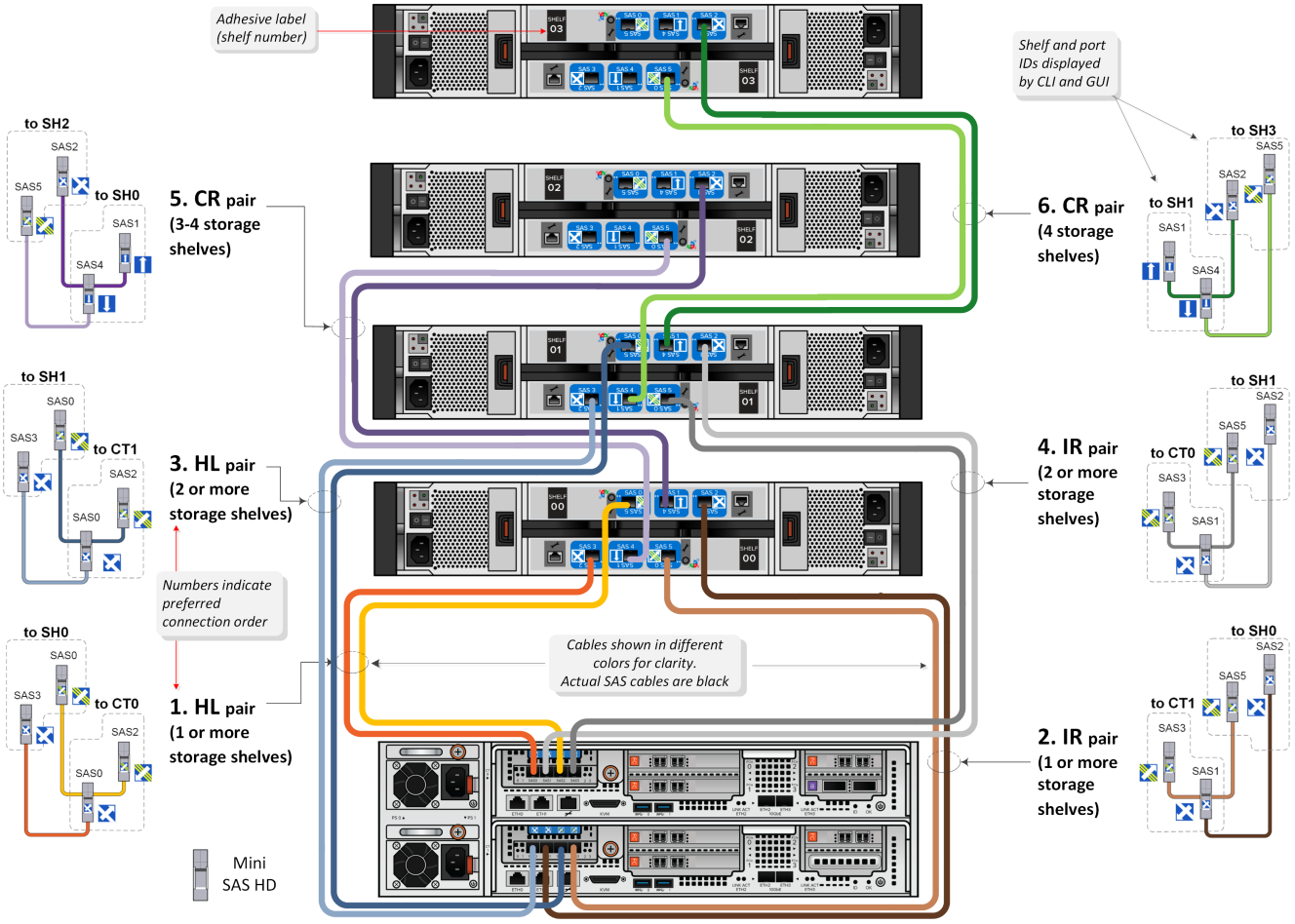

Figure 1. FlashArray//M or //XR1 Cabling for Arrays With All 12G Storage Shelves

Check SAS Connections

Log into the Purity CLI, and enter the following commands on each controller to check SAS connections:

```
storage_view.py config
```

```
storage_view.py enclosures
```

If the shelf cables are connected correctly, these commands return the following response:

```
No errors detected.
```

If errors are detected, contact Pure Storage Technical Support for assistance before you continue.

Step 1. Cabling FlashArray//M or //XR1 to Storage Shelves (Cont'd)

Cabling a FlashArray//M or //XR1 With Up to Four Storage Shelves (All 6G)

Perform the following steps to cable a FlashArray//M or //XR1 with up to four 6G storage shelves. See Figure 2 for the completed cabling configuration.

Step	Pair Type	Color (Figure 2)	Order	Connect from Device	Port	Label	Connect to Device	Port	Label	Available Cable Pair Lengths
For all arrays										
1	PL		1	CT0	SAS0		SH0	SAS3		1m (in Accessory Kit) 3m (82-0124-00) 5m (82-0125-00)
			2	CT0	SAS2		SH0	SAS0		
2	QR		3	CT1	SAS1		SH0	SAS2		1m (in Accessory Kit) 3m (82-0126-00) 5m (82-0127-00)
			4	CT1	SAS3		SH0	SAS5		
For arrays with two or more shelves										
3	PL		5	CT1	SAS0		SH1	SAS3		1m (in Accessory Kit) 3m (82-0124-00) 5m (82-0125-00)
			6	CT1	SAS2		SH1	SAS0		
4	QR		7	CT0	SAS1		SH1	SAS2		1m (in Accessory Kit) 3m (82-0126-00) 5m (82-0127-00)
			8	CT0	SAS3		SH1	SAS5		
For arrays with three or more shelves										
5	MR		9	SH0	SAS1		SH2	SAS2		1m (in Accessory Kit) 3m (80-0270-00) 5m (80-0271-00)
			10	SH0	SAS4		SH2	SAS5		
For arrays with four shelves										
6	MR		11	SH1	SAS1		SH3	SAS2		1m (in Accessory Kit) 3m (80-0270-00) 5m (80-0271-00)
			12	SH1	SAS4		SH3	SAS5		

Step 1. Cabling FlashArray//M or //XR1 to Storage Shelves (Cont'd)

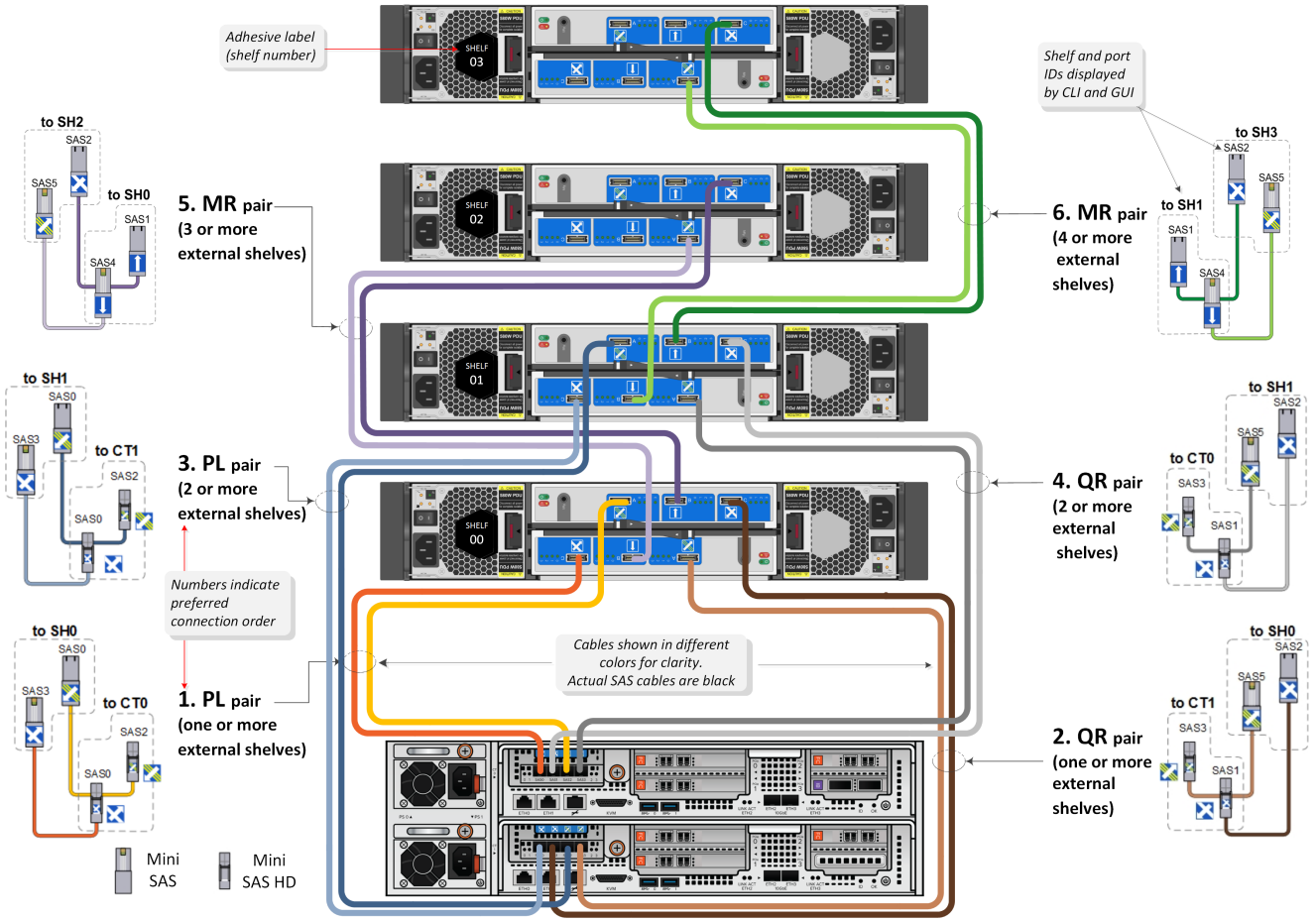

Figure 2. FlashArray//M or //XR1 Cabling for Arrays With All 6G Storage Shelves

Check SAS Connections

Log into the Purity CLI, and enter the following commands on each controller to check SAS connections:

```
storage_view.py config
```

```
storage_view.py enclosures
```

If the shelf cables are connected correctly, these commands return the following response:

```
No errors detected.
```

If errors are detected, contact Pure Storage Technical Support for assistance before you continue.

Step 1. Cabling FlashArray//M or //XR1 to Storage Shelves (Cont'd)

Cabling a FlashArray//M or //XR1 With Up to Four Storage Shelves (Mixed 6G/12G)

Perform the following steps to cable a FlashArray//M or //XR1 with up to four storage shelves: two 6G (**SH0** and **SH1**) and two 12G (**SH2** and **SH3**). See Figure 3 for the completed cabling configuration.

Step	Pair Type	Color (Figure 3)	Order	Connect from Device	Port	Label	Connect to Device	Port	Label	Available Cable Pair Lengths
For all arrays										
1	PL		1	CT0	SAS0		SH0	SAS3		1m (in Accessory Kit) 3m (82-0124-00) 5m (82-0125-00)
			2	CT0	SAS2		SH0	SAS0		
2	QR		3	CT1	SAS1		SH0	SAS2		1m (in Accessory Kit) 3m (82-0126-00) 5m (82-0127-00)
			4	CT1	SAS3		SH0	SAS5		
For arrays with two or more shelves										
3	PL		5	CT1	SAS0		SH1	SAS3		1m (in Accessory Kit) 3m (82-0124-00) 5m (82-0125-00)
			6	CT1	SAS2		SH1	SAS0		
4	QR		7	CT0	SAS1		SH1	SAS2		1m (in Accessory Kit) 3m (82-0126-00) 5m (82-0127-00)
			8	CT0	SAS3		SH1	SAS5		
For arrays with three or more shelves										
5	DR		9	SH0	SAS1		SH2	SAS2		1m (in Accessory Kit) 3m (80-0331-00) 5m (80-0332-00)
			10	SH0	SAS4		SH2	SAS5		
For arrays with four shelves										
6	DR		11	SH1	SAS1		SH3	SAS2		1m (in Accessory Kit) 3m (80-0331-00) 5m (80-0332-00)
			12	SH1	SAS4		SH3	SAS5		

Step 1. Cabling FlashArray//M or //XR1 to Storage Shelves (Cont'd)

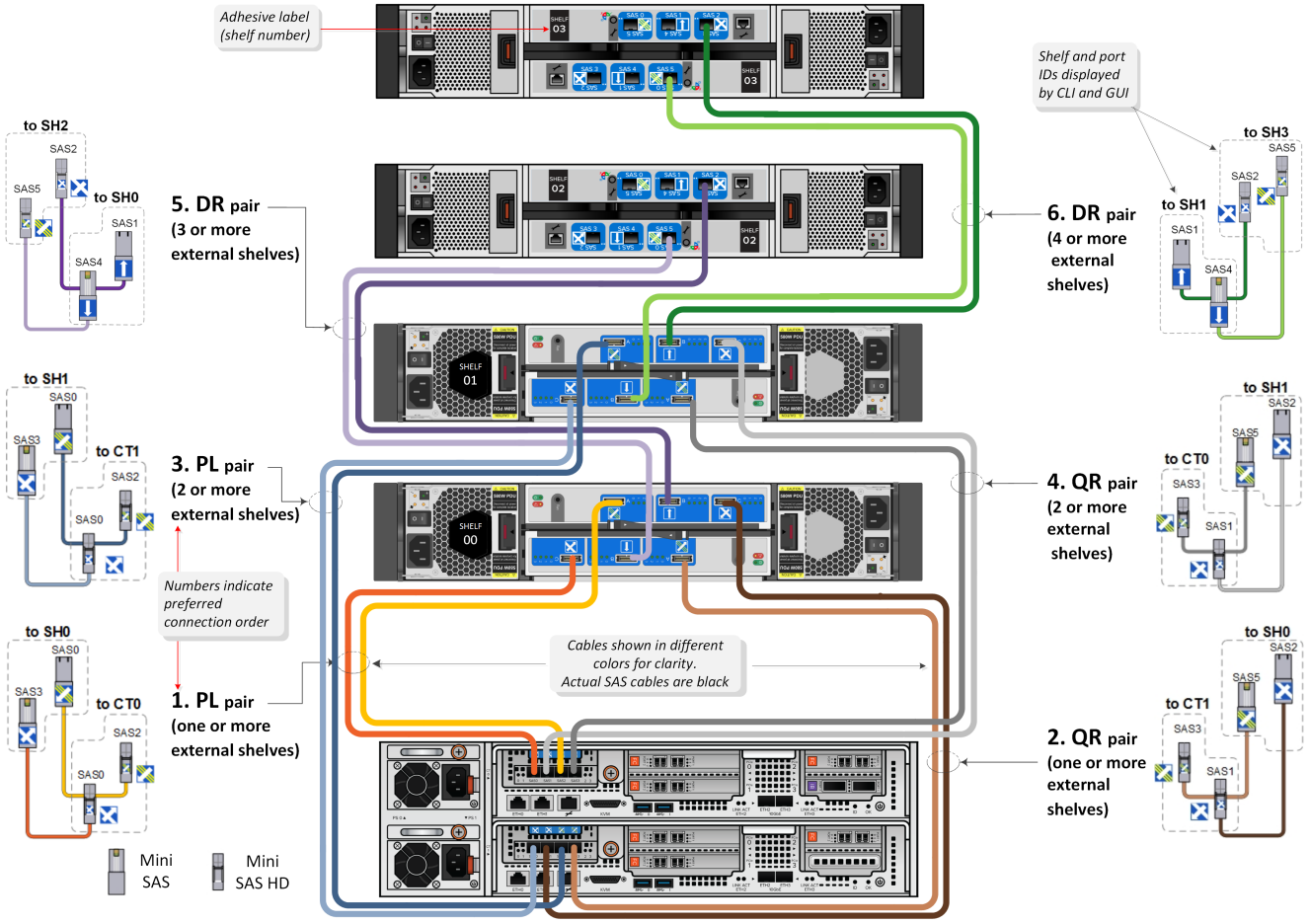

Figure 3. FlashArray//M or //XR1 Cabling for Arrays With Mixed 12G and 6G Storage Shelves

Check SAS Connections

Log into the Purity CLI, and enter the following commands on each controller to check SAS connections:

```
storage_view.py config
```

```
storage_view.py enclosures
```

If the shelf cables are connected correctly, these commands return the following response:

```
No errors detected.
```

If errors are detected, contact Pure Storage Technical Support for assistance before you continue.

Step 1. Cabling FlashArray//M or //XR1 to Storage Shelves (Cont'd)

Connect FlashArray//XR1 to a DirectFlash Shelf (FlashArray//XR1 Only)

This section describes how to connect FlashArray//XR1 to a DirectFlash shelf (**SH9**) (see Figure 4).

Match the cable connector labels with the labels on the FlashArray//XR1 and storage shelf ports.

Step	Cable Type	Color (Step 1)	Connect from Device	Port	Label	Connect to Device	Port	Label	Available Cable Pair Lengths
FlashArray//XR1 to DirectFlash Shelf SH9									
1	A		CH0.CT0	ETH6	CT0	SH9.SC0	ETH0	SC0	1m (80-0603-00) 3m (80-0607-00) 5m (80-0611-00)
2	B		CH0.CT0	ETH8	CT0	SH9.SC1	ETH0	SC1	1m (80-0604-00) 3m (80-0608-00) 5m (80-0612-00)
3	C		CH0.CT1	ETH6	CT1	SH9.SC0	ETH2	SC0	1m (80-0605-00) 3m (80-0609-00) 5m (80-0613-00)
4	D		CH0.CT1	ETH8	CT1	SH9.SC1	ETH2	SC1	1m (80-0606-00) 3m (80-0610-00) 5m (80-0614-00)

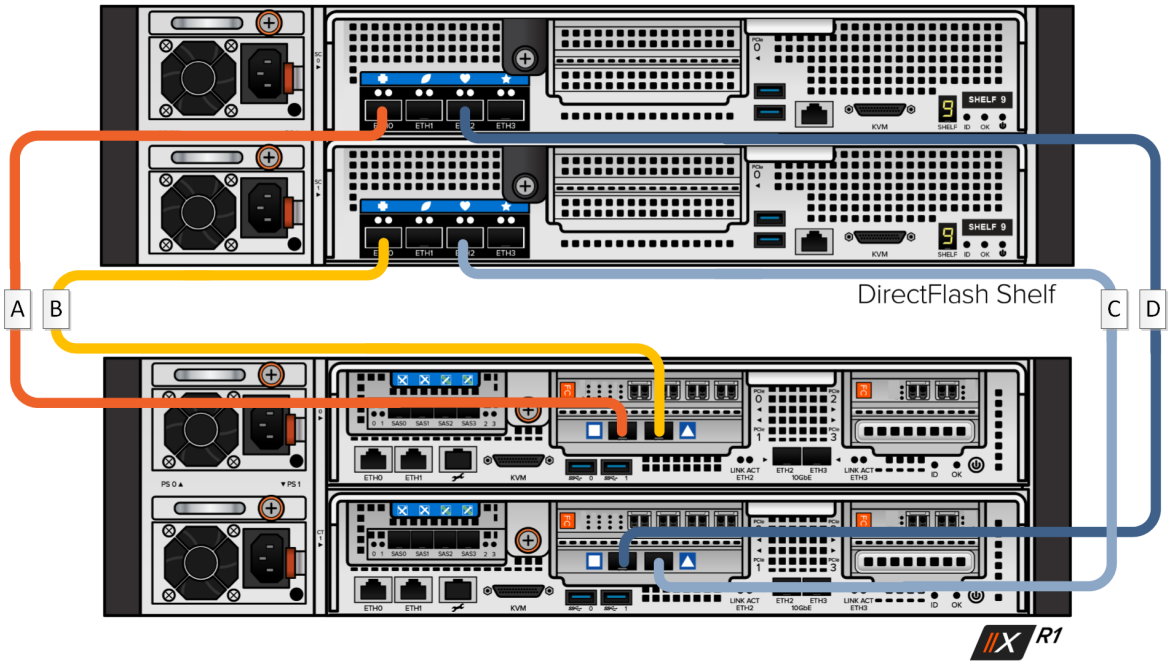

Figure 4. FlashArray//XR1 Connected to DirectFlash Shelf

Step 2. Connect Management Ports

Connect customer-supplied Ethernet cables to the FlashArray//M or //XR1 1-GbE management ports.

On FlashArray//M or //XR110, you must use **ETH1** for 1-GbE replication instead of management. On all other models, you can optionally use **ETH1** for 1-GbE replication. For more information, see "Connect Storage Area and Replication Networks" on page 1.

1. Connect the **CT0** **ETH0** port to the administrative network as directed by the customer.
2. Connect the **CT1** **ETH0** port to the administrative network as directed by the customer.
3. (Optional) Connect the **CT0** **ETH1** port to the administrative network as directed by the customer.
4. (Optional) Connect the **CT1** **ETH1** port to the administrative network as directed by the customer.

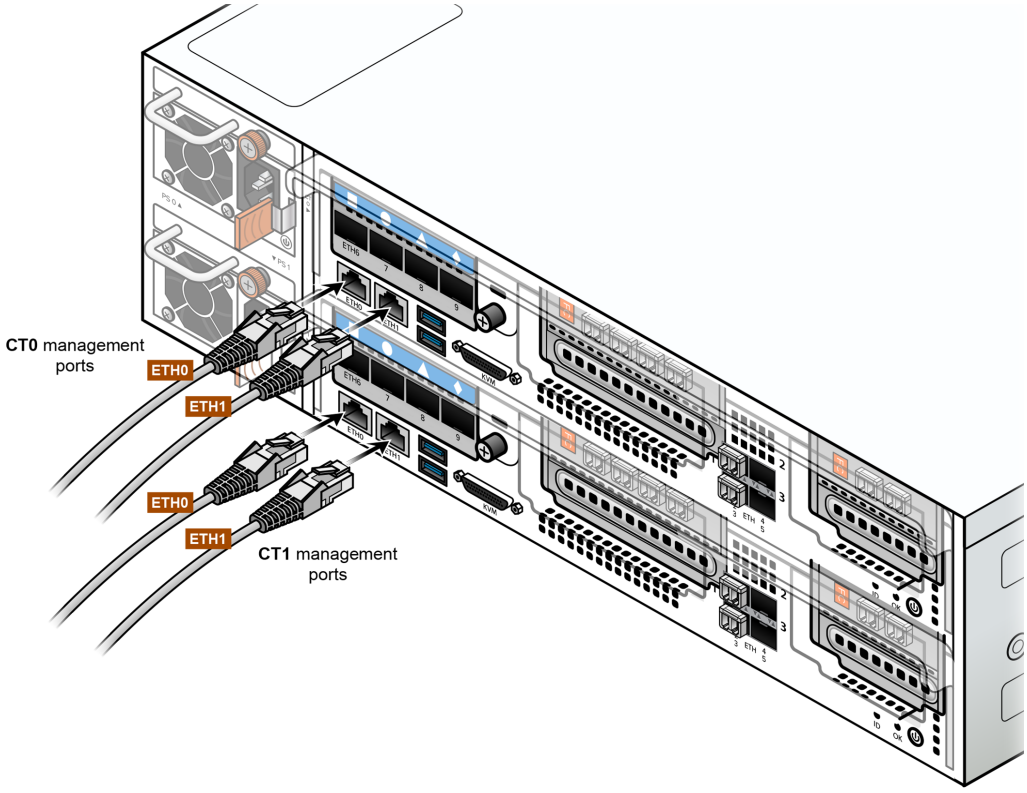

Figure 5. Connecting Management Cables

Step	Cable Type	Device	Port	Connect To
1	Customer-supplied Category 5/6	CT0	ETH0	Customer-designated 1-GbE switch port
2		CT1	ETH0	
3		CT0	ETH1	
4		CT1	ETH1	

Step 3. Connect Storage Area Networks

For redundancy, connect **CT0** and **CT1** to separate storage area networks (SANs).

1. On **CT0**, use customer-supplied cables to connect host ports. On FlashArray//M10 only, connect ETH2 and ETH3 to SANs. On all other FlashArray//M or //XR1 models, connect FC0 through FC9 or ETH4 through ETH9 to SANs. See Figure 6 for port locations.
2. Repeat step 1 on **CT1**.

Do not refer to any port numbering stamped on add-on cards such as Fibre Channel cards. Refer to the logical port numbering shown below, which matches the GUI numbering.

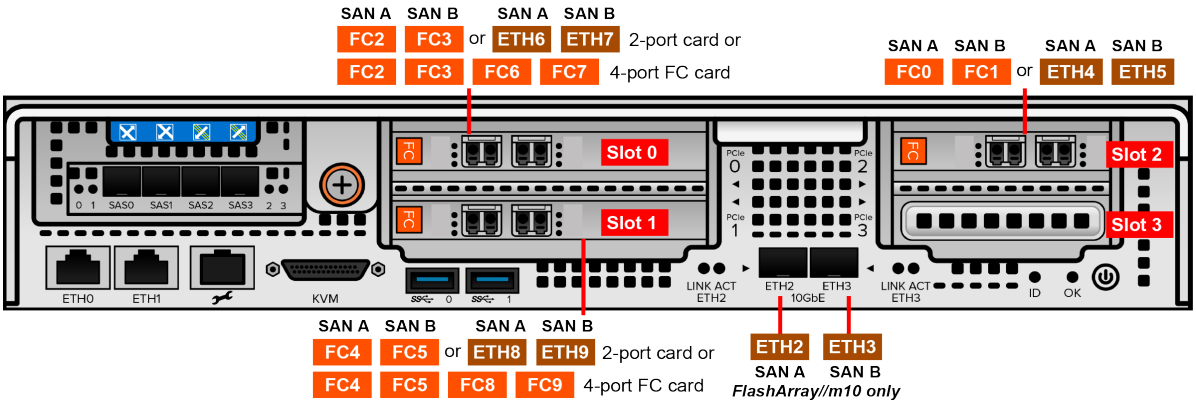

Figure 6. Connecting SAN Networks

Order	Connect from Port	Location	Connect to	Comment
On FlashArray//M10 only				
1	ETH2	Lower right	SAN A	10 GbE
2	ETH3	Lower right	SAN B	10 GbE
On all other FlashArray//M or //XR1 models				
1	FC0 / ETH4	Slot 2, left	SAN A	—
2	FC1 / ETH5	Slot 2, right	SAN B	—
3	FC2 / ETH6	Slot 0, left	SAN A	—
4	FC3 / ETH7	Slot 0, right	SAN B	—
5	FC6	Slot 0	SAN A	4-port card only
6	FC7	Slot 0	SAN B	4-port card only
7	FC4 / ETH8	Slot 1, left	SAN A	—
8	FC5 / ETH9	Slot 1, right	SAN B	—
9	FC8	Slot 1	SAN A	4-port card only
10	FC9	Slot 1	SAN B	4-port card only

Step 4. Connect Replication Fabrics

For redundancy, connect **CT0** and **CT1** to separate replication fabrics.

On FlashArray//M10, you must use port **ETH1** for 1-GbE replication. On all other FlashArray//M or //XR1 models, you can optionally configure either 10-GbE replication by using ports **ETH2** and **ETH3**, or configure 1-GbE replication by using port **ETH1**.

1. For replication, use either customer-supplied 10-GbE cables to connect ports **ETH2** and **ETH3** (labeled **REPL A** and **REPL B** in Figure 7) or a 1-GbE cable to port **ETH1** to replication network switch ports.
2. Repeat step 1 on **CT1**.

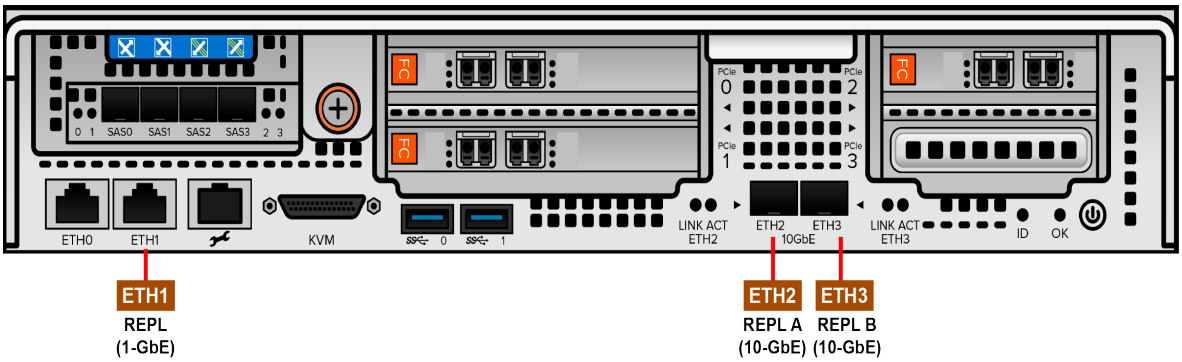

Figure 7. Connecting Replication Fabrics

Order	Connect from Port	Location	Connect to	Comment
Required on FlashArray//M10 and optional on all other models				
1	**ETH1**	Lower left	REPL	1 GbE
Standard on all other FlashArray//M or //XR1 models				
1	**ETH2**	Lower right	REPL A	10 GbE
2	**ETH3**	Lower right	REPL B	10 GbE

Appendix: Array Port Names

Do not refer to any port numbering stamped on add-on cards such as Fibre Channel cards. Refer to the logical port numbering shown below, which matches the GUI numbering.

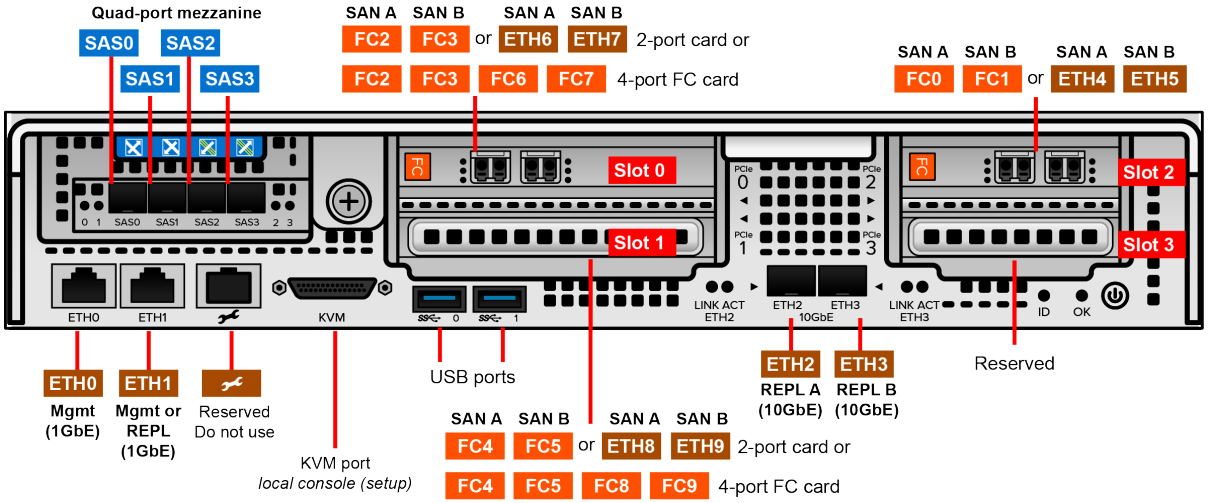

Figure 8. FlashArray//M or //XR1 Controller Ports

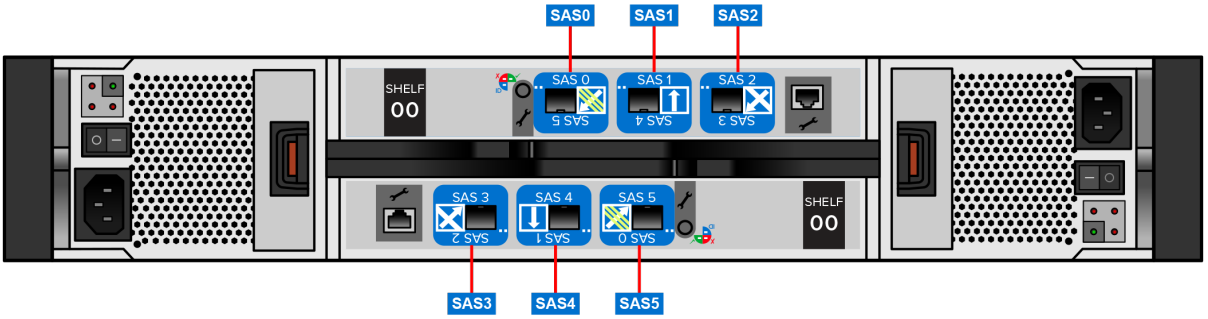

Figure 9. Storage Shelf Ports (12G)

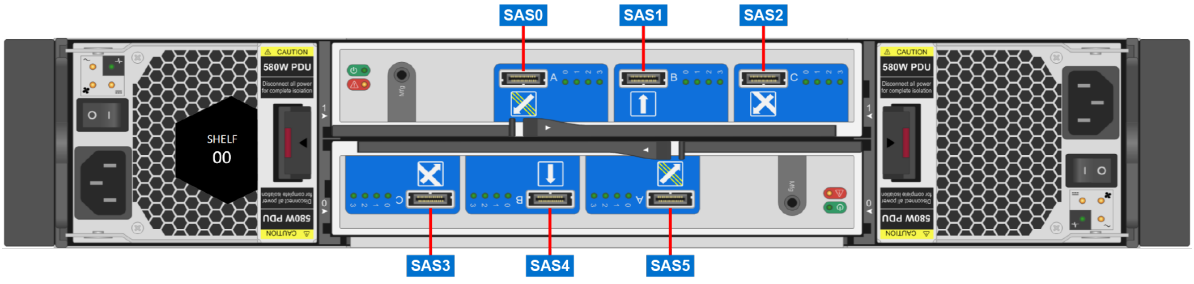

Figure 10. Storage Shelf Ports (6G)

Appendix: Array Port Names (Cont'd)

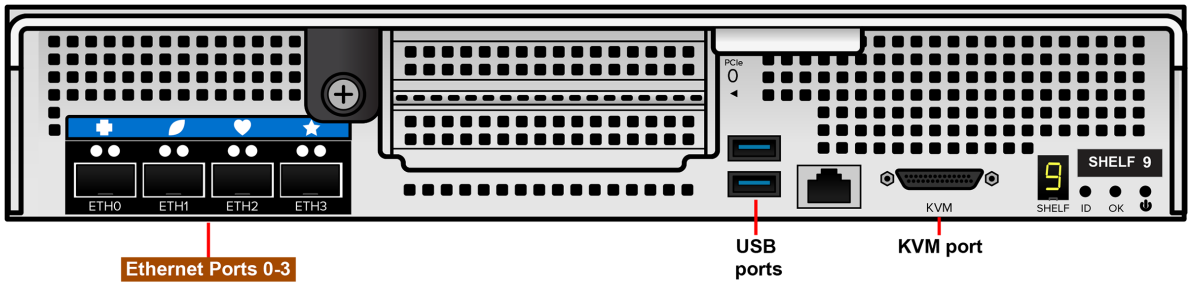

Figure 11. DirectFlash Shelf Ports

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