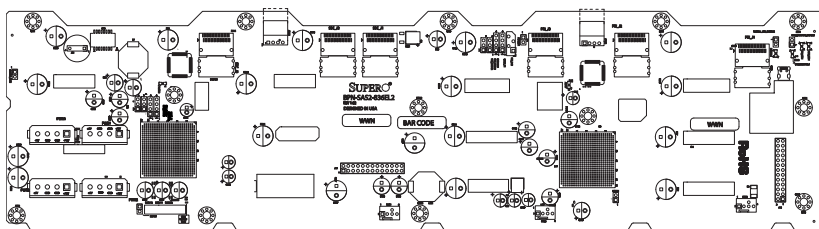




BPN-SAS2-836EL BACKPLANE



USER'S GUIDE

1.0b

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California Best Management Practices Regulations for Perchlorate Materials: This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. "Perchlorate Material-special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate"

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.

Chapter 1

Guidelines

This chapter offers guidelines for personal and equipment safety, and notes about the BPN-SAS2-836EL version documented in this manual.

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 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 Version Information

The BPN-SAS2-836EL 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-SAS2-836EL, Revision 1.03, the most current release available at the time of publication. Refer to the Supermicro Web site at www.supermicro.com for the latest updates, compatible parts and supported configurations.

Chapter 2

Jumper Settings and Pin Definitions

2-1 Rear Connectors

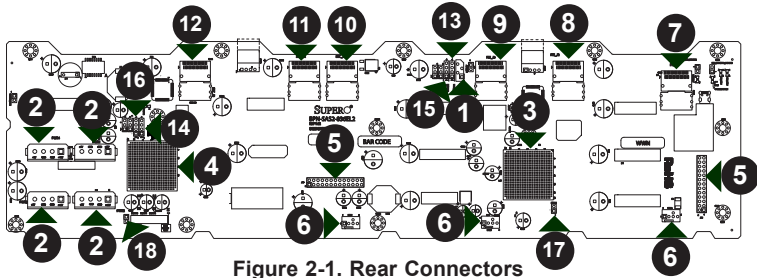


Figure 2-1. Rear Connectors

- | | |
|--|--|
| 1. Primary I ² C connector: PRI_I2C1 | 12. Secondary SAS connector SEC_J3 (Not available on SAS2-836EL1 backplane) |
| 2. Power connectors: PWR1, PWR2, PWR3 and PWR4 | 13. Primary UART connector: UART_P1 (Manufacturer's use only) |
| 3. Primary expander chip | 14. Secondary UART connector: UART_S1 (Manufacturer's use only, not present on SAS2-836EL1 backplane) |
| 4. Secondary expander chip (Not available on SAS2-836EL1 backplane) | 15. Primary debug connector: EXPDBG1 (Manufacturer's use only) |
| 5. EPP connectors: J16 and J19 | 16. Secondary debug connector: EXPDBG2 (Manufacturer's use only, not present on SAS2-836EL1 backplane) |
| 6. Fan connectors: FAN1, FAN2 and FAN3 | 17. Primary MDIO connector: MDIO1 (Manufacturer's use only) |
| 7. Primary SAS connector: PRI_J1 | 18. Secondary MDIO connector: MDIO2 (Manufacturer's use only, not present on SAS2-836EL1 backplane) |
| 8. Primary SAS connector: PRI_J2 | |
| 9. Primary SAS connector: PRI_J3 | |
| 10. Secondary SAS connector: SEC_J1 (Not available on SAS2-836EL1 backplane) | |
| 11. Secondary SAS connector SEC_J2 (Not available on SAS2-836EL1 backplane) | |

2-2 Rear Connector and Pin Definitions

1. Primary I²C Connector

The I²C connector is used to monitor the power supply status and to control the fans. See the table on the right for pin definitions.

I ² C Connector Pin Definitions	
Pin#	Definition
1	Data
2	Ground
3	Clock
4	No Connection

2. Backplane Main Power Connectors

The 4-pin connectors, designated PWR1, PWR2, PWR3 and PWR4, 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

3. and 4. Primary and Secondary Expander Chips

These primary and secondary expander chips allow the backplane to support dual ports, cascading, and failover.

5. EPP Ports

The EPP ports are used for manufacturer diagnostic purposes only.

6. Fan Connectors

The 4-pin connectors, designated FAN1 through FAN3, provide power to the fans. See the table on the right for pin definitions.

Fan Connectors	
Pin#	Definition
1	Ground
2	+12V
3	Tachometer
4	NC

7. - 12. SAS Connectors

The primary and secondary sets of SAS connectors provide expander features including cascading and failover. From right to left the ports are Primary 1, Primary 2, Primary 3 and Secondary 1, Secondary 2 and Secondary 3. Note that secondary SAS ports are not present on the SAS2-836EL1 backplane.

13. - 14. UART Connectors

The primary and secondary UART connectors are for manufacturer's diagnostic purposes only. (The secondary UART connector is not present on the SAS2-836EL1 model backplane)

15. - 16. Debug Connectors

The primary and secondary EXPDBG1 and EXPDBG2 connectors are for manufacturer's diagnostic purposes only. (The secondary EXPDBG2 connector is not present on the SAS2-836EL1 model backplane)

17. - 18. MDIO Connectors

The primary and secondary MDIO1 and MDIO2 connectors are for Supermicro's internal use only. (The secondary MDIO2 connector is not present on the SAS2-836EL1 model backplane)

2-3 Rear Jumper Locations and Settings

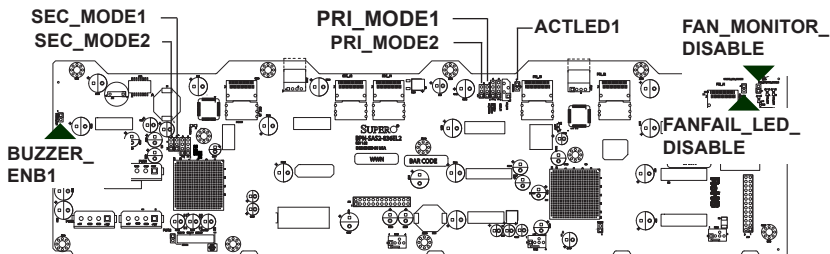


Figure 2-2. Rear Jumper Locations and Settings

General Jumper Settings		
Jumper	Jumper Settings	Note
PRI_MODE1 and 2	Pin 2-3	Factory setting Do not change
SEC_MODE1 and 2	Pin 2-3	Factory setting Do not change
BUZZER_ENB1*	Open: Disabled (Default) Closed: Enabled	Buzzer settings
ACTLED1	Open: Disabled (Default) Closed: Enabled	Activity LED testing (Supermicro internal use only)
FAN_LED_DISABLE	Open: Enabled Closed: Disabled (Default)	Turns off the FANFAIL1 LED
FAN_MONITOR_DISABLE	Open: Enabled (Default) Closed: Disabled	Turns off fan speed reporting

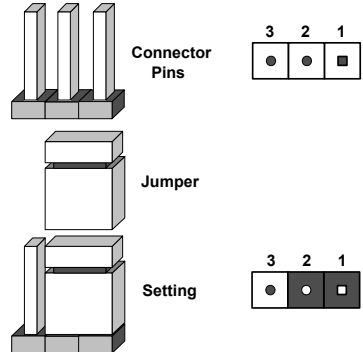
* Early versions of Supermicro SAS2 backplanes come equipped with a buzzer. New versions of these backplanes no longer support a buzzer. We recommend using the LSI MegaRAID Storage Manager or a similar management application to trigger an email alert instead.

The buzzer alarm is triggered by one of the following conditions:

- Hard drive failure.
- Fan failure.
- System temperature over 45° Celsius.

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.



2-4 Rear LEDs

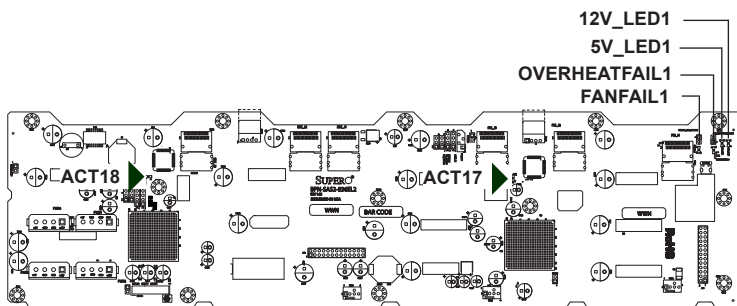


Figure 2-3. Rear LEDs

Rear LEDs		
LED	Active State	Specification
FANFAIL1	On	Fan failure
5V_LED1	On	5V power on LED
12v_LED1	On	12V power on LED
ACT17	On	Primary Ethernet Tx activity LED
ACT18	On	Secondary Ethernet Tx activity LED
OVERHEATFAIL1	On	Overheat/Drive Failure LED Indicator (Red light: flashing, buzzer: on)

2-5 Front Connectors and LED Indicators

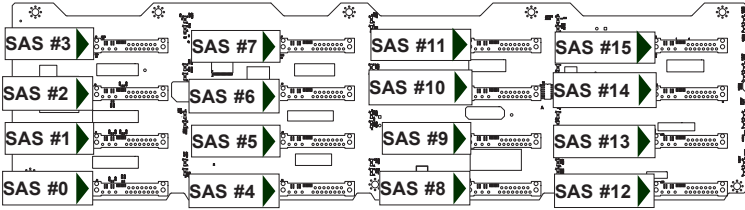


Figure 2-4. Front Connectors

Front SAS/SATA Connectors	
Connector	SAS/SATA Drive Number
SAS #0	SAS/SATA HDD #0
SAS #1	SAS/SATA HDD #1
SAS #2	SAS/SATA HDD #2
SAS #3	SAS/SATA HDD #3
SAS #4	SAS/SATA HDD #4
SAS #5	SAS/SATA HDD #5
SAS #6	SAS/SATA HDD #6
SAS #7	SAS/SATA HDD #7
SAS #8	SAS/SATA HDD #8
SAS #9	SAS/SATA HDD #9
SAS #10	SAS/SATA HDD #10
SAS #11	SAS/SATA HDD #11
SAS #12	SAS/SATA HDD #12
SAS #13	SAS/SATA HDD #13
SAS #14	SAS/SATA HDD #14
SAS #15	SAS/SATA HDD #15

Front LED Indicators		
Connector	Hard Drive Activity LED	Failure LED
SAS #0	ACT #0	FAIL #0
SAS #1	ACT #1	FAIL #1
SAS #2	ACT #2	FAIL #2
SAS #3	ACT #3	FAIL #3
SAS #4	ACT #4	FAIL #4
SAS #5	ACT #5	FAIL #5
SAS #6	ACT #6	FAIL #6
SAS #7	ACT #7	FAIL #7
SAS #8	ACT #8	FAIL #8
SAS #9	ACT #9	FAIL #9
SAS #10	ACT #10	FAIL #10
SAS #11	ACT #11	FAIL #11
SAS #12	ACT #12	FAIL #12
SAS #13	ACT #13	FAIL #13
SAS #14	ACT #14	FAIL #14
SAS #15	ACT #15	FAIL #15

Chapter 3

Dual Port and Cascading Configurations

3-1 Single and Dual Port Expanders

Single Ports

SAS2-836EL1 backplanes have a single-port expander that accesses all hard drives and supports cascading.

Dual Ports

SAS2-836EL2 backplanes have dual-port expanders that access all the hard drives. These dual-port expanders support cascading, failover, and multipath functionality.

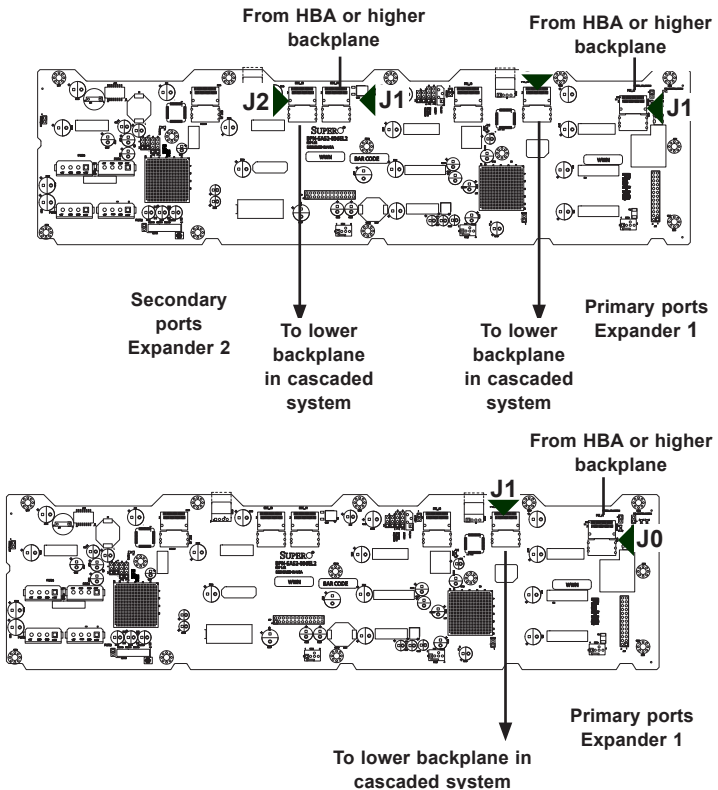


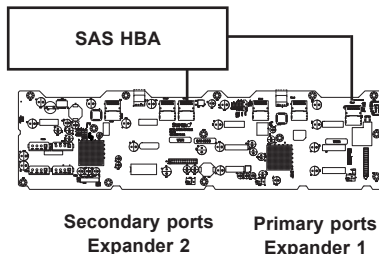
Figure 3-1: Dual Port Cascading Configurations

3-2 Failover

The SAS2-836EL2 backplane has two expanders which allow effective failover.

Single Host Bus Adapter

In a single host bus configuration, the backplane connects to one Host Bus Adapter (HBA).



Single Host Bus Adapter Failover

If the expander or data path in Port A fails, the system automatically switches to Port B.

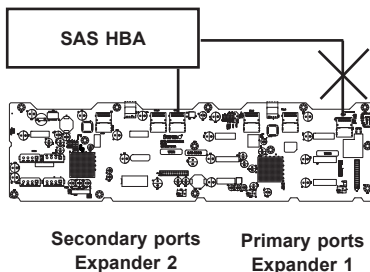


Figure 3-2: Single and Dual HBAs

3-3 Failover with RAID Cards and Multiple HBAs

The SAS-836EL 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 HBAs.

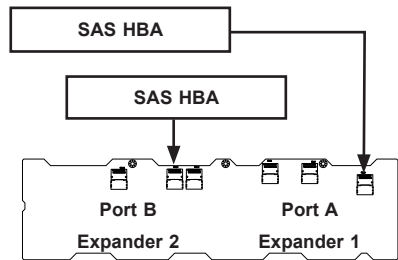


Figure 3-3: Dual HBA

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.

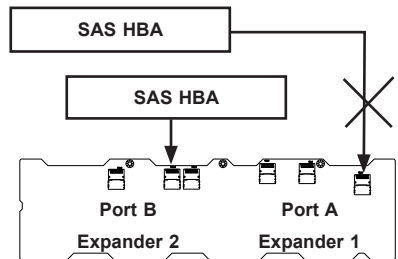


Figure 3-4: Dual HBA Failover

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

3-4 Chassis Power Card and Support Cables

Chassis Power Card

In a cascaded configuration, the first chassis includes a motherboard and at least one host bus adapter. Other servers in this enclosed system must have a power card. This section describes the supported power card for the SAS2-836EL series backplanes.

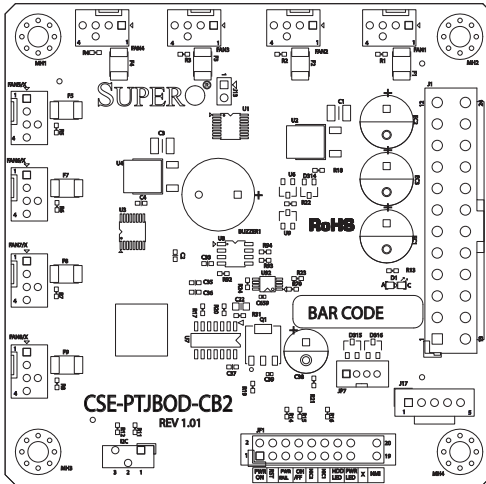


Figure 3-5: Chassis Power Card (Sold Separately)

Power Card		
Part Number	Part Type	Where Used
CSE-PTJBOD-CB2	Power card	Allows the chassis to be used as a JBOD (Just a Bunch of Drives) system.

Connecting an Internal Host Bus Adapter to the Backplane

The following section lists the most common cables used to connect the host bus adapter to the backplane.

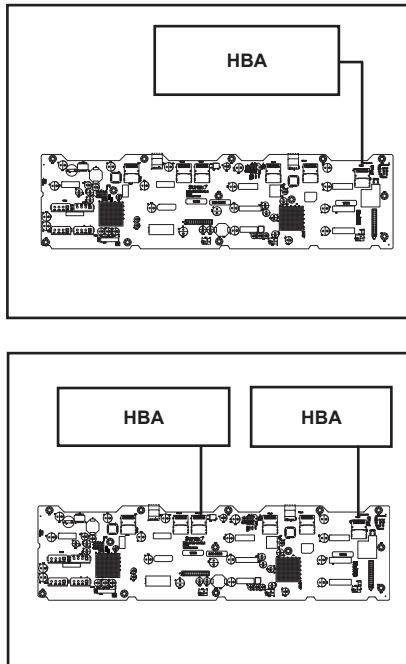


Figure 3-6: Connecting an Internal HBA to the Backplane

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

Supported Internal HBA Cables

Use the following cables to create connections between the internal HBA and SAS2-836EL backplane. The cables required depend upon the HBA connector.

Cable Name: iPass to 4-lane

Part #: CBL-0117L

Length: 46 cm (18 inches)

Description: This cable has one SFF-8484 (32-pin) connector on one end and one iPass (SFF-8087/Mini-SAS) connector (36-pin) at the other. This cable connects from the HBA to the SAS2-836EL backplane.

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

Part #: CBL-0108L-02

Length: 39 cm (15 inches)

Part #: CBL-0109L-02

Length: 22 cm (9 inches)

Part #: CBL-0110L-02

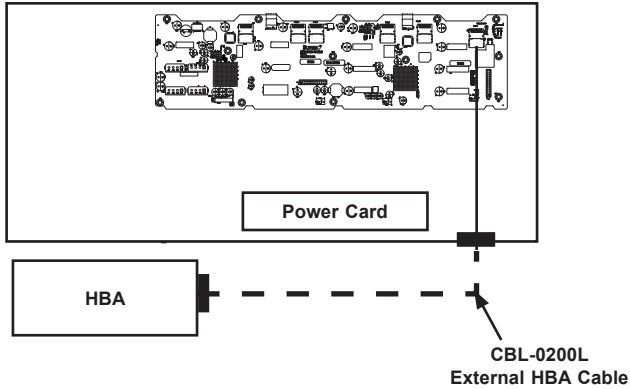
Length: 18 cm (7 inches)

Description: This cable has an iPass (SFF-8087/Mini-SAS) connector (36-pin) at each end. It connects from the HBA to the SAS2-836EL backplane.

Connecting an External Host Bus Adapter 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 configuration system to connect to another system that has an HBA.

Single External Host Bus Adapter



Dual External Host Bus Adapter

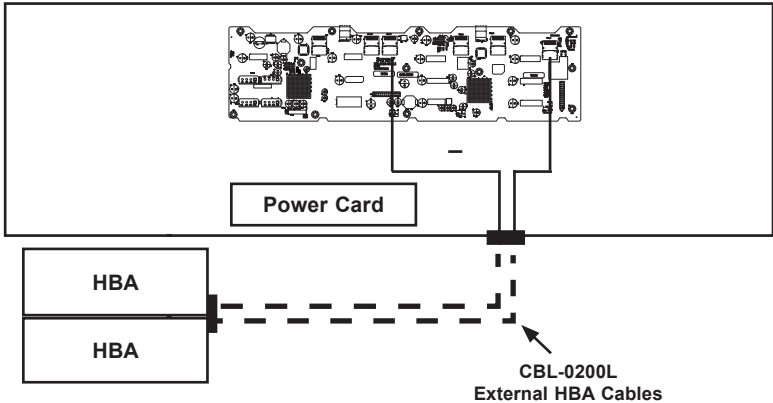


Figure 3-7: Connecting Single and Dual HBAs to the Backplane

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

Supported External HBA to Backplane Cable

Use the following cable if your external HBA has an InfiniBand connector.



Figure 3-8: External Cable (CBL-0166L)

Cable Name: SAS EL2/EL1 Cascading Cable (External), 68 cm

Part #: CBL-0166L (SFF-8088 1x to SFF-8088 x1)

Ports: Single or Dual

Placement: External cable

Description: External cascading cable. Connects ports between servers. With most connectors, use one cable for single port connections and two cables for dual port connections.

Connecting Multiple Backplanes in a Single Channel Environment

This section describes the cables used when cascading from a single HBA. These connections use CBL-0167L internal cables and CBL-0166L external cables.

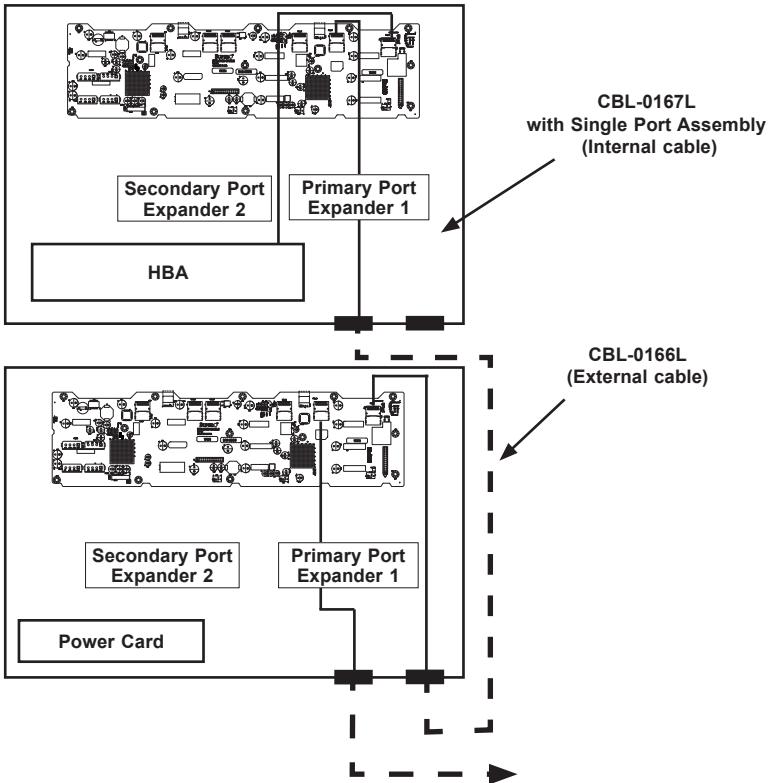


Figure 3-9 Single HBA Configuration

Single HBA Configuration Cables

Single Port Cable Assembly

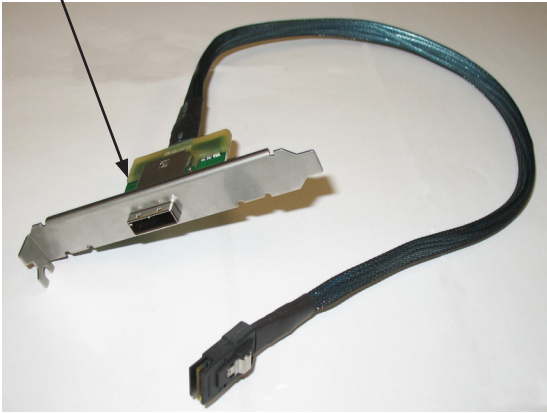


Figure 3-10: Single Port Internal Cable (CBL-0167L)

Cable Name: SAS EL2/EL1 Backplane Cable (Internal) with 2-port Cascading Cable, 68 cm

Part #: CBL-0167L (SFF-8087 to SFF-8088 x1)

Ports: Single

Placement: Internal cable

Description: Internal cable. Connects the backplane to the HBA or external port. Used in single port environments.



Figure 3-11: External Cable (CBL-0166L)

Cable Name: SAS EL2/EL1 Cascading Cable (External), 68 cm

Part #: CBL-0166L (SFF-8088 1x to SFF-8088 x1)

Ports: Single or Dual

Placement: External cable

Description: External cascading cable. Connects ports between servers. With most connectors, use one cable for single port connections and two cables for dual port connections.

Connecting Multiple Backplanes in a Dual Channel Environment

This section describes the cables used when cascading from dual HBAs. These connections use CBL-0168L internal cables and CBL-0166L external cables.

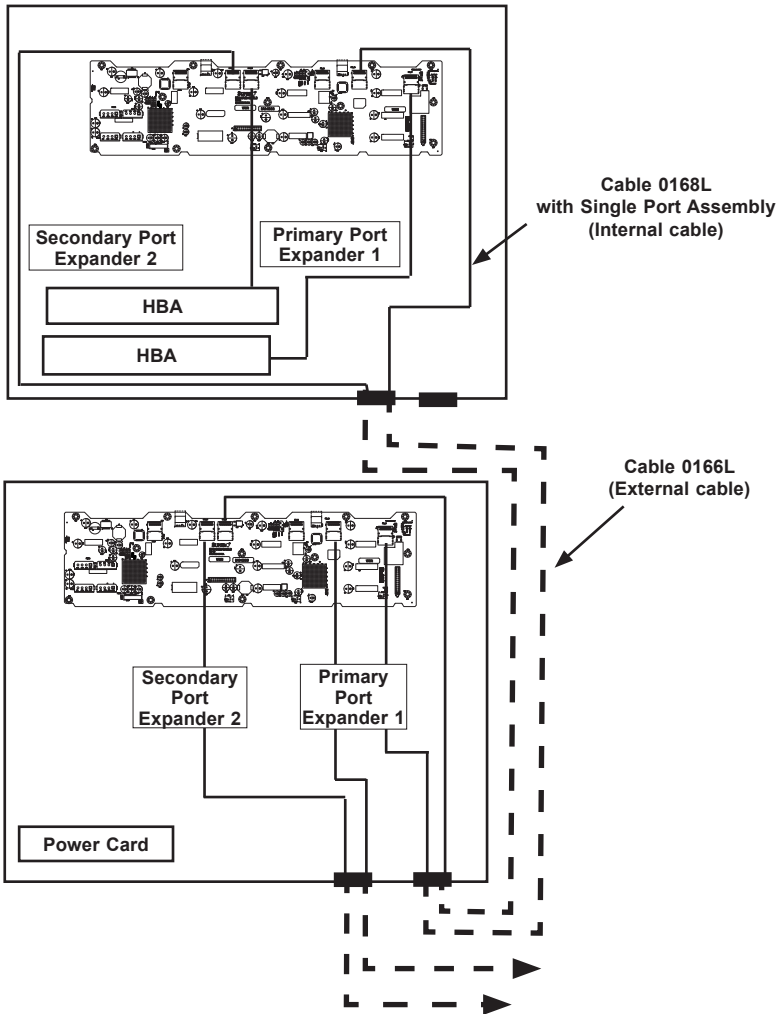


Figure 3-12: Multiple Backplanes in a Dual Channel Environment

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

Dual HBA Configuration Cables

Dual Port Cable
Assembly



Figure 3-13: Dual Port Internal Cable (CBL-0168L)

Cable Name: SAS Dual-port Cable Assembly, 68/76 cm

Part #: CBL-0168L

Placement: Internal cable

Ports: Dual

Description: Internal cascading cable. Connects the backplane to the HBA or external port. Used in dual port environments.



Figure 3-14: External Cable (CBL-0166L)

Cable Name: SAS EL2/EL1 Cascading Cable (External), 68 cm

Part #: CBL-0166L

Placement: External cable

Ports: Single or Dual

Description: External cascading cable. Connects ports between servers. Use one cable for single port connections and two cables for dual port connections.

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 power control card but with no motherboard and no HBA.

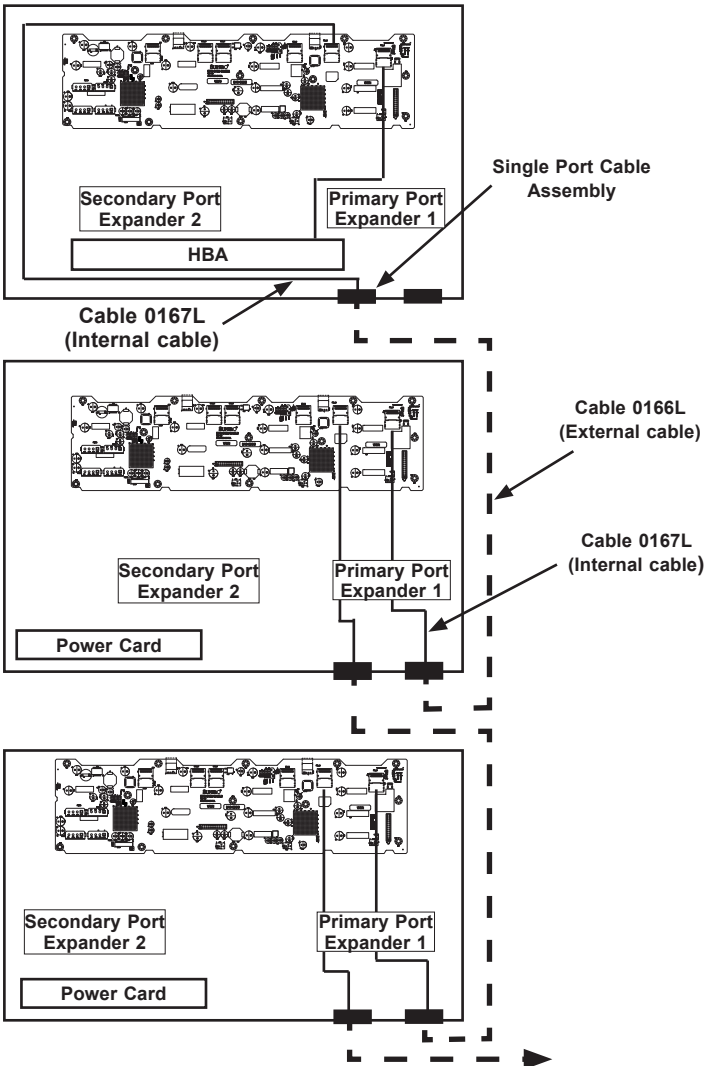


Figure 3-15: Simple Cascaded Configurations

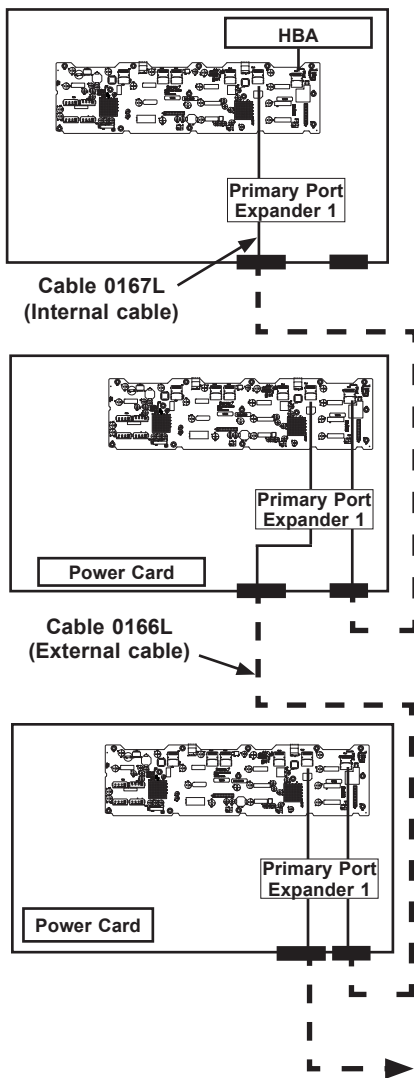


Figure 3-16: Cascaded Configuration with Horizontal Branching

Dual SAS HBA and Cascaded Configuration

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

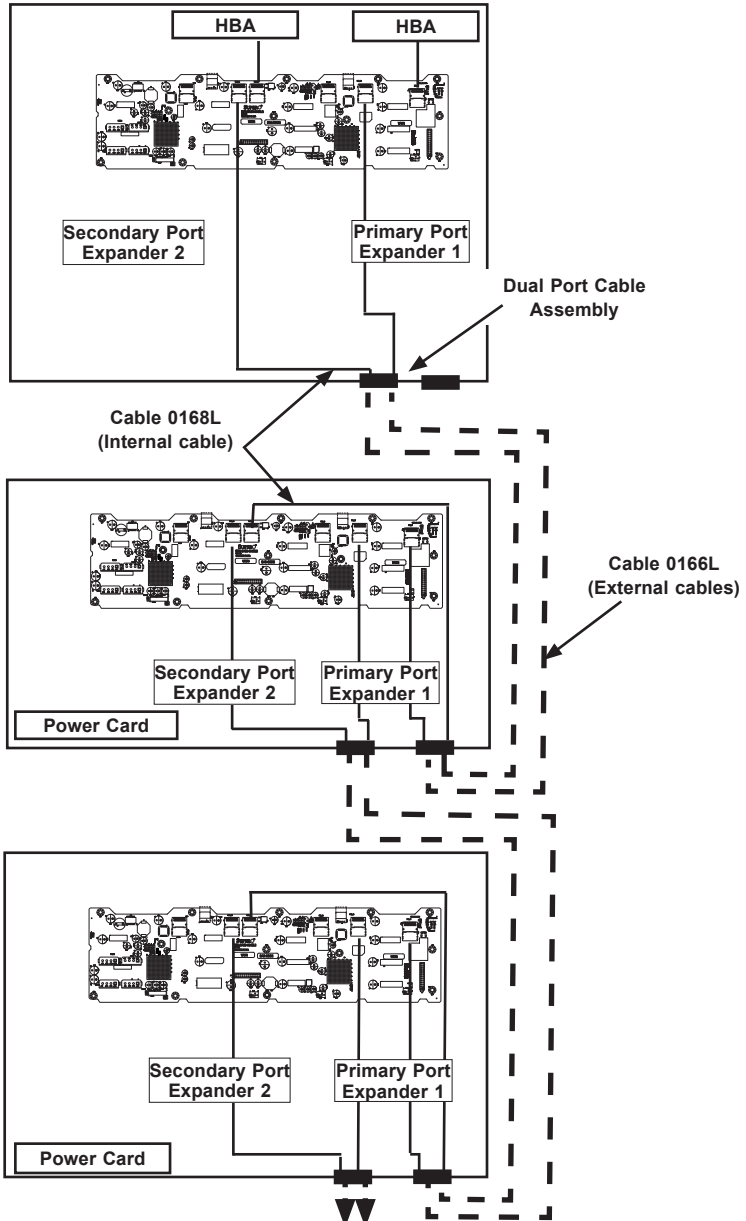


Figure 3-17: Dual SAS HBA with Cascaded Configuration

Dual SAS HBA Cascaded Configuration with Branching

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

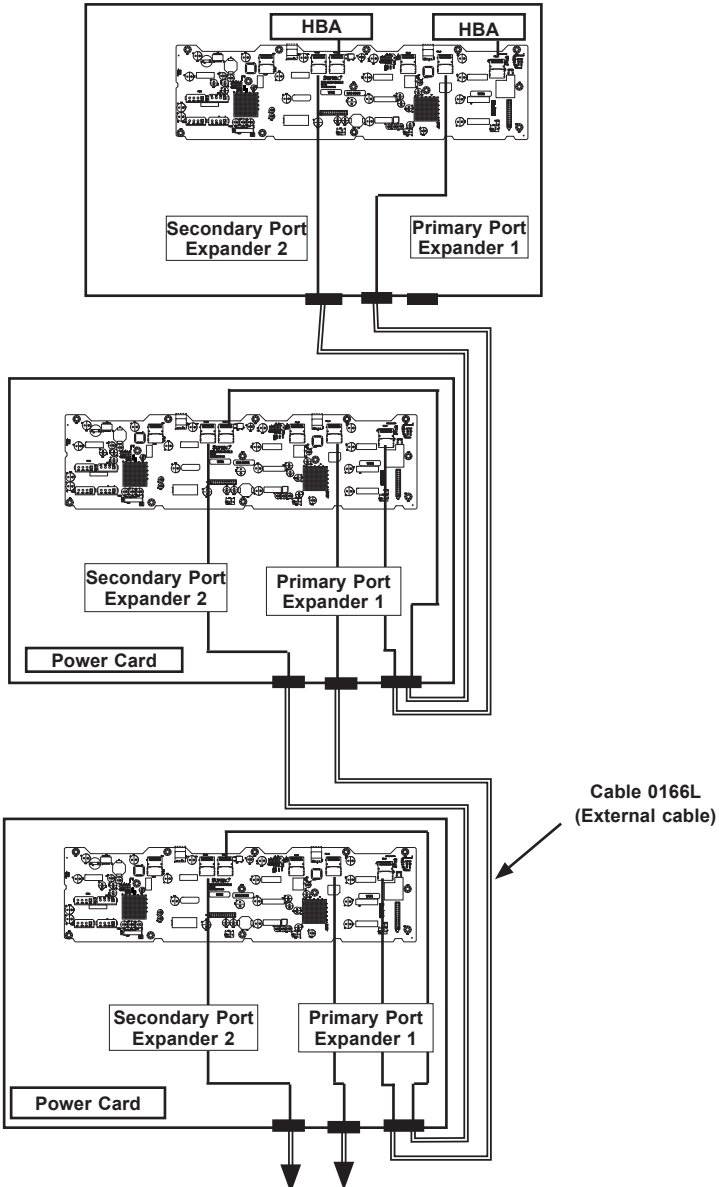


Figure 3-18: Dual SAS HBA with Cascaded Configuration and Branching

Notes

Disclaimer (cont.)

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