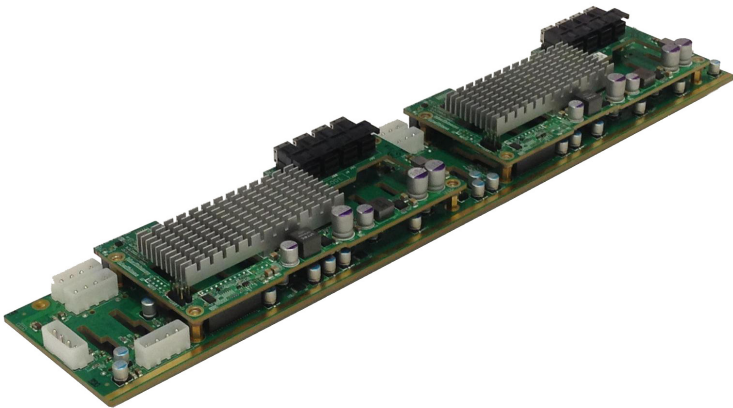




BPN-SAS3-216EL1/EL2

BACKPLANE



USER'S GUIDE

1.0a

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Manual Revision 1.0a
Release Date: March 11, 2015

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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.

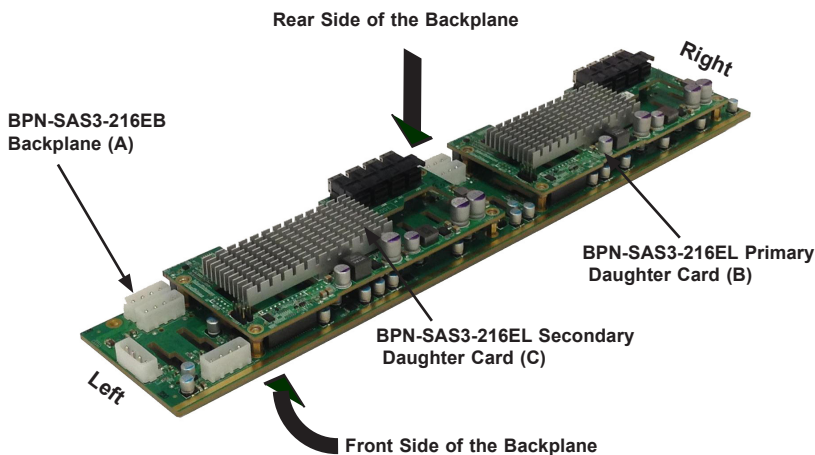
Overview of the BPN-SAS3-216EL1/EL2 Backplanes

The BPN-SAS3-216EL1/EL2 model backplanes consist of a BPN-SAS3-216EB backplane (A) with one or two BPN-SAS3-216EL daughter cards (B and C) mounted on the rear of the backplane. The front of the backplane is defined as the side which faces toward the front of the chassis when installed.

The BPN-SAS3-216EL1 model consists of the BPN-SAS3-216EB backplane (A) and **one** BPN-SAS3-216EL primary daughter card (B), mounted on the right-hand side of the backplane.

The BPN-SAS3-216EL2 model consists of the BPN-SAS3-216EB backplane (A) with a BPN-SAS3-216EL primary daughter card mounted on the right (B) and a BPN-SAS3-216EL secondary daughter card mounted on the left (C).

Components on the front side of the BPN-SAS3-216EB backplane include twenty-four SAS connectors and their respective activity and failure LEDs. Components on the rear side of the backplane include jumpers and power connectors. The daughter card's components include SAS ports, flash and expander chips.



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 the backplane 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 and daughter cards by their edges only; do not touch the components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the backplane 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 backplane.
- Disconnect the power cable before installing or removing any cables from the backplane.
- Make sure that the backplane is securely and properly installed on the motherboard to prevent damage to the system due to power shortage.

1-3 An Important Note to Users

All images and layouts shown in this user's guide are based upon the latest PCB 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-SAS3-216EL1/EL2 Backplane

The BPN-SAS3-216EL1/EL2 model backplane has been designed to utilize the most up-to-date technology available, providing your system with reliable, high-quality performance.

This manual reflects the BPN-SAS3-216EB Revision 1.00 backplane, the most current release available at the time of publication.

This manual also describes the BPN-SAS3-216EL daughter card, Revision 1.01, the most current release available at the time of publication. Always refer to the Supermicro website at www.supermicro.com for the latest updates, compatible parts and supported configurations.

Chapter 2

Connectors, Daughter Cards and LEDs

2-1 Connectors and Daughter Cards

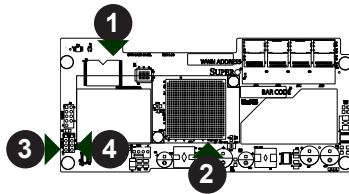
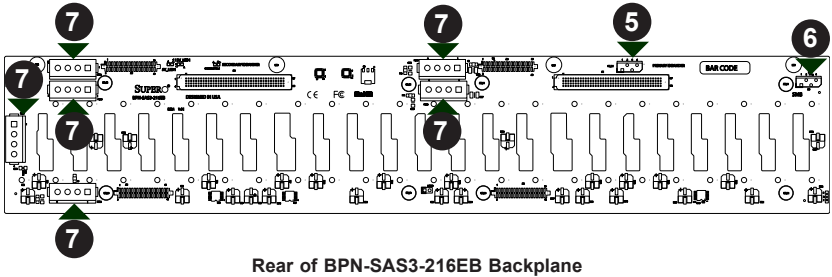


Figure 2-1. Connectors and Daughter Cards on the BPN-SAS3-216EL

Connectors

- | | |
|-----------------------|---|
| 1. Flash Chip | 5. Primary Expander Connector:
PRI_I2C |
| 2. Expander Chip | 6. SMB Expander Connector: J38 |
| 3. UART Connector: J5 | 7. Power Connectors: PWR1 - PWR6 |
| 4. SDB Connector: J10 | |

2-2 Front Connector and Pin Definitions

1. Flash Chips

The flash chip enhances the backplane memory.

2. Expander Chips

This expander chip allows the backplane to support dual ports, cascading, and failover.

3. UART Connector

The UART connector is designated UART and J5. It is used for manufacturer's diagnostic purposes only.

4. SDB Connector

The SDB connector is designated SDB and J10. It is the debug connector and is used for manufacturer's diagnostic purposes only.

5. Expander Connector

The primary expander connector is designated PRI_i2C and is reserved for future expansion.

6. Expander Connector

The secondary expander connector is designated J8. It is used to connect the chassis power cord and CSE-PTJBOD-CB3 for JBOD configuration.

7. Backplane Main Power Connectors

The 4-pin connectors are designated PWR1 - PWR6. They 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

2-3 Front Connectors and LED Indicators

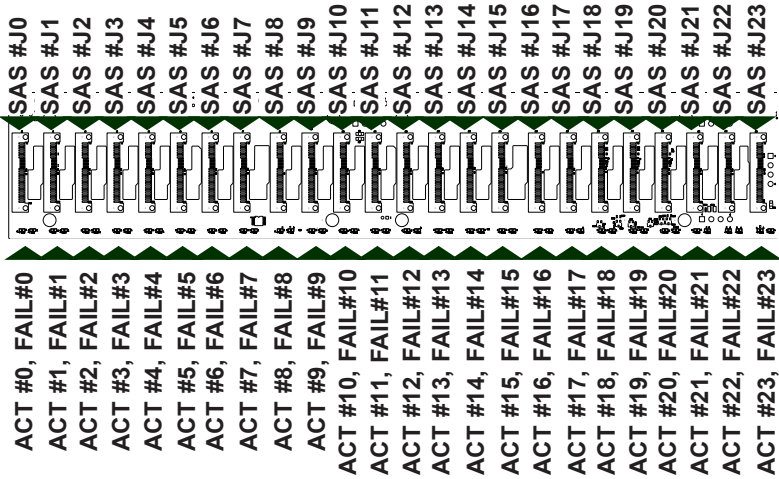


Figure 2-2. Front Connectors and LEDs

Front SAS/SATA Connectors			
Front Connector	SAS Drive Number	Front Connector	SAS Drive Number
SAS #J0	SAS/SATA HDD #1	SAS #J12	SAS/SATA HDD #13
SAS #J1	SAS/SATA HDD #2	SAS #J13	SAS/SATA HDD #14
SAS #J2	SAS/SATA HDD #3	SAS #J14	SAS/SATA HDD #15
SAS #J3	SAS/SATA HDD #4	SAS #J15	SAS/SATA HDD #16
SAS #J4	SAS/SATA HDD #5	SAS #J16	SAS/SATA HDD #17
SAS #J5	SAS/SATA HDD #6	SAS #J17	SAS/SATA HDD #18
SAS #J6	SAS/SATA HDD #7	SAS #J18	SAS/SATA HDD #19
SAS #J7	SAS/SATA HDD #8	SAS #J19	SAS/SATA HDD #20
SAS #J8	SAS/SATA HDD #9	SAS #J20	SAS/SATA HDD #21
SAS #J9	SAS/SATA HDD #10	SAS #J21	SAS/SATA HDD #22
SAS #J10	SAS/SATA HDD #11	SAS #J22	SAS/SATA HDD #23
SAS #J11	SAS/SATA HDD #12	SAS #J23	SAS/SATA HDD #24

Front LED Indicators		
Front LED	Hard Drive Activity	Failure LED
SAS #J0	ACT #0	FAIL #0
SAS #J1	ACT #1	FAIL #1
SAS #J2	ACT #2	FAIL #2
SAS #J3	ACT #3	FAIL #3
SAS #J4	ACT #4	FAIL #4
SAS #J5	ACT #5	FAIL #5
SAS #J6	ACT #6	FAIL #6
SAS #J7	ACT #7	FAIL #7
SAS #J8	ACT #8	FAIL #8
SAS #J9	ACT #9	FAIL #9
SAS #J10	ACT #10	FAIL #10
SAS #J11	ACT #11	FAIL #11
SAS #J12	ACT #12	FAIL #12
SAS #J13	ACT #13	FAIL #13
SAS #J14	ACT #14	FAIL #14
SAS #J15	ACT #15	FAIL #15
SAS #J16	ACT #16	FAIL #16
SAS #J17	ACT #17	FAIL #17
SAS #J18	ACT #18	FAIL #18
SAS #J19	ACT #19	FAIL #19
SAS #J20	ACT #20	FAIL #20
SAS #J21	ACT #21	FAIL #21
SAS #J22	ACT #22	FAIL #22
SAS #J23	ACT #23	FAIL #23

Chapter 3

Dual Port and Cascading Configurations

3-1 Single and Dual Port Expanders

Single Ports

BPN-SAS3-216EL1 model backplanes have a single-port expander on the daughter card that accesses all of the drives and supports cascading.

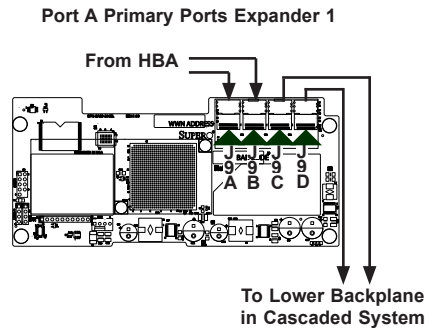


Figure 3-1. BPN-SAS3-216EL1 Single Port Configuration

Dual Ports

BPN-SAS3-216EL2 model backplanes have dual-port expanders on the daughter cards that access all of the hard drives. These dual-port expanders support cascading, failover, and recovery.

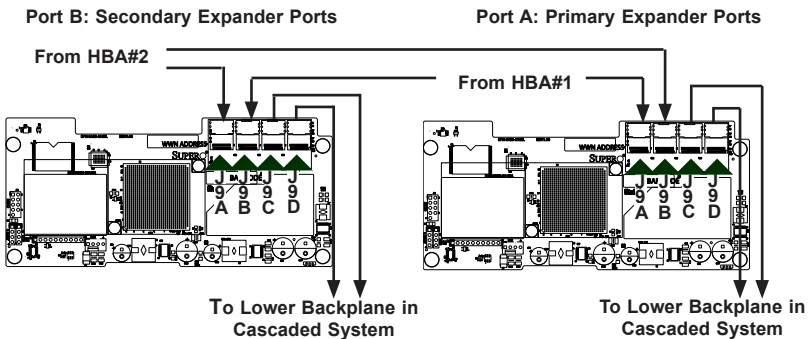


Figure 3-2. BPN-SAS3-216EL2 Dual Port Configuration

3-2 Failover

The BPN-SAS3-216EL2 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 (HBA).

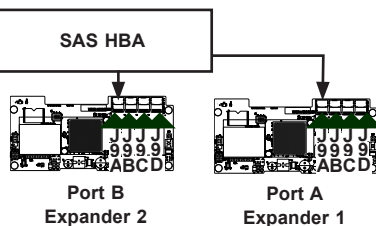


Figure 3-3. Single HBA

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.

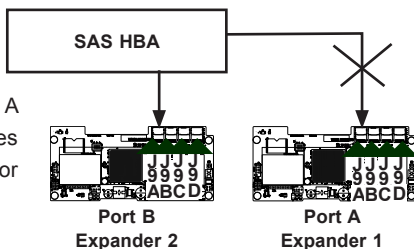


Figure 3-4. Single HBA Failover

3-3 Failover with RAID Cards and Multiple HBAs

The BPN-SAS3-216EL 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.

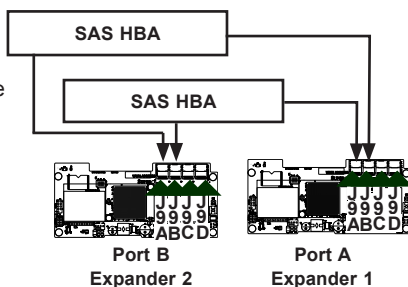


Figure 3-5. Dual HBA

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.

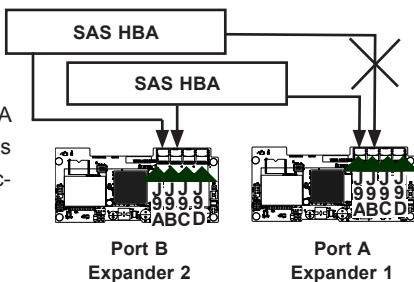


Figure 3-6. Dual HBA Failover

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

3-4 Chassis Control Card and Support Cables

Chassis Control Card

In a cascaded configuration, the first chassis includes a motherboard and at least one host bus adapter (HBA). Other servers in this enclosed system must be equipped with a control card. This section describes the supported control card for the BPN-SAS3-216EL series backplane.

For more information, see the Supermicro website at <http://www.supermicro.com>.

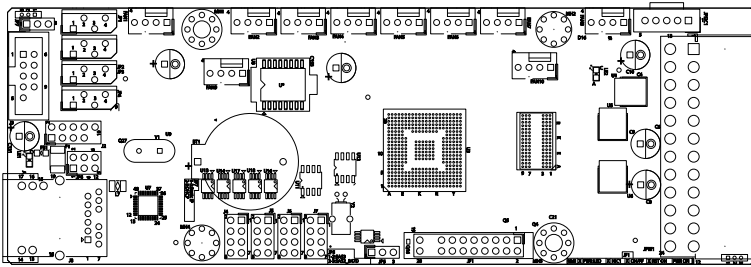


Figure 3-7. Chassis Control Card (Sold Separately)

Power Card		
Part Number	Part Type	Where Used
CSE-PTJBOD-CB3	Control card	Allows the chassis to be used as a JBOD (Just a Bunch of Drives) system, which supports IPMI for remote on/off control.

Connecting an Internal HBA to the Backplane

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

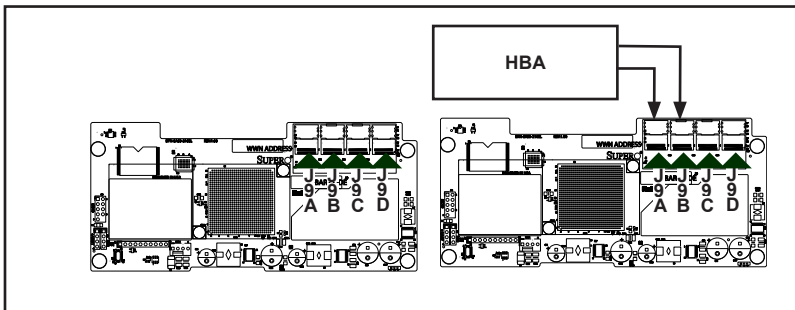


Figure 3-8. Single Internal Host Bus Adapter

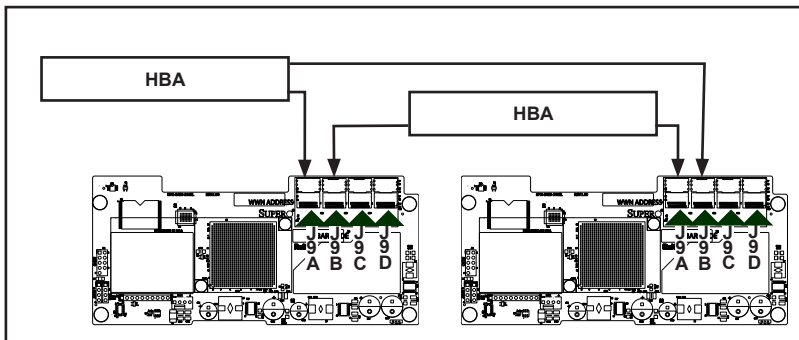


Figure 3-9. Dual Internal Host Bus Adapter

Supported Internal HBA Cables

Use the following cables to create connections between the internal HBA and BPN-SAS3-216EL 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-SAS3-216EL 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-SAS2-216EL 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

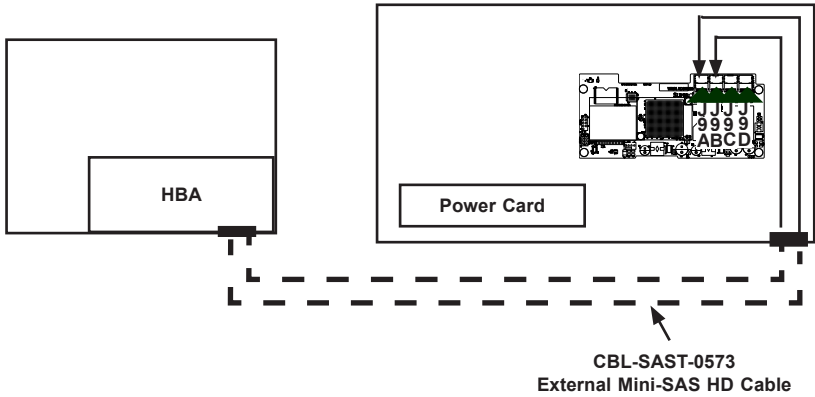


Figure 3-10. Single External Host Adapter

Dual External Host Bus Adapter

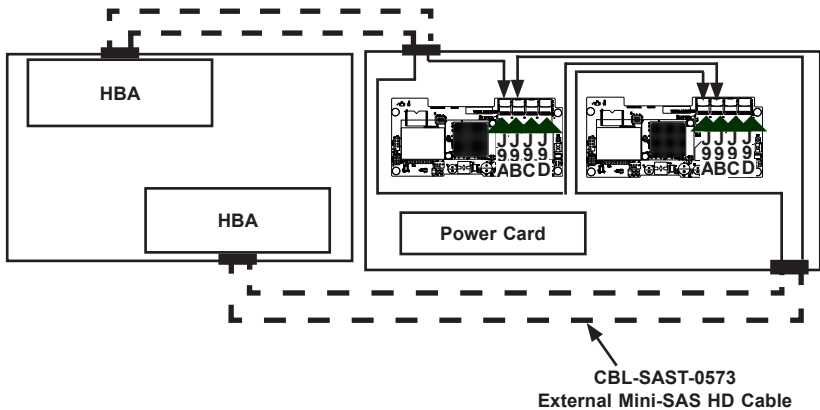


Figure 3-11. Dual External Host Bus Adapter

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.

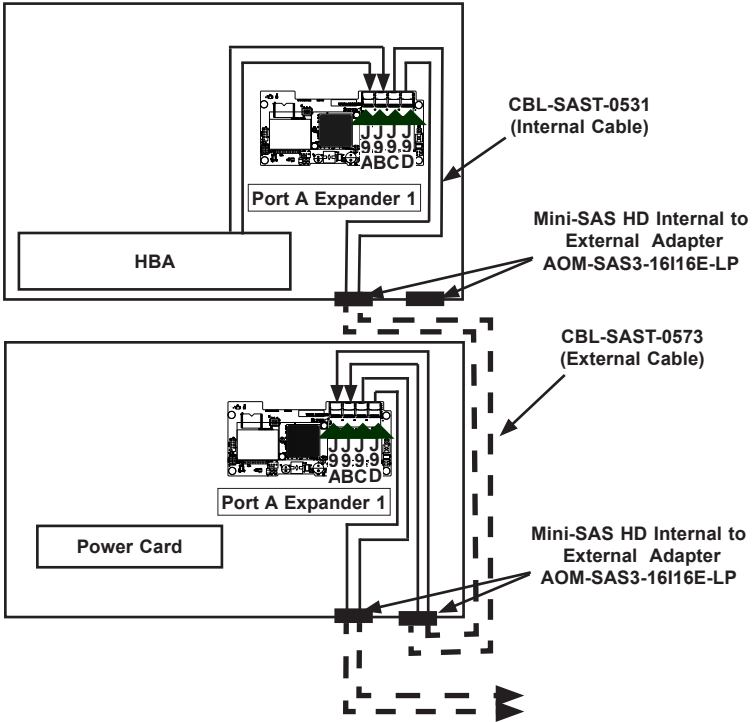


Figure 3-12. Single HBA Configuration

Single HBA Configuration Cables



Figure 3-13. 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.

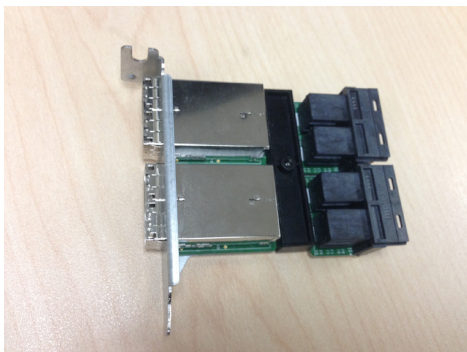


Figure 3-14. Mini-SAS HD Internal to External Adapter

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.

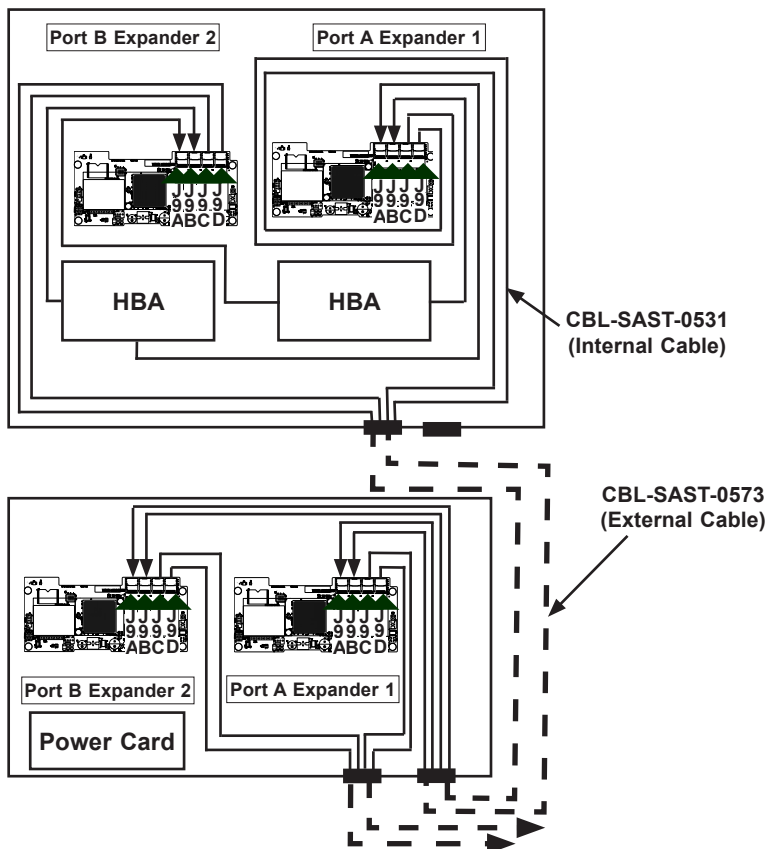


Figure 3-15. Dual HBA Configuration

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

3-5 Supported Cascading Configurations

Cascading allows the system to access data at a faster rate by allowing several backplanes to share resources to reduce latency time.

The first backplane in a cascaded system requires a motherboard and an HBA. Other servers require a chassis control card with no motherboard and no HBA. For more information, specific chassis manuals are available at www.supermicro.com.

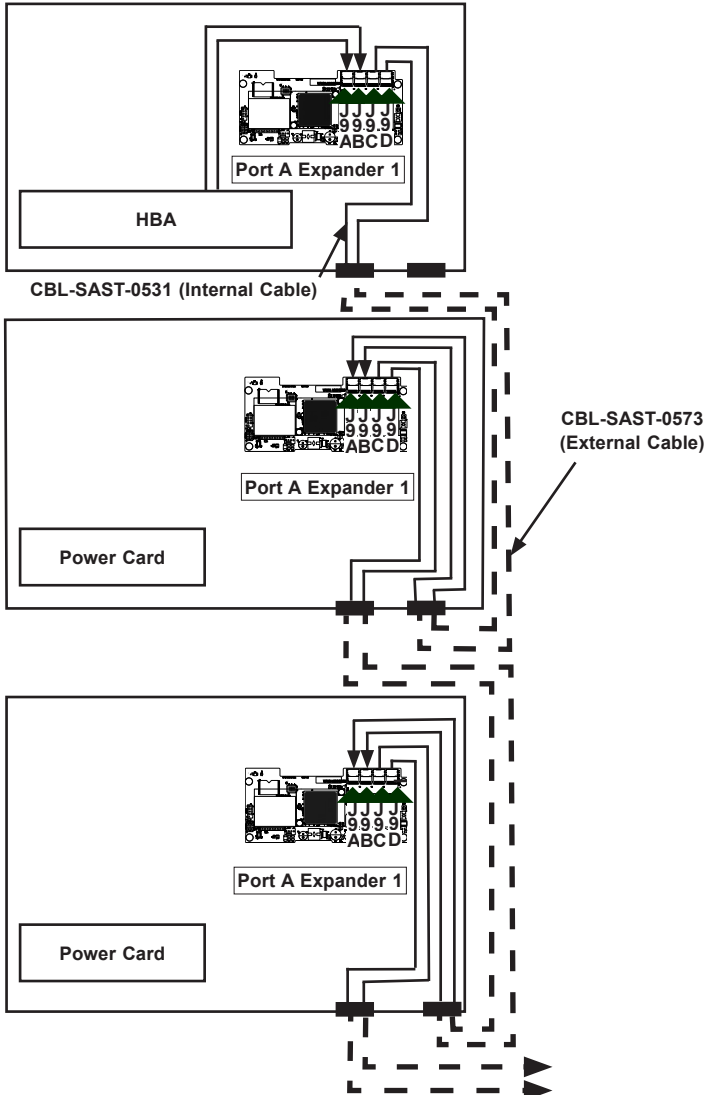


Figure 3-16. Simple Cascaded Configuration

Dual SAS HBA and Cascaded Configuration

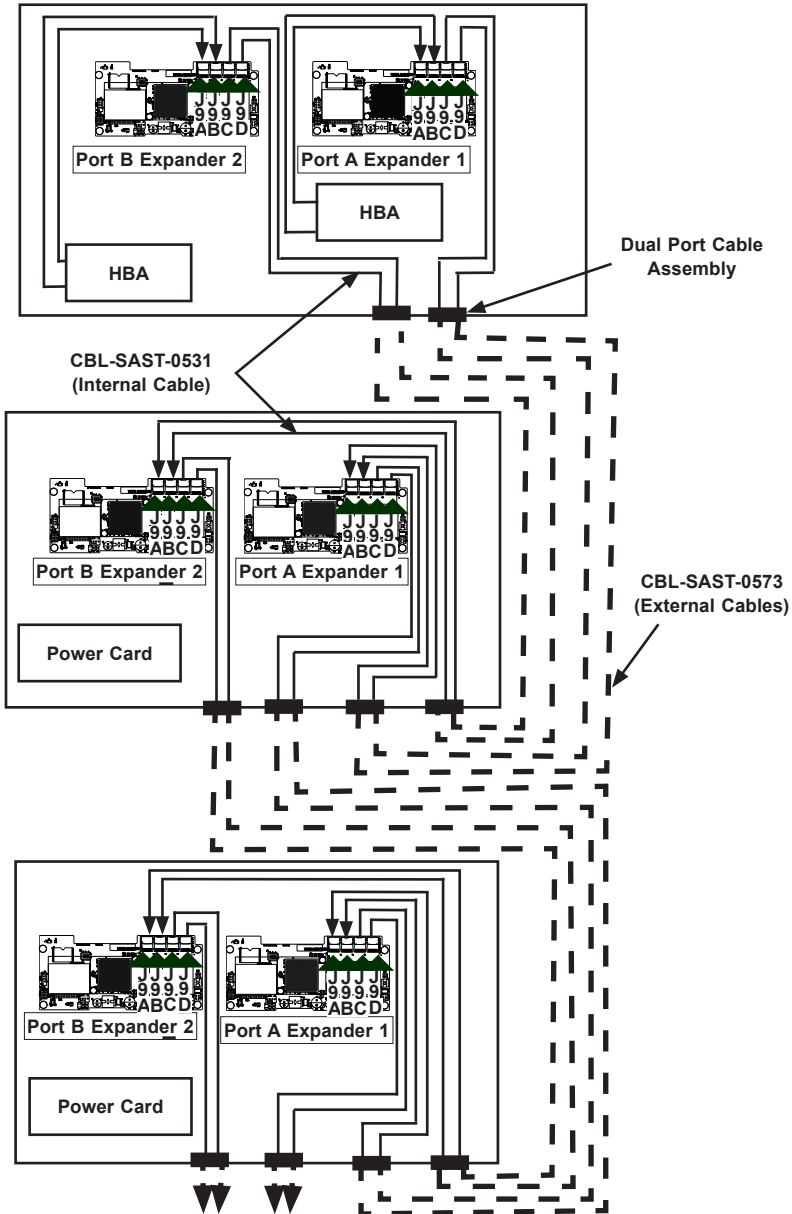


Figure 3-17. Dual SAS HBA with Cascaded Configuration

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

Notes

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