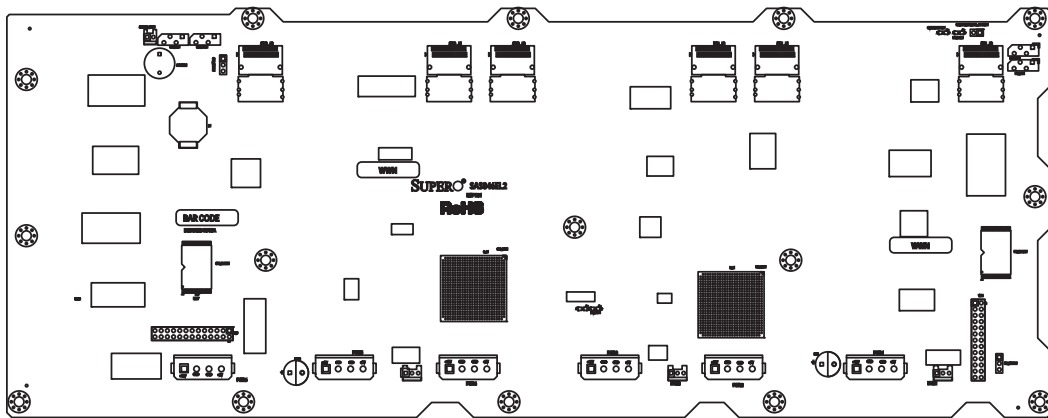


SUPERO[®]



SAS-846EL BACKPLANE

USER'S GUIDE

Rev. 1.0d

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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

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 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 SAS-846EL Backplane

The SAS-846EL backplane has been designed to utilize the most up-to-date technology available, providing your system with reliable, high-quality performance.

This manual reflects SAS-846EL Revision 1.01, 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.

Chapter 2

Jumper Settings and Pin Definitions

2-1 Front Connectors and Jumpers

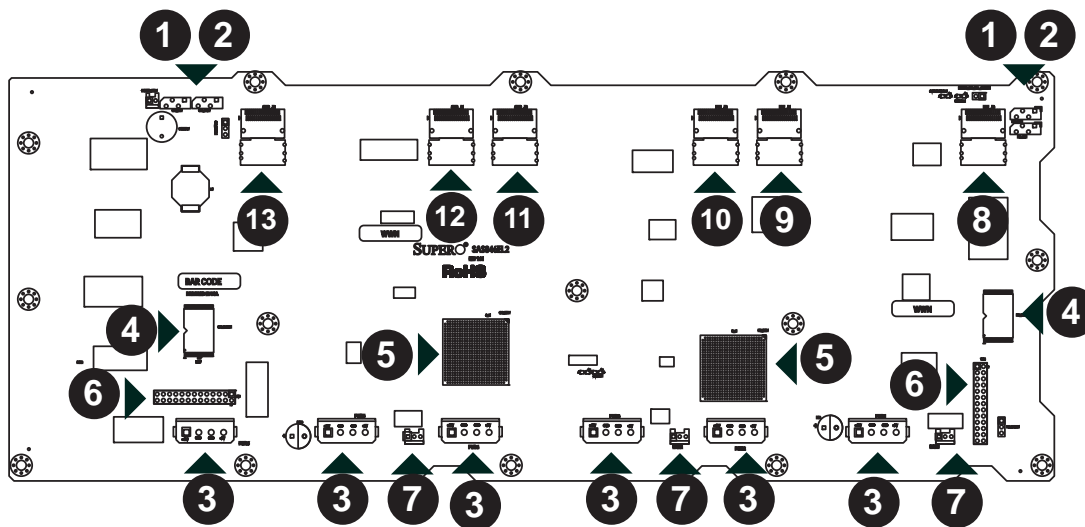


Figure 2-1: Front Connectors

Front Connectors

1. and 2. Primary and secondary I²C connectors (optional)
3. Power connectors: PWR1, PWR2, PWR3, PWR4, PWR5, and PWR6
4. Primary and secondary flash chip
5. Primary and secondary expander chip
6. EPP connectors: J24 and J25
7. Fan connectors: Fan1, Fan2, and Fan3
8. SAS connector: PRI_J0
9. SAS connector: PRI_J1
10. SAS connector: PRI_J2
11. SAS connectors SEC_J0 (not available in EL1 single port backplane)
12. SAS connector: SEC_J1 (not available in EL1 single port backplane)
13. SAS connector: SEC_J2 (not available in EL1 single port backplane)

2-2 Front Connector and Pin Definitions

1. and 2. Optional Primary and Secondary I²C Connectors

The optional I²C connectors are connected to the CSE-PTJBOD-CB2 board and are 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

3. 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

4. Primary and Secondary Flash Chips

The primary and secondary flash chips enhance the backplane memory.

5. Primary and Secondary Expander Chips

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

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 - 13. 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.

2-3 Front Jumper Locations and Pin Definitions

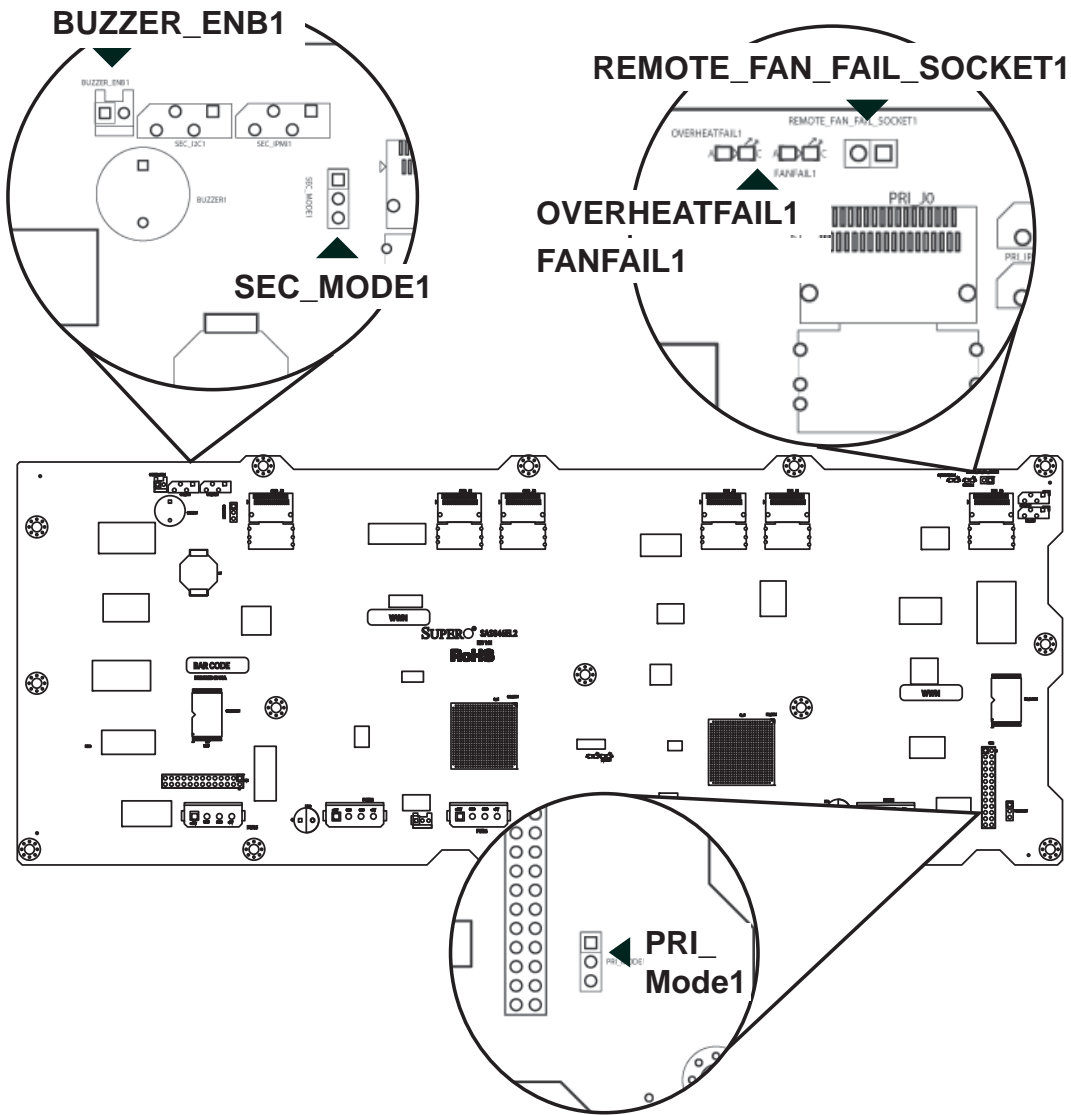
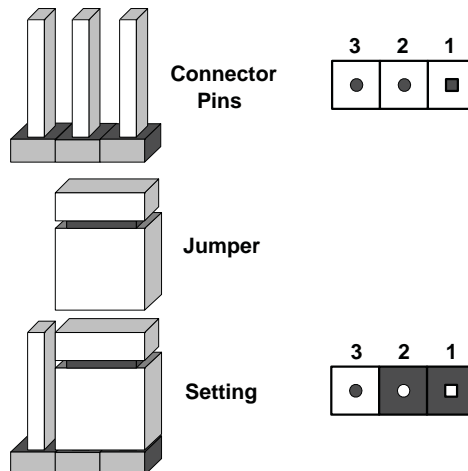


Figure 2-2: Front Jumper Locations and Pin Definitions

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
SEC_MODE1	1-2	Factory Setting Do not change
BUZZER_ENB1	Open: Disable Closed: Enable	Buzzer Enable*

*The buzzer sound indicates that a condition requiring immediate attention has occurred.

The buzzer alarm is triggered by the following conditions:

1. Hard drive failure
2. Fan failure
3. System temperature over 45° Celsius.

Socket Settings		
Socket	Socket Setting	Note
REMOTE_FAN_FAIL_SOCKET	Connected	Front Panel Fan Fail indicator (Optional)

Front Panel LEDs		
LED	State	Specification
OVERHEATFAIL1	ON	Overheat/Drive Failure LED Indicator (Red light: flashing, Buzzer: On)
FANFAIL1	ON	Failure in Fan #1

2-4 Rear Connectors and LED Indicators

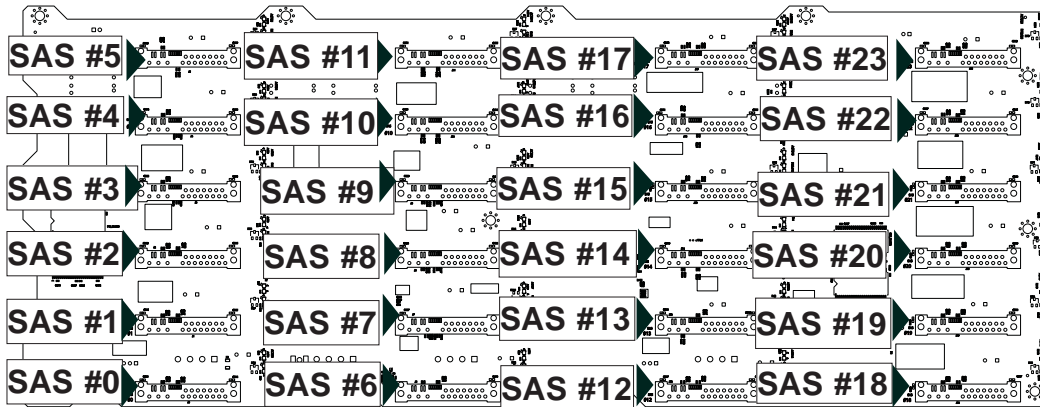


Figure 2-3: Rear Connectors

Rear SAS/SATA Connectors			
Rear Connector	SAS Drive Number	Rear Connector	SAS Drive Number
SAS #0	SAS/SATA HDD #0	SAS #12	SAS/SATA HDD #12
SAS #1	SAS/SATA HDD #1	SAS #13	SAS/SATA HDD #13
SAS #2	SAS/SATA HDD #2	SAS #14	SAS/SATA HDD #14
SAS #3	SAS/SATA HDD #3	SAS #15	SAS/SATA HDD #15
SAS #4	SAS/SATA HDD #4	SAS #16	SAS/SATA HDD #16
SAS #5	SAS/SATA HDD #5	SAS #17	SAS/SATA HDD #17
SAS #6	SAS/SATA HDD #6	SAS #18	SAS/SATA HDD #18
SAS #7	SAS/SATA HDD #7	SAS #19	SAS/SATA HDD #19
SAS #8	SAS/SATA HDD #8	SAS #20	SAS/SATA HDD #20
SAS #9	SAS/SATA HDD #9	SAS #21	SAS/SATA HDD #21
SAS #10	SAS/SATA HDD #10	SAS #22	SAS/SATA HDD #22
SAS #11	SAS/SATA HDD #11	SAS #23	SAS/SATA HDD #23

Rear LED Indicators		
Rear 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
SAS #16	ACT #16	FAIL #16
SAS #17	ACT #17	FAIL #17
SAS #18	ACT #18	FAIL #18
SAS #19	ACT #19	FAIL #19
SAS #20	ACT #20	FAIL #20
SAS #21	ACT #21	FAIL #21
SAS #22	ACT #22	FAIL #22
SAS #23	ACT #23	FAIL #23

Notes

Chapter 3

Dual Port and Cascading Configurations

3-1 Single and Dual Port Expanders

Single Ports

SAS-846EL1 backplanes have a single-port expander that access all twenty-four drives and supports cascading.

Dual Ports

SAS-846EL2 backplanes have dual-port expanders that access all twenty-four drives. These dual-port expanders support cascading, failover, and multipath.

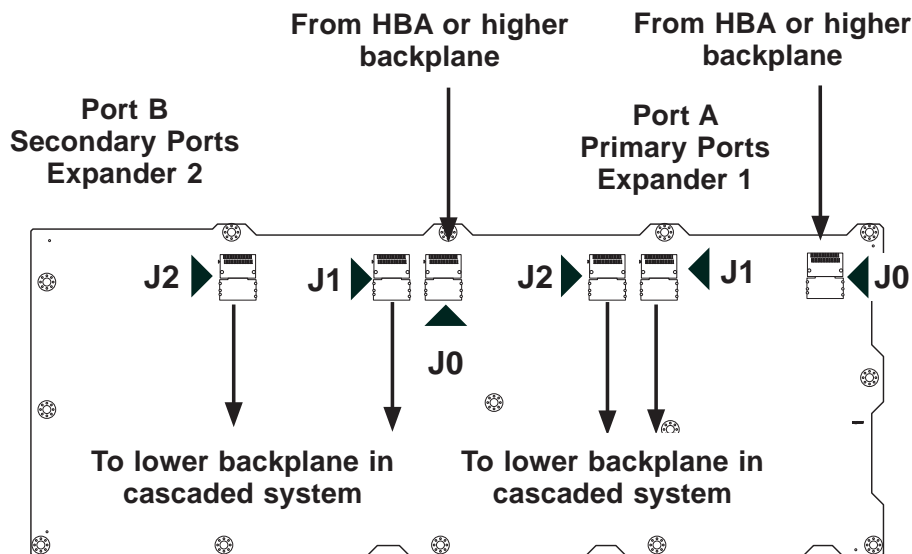


Figure 3-1: SAS-846EL2 Dual Port Configuration

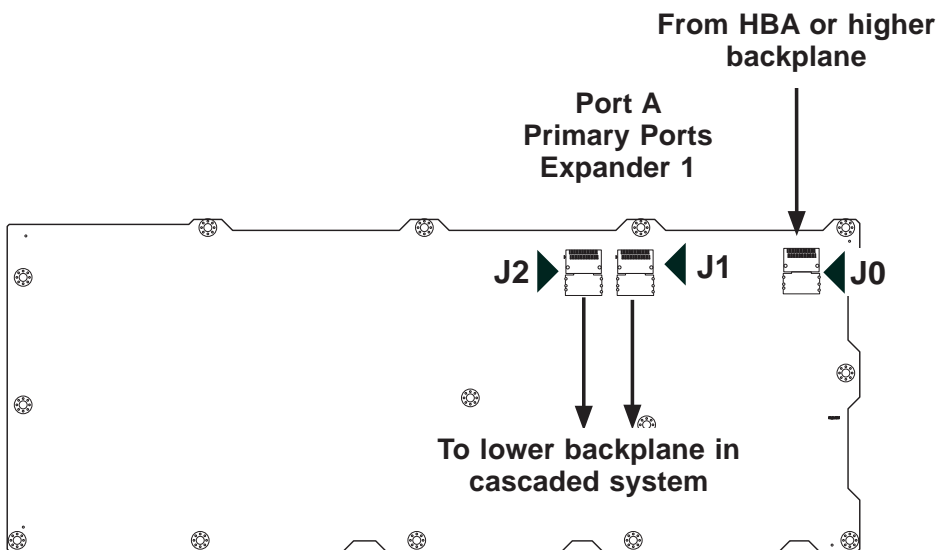


Figure 3-2: SAS-846EL1 Single Port Configuration

3-2 Failover

The SAS-846EL2 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).

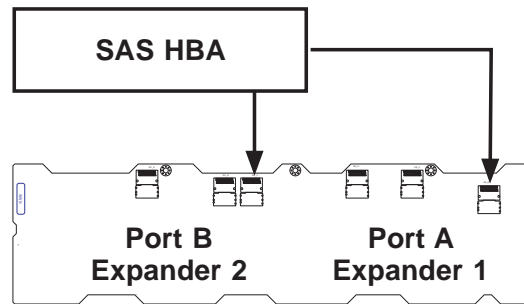


Figure 3-3: Single HBA

Single Host Bus Adapter Failover

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

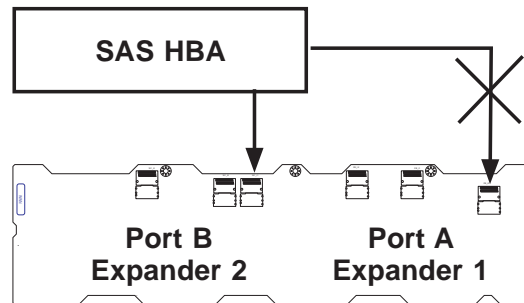


Figure 3-4: Single HBA Failover

Dual Host Bus Adapter

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

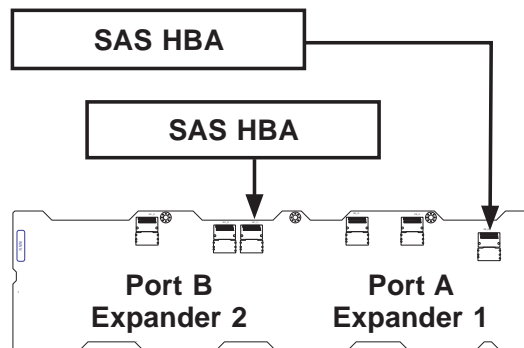


Figure 3-5: Dual HBA

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.

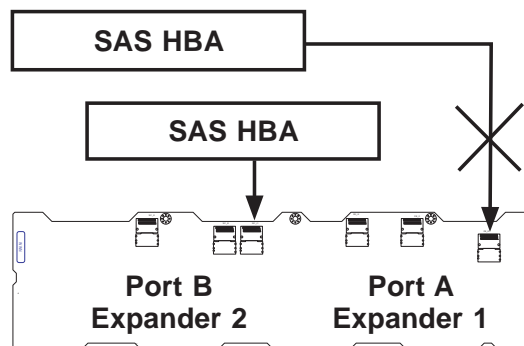


Figure 3-6: Dual HBA Failover

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 PCC-JBPWR2 power card manual. This manual can be found at the <http://www.supermicro.com> or as an appendix in the SAS-846EL chassis manual.

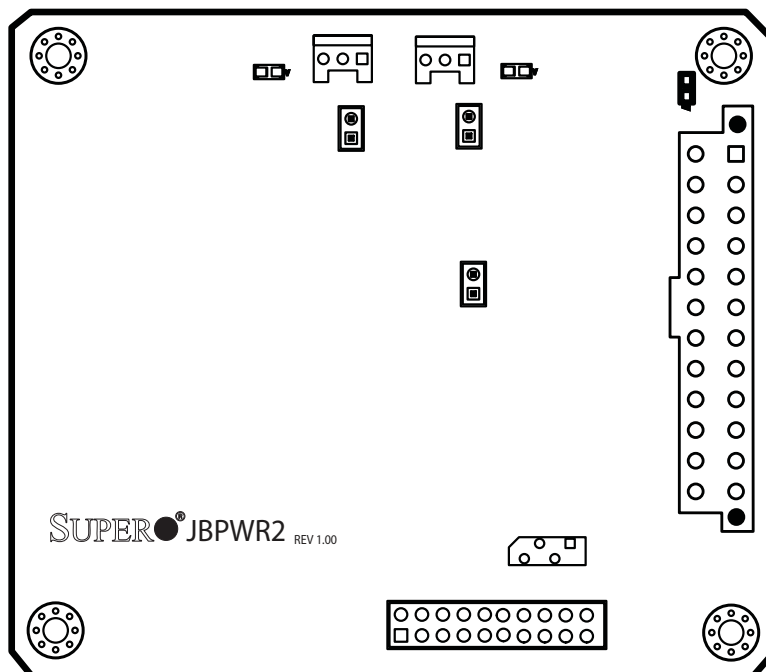


Figure 3-7: Chassis Power Card (Sold Separately)

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.

Connecting 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.

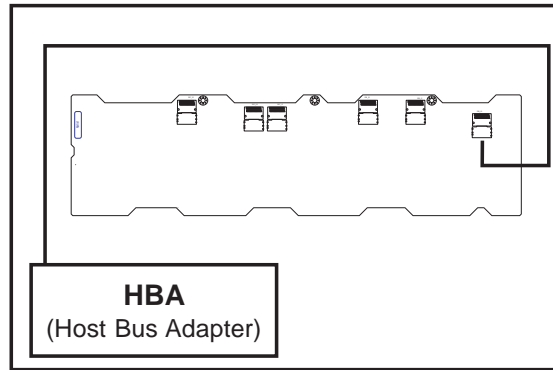


Figure 3-8: Single Internal Host Bus Adapter

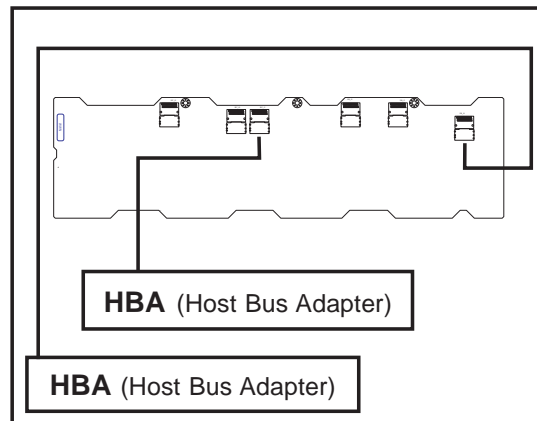


Figure 3-9: Dual Internal Host Bus Adapter

Supported Internal HBA Cables

Use the following listed cables to create connections between the internal HBA and SAS-846EL 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-846EL 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-846EL 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 the other system that has a HBA.

Single External Host Bus Adapter

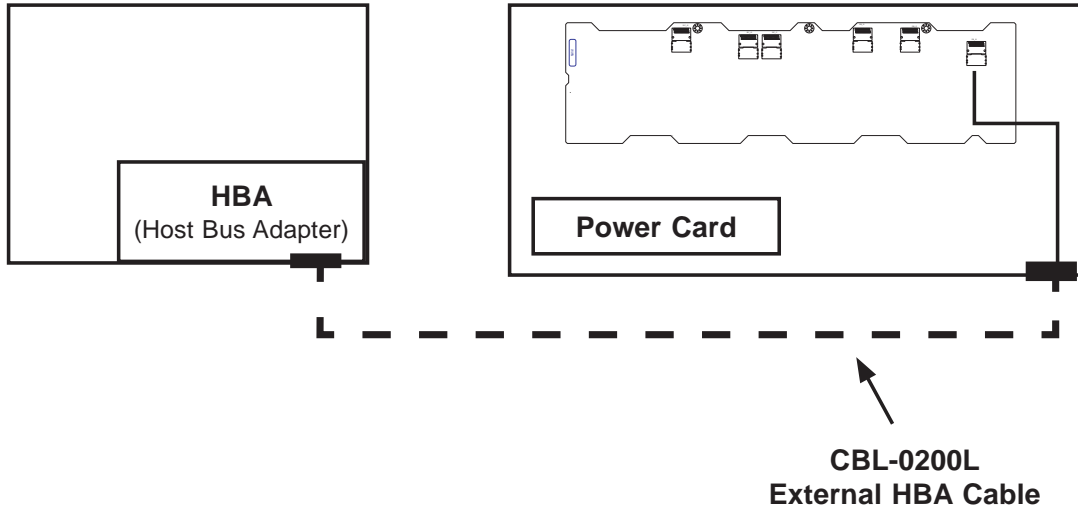


Figure 3-10: Single External Host Adapter

Dual External Host Bus Adapter

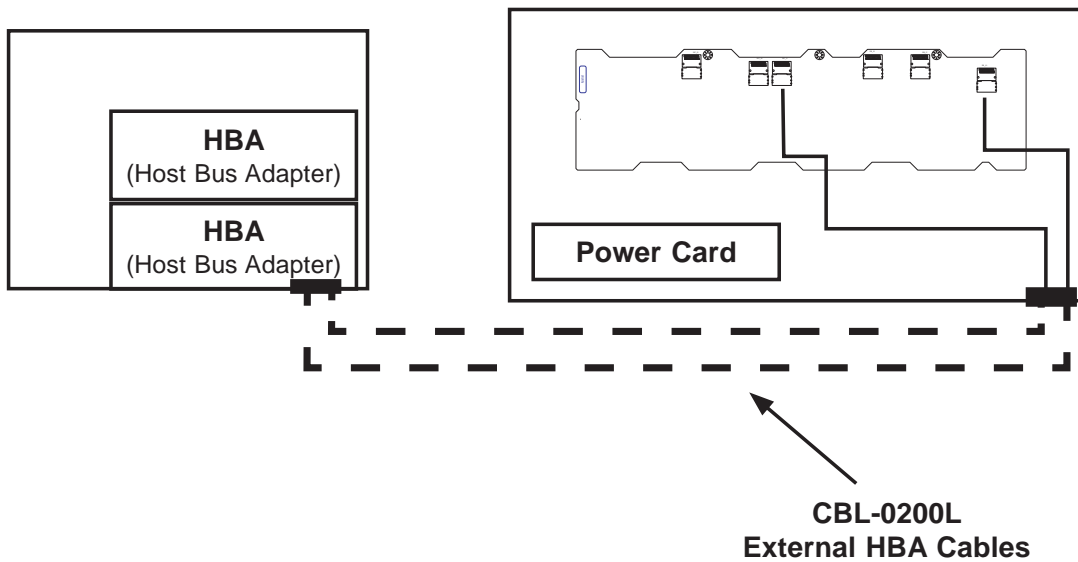


Figure 3-11: Dual External Host Bus Adapter

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.

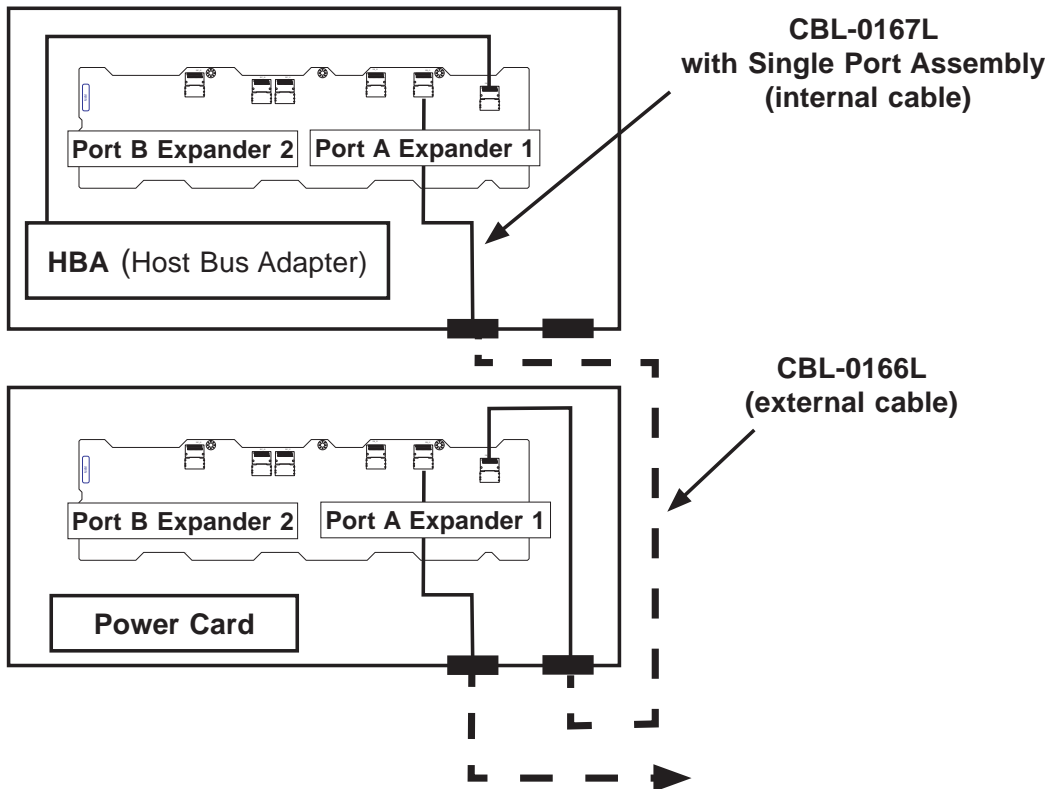


Figure 3-13: Single HBA Configuration

Single HBA Configuration Cables

Single Port Cable Assembly

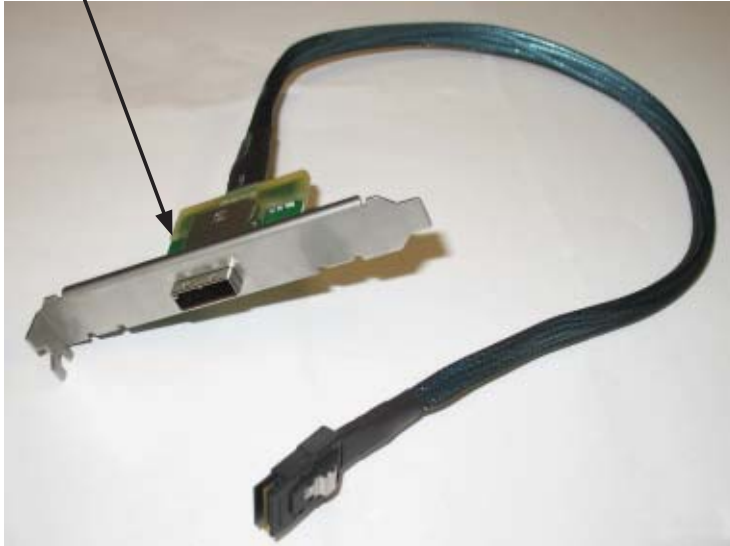


Figure 3-14: Single Port Internal Cable (CBL-0167L)

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.

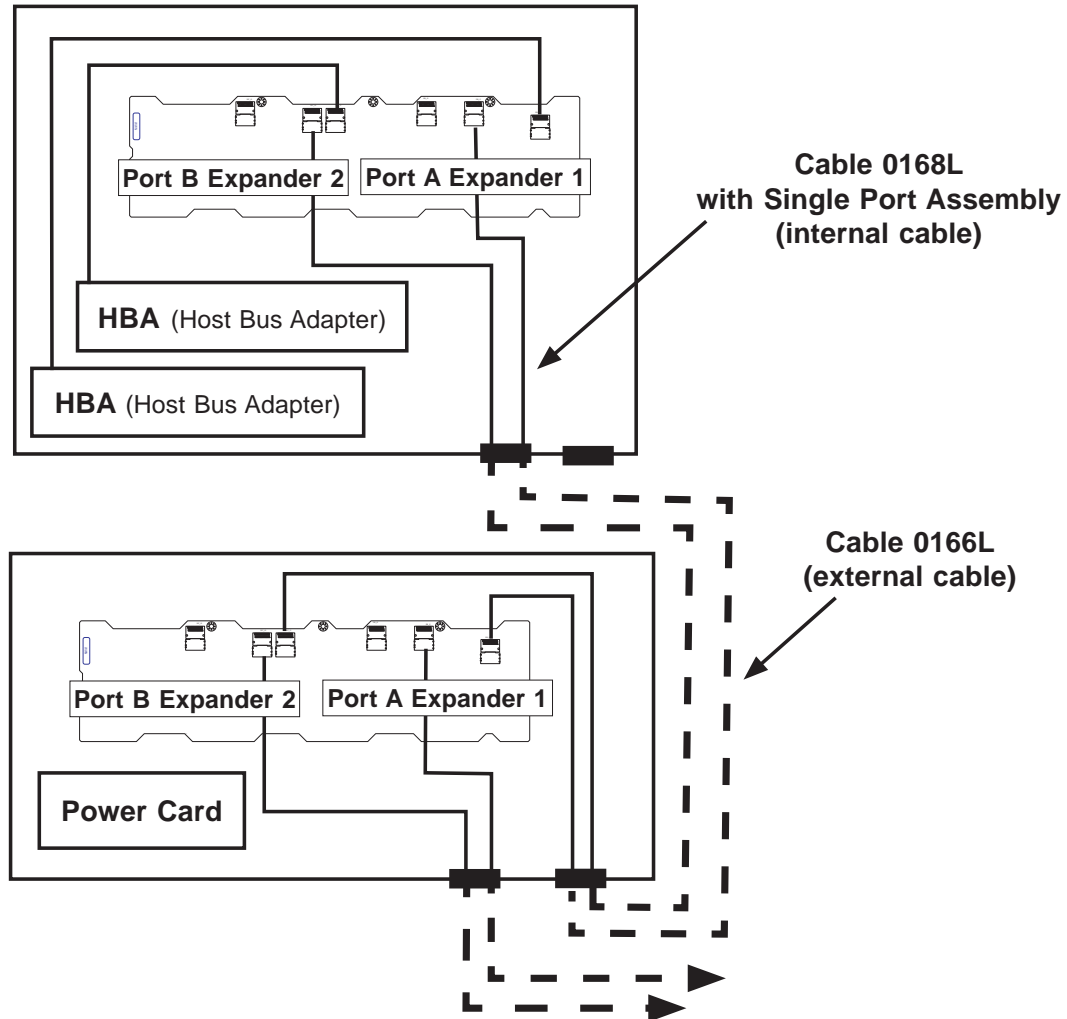


Figure 3-16: Dual HBA Configuration

Dual HBA Configuration Cables

Dual Port Cable
Assembly



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 SC846 Chassis Manual available at www.supermicro.com.

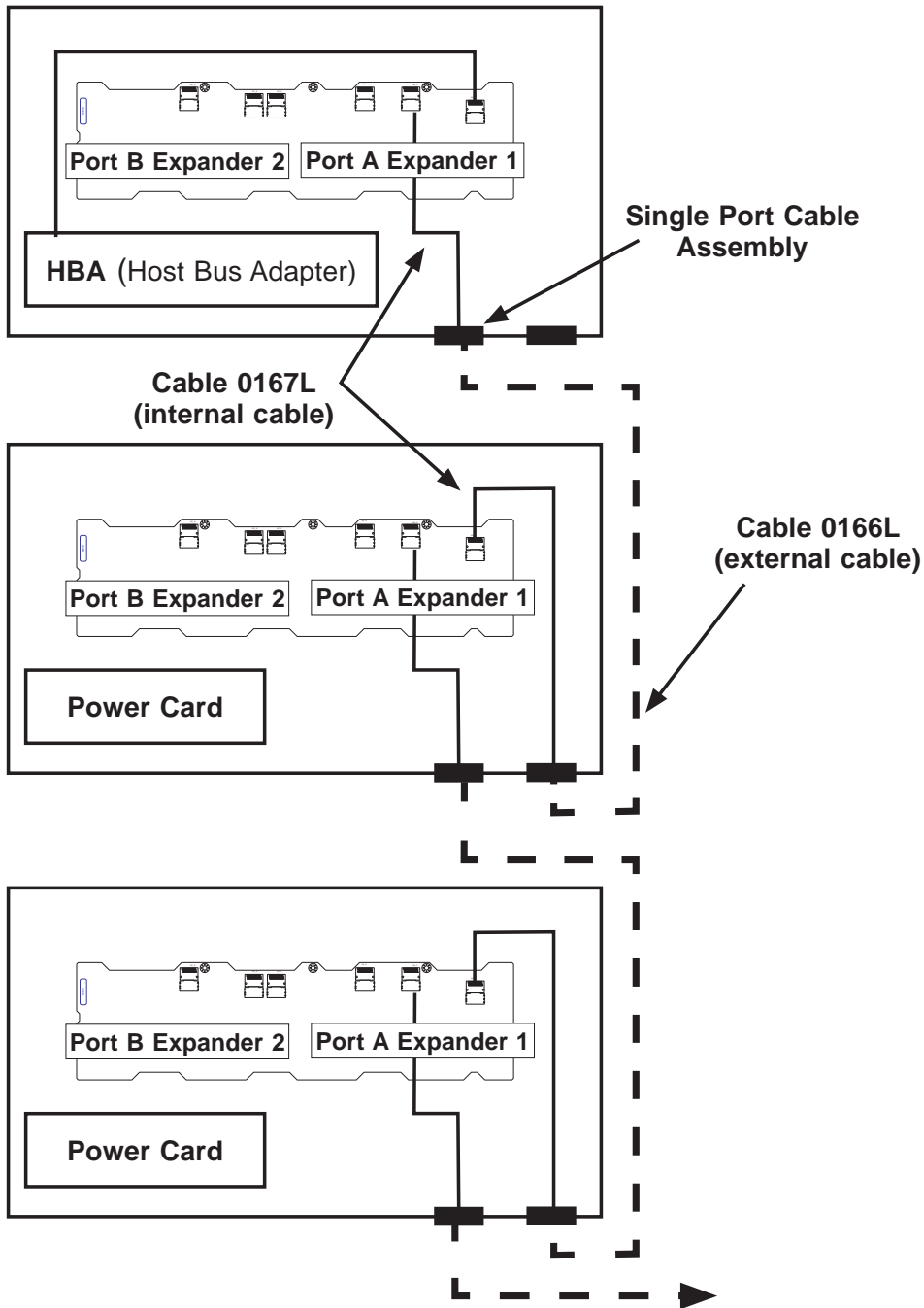


Figure 3-19: Simple Cascaded Configuration

Server System with Single SAS HBA

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

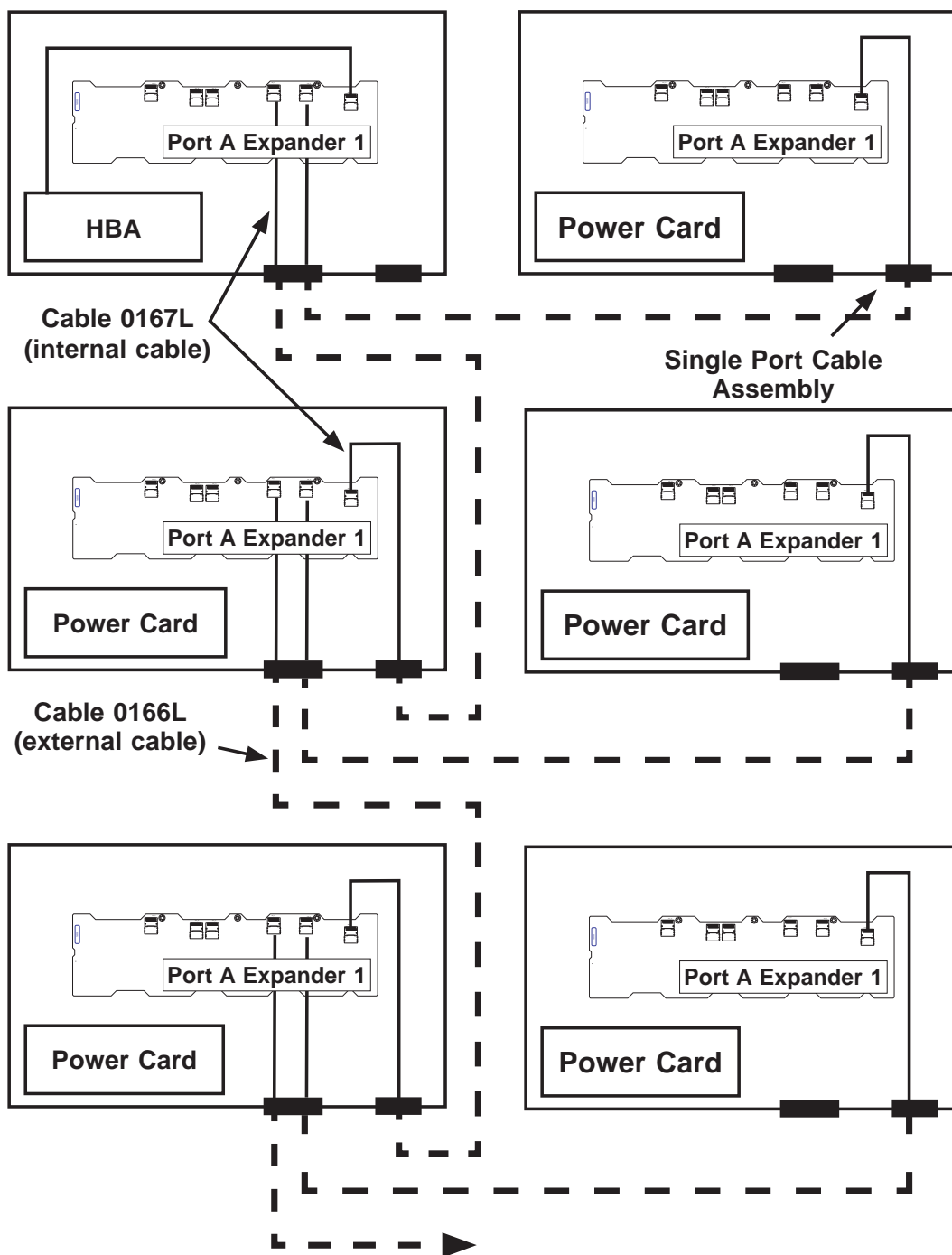


Figure 3-20: Cascaded Configuration with Horizontal Branching

Dual SAS HBA and Cascaded Configuration

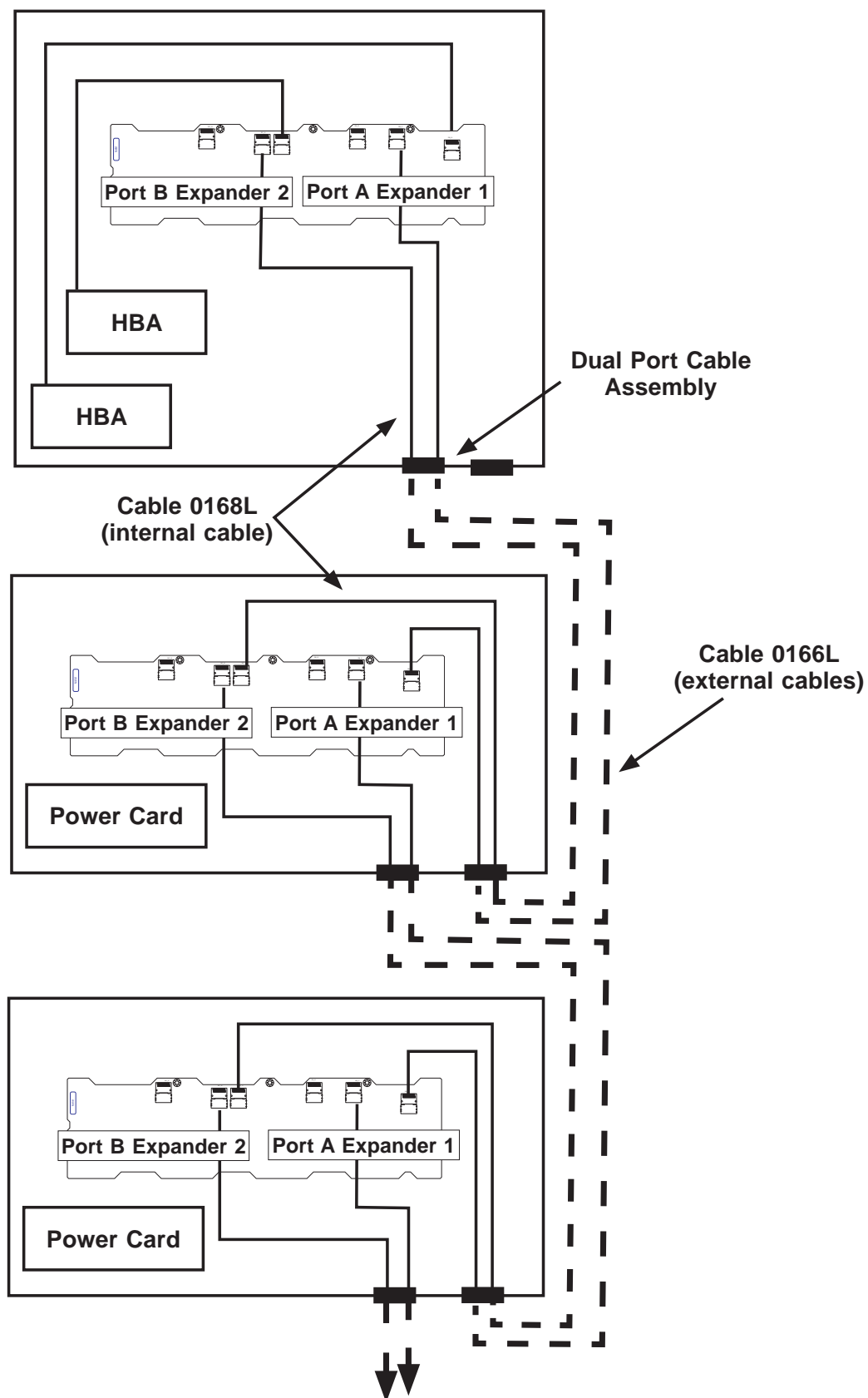


Figure 3-21: Dual SAS HBA with Cascaded Configuration

Dual SAS HBA and Cascaded Configuration with Branching

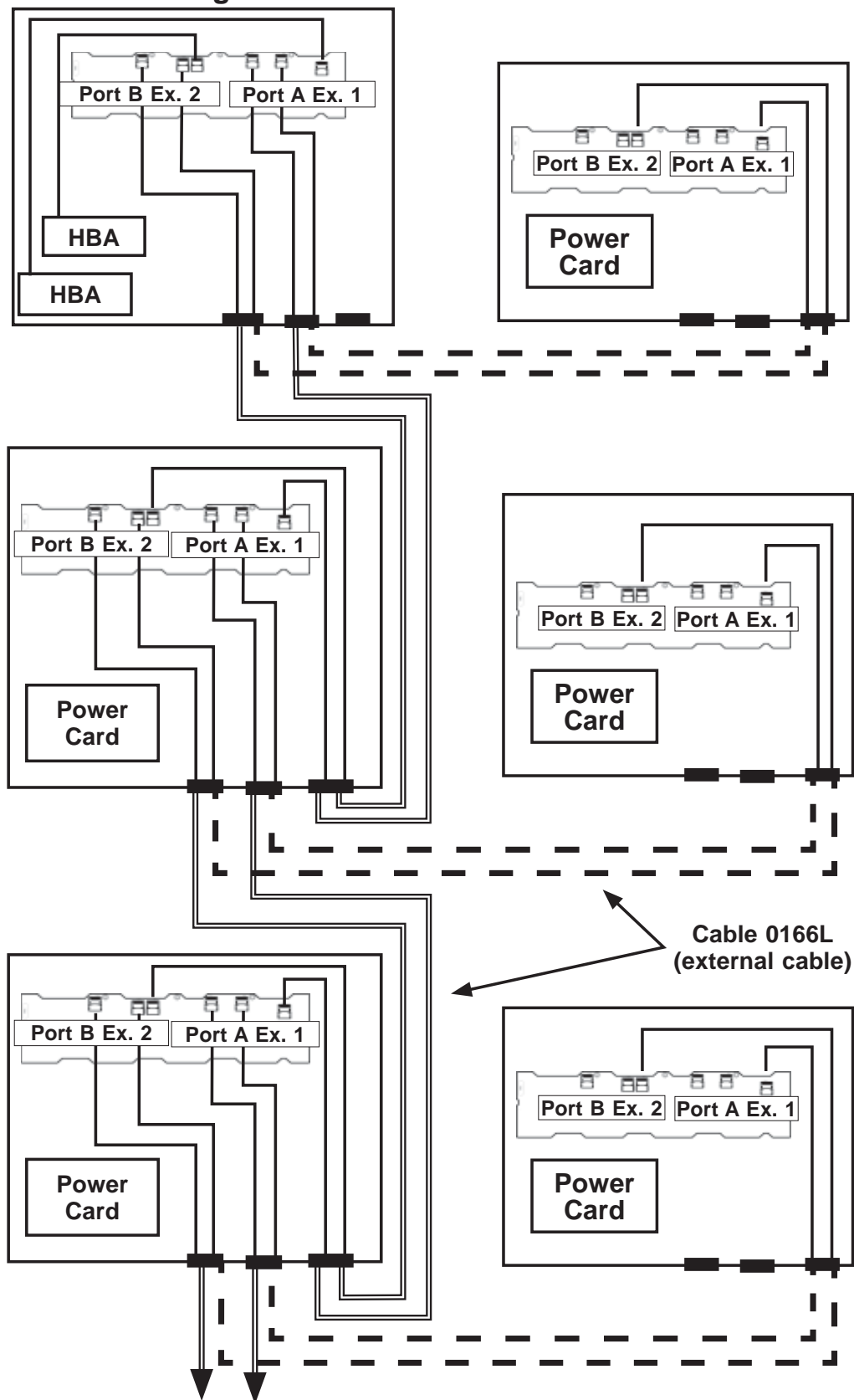


Figure 3-22: Dual SAS HBA with Cascaded Configuration and Branching

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