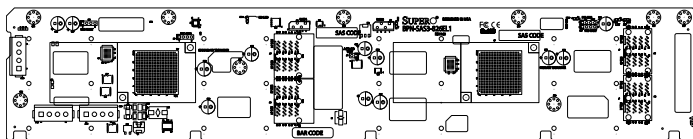


SUPERO®

BPN-SAS3-826EL Backplane



USER'S GUIDE

Revision 1.0a

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WARNING: Handling of lead solder materials used in this product may expose you to lead, a chemical known to the State of California to cause birth defects and other reproductive harm.

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Returning Merchandise for Service

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service will be rendered. You can obtain service by calling your vendor for a Returned Merchandise Authorization (RMA) number. When returning to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton, and mailed prepaid or hand-carried. Shipping and handling charges will be applied for all orders that must be mailed when service is complete.

For faster service, RMA authorizations may be requested online (<http://www.supermicro.com/support/rma/>).

Whenever possible, repack the backplane in the original Supermicro box, using the original packaging materials. If these are no longer available, be sure to pack the backplane in an anti-static bag and inside the box. Make sure that there is enough packaging material surrounding the backplane so that it does not become damaged during shipping.

This warranty only covers normal consumer use and does not cover damages incurred in shipping or from failure due to the alteration, misuse, abuse or improper maintenance of products.

During the warranty period, contact your distributor first for any product problems.

Notes

Chapter 1

Safety Guidelines

To avoid personal injury and property damage, carefully follow all the safety steps listed below when accessing your system or handling the components.

1-1 ESD Safety Guidelines

Electrostatic Discharge (ESD) can damage electronic components. To prevent damage to your system, it is important to handle it very carefully. The following measures are generally sufficient to protect your equipment from ESD.

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing a component from the antistatic bag.
- Handle the backplane by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the card and peripherals back into their antistatic bags when not in use.

1-2 General Safety Guidelines

- Always disconnect power cables before installing or removing any components from the computer, including the BPN-SAS3-826EL series backplane.
- Make sure that the backplane is properly and securely on the motherboard to prevent damage to the system due to power outages.

1-3 An Important Note to Users

All images and layouts shown in this user's guide are based upon the latest backplane revision available at the time of publishing. The card you have received may or may not look exactly the same as the graphics shown in this manual.

1-4 Introduction to the BPN-SAS3-826EL Backplane

The BPN-SAS3-826EL backplane has been designed to utilize the most up-to-date technology available, providing your system with reliable, high-quality performance.

This manual reflects BPN-SAS3-826EL Revision 1.00, the most current release available at the time of publication. Always refer to the Supermicro Web site at www.supermicro.com for the latest updates, compatible parts and supported configurations.

1-5 Overview of the BPN-SAS3-826EL1/EL2 Backplanes

The BPN-SAS3-826EL1 and BPN-SAS3-826EL2 model backplanes are identical, except that the BPN-SAS3-826EL2 backplane has duplicate secondary components which are not found on the BPN-SAS3-826EL1. The BPN-SAS3-826EL2 is divided into a two sections, with the primary components on the right side of the board and the secondary components on the left. SAS3 backplanes are not compatible with legacy SAS (3 Gbps) or SATA (1.5 Gbps) backplanes or lower.

Chapter 2

Connectors, Jumpers and LEDs

2-1 Front Connectors

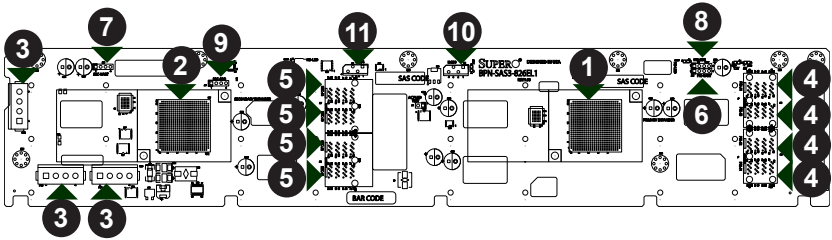


Figure 2-1: BPN-SAS3-826EL1/EL2 Connectors and Components

- | | |
|---|---|
| <ol style="list-style-type: none"> 1. Primary expander chip. 2. Secondary expander chip (not present on EL1 single port backplanes). 3. Power connectors: JPW1, JPW2, and JPW3. 4. Primary SAS ports: PRI-J1 through PRI-J4. 5. Secondary SAS ports: SEC-J1 through SEC-J4 (not present on EL1 single port backplanes). 6. Primary UART connector: PRI-UART (J22) for manufacturer's use only. 7. Secondary UART connector: SEC-UART(J23) for manufac- | <ol style="list-style-type: none"> 8. Primary SDB connector: PRI-SDB (J18), for manufacturer's use only. 9. Secondary SDB connector: SEC-SDB (J19), for manufacturer's use only, not present on EL1 backplanes. 10. Primary I²C connector. I2C#0 (J20). 11. Secondary I²C connector, I2C#4 (J21). |
|---|---|

2-2 Front Connector and Pin Definitions

1. - 2. Primary and Secondary Expander Chips

The primary and secondary expander chips allow the backplane to support dual port, cascading, and failover configurations.

3. Backplane Main Power Connectors

The 4-pin connectors, designated JPW1, JPW2, and JPW3, provide power to the backplane. See the table on the right for pin definitions.

Backplane Main Power 4-Pin Connector	
Pin#	Definition
1	+12V
2 and 3	Ground
4	+5V

4. - 5. Primary and Secondary SAS Connectors

The primary SAS connectors are designated PRI-J1 through PRI-J4. The secondary SAS Ports are designated SEC-J1 through SEC-J4 and are not present on EL1 single port backplanes.

6. - 7. Primary and Secondary UART Connectors

The primary UART connector is designated PRI-UART and J22. The secondary UART connector is designated SEC-UART and J23 and is not present on BPN-SAS3-826EL1. UART connectors are used for manufacturer's diagnostic purposes only.

8. - 9. SDB Connectors

The Primary SDB connector is designated PRI-SDB and J18. The secondary SDB connector is designated SEC-SDB and J19. (Not present on BPN-SAS3-826EL1 backplanes) These are debug connectors used for the manufacturer's diagnostic purposes only.

10. - 11. I²C Connectors

The primary I²C connector. is designated I2C#0 and J20. The secondary I²C connector is designated I2C#4 and J21.

2-3 Front Jumper Location and Settings

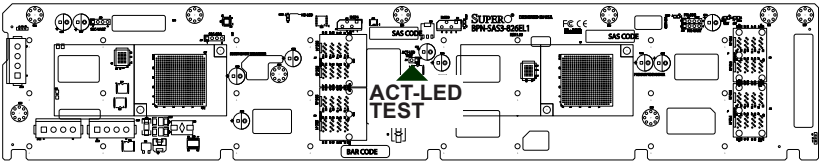
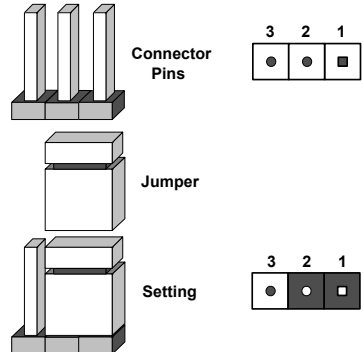


Figure 2-3: Front Jumpers

Explanation of Jumpers

To modify the operation of the backplane, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. Note: On two pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.



General Jumper Settings		
Jumper	Jumper Settings	Note
ACT-LED TEST	Open: Disabled (Default) Closed: Enabled	Activity LED test.

2-4 Front LED Indicators

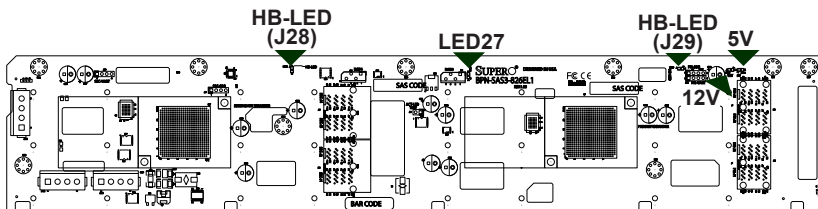


Figure 2-4: Front LEDs

Backplane LEDs			
LED	Normal State	Abnormal State	Specification
HB-LED (J29)	Blinking	On/Off	Heartbeat LED, primary expander
HB-LED (J28)	Blinking	On/Off	Heartbeat LED, secondary expander
LED27	Off	On	System overheat LED
5V	On	Off	5V power status
12V	On	Off	12V power status

2-5 Rear Connectors and LED Indicators

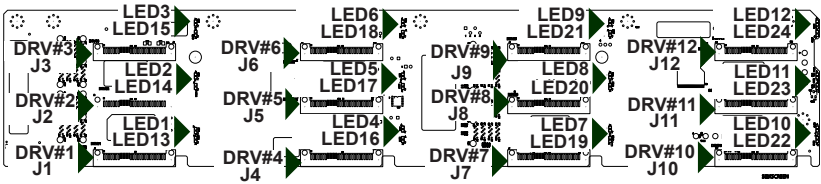


Figure 2-5: Rear Connectors and LEDs

Rear SAS Connectors			
Rear Connector	SAS Drive Number	Rear Connector	SAS Drive Number
DRV#1	SAS HDD #1	DRV#7	SAS HDD #7
DRV#2	SAS HDD #2	DRV#8	SAS HDD #8
DRV#3	SAS HDD #3	DRV#9	SAS HDD #9
DRV#4	SAS HDD #4	DRV#10	SAS HDD #10
DRV#5	SAS HDD #5	DRV#11	SAS HDD #11
DRV#6	SAS HDD #6	DRV#12	SAS HDD #12

Rear LED Indicators		
Rear LED	Hard Drive Activity	Failure LED
SAS #1	LED1	LED13
SAS #2	LED2	LED14
SAS #3	LED3	LED15
SAS #4	LED4	LED16
SAS #5	LED5	LED17
SAS #6	LED6	LED18
SAS #7	LED7	LED19
SAS #8	LED8	LED20
SAS #9	LED9	LED21
SAS #10	LED10	LED22
SAS #11	LED11	LED23
SAS #12	LED12	LED24

Notes

Chapter 3

Dual Port and Cascading Configurations

3-1 Single and Dual Port Expanders

SAS connectors PRI-J1 to J4 and SEC-J1 to J4 are bidirectional and can be treated as input or output.

Single Ports

BPN-SAS3-826EL1 backplanes have a single port expander that accesses all of the drives and supports cascading.

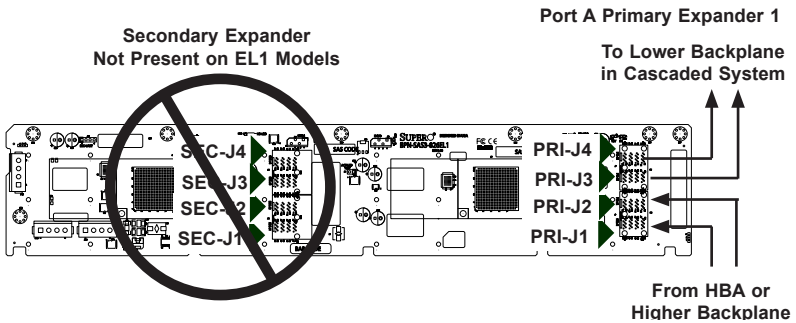


Figure 3-1: BPN-SAS3-826EL1 Single Port Configuration

Dual Ports

BPN-SAS3-826EL2 model backplanes have dual-port expanders that access all of the hard drives. These dual-port expanders support cascading, failover, and recovery.

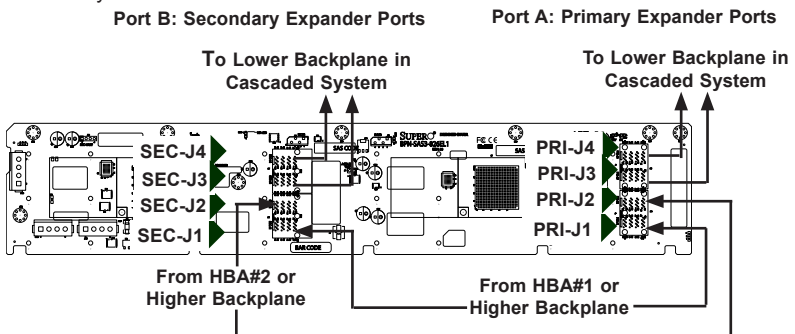


Figure 3-2: BPN-SAS3-826EL2 Dual Port Configuration

3-2 Failover

The BPN-SAS3-826EL2 model backplane has two expanders which enable effective failover and recovery.

Single Host Bus Adapter

In a single host bus configuration, the backplane connects to one host bus adapter.

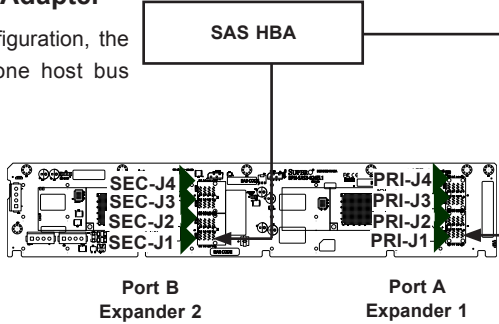


Figure 3-3: Single HBA

Single Host Bus Adapter Failover

If the expander or data path in Port A fails, the system automatically switches to Port B with application software or failover support.

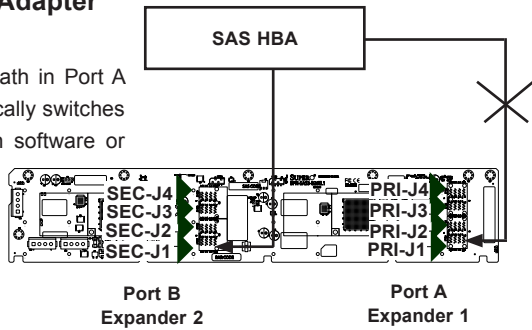


Figure 3-4: Single HBA Failover

3-3 Failover with RAID Cards and Multiple HBAs

The BPN-SAS3-826EL backplane may be configured for failover with multiple HBAs using either RAID controllers or HBAs to achieve failover protection.

RAID Controllers: If RAID controllers are used, then the failover is accomplished through port failover on the same RAID card.

HBAs: If multiple HBAs are used to achieve failover protection and load balancing, **Linux MPIO software must be installed and correctly configured to perform the load balancing and failover tasks.**

Dual Host Bus Adapter

In a dual host bus configuration, the backplane connects to two HBA's.

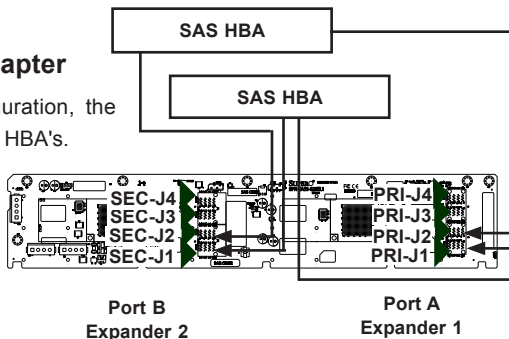


Figure 3-5: Dual HBA

Dual Host Bus Adapter Failover

If the expander or data path in Port A fails, the system automatically switches to Port B. This maintains a full connection to all drives.

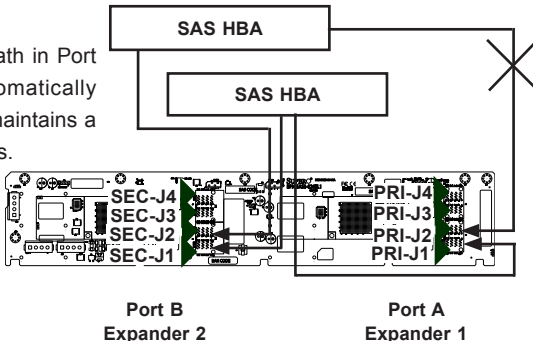


Figure 3-6: Dual HBA Failover

IMPORTANT: For RAID controllers, redundancy is achieved through port failover. For multiple HBAs MPIO software is required to achieve failover protection.

3-4 Connecting HBAs to the Backplane

Connecting an Internal HBA to the Backplane

The following section lists the most common cables used to connect the HBA to the backplane.

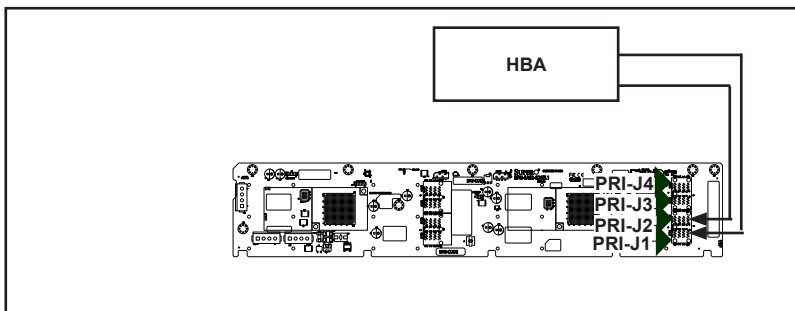


Figure 3-7: Single Internal Host Bus Adapter

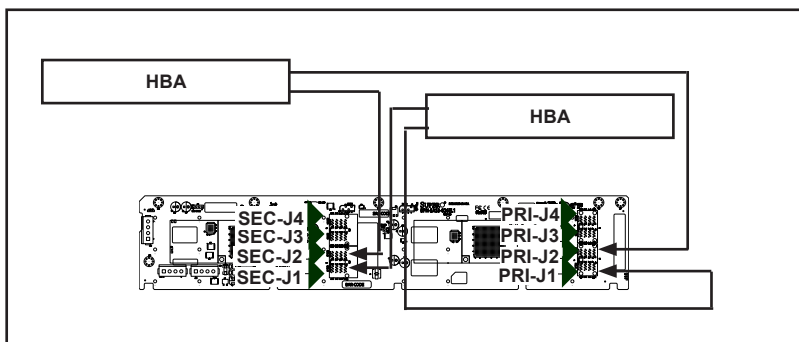


Figure 3-8: Dual Internal Host Bus Adapter

Supported Internal HBA Cables

Use the following cables to create connections between the internal HBA and BPN-SAS3-826EL model backplane. The cables required depend upon the HBA connector.

IMPORTANT: See Section 3-3 of this manual, *Failover with RAID Cards and Multiple HBAs* for important information on supported configurations.

Cable Name: Internal iPass (Mini-SAS) to HD (Mini-SAS)

Part #: CBL-SAST-0508-01 **Length:** 50 cm (19 inches)

Part #: CBL-SAST-0507-01 **Length:** 80 cm (31 inches)

Description: This cable has an iPass (SFF-8087/Mini-SAS) connector (36-pin) at one end and a Mini-SAS HD (SFF-8643) connector at the other end. It connects from the SAS2 HBA to the BPN-SAS3-826EL model backplane.

Cable name: Internal HD (Mini-SAS) to HD (Mini-SAS)

Part #: CBL-SAST-0568 **Length:** 35 cm (13 inches)

Part #: CBL-SAST-0593 **Length:** 60 cm (23 inches)

Part #: CBL-SAST-0531 **Length:** 80 cm (31 inches)

Description: This cable has a Mini-SAS HD (SFF-8643) connector at both ends. It connects from the SAS3 HBA to the BPN-SAS3-826EL model backplane.

Connecting an External HBA to the Backplane

This backplane supports external host bus adapters. In this configuration, the HBA and the backplane are in different physical chassis. This allows a JBOD (Just a Bunch Of Drives) configuration from an existing system.

Single External Host Bus Adapter

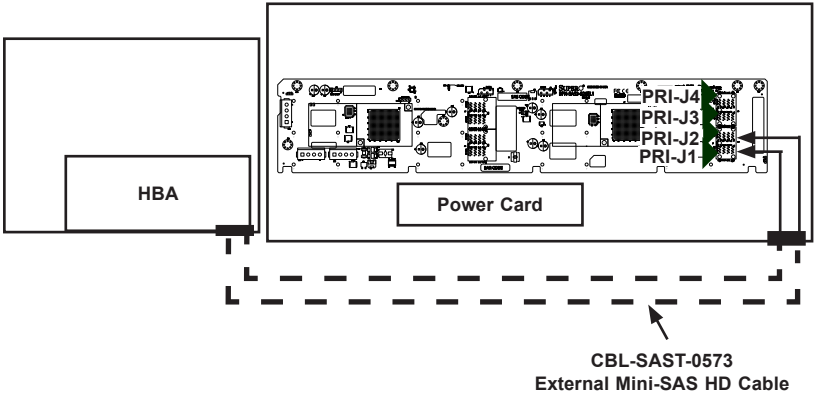


Figure 3-9: Single External Host Adapter

Dual External Host Bus Adapter

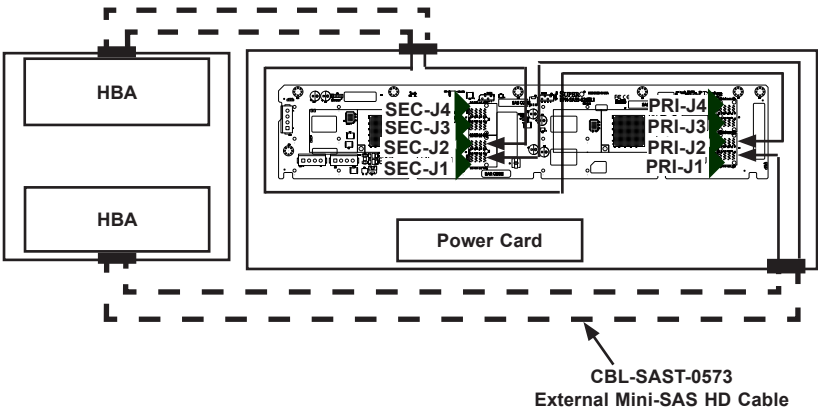


Figure 3-10: Dual External Host Bus Adapter

IMPORTANT: See Section 3-3 of this manual, *Failover with RAID Cards and Multiple HBAs* for important information on supported configurations.

Connecting Multiple Backplanes in a Single Channel Environment

This section describes the cables used when cascading from a single HBA. These connections use CBL-SAST-0531 internal cables and CBL-SAST-0573 external cables.

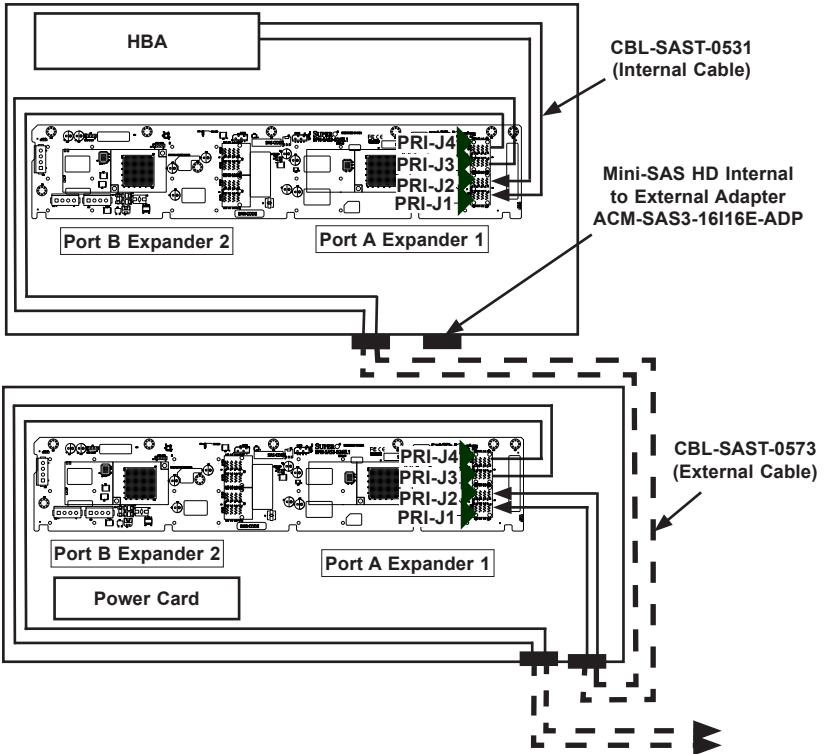


Figure 3-11: Single HBA Configuration

Single HBA Configuration Cables



Figure 3-12: External Mini-SAS HD to External Mini-SAS HD Cable

Cable Name: 1 Meter External Mini-SAS HD to External Mini-SAS HD Cable

Part #: CBL-SAST-0573

Ports: Single

Placement: External Cable

Description: External cascading cable, connects ports between servers and JBODs.

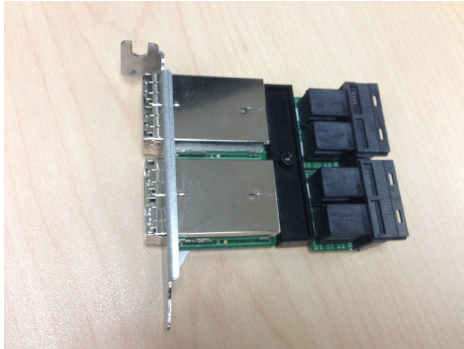


Figure 3-13: Mini-SAS HD Internal to External Adapter

Cable Name: 16-port Mini-SAS HD Internal to External Cable Adapter with LP Bracket

Part #: AOM-SAS3-16I16E-LP

Ports: Four wide-ports (sixteen ports total)

Placement: Internal cable with adapter

Description: Internal cable, connects the SAS3 backplane to external ports.

Connecting Multiple Backplanes in a Dual Channel Environment

This section describes the cables used when cascading from dual HBAs. These connections use CBL-SAST-0531 internal cables and CBL-SAST-0573 external cables.

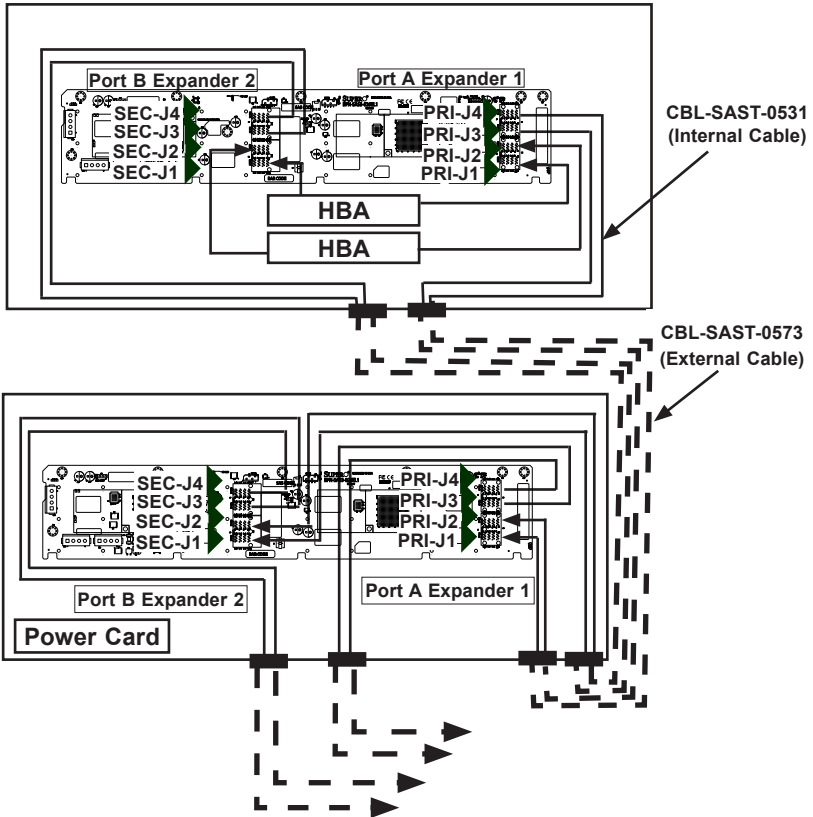


Figure 3-14: Dual HBA Configuration

IMPORTANT: See Section 3-3 of this manual, *Failover with RAID Cards and Multiple HBAs* for important information on supported configurations.

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