SUPER®

SAS-216EL1/EL2 BACKPLANE

USER'S GUIDE

Rev. 1.0

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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.

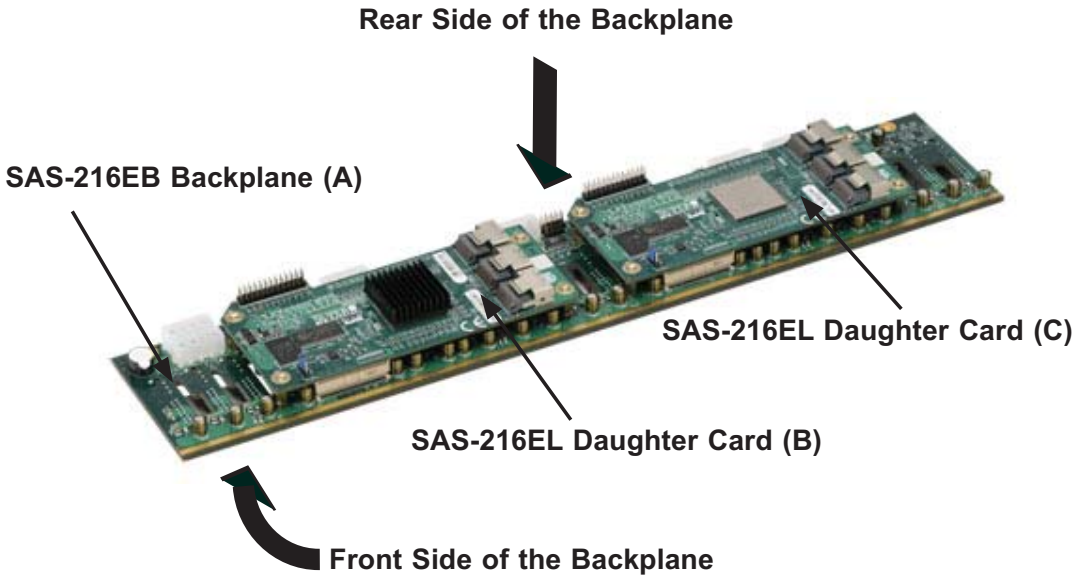
Overview of the SAS-216EL1/EL2 Backplanes

The SAS-216EL1/EL2 series of backplanes consists of a SAS-216EB backplane (A) with one or two SAS-216EL daughter cards (B and C) mounted on the rear of the backplane.

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

The SAS-216EL2 model consists of the SAS-216EB backplane (A), and **two** SAS216EL daughter cards (B and C), mounted on the rear of the backplane.

Components on the front side of the SAS-216ELB backplane include 24 SAS connectors and their respecitve activity and failure LEDs. Components on the rear side of the backplane include jumpers and power and fan connectors. The daughter card's components include SAS ports, flash and expander chips, and mode select jumpers.



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

Electric Static 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 and daughter cards by their 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 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.

Chapter 2

Jumper Settings and Pin Definitions

2-1 Rear Components, Connectors and Jumpers

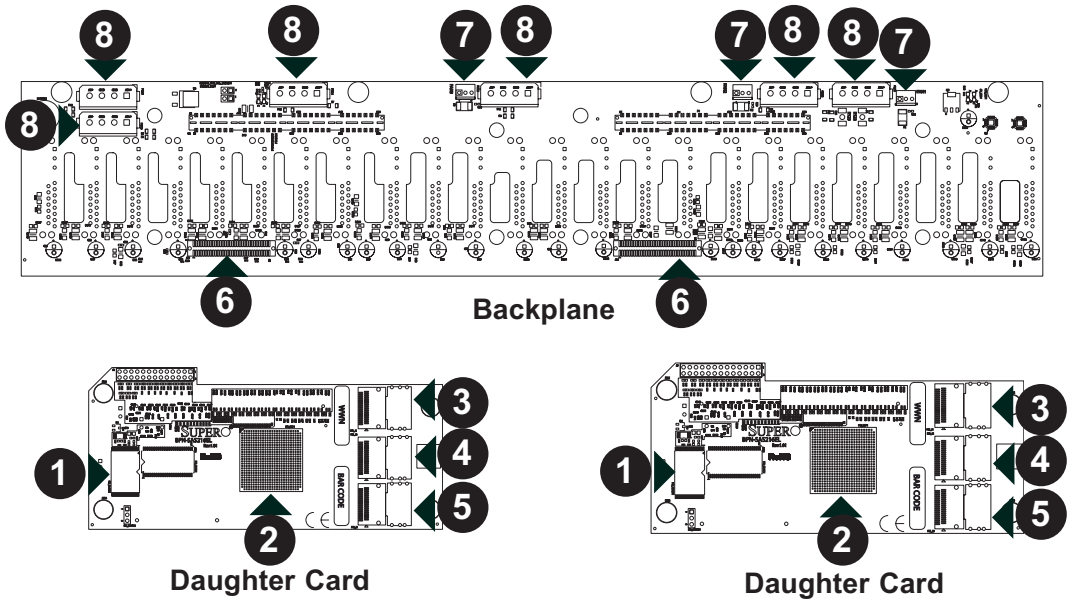


Figure 1-1: Front Connectors on Backplane and Daughter Cards

Rear Components and Connectors

Components

1. Primary Flash Chip
2. Primary Expander Chip
3. SAS Port: PRI_J1
4. SAS Port: PRI_J2
5. SAS Port: PRI_J3
6. EPP Connectors: J24 and J25
7. Fan Connectors: Fan1, Fan2, and Fan3
8. Power Connectors: PWR1 - PWR6

2-2 Rear Connector and Pin Definitions

1. Primary Flash Chips

The Primary Flash Chip enhances the backplane memory.

2. Expander Chips

This Expander Chip allows the backplane to support dual ports, cascading, and failover.

3. - 5. SAS Ports

The primary and secondary sets of SAS ports provide expander features including cascading and failover From right to left the ports are Primary 1/2/3 and Secondary 1/2/3.

6. EPP Ports

The EPP ports are used for manufacturer diagnostic purposes only.

7. Fan Connectors

The 3-pin connectors, designated FAN1, FAN2, and 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

8. Backplane Main Power Connectors

The 4-pin connectors, designated PWR1, PWR2, PWR3, PWR4, PWR5, and PWR6, 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 Rear Jumper Locations and Pin Definitions

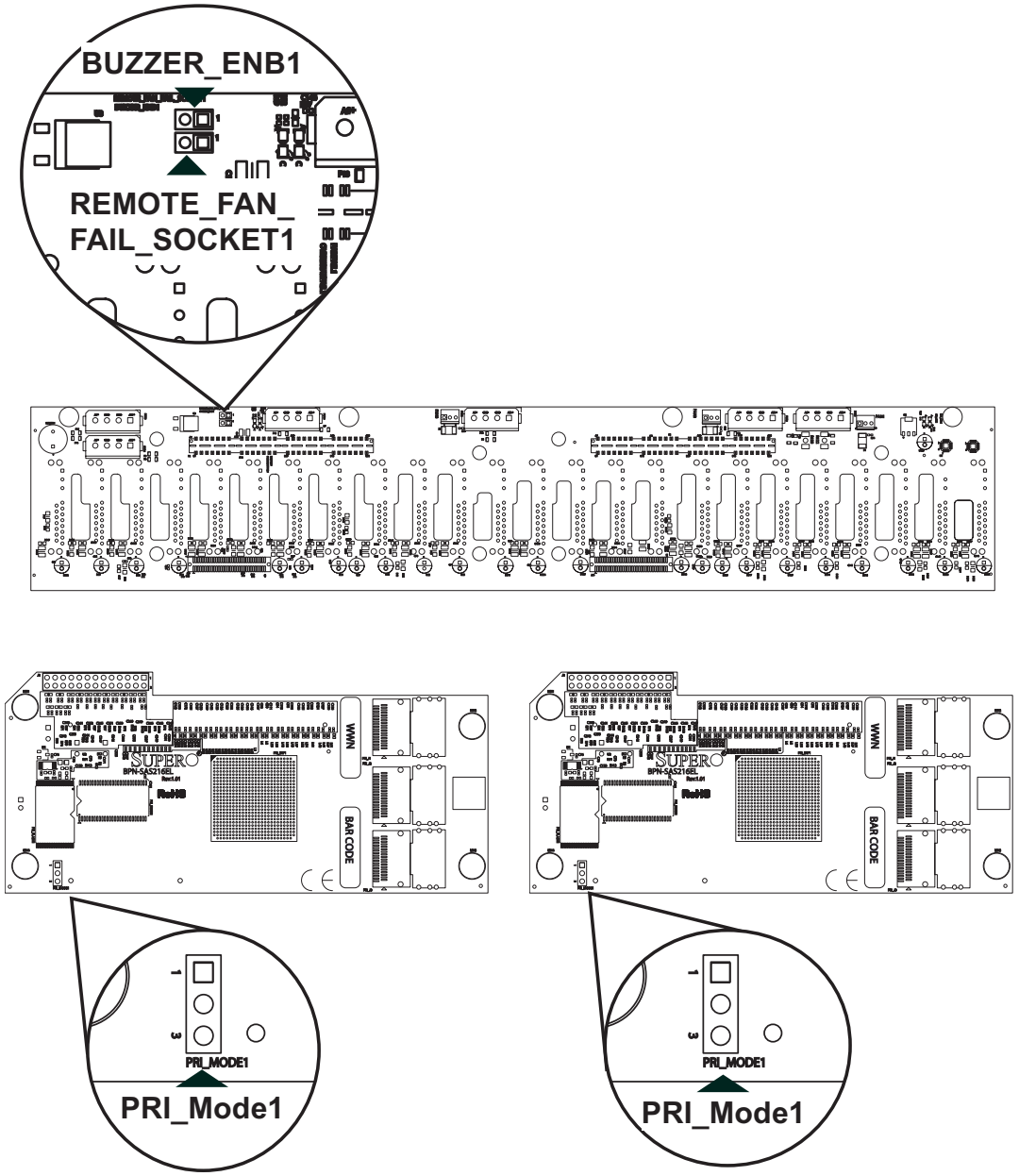
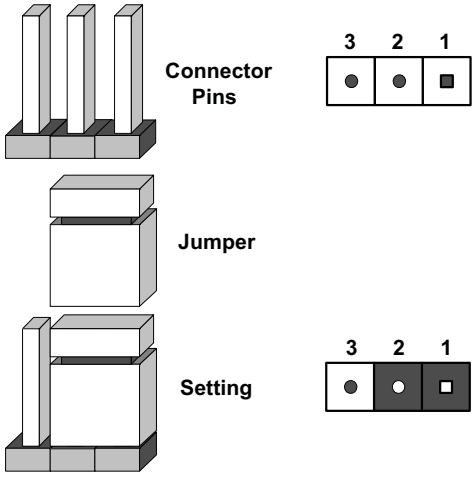


Figure 1-2: Front Jumper Locations and Pin Defimitions

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.

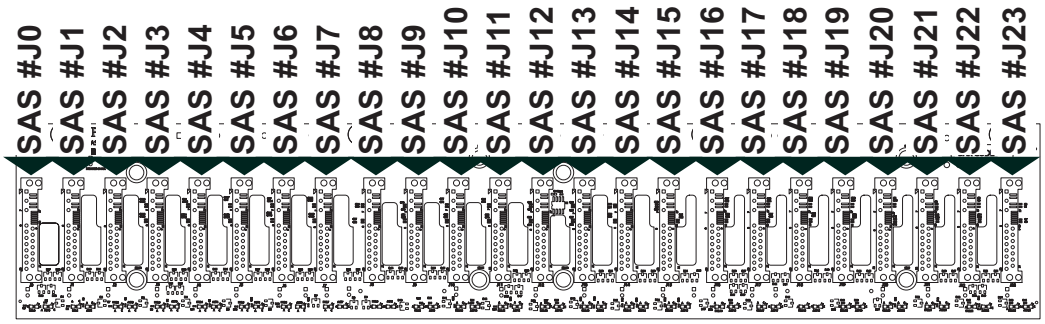


General Jumper Settings		
Jumper	**Jumper Settings**	**Note**
PRI_MODE1	1-2	Factory Setting Do not change
BUZZER_ENB1	Open: Disable Closed: Enable	Buzzer Enable

Socket Settings		
Socket	**Socket Setting**	**Note**
REMOTE_FAN_FAIL_ SOCKET1	Connected	Front Panel Fan Fail indicator (Optional)

Front Panel LEDs		
LED	**STATE**	**SPECIFICATION**
12V_LED1	OFF	Backplane power failure. Light is on during normal operation.
5V_LED1	OFF	Backplane power failure. Light is on during normal operation.

2-4 Front Connectors and LED Indicators



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

2-5 Front Connectors and Jumpers

Front Components

1. Power Connectors: PWR1, PWR2, PWR3, PWR4, PWR5, and PWR6

Chapter 3

Dual Port and Cascading Configurations

3-1 Single and Dual Port Expanders

Single Ports

SAS-216EL1 backplanes have a single-port expander on the daughter card, that accesses all 24 drives and supports cascading.

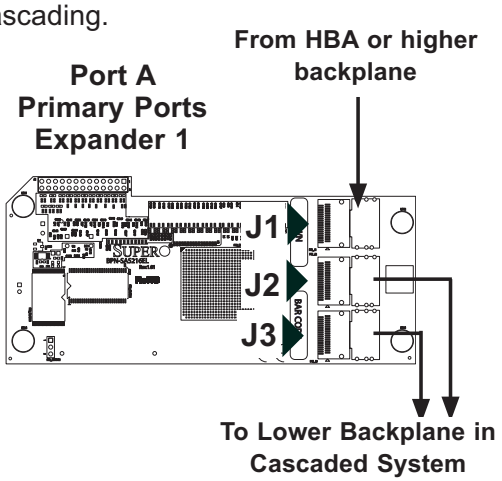


Figure 3-1: SAS-216EL2 Single Port Configuration

Dual Ports

SAS-216EL2 backplanes have dual-port expanders on the daughter cards, that access all 24 drives. These dual-port expanders support cascading, failover, and recovery.

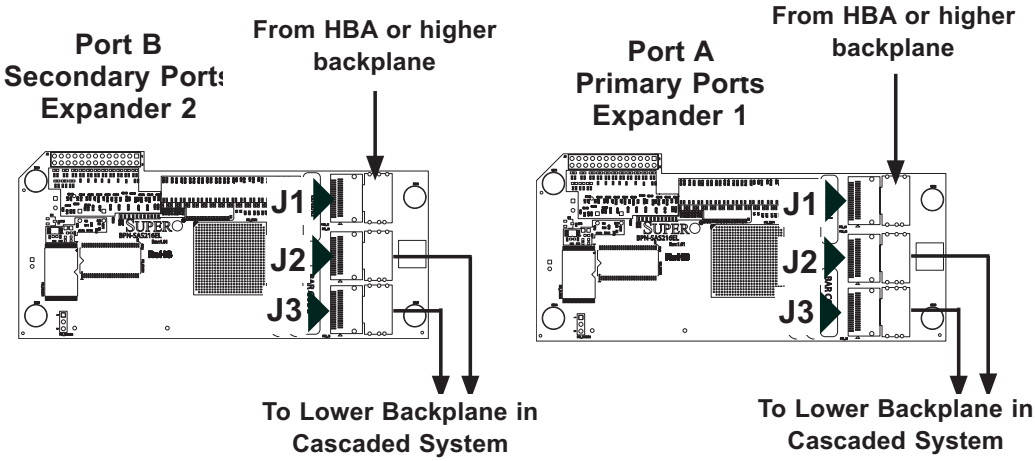


Figure 3-2: SAS-216EL2 Dual Port Configuration

3-2 Failover

The SAS-216EL2 backplane has two expanders which allow effective failover and recovery.

Single Host Bus Adapter

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

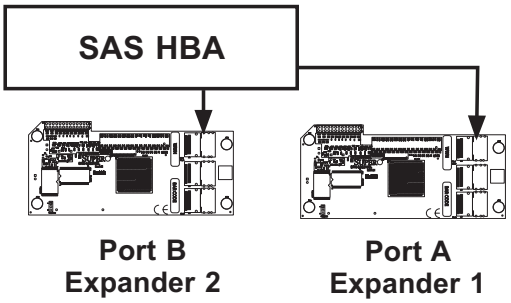


Figure 3-3: Single HBA

Single Host Bus Adapter Failover

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

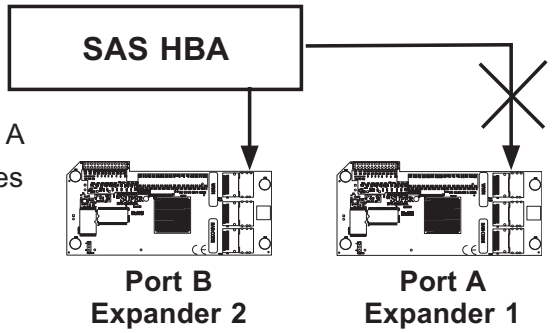


Figure 3-4: Single HBA Failover

Dual Host Bus Adapter

In a Dual Host Bus Configuration, the backplane connects to two Host Bus Adapters (HBA).

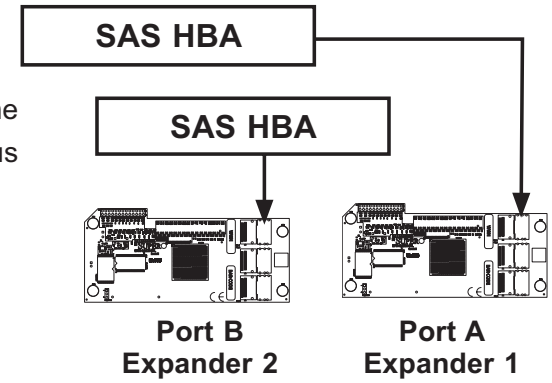


Figure 3-5: Dual HBA

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.

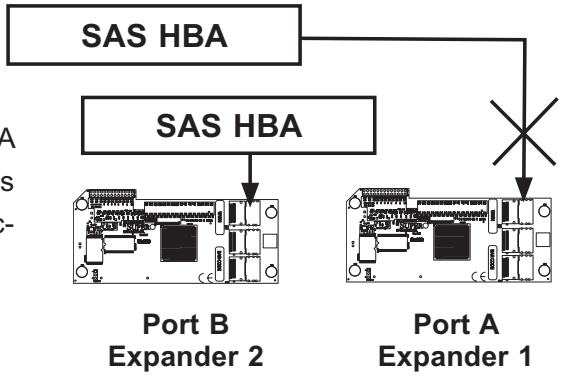


Figure 3-6: Dual HBA Failover

3-3 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 (HBA). Other servers in this enclosed system, include a power card. This section describes the supported power card for the SAS-846 series backplane.

For more information, see the Supermicro Web site at http://www.supermicro.com.

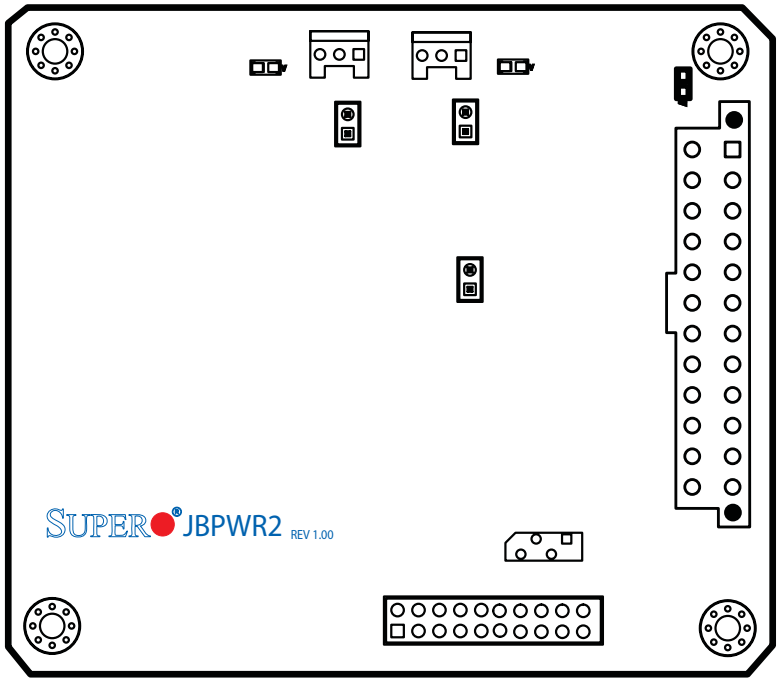


Figure 3-7: Chassis Power Card (Sold Separately)

Power Card		
Part Number	**Part Type**	**Where Used**
CSE-PTJBOD-CB1	Power Card	Allows the chassis to be in a JBOD (Just a Bunch of Drives) system.

Connectioning an Internal Host Bus Adapter to the Backplane

The following section lists the most common cables used to connect the Host Bus Adapter (HBA) to the backplane.

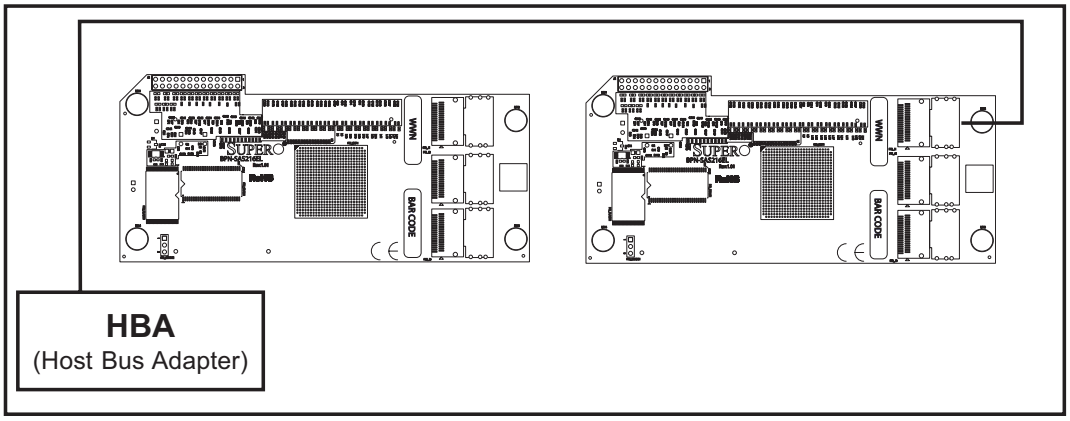


Figure 3-8: Single Internal Host Bus Adapter

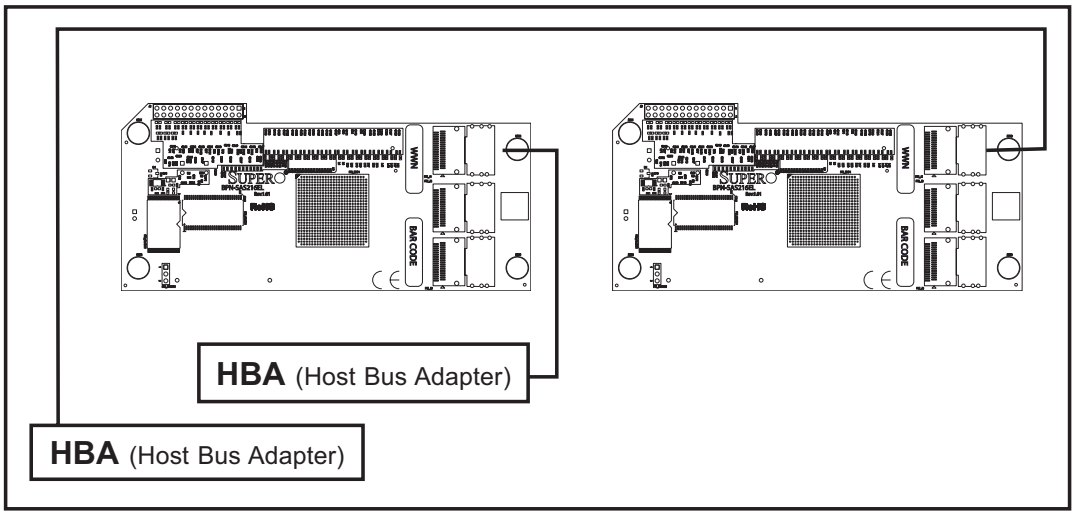


Figure 3-9: Dual Internal Host Bus Adapter

Supported Internal HBA Cables

Use the following listed cables to create connections between the internal HBA and SAS-216EL backplane. The cables required depend on 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 ipass (SFF-8087/mini-sas) connector (36 pins) at the other. This cable connects from the HBA to the SAS-216EL 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 pins) at each end. It connects from the HBA to the SAS-216EL 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 (Just a Bunch Of Drives) configuration from an existing system.

Single External Host Bus Adapter

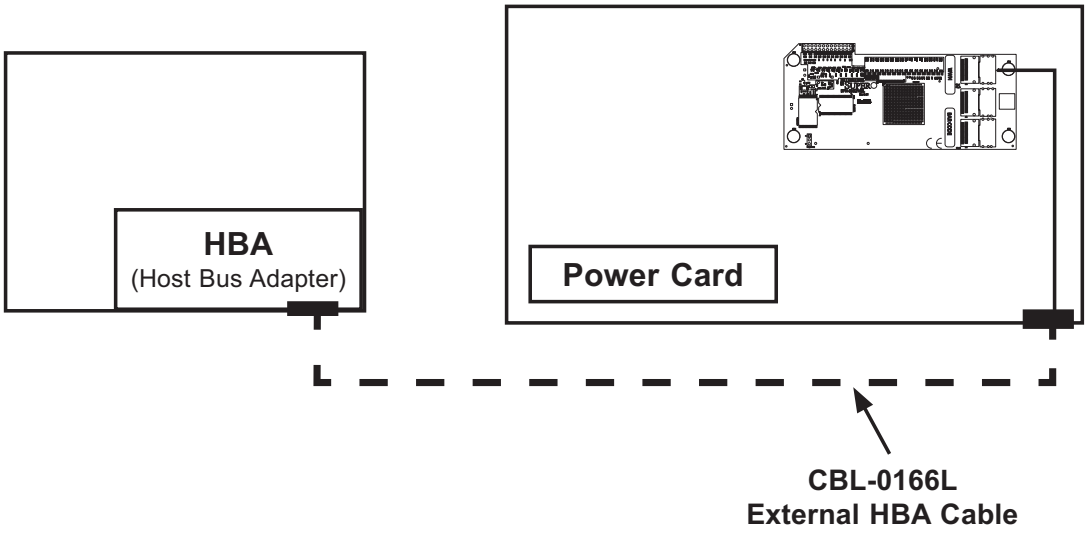


Figure 3-10: Single External Host Adapter

Dual External Host Bus Adapter

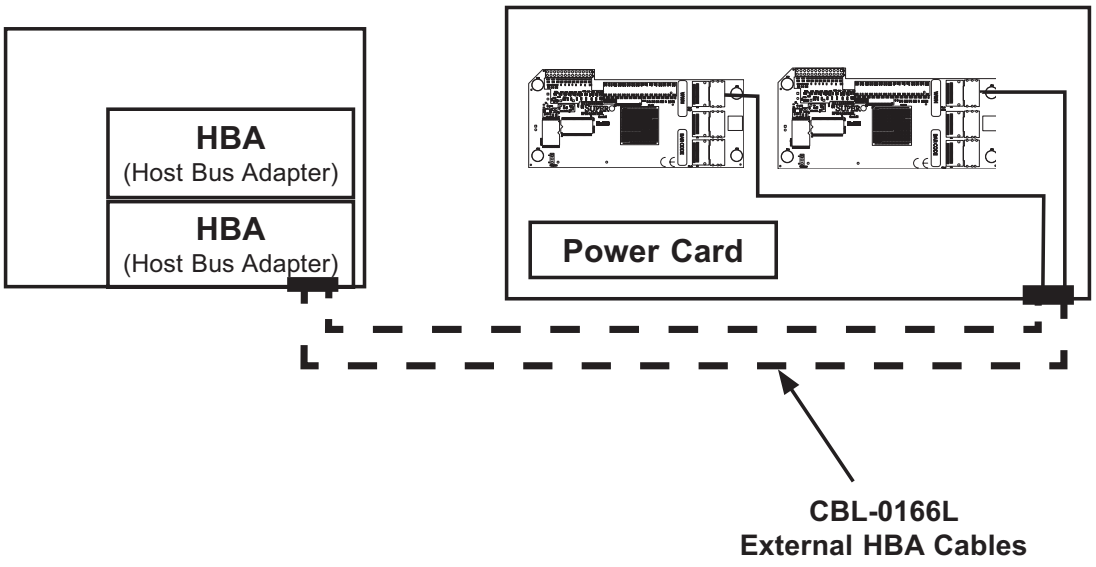


Figure 3-11: Dual External Host Bus Adapter

Supported External HBA to Backplane Cable

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

Figure 3-12: SAS InfiniBand Cable (CBL-0200L)

Cable Name: SAS InfiniBand to Mini SAS X4 1M cable, PBF
Part #: CBL-0200L
Length: 1 meter
Description: This cable has an InfiniBand connector (SFF-8470) on one end and an SFF-8088-1X (26-pins) at the other end.

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.

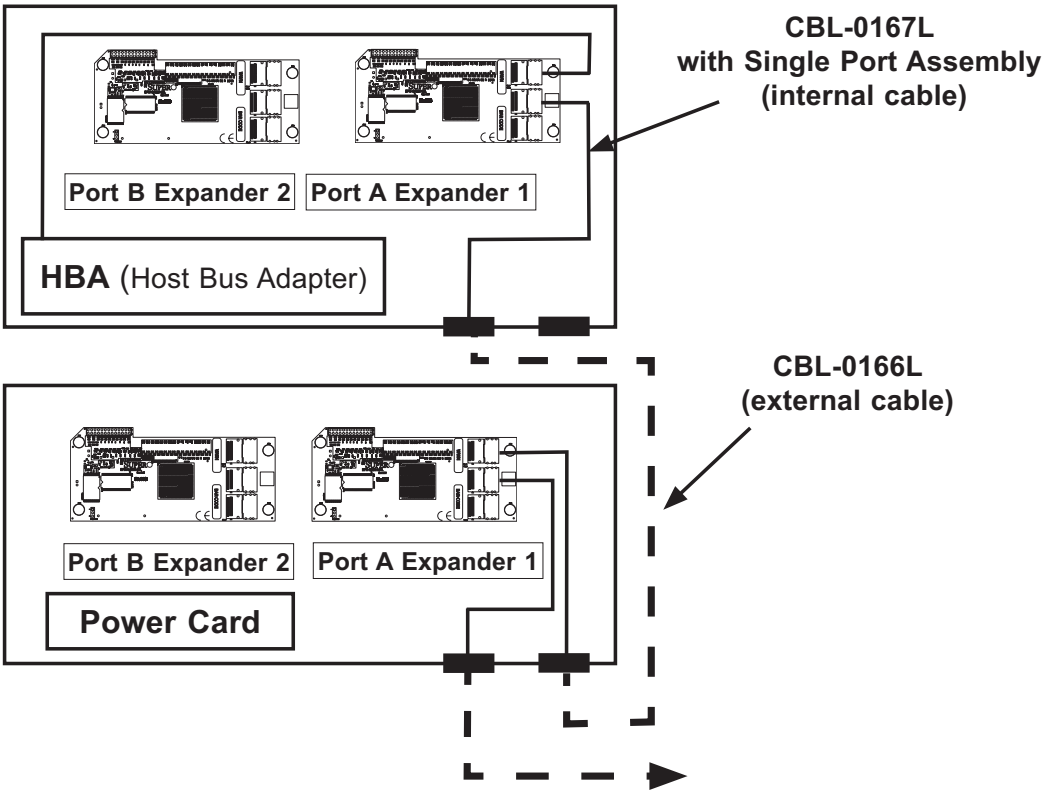


Figure 3-13: Single HBA Configuration

Single HBA Configuration Cables

Single Port Cable Assembly

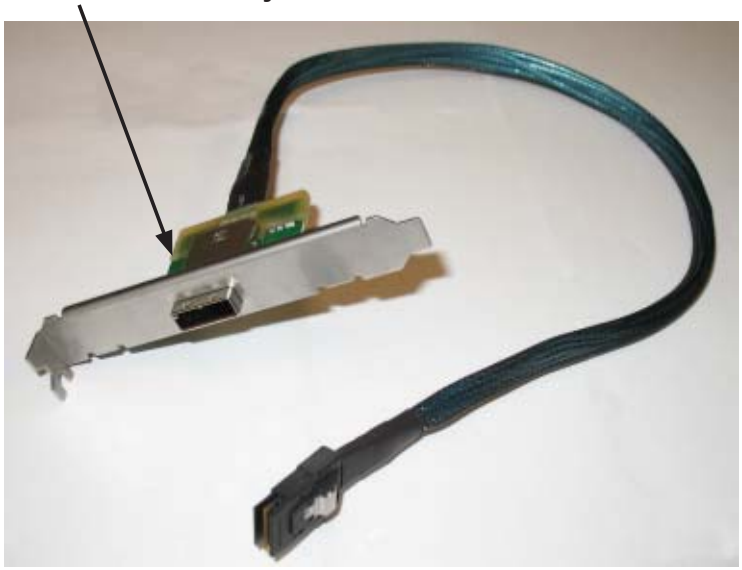


Figure 3-14: Single Port Internal Cable (CBL-0167L)

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 Host Bus Adapter (HBA) or external port. Used in single port environments

Figure 3-15: External Cable (CBL-0166L)

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

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.

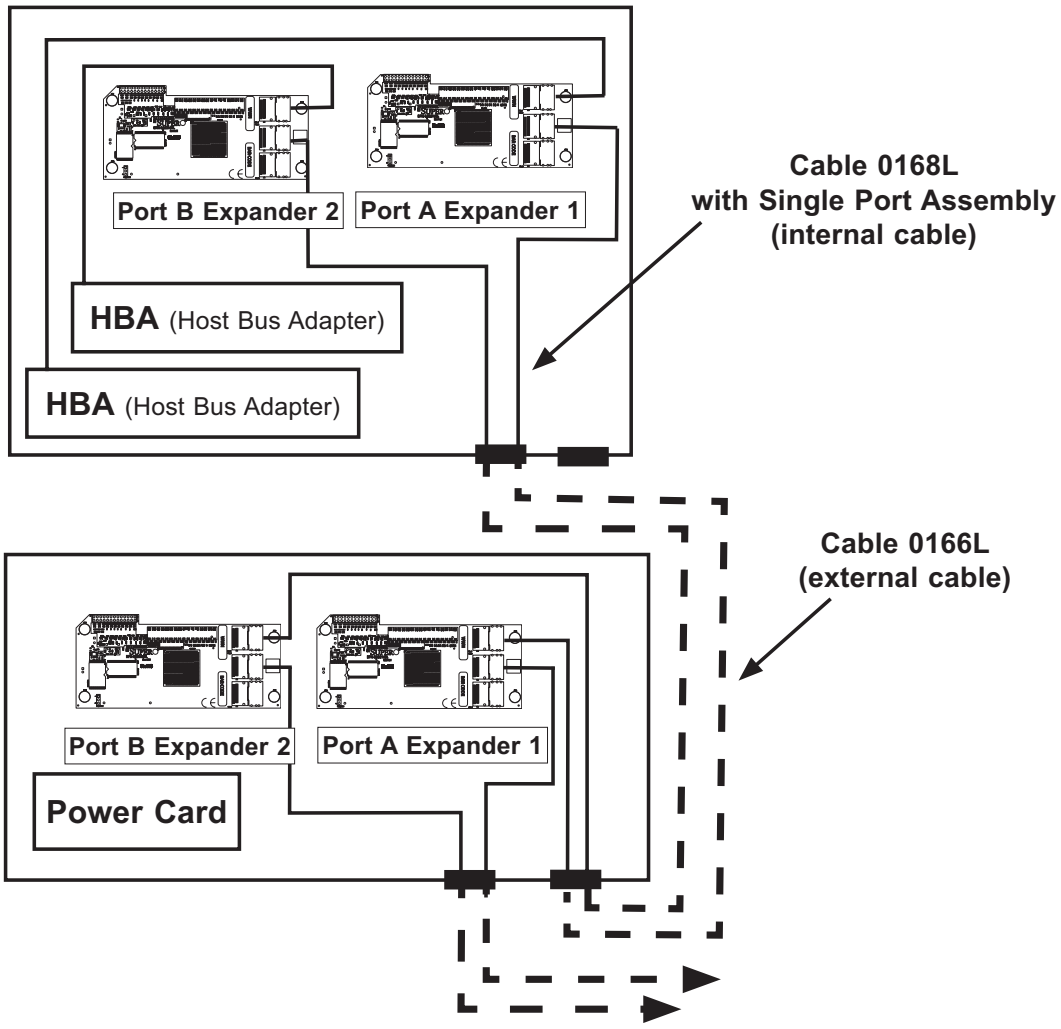


Figure 3-16: Dual HBA Configuration

Dual HBA Configuration Cables

Figure 3-17: Dual Port Internal Cable (CBL-0168L)

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

Part #: CBL-0168L
Placement: Internal cable
Ports: Dual

Description: Internal cascading cable. Connects the backplane to the Host Bus Adapter (HBA) or external port. Used in dual port environments.

Figure 3-18: External Cable (CBL-0166L)

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

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.

3-4 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 HBA. Other servers require a power control card with no motherboard and no HBA. For more information, see the SC216 Chassis Manual available at www.supermicro.com.

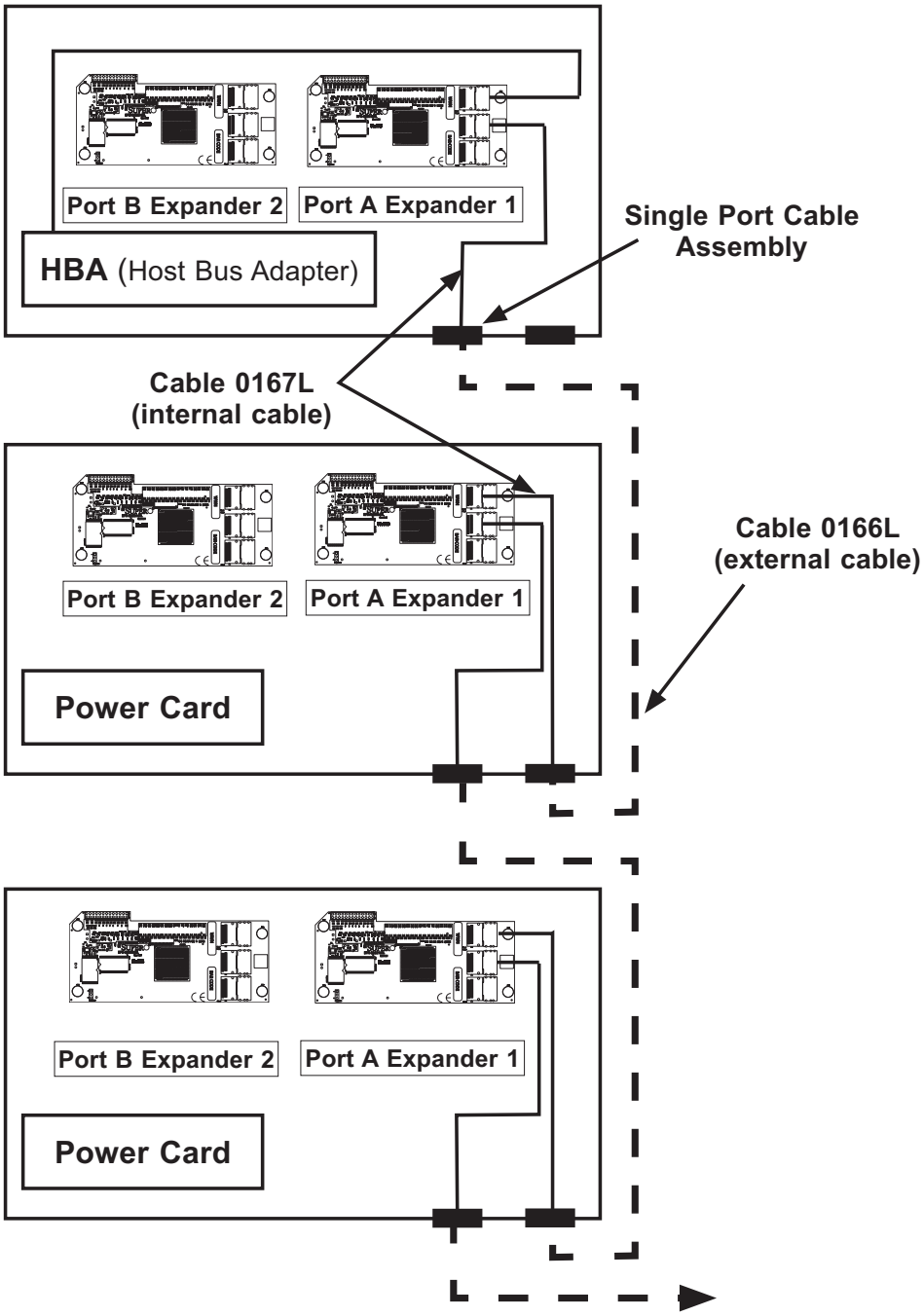


Figure 3-19: Simple Cascaded Configuration

Server System with Single SAS HBA

The expanders allow horizontal branching. This configuration also applies to dual ports.

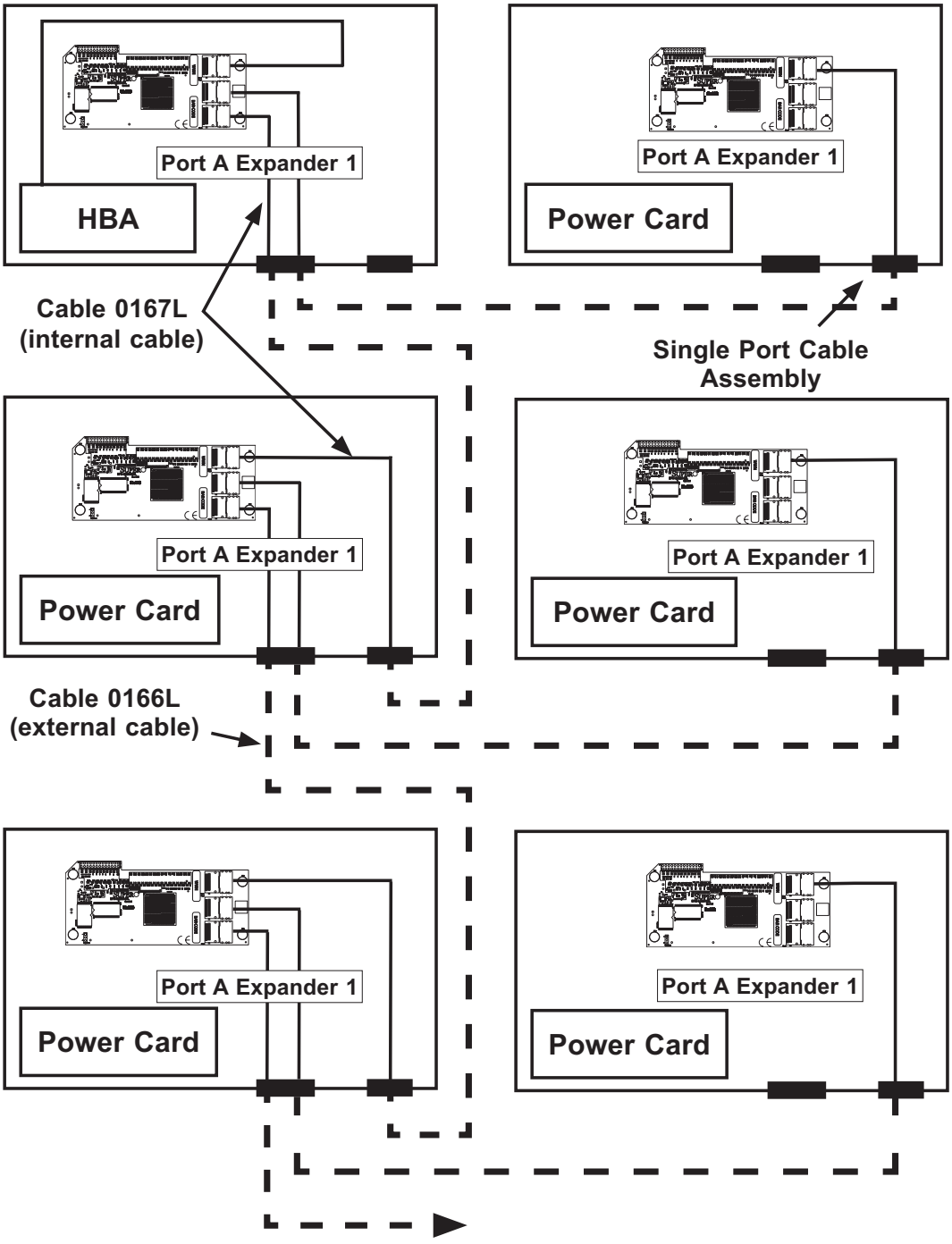


Figure 3-20: Cascaded Configuration with Horizontal Branching

Dual SAS HBA and Cascaded Configuration

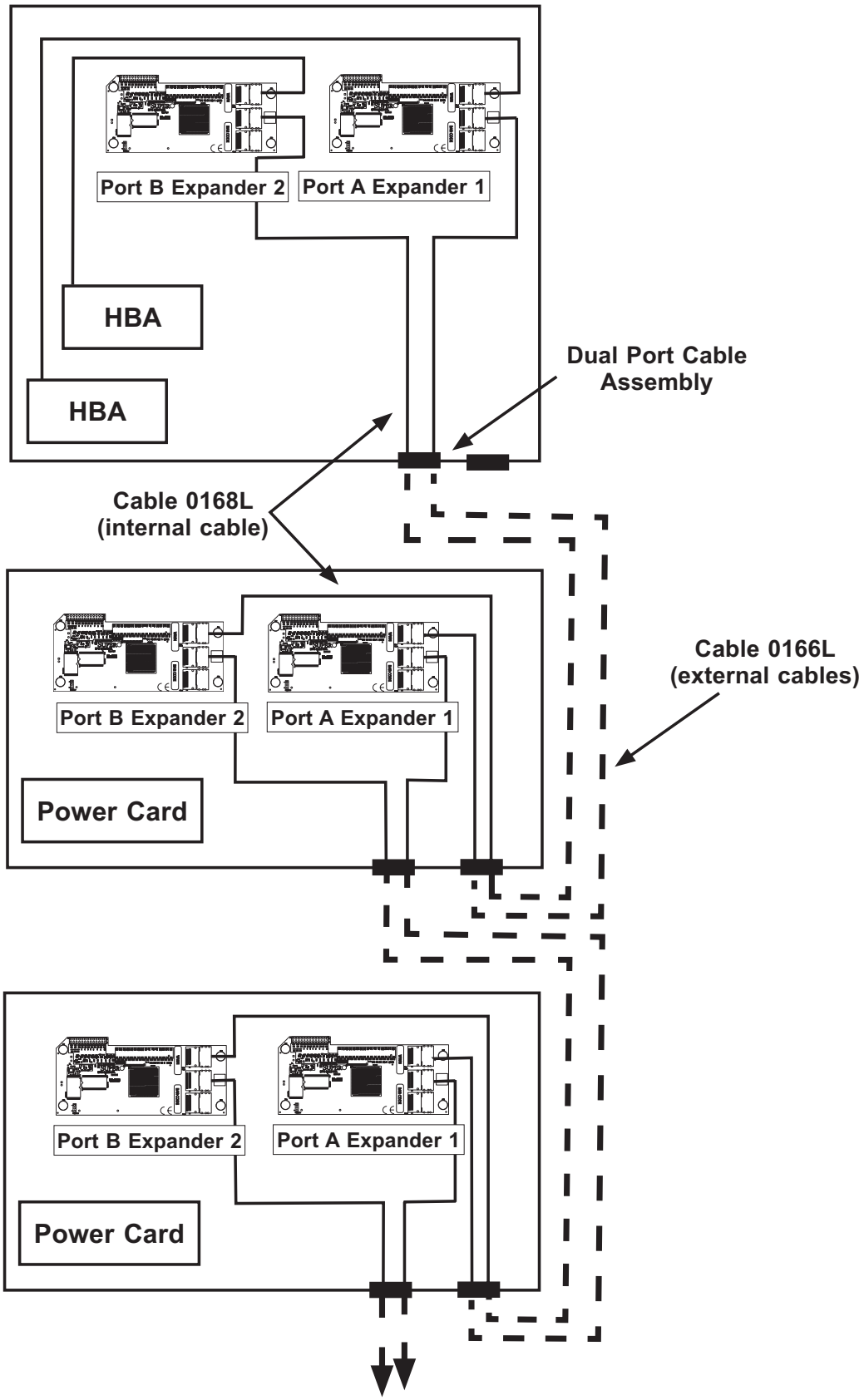


Figure 3-21: Dual SAS HBA with Cascaded Configuration

Dual SAS HBA and Cascaded Configuration with Branching

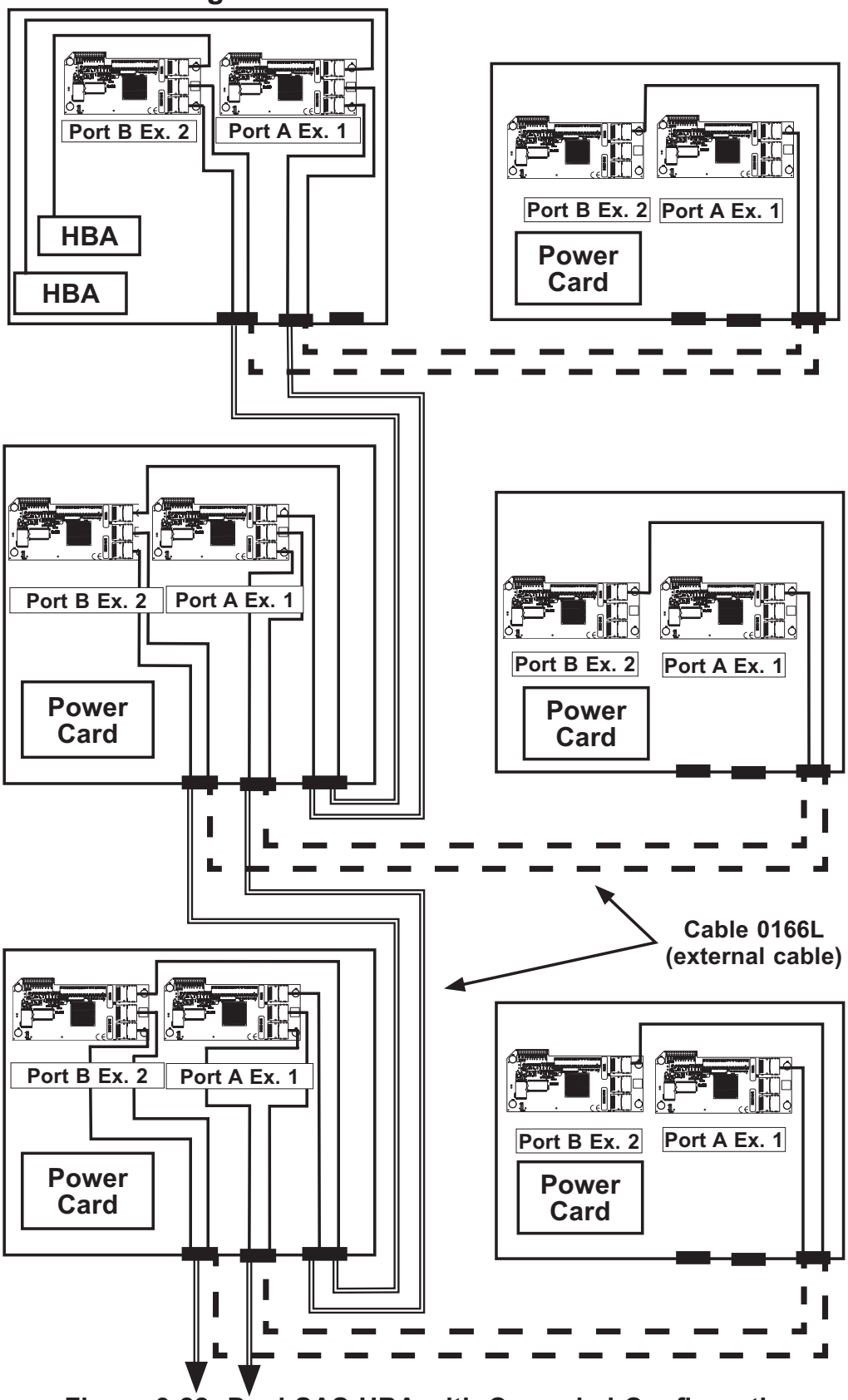


Figure 3-22: Dual SAS HBA with Cascaded Configuration and Branching

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