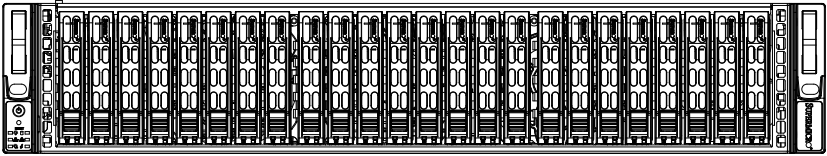# SUPERMICRO®

SC216 CHASSIS Series

SC216BE1C-R920LPB	SC216BE1C-R920WB
SC216BE2C-R920LPB	SC216BE2C-R920WB
SC216BE16-R1K28LPB	SC216BE16-R1K28WB
SC216E16-R1200LPB	SC216E16-R1200UB
SC216E16-R1010LPB	SC216BE16-R920WB
SC216BE16-R920LPB	SC216BE16-R920UB
SC216BE-R1K28LPB	SC216BE-R1K28WB
SC216E26-R1200LPB	SC216E26-R1200UB
SC216BE26-R920LPB	SC216BE26-R920WB
SC216BE26-R920UB	SC216BA-R1K28WB
SC216BA-R1K28LPB	SC216BA-R920WB
SC216BA-R920LPB	SC216BA-R920UB
SC216A-R900LPB	SC216A-R900UB
SC216E1-R900LPB*	SC216E1-R900UB*
SC216E2-R900LPB*	SC216E2-R900UB*
SC216BAC-R920LPB	SC216BE1C4-R1K23LPB

USER'S MANUAL

1.1

The information in this User's Manual has been carefully reviewed and is believed to be accurate. The vendor assumes no responsibility for any inaccuracies that may be contained in this document, makes no commitment to update or to keep current the information in this manual, or to notify any person or organization of the updates. **Please Note: For the most up-to-date version of this manual, please see our web site at www.supermicro.com.**

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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.

Manual Revision 1.1
Release Date: May 20, 2022

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Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SC216 2U chassis. Installation and maintenance should be performed by experienced technicians only.

This document lists compatible parts and configurations available when this document was published. Always refer to the our Web site for updates on supported parts and configurations at www.supermicro.com.

Models marked with and asterisk (*) on the front cover have been designated *End of Life*, that is, no longer sold.

Manual Organization

Chapter 1 Introduction

The first chapter covers the primary components included with this chassis and describes the main features of the SC216 chassis. This chapter also includes contact information.

Chapter 2 Warning Statements for AC Systems

This chapter lists warnings, precautions, and system safety. You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed before installing and servicing this chassis.

Chapter 3 Chassis Components

Refer here for details on this chassis model including the fans, hard drives, airflow shields, and other components.

Chapter 4 System Interface

Refer to this chapter for details on the system interface, which includes the functions and information provided by the control panel on the chassis as well as other LEDs located throughout the system.

Chapter 5 Chassis Setup and Maintenance

This chapter providesdetailed information on this chassis. You should follow the procedures given in this chapter when installing, removing, or reconfiguring your chassis.

Chapter 6 Rack Installation

Refer to this chapter for detailed information on chassis rack installation. You should follow the procedures given in this chapter when installing, removing or reconfiguring your chassis into a rack environment.

Appendices

This section lists compatible cables, power supply specifications, and compatible backplanes. Not all compatible backplanes may be listed. Refer to our Web site for the latest compatible backplane information at http://www.supermicro.com

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Chapter 5 Chassis Setup and Maintenance

Chapter 6 Rack Installation

Dual Port and Cascading Configurations

Appendix E SAS2-216EL1/EL2 Backplane Specifications

Appendix G BPN-SAS3-216EL Backplane Specifications

Chapter 1

Introduction

1-1   Overview

Supermicro's SC216 maximizes storage capacity in a 2U form factor by offering twenty-four hot-swappable 2.5" SAS/SATA hard drive bays for applications requiring extra storage. The chassis design optimizes every aspect of interior space without compromising superior cooling capabilities. The chassis is equipped with a redundant, efficient power supply for outstanding power savings, with specially designed optimized cooling, and seven low-profile or UIO solution expansion slots for superior networking options. Quick release, tool-less slide rails are availble for quick installation.

SC216E1 and SC216E2 chassis models support only SATA, SATA2 and SAS1 hard drives. The maximum capacity supported by each of these drives is 2TB. The SC216E1 and SC216E2 models do not support JBOD configurations.

Note: A complete list of safety warnings is provided on the Supermicro web site at www.supermicro.com.

Model	HDD	Backplane	I/O Slots	Power Supply
SC216BE1C4-R1K23LPB	24x 2.5" SAS/SATA plus 2x2.5" (opt)	SAS3-216EL1-N4	7x LP	1200W (Titanium Level)
SC216BAC-R920LPB	24x 2.5" SAS/SATA plus 2x2.5" (opt)	SAS3-216A	7x LP	920W (Platinum Level)
SC216BE1C-R920LPB	24x 2.5" SAS/SATA plus 2x2.5" (opt)	SAS3-216EL1	7x LP	920W (Platinum Level)
SC216BE1C-R920WB	24x 2.5" SAS/SATA plus 2x2.5" (opt)	SAS3-216EL1	4x FH, 3x LP	920W (Platinum Level)
SC216BE2C-R920LPB	24x 2.5" SAS/SATA plus 2x2.5" (opt)	SAS3-216EL2	7x LP	920W (Platinum Level)
SC216BE2C-R920WB	24x 2.5" SAS/SATA plus 2x2.5" (opt)	SAS3-216EL2	4x FH, 3x LP	920W (Platinum Level)
SC216BE16-R1K28LPB	24x 2.5" SAS/SATA plus 2x2.5" (opt)	SAS2-216EL1	7x LP	1280W (Platinum Level)
SC216BE16-R1K28WB	24x 2.5" SAS/SATA plus 2x2.5" (opt)	SAS2-216EL1	4x FH, 3x LP	1280W (Platinum Level)

Model	HDD	Backplane	I/O Slots	Power Supply
SC216E16-R1200LPB	24x 2.5" SAS/SATA	SAS2-216EL1	7x LP	1200W (Gold Level)
SC216E16-R1200UB	24x 2.5" SAS/SATA	SAS2-216EL1	4x FH, 3x LP	1200W (Gold Level)
SC216E16-R1010LPB	24x 2.5" SAS/SATA	SAS2-216EL1	7x LP	1010W DC
SC216BE16-R920LPB	24x 2.5" SAS/SATA plus 2x2.5" (opt)	SAS2-216EL1	7x LP	920W (Platinum Level)
SC216BE16-R920UB	24x 2.5" SAS/SATA plus 2x2.5" (opt)	SAS2-216EL1	4x FH, 3x LP	920W (Platinum Level)
SC216BE16-R920WB	24x 2.5" SAS/SATA plus 2x2.5" (opt)	SAS2-216EL1	4x FH, 3x LP	920W (Platinum Level)
SC216BE-R1K28LPB	24x 2.5" SAS/SATA plus 2x2.5" (opt)	SAS2-216EL2	7x LP	1280W (Platinum Level)
SC216BE-R1K28WB	24x 2.5" SAS/SATA plus 2x2.5" (opt)	SAS2-216EL2	4x FH, 3x LP	1280W (Platinum Level)
SC216E26-R1200LPB	24x 2.5" SAS/SATA	SAS2-216EL2	7x LP	1200W (Gold Level)
SC216E26-R1200UB	24x 2.5" SAS/SATA	SAS2-216EL2	4x FH, 3x LP	1200W (Gold Level)t
SC216BE26-R920LPB	24x 2.5" SAS/SATA plus 2x2.5" (opt)	SAS2-216EL2	7x LP	920W (Platinum Level)
SC216BE26-R920WB	24x 2.5" SAS/SATA plus 2x2.5" (opt)	SAS2-216EL2	4x FH, 3x LP	920W (Platinum Level)
SC216BE26-R920UB	24x 2.5" SAS/SATA plus 2x2.5" (opt)	SAS2-216EL2	4x FH, 3x LP	920W (Platinum Level)
SC216BA-R1K28LPB	24x 2.5" SAS/SATA plus 2x2.5" (opt)*	SAS-216A	7x LP	1280W (Platinum Level)
SC216BA-R1K28WB	24x 2.5" SAS/SATA plus 2x2.5" (opt)	SAS-216A	4x FH, 3x LP	1280W (Platinum Level)
SC216BA-R920LPB	24x 2.5" SAS/SATA plus 2x2.5" (opt)	SAS-216A	7x LP	920W (Platinum Level)
SC216BA-R920WB	24x 2.5" SAS/SATA plus 2x2.5" (opt)	SAS-216A	7x LP	920W (Platinum Level)
SC216BA-R920UB	24x 2.5" SAS/SATA plus 2x2.5" (opt)	SAS-216A	4x FH, 3x LP	920W (Platinum Level)
SC216A-R900LPB	24x 2.5" SAS/SATA	SAS-216A	7x LP	900W
SC216A-R900UB	24x 2.5" SAS/SATA	SAS-216A	4x FH, 3x LP	900W

Model	HDD	Backplane	I/O Slots	Power Supply
SC216E1-R900LPB**	24x 2.5" SAS/SATA	SAS-216EL1	7x LP	900W
SC216E1-R900UB**	24x 2.5" SAS/SATA	SAS-216EL1	4x FH, 3x LP	900W
SC216E2-R900LPB**	24x 2.5" SAS/SATA	SAS-216EL2	7x LP	900W
SC216E2-R900UB**	24x 2.5" SAS/SATA	SAS-216EL2	4x FH, 3x LP	900W

*Optional with SC216B models: two additional 2.5" drives that mount in the rear of the chassis.

** End of Life

Key: FH = Full-height, half-length,   LP = Low-profile

1-2   Contacting Supermicro

Headquarters

Address:	Super Micro Computer, Inc.
	980 Rock Ave.
	San Jose, CA 95131 U.S.A.
Tel:	+1 (408) 503-8000
Fax:	+1 (408) 503-8008
Email:	marketing@supermicro.com (General Information)
	support@supermicro.com (Technical Support)
Web Site:	www.supermicro.com

Europe

Address:	Super Micro Computer B.V.
	Het Sterrenbeeld 28, 5215 ML
	's-Hertogenbosch, The Netherlands
Tel:	+31 (0) 73-6400390
Fax:	+31 (0) 73-6416525
Email:	sales@supermicro.nl (General Information)
	support@supermicro.nl (Technical Support)
	rma@supermicro.nl (Customer Support)
Web Site:	www.supermicro.nl

Asia-Pacific

Address:	Super Micro Computer, Inc.
	3F, No. 150, Jian 1st Rd.
	Zhonghe Dist., New Taipei City 235
	Taiwan (R.O.C)
Tel:	+886-(2) 8226-3990
Fax:	+886-(2) 8226-3992
Email:	support@supermicro.com.tw
Web Site:	www.supermicro.com.tw

1-3   Returning Merchandise for Service

A receipt or copy of your invoice marked with the date of purchase is required be-
fore 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.super-
micro.com/support/rma/).

Whenever possible, repack the chassis in the original Supermicro carton, using the
original packaging material. If these are no longer available, be sure to pack the
chassis securely, using packaging material to surround the chassis so that it does
not shift within the carton and become damaged during shipping.

This warranty only covers normal consumer use and does not cover damages in-
curred 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 2

Standardized Warning Statements for AC Systems

2-1 About Standardized Warning Statements

The following statements are industry standard warnings, provided to warn the user of situations which have the potential for bodily injury. Should you have questions or experience difficulty, contact Supermicro's Technical Support department for assistance. Only certified technicians should attempt to install or configure components.

Read this appendix in its entirety before installing or configuring components in the Supermicro chassis.

These warnings may also be found on our web site at http://www.supermicro.com/about/policies/safety_information.cfm.

Warning Definition

Warning!

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents.

警告の定義
この警告サインは危険を意味します。
人身事故につながる可能性がありますので、いずれの機器でも動作させる前に、
電気回路に含まれる危険性に注意して、標準的な事故防止策に精通して下さい。

此警告符号代表危 。
您正处于可能受到 重 害的工作环境中。在您使用 始工作之前，必 充分 意 到触 的危 ，并熟 掌握防止事故 生的 准工作程序。 根据每 警告尾的声明号 找到此 的安全性警告 明的翻 文本。

此警告符號代表危險。
您正處於可能身體可能會受損傷的工作環境中。在您使用任何設備之前，請注意觸電的危險，並且要熟悉預防事故發生的標準工作程序。請依照每一注意事項後的號碼找到相關的翻譯說明內容。

Warnung

WICHTIGE SICHERHEITSHINWEISE

Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu Verletzungen führen kann. Machen Sie sich vor der Arbeit mit Geräten mit den Gefahren elektrischer Schaltungen und den üblichen Verfahren zur Vorbeugung vor Unfällen vertraut. Suchen Sie mit der am Ende jeder Warnung angegebenen Anweisungsnummer nach der jeweiligen Übersetzung in den übersetzten Sicherheitshinweisen, die zusammen mit diesem Gerät ausgeliefert wurden.

BEWAHREN SIE DIESE HINWEISE GUT AUF.

INSTRUCCIONES IMPORTANTES DE SEGURIDAD

Este símbolo de aviso indica peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considere los riesgos de la corriente eléctrica y familiarícese con los procedimientos estándar de prevención de accidentes. Al final de cada advertencia encontrará el número que le ayudará a encontrar el texto traducido en el apartado de traducciones que acompaña a este dispositivo.

GUARDE ESTAS INSTRUCCIONES.

IMPORTANTES INFORMATIONS DE SÉCURITÉ

Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant entraîner des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers liés aux circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions des avertissements figurant dans les consignes de sécurité traduites qui accompagnent cet appareil, référez-vous au numéro de l'instruction situé à la fin de chaque avertissement.

CONSERVEZ CES INFORMATIONS.

תקנון הצהרות אזהרה

הצהרות הבאות הן אזהרות על פי תקני התעשייה, על מנת להזהיר את המשתמש מפני חבלה פיזית אפשרית. במידה ויש שאלות או היתקלות בבעיה כלשהי, יש ליצור קשר עם מחלקת תמיכה טכנית של סופרמיקרו. טכנאים מוסמכים בלבד רשאים להתקין או להגדיר את הרכיבים.

יש לקרוא את הנספח במלואו לפני התקנת או הגדרת הרכיבים במארזי סופרמיקרו.

تحذير! هذا الرمز يعني خطر انك في حالة يمكن أن تتسبب في اصابة جسدية .
قبل أن تعمل على أي معدات،كن على علم بالمخاطر الناجمة عن الدوائر
الكهربائية
وكن على دراية بالممارسات الوقائية لمنع وقوع أي حوادث
استخدم رقم البيان المنصوص في نهاية كل تحذير للعثور ترجمتها

안전을 위한 주의사항

경고!

이 경고 기호는 위험이 있음을 알려 줍니다. 작업자의 신체에 부상을 야기 할 수
있는 상태에 있게 됩니다. 모든 장비에 대한 작업을 수행하기 전에 전기회로와
관련된 위험요소들을 확인하시고 사전에 사고를 방지할 수 있도록 표준
작업절차를 준수해 주시기 바랍니다.

해당 번역문을 찾기 위해 각 경고의 마지막 부분에 제공된 경고문 번호를
참조하십시오

BELANGRIJKE VEILIGHEIDSINSTRUCTIES

Dit waarschuwings symbool betekent gevaar. U verkeert in een situatie die
lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken,
dient u zich bewust te zijn van de bij een elektrische installatie betrokken risico's
en dient u op de hoogte te zijn van de standaard procedures om ongelukken te
voorkomen. Gebruik de nummers aan het eind van elke waarschuwing om deze te
herleiden naar de desbetreffende locatie.

BEWAAR DEZE INSTRUCTIES

Installation Instructions

⚠️ **Warning!**

Read the installation instructions before connecting the system to the power source.

設置手順書

システムを電源に接続する前に、設置手順書をお読み下さい。

警告
将此系 接 源前，先 安 明。

警告
將系統與電源連接前，請先閱讀安裝說明。

Warnung

Vor dem Anschließen des Systems an die Stromquelle die Installationsanweisungen lesen.

¡Advertencia!

Lea las instrucciones de instalación antes de conectar el sistema a la red de alimentación.

Attention

Avant de brancher le système sur la source d'alimentation, consulter les directives d'installation.

יש לקרוא את הוראות התקנה לפני חיבור המערכת למקור מתח.

اقر إرشادات التركيب قبل توصيل النظام إلى مصدر للطاقة

시스템을 전원에 연결하기 전에 설치 안내를 읽어주십시오.

Waarschuwing

Raadpleeg de installatie-instructies voordat u het systeem op de voedingsbron aansluit.

Circuit Breaker

Warning!

This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that the protective device is rated not greater than: 250 V, 20 A.

サーキット・ブレーカー

この製品は、短絡(過電流)保護装置がある建物での設置を前提としています。

保護装置の定格が250 V、20 Aを超えないことを確認下さい。

警告
此 品的短路 (过   流) 保 由建筑物的供 系 提供 , 确保短路保   的 定 流不大于250V , 20A。

警告
此產品的短路(過載電流)保護由建築物的供電系統提供,確保短路保護設備的額定電 流不大於250V , 20A。

Warnung

Dieses Produkt ist darauf angewiesen, dass im Gebäude ein Kurzschluss- bzw. Überstromschutz installiert ist. Stellen Sie sicher, dass der Nennwert der Schutzvorrichtung nicht mehr als: 250 V, 20 A beträgt.

¡Advertencia!

Este equipo utiliza el sistema de protección contra cortocircuitos (o sobrecorrientes) del edificio. Asegúrese de que el dispositivo de protección no sea superior a: 250 V, 20 A.

Attention

Pour ce qui est de la protection contre les courts-circuits (surtension), ce produit dépend de l'installation électrique du local. Vérifiez que le courant nominal du dispositif de protection n'est pas supérieur à :250 V, 20 A.

מוצר זה מסתמך על הגנה המותקנת במבנים למניעת קצר חשמלי. יש לוודא כי המכשיר המגן מפני הקצר החשמלי הוא לא יותר מ-A 20 ,V 250

هذا المنتج يعتمد على معدات الحماية من الدوائرالقصيرة التي تم تثبيتها في المبنى
تأكد من أن تقييم الجهاز الوقائي ليس أكثر من: 20A, 250V

경고!

이 제품은 전원의 단락(과전류)방지에 대해서 전적으로 건물의 관련 설비에
의존합니다. 보호장치의 정격이 반드시 250V(볼트), 20A(암페어)를 초과하지
않도록 해야 합니다.

Waarschuwing

Dit product is afhankelijk van de kortsluitbeveiliging (overspanning) van
uw electrische installatie. Controleer of het beveiligde aparaat niet groter
gedimensioneerd is dan 220V, 20A.

Power Disconnection Warning

 Warning!

The system must be disconnected from all sources of power and the power cord
removed from the power supply module(s) before accessing the chassis interior to
install or remove system components.

電源切断の警告

システムコンポーネントの取り付けまたは取り外しのために、シャーシー内部にアクセス
するには、
システムの電源はすべてのソースから切断され、電源コードは電源モジュールから取り
外す必要があります。

警告

在你打 机箱并安 或移除内部器件前，必 将系 完全断 ，并移除 源 。

警告

在您打開機殼安裝或移除內部元件前，必須將系統完全斷電，並移除電源線。

Warnung

Das System muss von allen Quellen der Energie und vom Netzanschlusskabel
getrennt sein, das von den Spg.Versorgungsteilmodulen entfernt wird, bevor es
auf den Chassisinnenraum zurückgreift, um Systemsbestandteile anzubringen oder
zu entfernen.

¡Advertencia!

El sistema debe ser disconnected de todas las fuentes de energía y del cable eléctrico quitado de los módulos de fuente de alimentación antes de tener acceso el interior del chasis para instalar o para quitar componentes de sistema.

Attention

Le système doit être débranché de toutes les sources de puissance ainsi que de son cordon d'alimentation secteur avant d'accéder à l'intérieur du chassis pour installer ou enlever des composants de systéme.

אזהרה !
יש לנתק את המערכת מכל מקורות החשמל ויש להסיר את כבל החשמלי מהספק לפני גישה לחלק הפנימי של המארז לצורך התקנת או הסרת רכיבים.

يجب فصل النظام من جميع مصادر الطاقة وإزالة سلك الكهرباء من وحدة امداد الطاقة قبل
الوصول إلى المناطق الداخلية للهيكل لتثبيت أو إزالة مكونات الجهاز

경고!

시스템에 부품들을 장착하거나 제거하기 위해서는 섀시 내부에 접근하기 전에 반드시 전원 공급장치로부터 연결되어있는 모든 전원과 전기코드를 분리해주어야 합니다.

Waarschuwing

Voordat u toegang neemt tot het binnenwerk van de behuizing voor het installeren of verwijderen van systeem onderdelen, dient u alle spanningsbronnen en alle stroomkabels aangesloten op de voeding(en) van de behuizing te verwijderen

Equipment Installation

⚠️ **Warning!**

Only trained and qualified personnel should be allowed to install, replace, or service this equipment.

機器の設置
トレーニングを受け認定された人だけがこの装置の設置、交換、またはサービスを許可されています。

警告
只有 过培 且具有 格的人 才能 行此 的安 、更 和 修。

警告
只有經過受訓且具資格人員才可安裝、更換與維修此設備。

Warnung

Das Installieren, Ersetzen oder Bedienen dieser Ausrüstung sollte nur geschultem, qualifiziertem Personal gestattet werden.

¡Advertencia!

Solamente el personal calificado debe instalar, reemplazar o utilizar este equipo.

Attention

Il est vivement recommandé de confier l'installation, le remplacement et la maintenance de ces équipements à des personnels qualifiés et expérimentés.

אזהרה !
צוות מוסמך בלבד רשאי להתקין, להחליף את הציוד או לתת שירות עבור הציוד.

يجب أن يسمح فقط للموظفين المؤهلين والمدربين لتركيب واستبدال أو خدمة هذا الجهاز

경고!

훈련을 받고 공인된 기술자만이 이 장비의 설치, 교체 또는 서비스를 수행할 수 있습니다.

Waarschuwing

Deze apparatuur mag alleen worden geïnstalleerd, vervangen of hersteld door geschoold en gekwalificeerd personeel.

Restricted Area

 Warning!

This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key, or other means of security. (This warning does not apply to workstations).

アクセス制限区域
このユニットは、アクセス制限区域に設置されることを想定しています。
アクセス制限区域は、特別なツール、鍵と錠前、その他のセキュリティの手段を用いてのみ出入りが可能です。

警告
此部件 安 在限制 出的 所，限制 出的 所指只能通过使用特殊工具、 和 匙或其它安全手段 出的 所。

警告
此裝置僅限安裝於進出管制區域，進出管制區域係指僅能以特殊工具、鎖頭及鑰匙或其他安全方式才能進入的區域。

Warnung

Diese Einheit ist zur Installation in Bereichen mit beschränktem Zutritt vorgesehen. Der Zutritt zu derartigen Bereichen ist nur mit einem Spezialwerkzeug, Schloss und Schlüssel oder einer sonstigen Sicherheitsvorkehrung möglich.

¡Advertencia!

Esta unidad ha sido diseñada para instalación en áreas de acceso restringido. Sólo puede obtenerse acceso a una de estas áreas mediante la utilización de una herramienta especial, cerradura con llave u otro medio de seguridad.

Attention

Cet appareil doit être installée dans des zones d'accès réservés. L'accès à une zone d'accès réservé n'est possible qu'en utilisant un outil spécial, un mécanisme de verrouillage et une clé, ou tout autre moyen de sécurité.

אזור עם גישה מוגבלת

אזהרה !
יש להתקין את היחידה באזורים שיש בהם הגבלת גישה. הגישה ניתנת בעזרת
כלי אבטחה בלבד (מפתח, מנעול וכד׳).

تم تخصيص هذه الوحدة لتركيبها في مناطق محظورة .
يمكن الوصول إلى منطقة محظورة فقط من خلال استخدام أداة خاصة،
قفل ومفتاح أو أي وسيلة أخرى للالأمان

경고!

이 장치는 접근이 제한된 구역에 설치하도록 되어있습니다. 특수도구, 잠금 장치 및
키, 또는 기타 보안 수단을 통해서만 접근 제한 구역에 들어갈 수 있습니다.

Waarschuwing

Dit apparaat is bedoeld voor installatie in gebieden met een beperkte toegang.
Toegang tot dergelijke gebieden kunnen alleen verkregen worden door gebruik te
maken van speciaal gereedschap, slot en sleutel of andere veiligheidsmaatregelen.

Battery Handling

Warning!

There is the danger of explosion if the battery is replaced incorrectly. Replace the
battery only with the same or equivalent type recommended by the manufacturer.
Dispose of used batteries according to the manufacturer's instructions

電池の取り扱い

電池交換が正しく行われなかった場合、破裂の危険性があります。交換する電池はメー
カーが推奨する型、または同等のものを使用下さい。使用済電池は製造元の指示に従
って処分して下さい。

警告

 池更 不当会有爆炸危 。 只使用同类 池或制造商推荐的功能相当的 池更
 原有 池。 按制造商的 明处理 旧 池。

警告

電池更換不當會有爆炸危險。請使用製造商建議之相同或功能相當的電池更換原有
電池。請按照製造商的說明指示處理廢棄舊電池。

Warnung

Bei Einsetzen einer falschen Batterie besteht Explosionsgefahr. Ersetzen Sie die Batterie nur durch den gleichen oder vom Hersteller empfohlenen Batterietyp. Entsorgen Sie die benutzten Batterien nach den Anweisungen des Herstellers.

Attention

Danger d'explosion si la pile n'est pas remplacée correctement. Ne la remplacer que par une pile de type semblable ou équivalent, recommandée par le fabricant. Jeter les piles usagées conformément aux instructions du fabricant.

¡Advertencia!

Existe peligro de explosión si la batería se reemplaza de manera incorrecta. Reemplazar la batería exclusivamente con el mismo tipo o el equivalente recomendado por el fabricante. Desechar las baterías gastadas según las instrucciones del fabricante.

אזהרה !

קיימת סכנת פיצוץ של הסוללה במידה והוחלפה בדרך לא תקינה. יש להחליף את הסוללה בסוג התואם מחברת יצרן מומלצת.

סילוק הסוללות המשומשות יש לבצע לפי הוראות היצרן.

هناك خطر من انفجار في حالة استبدال البطارية بطريقة غير صحيحة فعليك استبدال البطارية
فقط بنفس النوع أو ما يعادلها كما أوصت به الشركة المصنعة
تخلص من البطاريات المستعملة وفقا لتعليمات الشركة الصانعة

경고!

배터리가 올바르게 교체되지 않으면 폭발의 위험이 있습니다. 기존 배터리와 동일하거나 제조사에서 권장하는 동등한 종류의 배터리로만 교체해야 합니다. 제조사의 안내에 따라 사용된 배터리를 처리하여 주십시오.

Waarschuwing

Er is ontploffingsgevaar indien de batterij verkeerd vervangen wordt. Vervang de batterij slechts met hetzelfde of een equivalent type die door de fabrikant aanbevolen wordt. Gebruikte batterijen dienen overeenkomstig fabrieksvoorschriften afgevoerd te worden.

Redundant Power Supplies

⚠️ **Warning!**

This unit might have more than one power supply connection. All connections must be removed to de-energize the unit.

冗長電源装置
このユニットは複数の電源装置が接続されている場合があります。
ユニットの電源を切るためには、すべての接続を取り外さなければなりません。

警告
此部件 接的 源可能不止一个，必 将所有 源断 才能停止 部件供 。

警告
此裝置連接的電源可能不只一個，必須切斷所有電源才能停止對該裝置的供電。

Warnung

Dieses Gerät kann mehr als eine Stromzufuhr haben. Um sicherzustellen, dass der Einheit kein trom zugeführt wird, müssen alle Verbindungen entfernt werden.

¡Advertencia!

Puede que esta unidad tenga más de una conexión para fuentes de alimentación. Para cortar por completo el suministro de energía, deben desconectarse todas las conexiones.

Attention

Cette unité peut avoir plus d'une connexion d'alimentation. Pour supprimer toute tension et tout courant électrique de l'unité, toutes les connexions d'alimentation doivent être débranchées.

אם קיים יותר מספק אחד

אזהרה !
ליחדה יש יותר מחיבור אחד של ספק. יש להסיר את כל החיבורים על מנת לרוקן
את היחידה.

قد يكون لهذا الجهاز عدة اتصالات بوحدات امداد الطاقة.
يجب إزالة كافة الاتصالات لعزل الوحدة عن الكهرباء

경고!

이 장치에는 한 개 이상의 전원 공급 단자가 연결되어 있을 수 있습니다. 이 장치에
전원을 차단하기 위해서는 모든 연결 단자를 제거해야만 합니다.

Waarschuwing

Deze eenheid kan meer dan één stroomtoevoeraansluiting bevatten. Alle
aansluitingen dienen verwijderd te worden om het apparaat stroomloos te maken.

Backplane Voltage

Warning!

Hazardous voltage or energy is present on the backplane when the system is
operating. Use caution when servicing.

バックプレーンの電圧
システムの稼働中は危険な電圧または電力が、バックプレーン上にかかっています。
修理する際には注意ください。

警告
当系 正在 行时，背板上有很危 的 压或能量， 行 修时 必小心。

警告
當系統正在進行時，背板上有危險的電壓或能量，進行維修時務必小心。

Warnung

Wenn das System in Betrieb ist, treten auf der Rückwandplatine gefährliche
Spannungen oder Energien auf. Vorsicht bei der Wartung.

¡Advertencia!

Cuando el sistema está en funcionamiento, el voltaje del plano trasero es peligroso.
Tenga cuidado cuando lo revise.

Attention

Lorsque le système est en fonctionnement, des tensions électriques circulent sur
le fond de panier. Prendre des précautions lors de la maintenance.

מתח בפנל האחורי

אזהרה !
קיימת סכנת מתח בפנל האחורי בזמן תפעול המערכת. יש להיזהר במהלך
העבודה.

هناك خطر من التيار الكهربائي أوالطاقة الموجودة على اللوحة
عندما يكون النظام يعمل كن حذرا عند خدمة هذا الجهاز

경고!

시스템이 동작 중일 때 후면판 (Backplane)에는 위험한 전압이나 에너지가 발생
합니다. 서비스 작업 시 주의하십시오.

Waarschuwing

Een gevaarlijke spanning of energie is aanwezig op de backplane wanneer het
systeem in gebruik is. Voorzichtigheid is geboden tijdens het onderhoud.

Comply with Local and National Electrical Codes

Warning!

Installation of the equipment must comply with local and national electrical codes.

地方および国の電気規格に準拠
機器の取り付けはその地方および国の電気規格に準拠する必要があります。

警告

安 必 符合本地与本国 气法 。

警告

設備安裝必須符合本地與本國電氣法規。

Warnung

Die Installation der Geräte muss den Sicherheitsstandards entsprechen.

¡Advertencia!

La instalacion del equipo debe cumplir con las normas de electricidad locales y
nacionales.

Attention

L'équipement doit être installé conformément aux normes électriques nationales et locales.

תיאום חוקי החשמל הארצי

אזהרה !
התקנת הציוד חייבת להיות תואמת לחוקי החשמל המקומיים והארציים.

تركيب المعدات الكهربائية يجب أن يمتثل للقوانين المحلية والوطنية المتعلقة بالكهرباء

경고!

현 지역 및 국가의 전기 규정에 따라 장비를 설치해야 합니다.

Waarschuwing

Bij installatie van de apparatuur moet worden voldaan aan de lokale en nationale elektriciteitsvoorschriften.

Product Disposal

 Warning!

Ultimate disposal of this product should be handled according to all national laws and regulations.

製品の廃棄

この製品を廃棄処分する場合、国の関係する全ての法律・条例に従い処理する必要があります。

警告
本 品的 弃处理 根据所有国家的法律和 章 行。

警告
本產品的廢棄處理應根據所有國家的法律和規章進行。

Warnung

Die Entsorgung dieses Produkts sollte gemäß allen Bestimmungen und Gesetzen des Landes erfolgen.

¡Advertencia!

Al deshacerse por completo de este producto debe seguir todas las leyes y reglamentos nacionales.

Attention

La mise au rebut ou le recyclage de ce produit sont généralement soumis à des lois et/ou directives de respect de l'environnement. Renseignez-vous auprès de l'organisme compétent.

סילוק המוצר

אזהרה !
סילוק סופי של מוצר זה חייב להיות בהתאם להנחיות וחוקי המדינה.

عند التخلص النهائي من هذا المنتج ينبغي التعامل معه وفقا لجميع القوانين واللوائح الوطنية

경고!

이 제품은 해당 국가의 관련 법규 및 규정에 따라 폐기되어야 합니다.

Waarschuwing

De uiteindelijke verwijdering van dit product dient te geschieden in overeenstemming met alle nationale wetten en reglementen.

Hot Swap Fan Warning

 Warning!

The fans might still be turning when you remove the fan assembly from the chassis. Keep fingers, screwdrivers, and other objects away from the openings in the fan assembly's housing.

ファン・ホットスワップの警告

シャーシから冷却ファン装置を取り外した際、ファンがまだ回転している可能性があります。ファンの開口部に、指、ドライバー、およびその他のものを近づけないで下さい。

警告
当您从机架移除 扇 置， 扇可能仍在 动。小心不要将手指、螺 起子和其他物品太靠近 扇

警告

當您從機架移除風扇裝置，風扇可能仍在轉動。小心不要將手指、螺絲起子和其他物品太靠近風扇。

Warnung

Die Lüfter drehen sich u. U. noch, wenn die Lüfterbaugruppe aus dem Chassis genommen wird. Halten Sie Finger, Schraubendreher und andere Gegenstände von den Öffnungen des Lüftergehäuses entfernt.

¡Advertencia!

Los ventiladores podran dar vuelta cuando usted quite ell montaje del ventilador del chasis. Mandtenga los dedos, los destornilladores y todos los objetos lejos de las aberturas del ventilador

Attention

Il est possible que les ventilateurs soient toujours en rotation lorsque vous retirerez le bloc ventilateur du châssis. Prenez garde à ce que doigts, tournevis et autres objets soient éloignés du logement du bloc ventilateur.

אזהרה !
כאשר מסירים את חלקי המאוורר מהמארז, יתכן והמאווררים עדיין עובדים. יש
להרחיק למרחק בטוח את האצבעות וכלי עבודה שונים מהפתחים בתוך המאוורר

من الممكن أن المراوح لا تزال تدور عند إزالة كتلة المروحة من الهيكل يجب إبقاء
الأصابع ومفكات البراغي
وغيرها من الأشياء بعيدا عن الفتحات في كتلة المروحة.

경고!

섀시로부터 팬 조립품을 제거할 때 팬은 여전히 회전하고 있을 수 있습니다. 팬 조립품 외관의 열려있는 부분들로부터 손가락 및 스크류드라이버, 다른 물체들이 가까이 하지 않도록 배치해 주십시오.

Waarschuwing

Het is mogelijk dat de ventilator nog draait tijdens het verwijderen van het ventilatorsamenstel uit het chassis. Houd uw vingers, schroevendraaiers en eventuele andere voorwerpen uit de buurt van de openingen in de ventilatorbehuizing.

Power Cable and AC Adapter

⚡ **Warning!**

When installing the product, use the provided or designated connection cables, power cables and AC adaptors. Using any other cables and adaptors could cause a malfunction or a fire. Electrical Appliance and Material Safety Law prohibits the use of UL or CSA -certified cables (that have UL/CSA shown on the code) for any other electrical devices than products designated by Supermicro only.

電源コードとACアダプター

製品を設置する場合、提供または指定された接続ケーブル、電源コードとACアダプターを使用下さい。他のケーブルやアダプタを使用すると故障や火災の原因になることがあります。電気用品安全法は、ULまたはCSA認定のケーブル(UL/CSEマークがコードに表記)を Supermicroが指定する製品以外に使用することを禁止しています。

警告
安 此 品时，使用本身提供的或指定的 接 ， 源 和 源适配器 . 使用其它材或适配器可能会引起故障或火灾。除了Supermicro所指定的 品，气用品和材料安全法律 定禁止使用未 UL或CSA 的 材。(材上会 示UL/CSA符号)。

警告
安裝此產品時，請使用本身提供的或指定的連接線，電源線和電源適配器 . 使用其它線材或適配器可能會引起故障或火災。除了Supermicro所指定的產品，電氣用品和材料安全法律規定禁止使用未經UL或CSA認證的線材。(線材上會顯示UL/CSA符號)。

Warnung

Bei der Installation des Produkts, die zur Verfügung gestellten oder benannt Anschlusskabel, Stromkabel und Netzteile. Verwendung anderer Kabel und Adapter kann zu einer Fehlfunktion oder ein Brand entstehen. Elektrische Geräte und Material Safety Law verbietet die Verwendung von UL-oder CSA-zertifizierte Kabel, UL oder CSA auf der Code für alle anderen elektrischen Geräte als Produkte von Supermicro nur bezeichnet gezeigt haben.

¡Advertencia!

Al instalar el producto, utilice los cables de conexión previstos o designados, los cables y adaptadores de CA. La utilización de otros cables y adaptadores podría ocasionar un mal funcionamiento o un incendio. Aparatos Eléctricos y la Ley de Seguridad del Material prohíbe el uso de UL o CSA cables certificados que tienen UL o CSA se muestra en el código de otros dispositivos eléctricos que los productos designados por Supermicro solamente.

Attention

Lors de l'installation du produit, utilisez les bables de connection fournis ou désigné. L'utilisation d'autres cables et adaptateurs peut provoquer un dysfonctionnement ou un incendie. Appareils électroménagers et de loi sur la sécurité Matériel interdit l'utilisation de UL ou CSA câbles certifiés qui ont UL ou CSA indiqué sur le code pour tous les autres appareils électriques que les produits désignés par Supermicro seulement.

חשמליים ומתאמי AC

אזהרה !
כאשר מתקינים את המוצר, יש להשתמש בכבלים, ספקים ומתאמים AC אשר נועדו וסופקו לשם כך. שימוש בכל כבל או מתאם אחר יכול לגרום לתקלה או קצר חשמלי. על פי חוקי שימוש במכשירי חשמל וחוקי בטיחות, קיים איסור להשתמש בכבלים המוסמכים ב- UL או ב- CSA (כשאר מופיע עליהם קוד של UL/CSA) עבור כל מוצר חשמלי אחר שלא צוין על ידי סופרקמיקרו בלבד.

عند تركيب الجهاز يجب استخدام كابلات التوصيل،والكابلات الكهربائية ومحولات التيار المتردد
التي . أن استخدام أي كابلات ومحولات أخرى يتسبب في حدوث عطل أو حريق.
تم توفيرها لك مع المنتج
الأجهزة الكهربائية ومواد قانون السلامة يحظر استخدام الكابلات CSA أو UL
معتمدة من قبل
لأي أجهزة كهربائية أخرى غير المنتجات المعينة من قبل Supermicro
(التي تحمل علامة UL/CSA)

경고!

제품을 설치할 때에는 제공되거나 지정된 연결케이블과 전원케이블, AC어댑터를 사용해야 합니다. 그 밖의 다른 케이블들이나 어댑터들은 고장 또는 화재의 원인이 될 수 있습니다. 전기용품안전법 (Electrical Appliance and Material Safety Law)은 슈퍼마이크로에서 지정한 제품들 외에는 그 밖의 다른 전기 장치들을 위한 UL또는 CSA에서 인증한 케이블(전선 위에 UL/CSA가 표시)들의 사용을 금지합니다.

Waarschuwing

Bij het installeren van het product, gebruik de meegeleverde of aangewezen kabels, stroomkabels en adapters. Het gebruik van andere kabels en adapters kan leiden tot een storing of een brand. Elektrisch apparaat en veiligheidsinformatiebladen wet verbiedt het gebruik van UL of CSA gecertificeerde kabels die UL of CSA die op de code voor andere elektrische apparaten dan de producten die door Supermicro alleen.

Notes

Chapter 3

Chassis Components

3-1   Overview

This chapter describes the most common components included with your chassis. Some components listed may not be included or compatible with your particular chassis model. For more information, see the installation instructions detailed later in this manual.

3-2   Components

For the latest shipping lists, visit our Web site at: http://www.supermicro.com.

Drives

The chassis includes hard disk drive bays, which support twenty-four 2.5" hard drives. The hard drives must be purchased separately.

The SC216B chassis supports two additional, optional hard drives mounted in the rear of the chassis.

Backplane

Each SC216 chassis comes with a 2U backplane which supports SAS/SATA. For more information regarding compatible backplanes, see the appendices at the end of this manual.

Fans

The SC216 chassis supports three system fans. System fans are powered from the motherboard or the backplane. Fan speed may be controlled if the motherboard has either PWM or DC control ability.

Mounting Rails

The SC216 can be mounted in a rack and rails are included.

Power Supply

Each SC216 chassis model includes a high-efficiency redundant power supply rated at 900, 920, 1010, 1200, or 1800 Watts.

Air Shroud

Air shrouds are shields, usually plastic, that funnel air directly to where it is needed. Always use the air shroud included with your chassis.

3-3 Where to get Replacement Components

Infrequently, you may need replacement parts for your system. To ensure the highest level of professional service and technical support, we strongly recommend purchasing exclusively from our Supermicro authorized distributors, system integrators and resellers. A list of Supermicro authorized distributors, system integrators and resellers can be found at: http://www.supermicro.com. Click the Where to Buy link.

Chapter 4

System Interface

4-1 Overview

Several buttons and LEDs indicate the status of the system. The control panel on the front edge of the chassis includes power buttons and status LEDs. There are also LEDs on the drive carriers the indicate the status of the drive.

This chapter explains the LED indicators and responses.
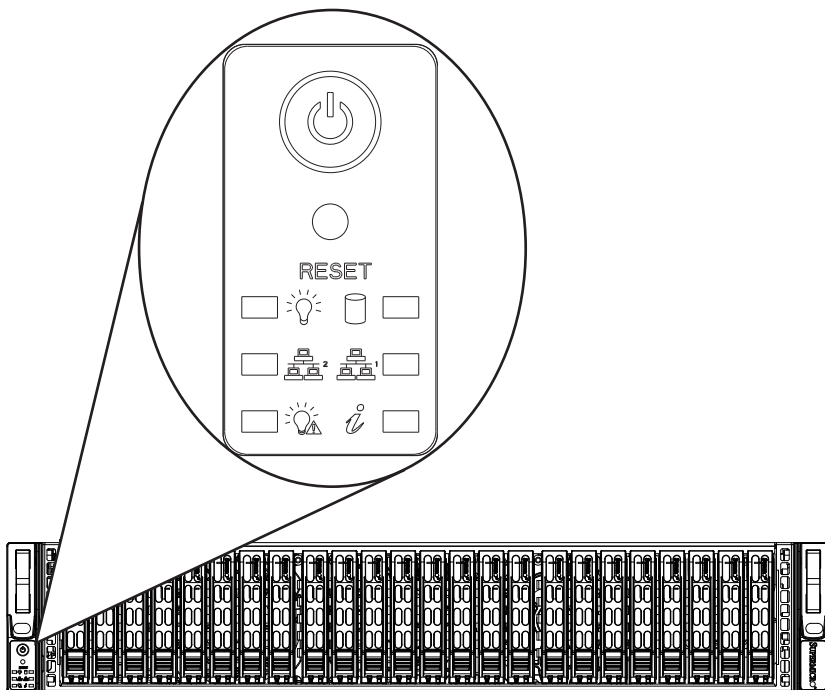
4-2   Control Panel Buttons

There are two push-buttons located on the front of the chassis. These are a power on/off button and a reset button.

Power: The main power switch is used to apply or remove power from the power supply to the server system. Turning off system power with this button removes the main power but keeps standby power supplied to the system. Therefore, you must unplug system before servicing.

Reset: The reset button is used to reboot the system. A needle, pen, or other small device is required to activate this button and reset the system

4-3   Control Panel LEDs

The control panel located on the front of the SC216 chassis has five LEDs. These LEDs provide you with critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any corrective action you may need to take.

Power: Indicates power is being supplied to the system's power supply units. This LED should normally be illuminated when the system is operating.

HDD: Indicates IDE channel activity. SAS/SATA drive and/or DVD-ROM drive activity when flashing.

NIC2: Indicates network activity on GLAN2 when flashing.

NIC1: Indicates network activity on GLAN1 when flashing.

Power Failure: When this LED flashes, it indicates a power failure in the power supply.

Information LED: Alerts operator of several states, as noted in the table below.

Informational LED	
Status	**Description**
Continuously on and red	An overheat condition has occured. (This may be caused by cable congestion.)
Blinking red (1Hz)	Fan failure, check for an inoperative fan.
Blinking red (0.25Hz)	Power failure, check for a non-operational power supply.
Solid blue	Local UID has been activated. Use this function to locate the server in a rack mount environment.
Blinking blue	Remote UID is on. Use this function to identify the server from a remote location.

4-4   Drive Carrier LEDs

The SC216 chassis supports SAS/SATA drives.

SAS/SATA Drives

Each SAS/SATA drive carrier has two LEDs.

- **Green or Blue:** Each hard disk drive carrier has either a green or a blue LED, depending upon the hard disk drives and backplane used. When illuminated, this LED indicates drive activity. A connection to the SATA backplane enables this LED to blink on and off when that particular drive is being accessed. .

- **Red:** The red LED indicates a SAS/SATA drive failure. If one of the SAS/SATA drives fail, you should be notified by your system management software.

Chapter 5

Chassis Setup and Maintenance

5-1   Overview

This chapter covers the steps required to install components and perform maintenance on the chassis. The only tool required is a Phillips screwdriver.

Review the warnings and precautions listed in the manual before setting up or servicing this chassis. These include information in Chapter 2: Warnings for AC Systems, and the precautions listed in the setup instructions.

5-2   Removing the Power Cord

Before performing any setup or maintenance on the chassis, use the following procedure to ensure that power has been removed from the system.

1. Use the operating system to power down the node, following the on-screen prompts.

2. After the system has completely shut-down, carefully grasp the head of the power cord and gently pull it out of the back of the power supply. If your system has dual power supplies, remove the cords from both power supplies.

3. Disconnect the cord from the power strip or wall outlet.

5-3   Removing the Chassis Cover
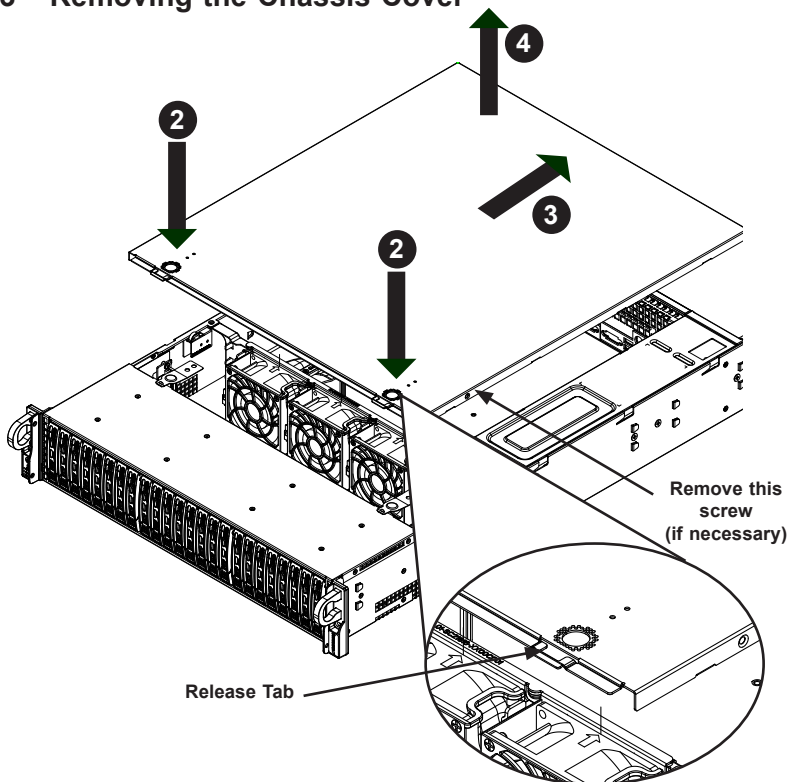
Figure 5-1. Removing the Chassis Cover

Removing the Chassis Cover

1. Press the release tabs to remove the cover from the locked position. Press both tabs at the same time.

2. Once the top cover is released from the locked position, slide the cover toward the rear of the chassis.

3. Lift the cover off the chassis.

Caution: Except for short periods of time, do *not* operate the server without the cover in place. The chassis cover assists with proper airflow that prevents overheating.

5-4   Installing Hard Drives
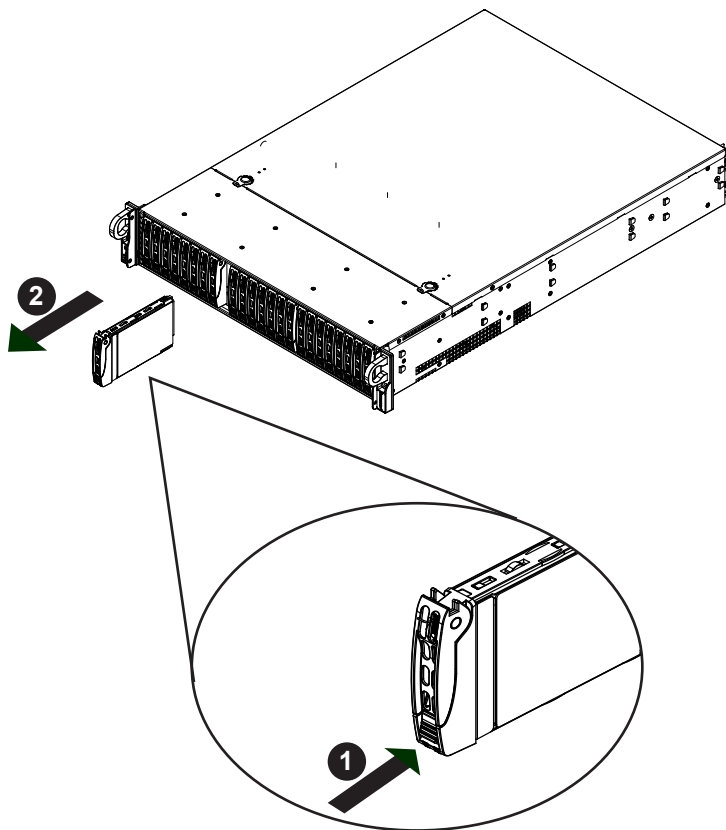
Figure 5-2. Removing Hard Drive

The SC216 comes equipped with twenty-four hot-swappable hard drives which can be removed without powering down the system. Only enterprise level SAS or SATA HDDs are recommended.

Removing Hard Drive Carriers from the Chassis

1. Press the release button on the drive tray. This extends the drive bay handle.

2. Use the handle to pull the tray out of the chassis.
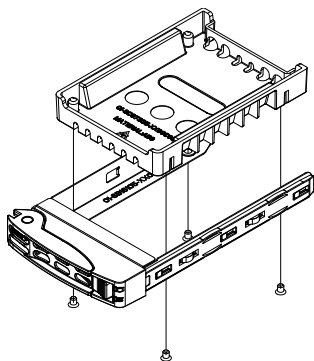
Figure 5-3. Hard Drive Carrier

Installing a Hard Drive into a Drive Carrier

1. Insert a drive into the carrier with the PCB side facing down and the connector end toward the rear of the carrier.

2. Align the drive in the carrier so that the mounting holes of both are aligned. Note that there are holes in the carrier marked "SAS" or "SATA" to aid in correct installation.

3. Secure the drive to the carrier with four screws as illustrated above. Use the four M3 flat-head screws included in the HDD bag of the accessory box. Note that the screws used to secure the dummy drive to the carrier cannot be used to secure the hard drive.

4. Insert the hard drive and drive carrier into its bay vertically, keeping the carrier oriented so that the release button is on the bottom. When the carrier reaches the rear of the bay, the release handle will retract.

5. Using the thumb, push against the upper part of the hard drive handle. Push the hard drive into the hard drive bay as illustrated below, until the hard drive clicks into the locked position.
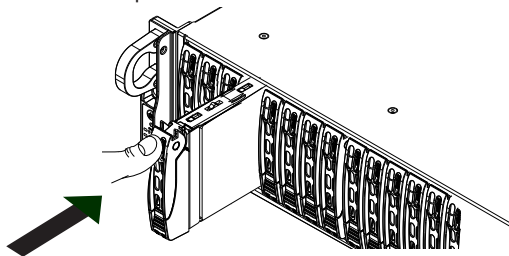
Figure 5-4. Proper Installation of the Hard Drive into the Hard Drive Bay

Installing the Rear 2.5" Hard Drive--SC216B Only

The SC216B model chassis supports an optional hard drive cage for two additional 2.5" hot-swappable hard drives. The hard drive cage installs in the rear of the chassis next to the power supply. Once the hard drive cage has been installed, the 2.5" hard drives may be removed without powering down the server.

Installing the 2.5" Rear Hard Drive Cage

1. Power down the system as described in Section 5-2, lay the chassis on a flat, stable surface and remove the chassis cover.

2. Orient the rear hard drive cage as shown (Figure 5-5), aligning the opening at the end of the cage with the opening at the back of the chassis.
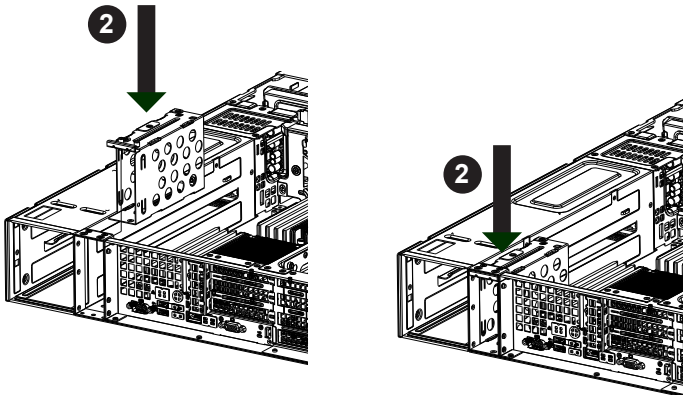
Figure 5-5. Installing the Rear 2.5" Hard Drive Cage
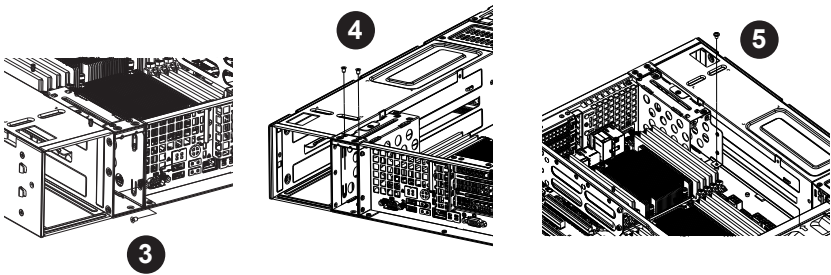
Figure 5-6. Securing the Rear 2.5" Hard Drive Cage to the Chassis

3. Place the hard drive cage into the chassis. Secure the front of the hard drive cage to the chassis by fastening one screw inside the opening of the hard drive cage as illustrated.

4. Secure the top of the hard drive cage to the chassis frame with two screws, fastened at the upper edge of the hard drive cage above the opening of the hard drive cage.

5. Secure the back of the hard drive cage to the chassis with one screw as shown above.

6. Replace the power cords and power up the server.

Caution: Except for short periods of time, such as swapping hard drives, do not operate the server with the hard drives empty.
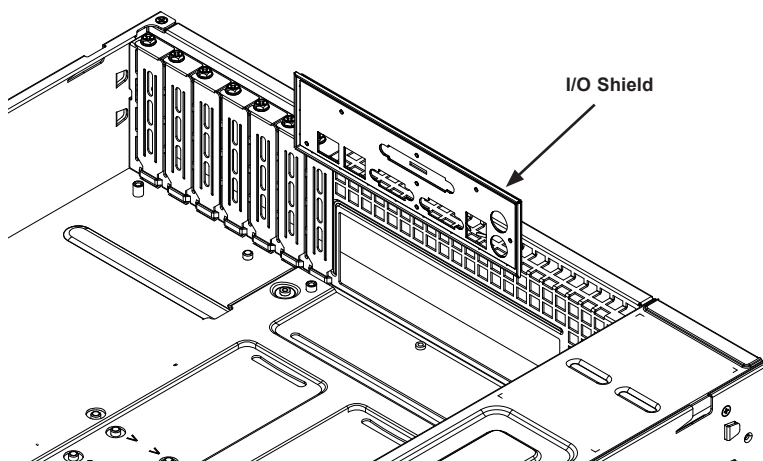
Figure 5-7. I/O Shield Placement

5-5   Installing the Motherboard

I/O Shield

The I/O shield holds the motherboard ports in place. Install the I/O shield before installing the motherboard. If the motherboard you purchased did not include a standard I/O shield, contact the motherboard vendor for a compatible shield.

Installing the I/O Shield

1. Review the documentation that came with your motherboard. Become familiar with component placement, requirements, and precautions.

2. Power down the system as described in Section 5-2 and open the chassis cover.

3. With the illustrations facing the outside of the chassis, place the shield into the space provided at the rear of the chassis as illustrated above.

Permanent and Optional Standoffs

Standoffs prevent short circuits by creating space between the motherboard and the chassis surface. The SC216 chassis includes permanent standoffs in locations used by most motherboards. These standoffs accept the rounded Phillips head screws included in the accessories package.

Some motherboards require additional screws for heatsinks, general components or non-standard security. Optional standoffs are included for these motherboards. To use an optional standoff, place the hexagonal nut with the rounded side up, in the holes provided on the floor of the chassis.
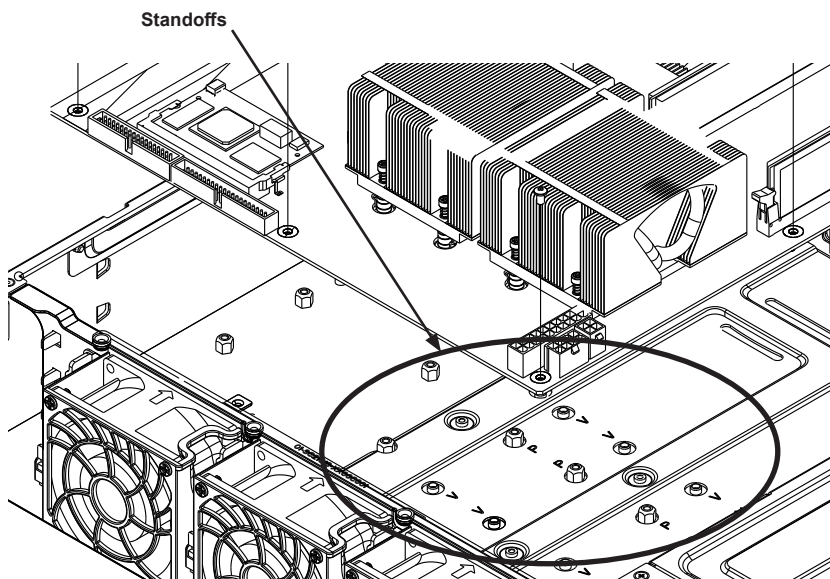
Standoffs

Figure 5-8. Chassis Standoffs and Motherboard Installation

Motherboard Installation

Installing the Motherboard

1. Review the documentation that came with your motherboard. Become familiar with component placement, requirements, precautions, and cable connections.

2. Power down the system as described in Section 5-2 and open the chassis cover.

3. If necessary, remove the air shroud and riser card bracket.

4. Ensure that the I/O shield has been installed correctly.

5. As required by your motherboard, install standoffs in any areas that do not have a permanent standoff and remove any standoffs that are not required by the motherboard.

6. Lay the motherboard on the chassis aligning the permanent and optional standoffs.

7. Secure the motherboard to the chassis using the rounded, Phillips head screws which are included in the motherboard bag of the accessory box. Do not exceed eight pounds of torque when securing the motherboard.

8. Secure the CPUs, heatsinks, and other components to the motherboard as described in the motherboard documentation.

9. Connect the cables between the motherboard, backplane, chassis, front panel, and power supply, as needed. Additionally, the fans may be temporarily removed to allow access to the backplane ports and to allow for ease of installation.

5-6   Installing the Expansion Cards

For the LP models, such as SC216BAC-R920**LP**B, the chassis slots are vertical and allow the addition of low profile expansion cards. For the W models such as SC216BE1C-R920**W**B, and the U models such as SC216E16-R1200**U**B the chassis slots are horizontal. The U models allow a Supermicro universal I/O (UIO) card in addition to expansion cards.

The motherboard must be installed before expansion cards.

Expansion Cards for an LP Model Chassis

The LPB model chassis includes seven slots for expansion cards.

Installing an Expansion Card for an LP Model Chassis

1. Power down the system as described in Section 5-2 and remove the cover.

2. In the rear of the chassis, remove the blank PCI shield that is pre-installed covering the expansion slot.
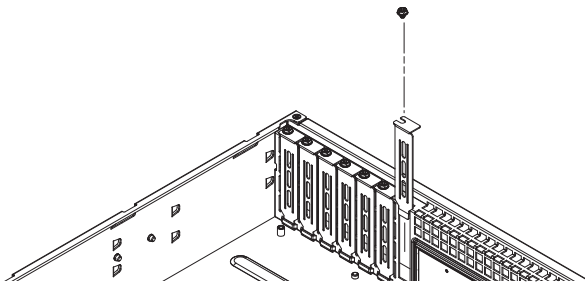
Figure 5-9. Removing the Blank Shield

3. Slide the expansion card into the expansion slot on the motherboard while aligning it with the chassis slot in the rear of the chassis.

4. Secure the expansion card shield onto the rear of the chassis with a screw.
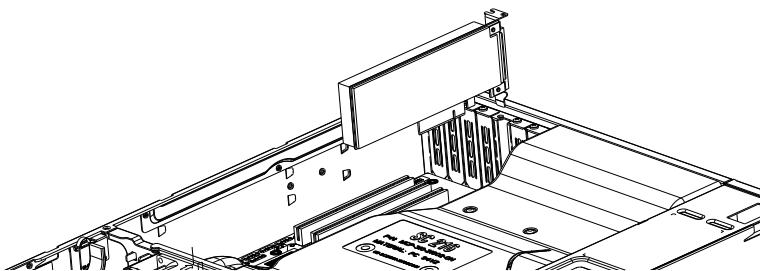
Figure 5-10. Installing the Low-Profile Expansion Card

Expansion Cards for a W or U Model Chassis

The W or U model chassis accomodates expansion cards using riser cards. If your motherboard supports a Supermicro universal I/O (UIO) card, the U model chassis supports an additional three full-height expansion cards and three low profile expansion cards. If the motherboard does not support a UIO, then the W model chassis supports four full-height expansion cards and three low profile expansion cards.

Installing a UIO Card

1. Power down the system as described in Section 5-2 and remove the cover.

2. Release the clamp that secures all four full-height PCI shields (Figure 5-12). Looking at the rear of the chassis, this clamp is in the right corner. Unscrew the single screw that secures the clamp and rotate the clamp away from the shields. Remove the blank PCI shield covering the expansion slot in the chassis.

3. Place the UIO card horizontally in the rear left area of the chassis bottom and insert it into the UIO slot in the motherboard, while aligning it with slot in the rear of the chassis.

4. Secure the shield to the rear of the chassis with the lever.

Installing an Expansion Card for a W or U Model Chassis

1. If this is the first expansion card, start by locating the *riser card bracket* in your chassis accessory bag, and one or two riser cards, which are purchased separately. One riser card accomodates the full-height expansion cards and another riser card accomodates the three low profile expansion cards.

2. Power down the system as described in Section 5-2 and remove the cover.

3. Attach the riser card(s) to the riser card bracket using screws. Note that there are different cards for the right and left side of the bracket.

4. Insert the riser card(s) into the motherboard expansion slot(s) while aligning the riser card bracket with the rear of the chassis. Secure the bracket with screws (Figure 5-11).

Secure the tail of the riser card bracket to the fan tray with one screw

Secure the head of the riser card bracket to the rear of the chassis with two screws
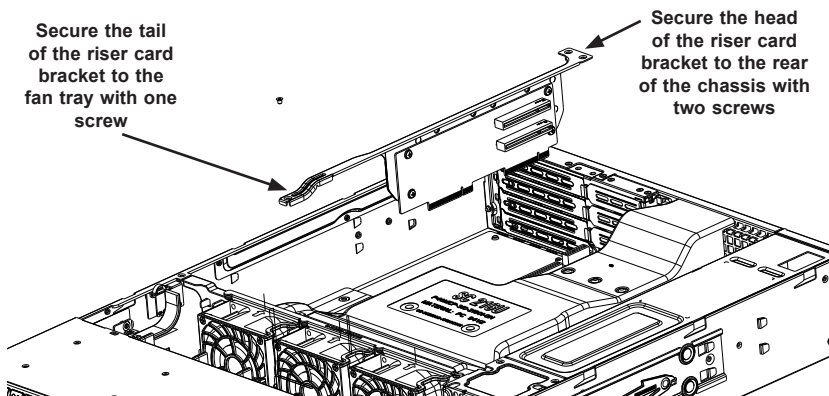
Figure 5-11. Installing the Riser Card Bracket

**Shield Clamp for
Full-Height Card**

This U model chassis is
pictured without the riser card
bracket.

**Shield Clamp for
Low Profile Card**
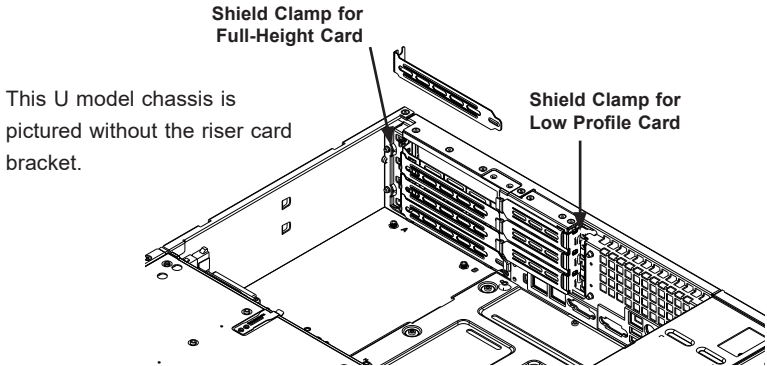
Figure 5-12. Remove an Expansion Card Slot Shield

5. For a **full-height** extension card, release the clamp that secures all four PCI
    shields. Looking at the rear of the chassis, this clamp is in the right corner.
    Unscrew the single screw that secures the clamp and rotate the clamp away
    from the shields.

    For a **low profile** extension card, release the box-shaped clamp that secures
    all three PCI shields. Looking at the rear of the chassis, this clamp is near the
    middle, just left of the low profile PCI slots. Unscrew the single screw that se-
    cures the clamp and slide the clamp to the left away from the shields.

6. Insert the expansion card into a slot on the riser card while aligning the
    expansion card backplate with the open slot in the rear of the chassis. Repeat
    for other expansion cards if you are installing more than one.

7. Secure the card backplates to the chassis by returning the clamp to the
    closed position and installing the locking screw.

8. Replace the chassis cover and power up.

5-7 Installing the Air Shrouds
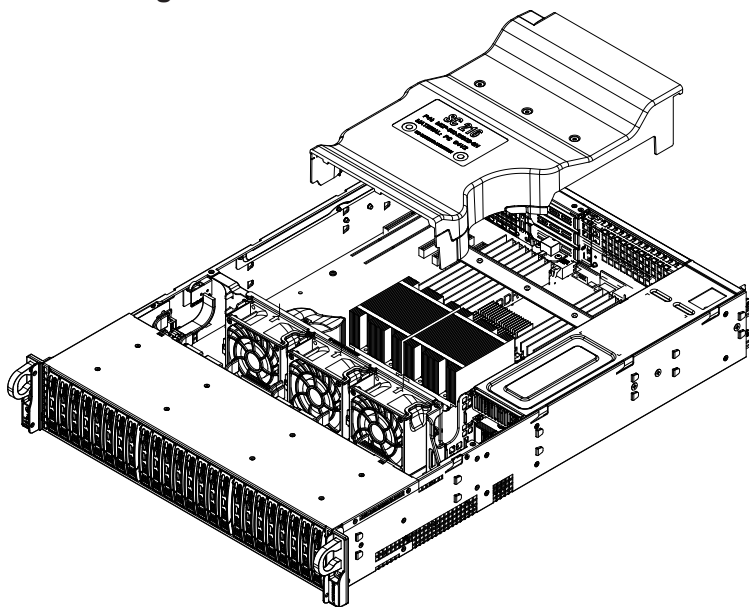
Figure 5-13. Installing the Air Shroud

Air shrouds concentrate airflow to maximize fan efficiency. They do not require screws for installation.

Installing the Air Shrouds in the Chassis

Installing the Air Shrouds

1. Power down the system as described in Section 5-2 and open the chassis cover.

2. Ensure that the motherboard, CPU, heatsink and memory are all properly installed.

3. If necessary, move any cables that interfere with the air shroud placement.

4. Place the air shroud in the chassis. The air shroud fits just behind the three fans in the fan rack. Slide the air shroud into the grooves just behind the fan rack.
    Note that some motherboards may require the air shroud to be modified to fit over the motherboard. The SC216 chassis air shroud is designed with break-away pieces that may be removed to accomodate differing styles of motherboards.
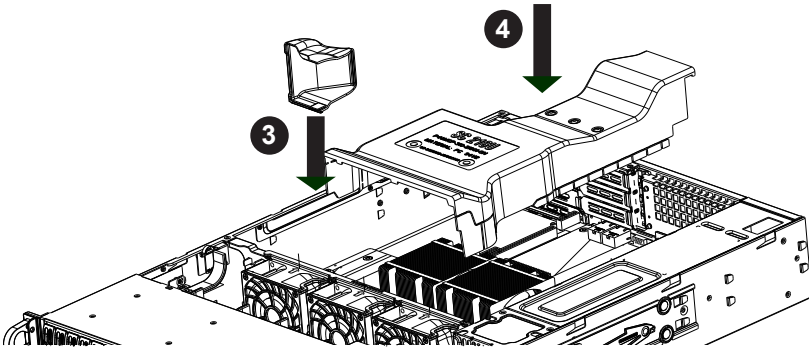
Figure 5-14. Installing the Additional Air Shroud

An additional air shroud is required for high-powered CPUs, to provide extra cooling. Install the additional air shroud if necessary.

Installing the Additional Air Shroud

Installing the Additional Air Shroud in the Chassis

1. Power down the system as described in Section 5-2 and open the chassis cover.

2. Remove the left side break-away piece of the main air shroud.

3. Slide the additional air shroud into the chassis before installing the main air shroud.

4. Install the main air shroud as directed on the previous page.

5-8   Checking the Airflow

Checking the Server's Airflow

1. Make sure there are no objects to obstruct airflow in and out of the server. In addition, if you are using a front bezel, make sure the bezel filter is replaced periodically.

2. Do not operate the server without drives or drive carriers in the drive bays. Use only recommended server parts.

3. Make sure no wires or foreign objects obstruct airflow through the chassis. Pull all excess cabling out of the airflow path or use shorter cables.

The control panel LEDs inform you of system status. See "Chapter 4 System Interface" for details on the LEDs and the control panel buttons.

5-9   System Fans

Three heavy-duty fans provide cooling for the chassis. These fans circulate air through the chassis as a means of lowering the chassis internal temperature. The SC216 fans are hot-swappable, enabling the fans to be replaced without powering -down the system.

Release Tab
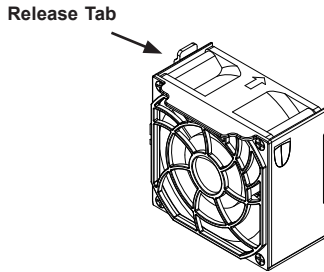
Figure 5-15. System Fan

Replacing a System Fan

1. If necessary, open the chassis while the power is running to determine which fan requires changing. (Never run the server for an extended period of time with the chassis open.)

2. Power down the system as described in Section 5-2 and open the chassis cover.

3. Press the fan release tab to lift the failed fan from the chassis and pull it completely out of the chassis.

4. Place the new fan into the vacant space in the housing while making sure the arrows on the top of the fan (indicating air direction) point in the same direction as the arrows on the other fans.

5. The fan will automatically begin running at the correct speed.
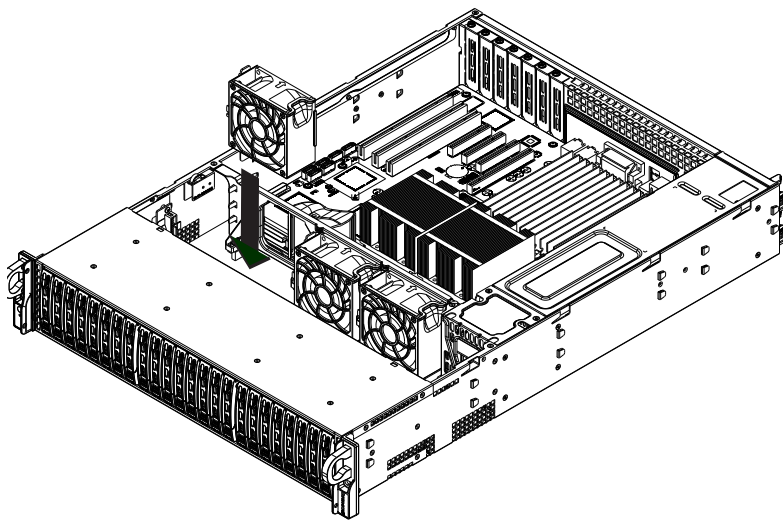
Figure 5-16. Placing the System Fan

5-10 Power Supply

The SC216 chassis has two redundant power supplies. The power modules are hot-swappable, enabling the power supplies to be changed without powering down the system. These power supplies are auto-switching capable. This enables the power supply to automatically sense and operate at a 100v to 240v input voltage. An amber light will be illuminated on the power supply when the power is off. An illuminated green light indicates that the power supply is operating.
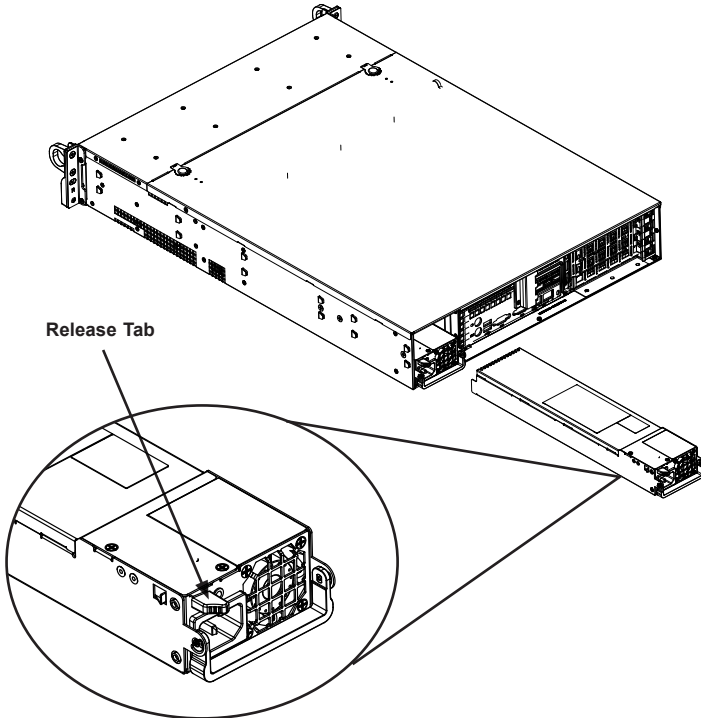
Release Tab

Figure 5-17. Removing the Power Supply

Changing the Power Supply

1. Determine which power supply needs to be replaced and unplug the power cord to that module.

2. Push the release tab (on the back of the power supply) as illustrated, to release the power module from the chassis.

3. While holding down the release tab, pull the power supply out using the handle provided on the power module.

4. Replace the failed power module with the same model power supply.

5. Push the new power supply module into the power bay until the tab clicks into the locked position.

6. Plug the AC power cord back into the module and the replacment power module will automatically power-up.
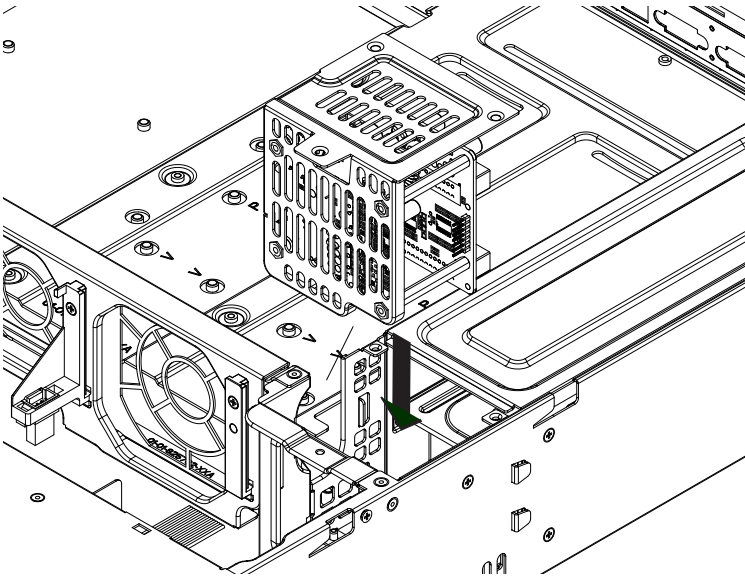
Figure 5-18. Replacing the Power Distributor

Power Distributor

The power distributor provides failover and power supply redundancy, and is pre-installed in the chassis. In the rare event that you have to replace the power distributor, follow the steps below.

Changing the Power Distributor

1. Power down the system as described in Section 5-2 and open the chassis cover.

2. Remove all cable connections to the power supply from the motherboard, backplane, and other components. Also, remove both power supply modules.

3. Remove the screws securing the power distributor.

4. Gently pull the power distributor from the chassis. Gently guide all the cables through the power distributor housing.

5. Slide the new power distributor module into the power distributor housing. Make that you slide the cables through the bottom of the housing.

6. Reconnect all the power cables, replace the power supply, and insert the plug into the wall.

5-11 Removing the Backplane

The SC216 chassis backplane is located behind the hard drives and in front of the front system fans. In order to change jumper settings on the backplane, it may be necessary to remove the backplane from the chassis.

Removing the Backplane from the Chassis

1. Power down the system as described in Section 5-2 and open the chassis cover.

2. Disconnect the cabling to the backplane.

3. Remove all of the hard drive trays from the front of the chassis.

4. Remove the four upper screws at the top of the backplane, indicated by the arrows below.
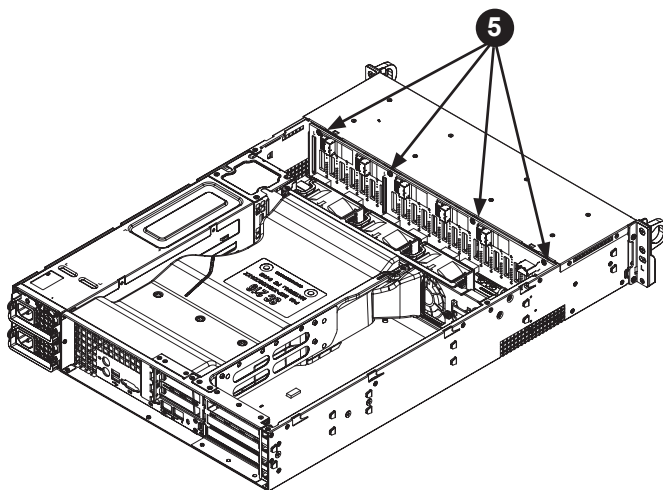
Figure 5-19. Removing the Screws at the Top of the Backplane

5. Loosen the three screws in the spring bar, located on the floor of the chassis, indicated by the arrows below.
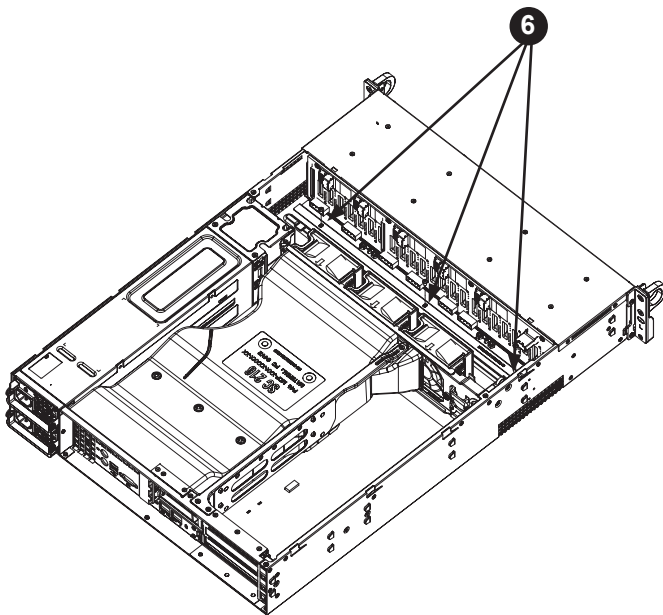
Figure 5-20. Loosening the Spring Bar Screws in the Floor of the Chassis

6. Gently ease the backplane up and out of the chassis.

5-12 Installing the Backplane

Installing the Backplane into the Chassis

1. Power down the system as described in Section 5-2 and open the chassis cover.

2. Ensure that all of the hard drive carriers have been removed from the bays in the front of the chassis and that the spring bar has been loosened as directed in the previous section.

3. Slide the backplane into the chassis at a slight angle, pushing it up against the side of the chassis.

4. Ease the backplane forward, against the front of the chassis. This will aid in the alignment of the mounting holes.

5. Align the mounting holes in the backplane with the holes in the chassis. Re-place the four screws at the top of the backplane and the three screws in the floor of the chassis.

6. Reconnect all cables and return the hard drive trays to their bays in the front of the chassis.
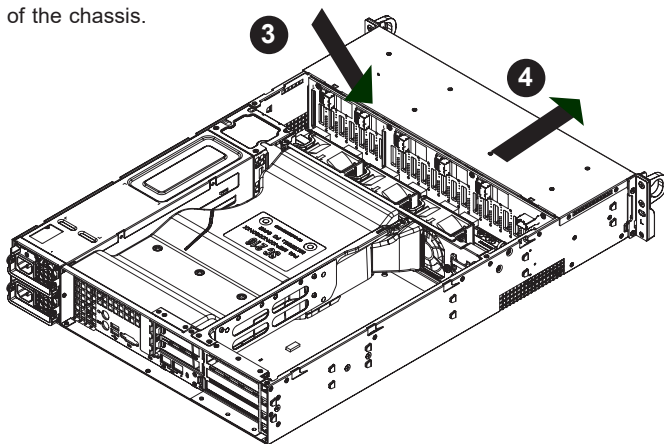
Figure 5-21. Installing the Backplane

Notes

Chapter 6

Rack Installation

6-1   Overview

This chapter provides a quick setup to get your chassis up and running. Following these steps in the order given should enable you to have the system operational within a minimal amount of time.

6-2   Unpacking the System

You should inspect the box which the chassis was shipped in and note if it was damaged in any way. If the chassis itself shows damage, you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack unit that will hold your chassis. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. The system needs to be placed near a grounded power outlet. Be sure to read the Rack and Server Precautions in the next section.

6-3   Preparing for Setup

The box your chassis was shipped in should include two sets of rail assemblies and the mounting screws needed for installing the system into the rack. Also included is an optional square hole to round hole converter bracket, for use in racks with round mounting holes. *Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow*.

Choosing a Setup Location

- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches).

- Leave approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.

- This product is for installation only in a Restricted Access Location (dedicated equipment rooms, service closets and the like).

6-4   Warnings and Precautions

Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.

- In single rack installations, stabilizers should be attached to the rack.

- In multiple rack installations, the racks should be coupled together.

- Always make sure that the rack is stable before extending a component from the rack.

- You should extend only one component at a time - extending two or more simultaneously may cause the rack to become unstable.

General Server Precautions

- Review the electrical and general safety precautions that came with the components you are adding to your chassis.

- Determine the placement of each component in the rack *before* you install the rails.

- Install the heaviest server components on the bottom of the rack first, and then work upwards.

- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.

- Allow the hot plug hard drives and power supply modules to cool before touching them.

- Always keep the rack's front door and all panels and components on the servers closed when not servicing to maintain proper cooling.

Rack Mounting Considerations

Ambient Operating Temperature

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (TMRA).

Reduced Airflow

Equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised.

Mechanical Loading

Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

Circuit Overloading

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Ground

A reliable ground must be maintained at all times. To ensure this, the rack itself should be grounded. Particular attention should be given to power supply connections other than the direct connections to the branch circuit (i.e. the use of power strips, etc.).

Warning: To prevent bodily injury when mounting or servicing this unit in a rack, you must take special precautions to ensure that the system remains stable. The following guidelines are provided to ensure your safety:

- This unit should be mounted at the bottom of the rack if it is the only unit in the rack.

- When mounting this unit in a partially filled rack, load the rack from the bottom to the top with the heaviest component at the bottom of the rack.

- If the rack is provided with stabilizing devices, install the stabilizers before mounting or servicing the unit in the rack.

6-5   Rack Mounting Instructions

This section provides information on installing the chassis into a rack unit with the rails provided. There are a variety of rack units on the market, which may mean that the assembly procedure will differ slightly from the instructions provided. You should also refer to the installation instructions that came with the rack unit you are using. **Note:** This rail will fit a rack between 26.5" and 36.4" deep.

Identifying the Sections of the Rack Rails

The chassis package includes two rail assemblies in the rack mounting kit. Each assembly consists of three sections: An inner chassis rail which secures directly to the chassis, an outer rail that secures to the rack, and a middle rail which extends from the outer rail. These assemblies are specifically designed for the left and right side of the chassis.
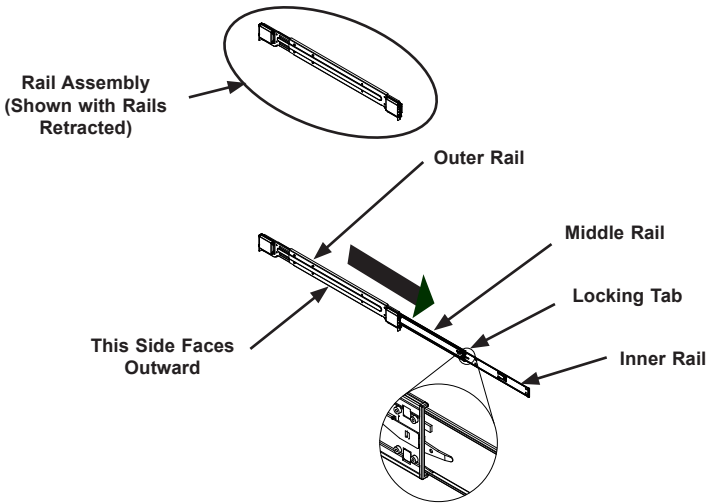
Figure 6-1. Identifying the Outer Rail, Middle Rail and Inner Rails (Left Rail Assembly Shown)

Locking Tabs

Each inner rail has a locking tab. This tab locks the chassis into place when installed and pushed fully into the rack. These tabs also lock the chassis in place when fully extended from the rack. This prevents the server from coming completely out of the rack when when the chassis is pulled out for servicing.

Releasing the Inner Rail

Releasing Inner Rail from the Outer Rails

1. Identify the left and right outer rail assemblies as described on page 6-4.

2. Pull the inner rail out of the outer rail until it is fully extended as illustrated below.

3. Press the locking tab down to release the inner rail.

4. Repeat steps 1-3 for the second outer rail.
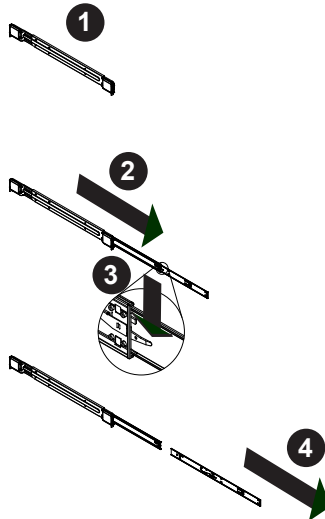
Figure 6-2. Extending and Releasing the Inner Rail
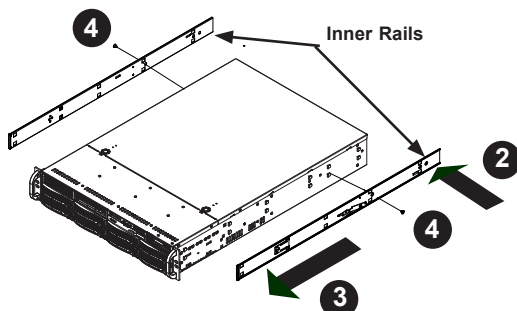
Figure 6-3. Installing the Inner Rails
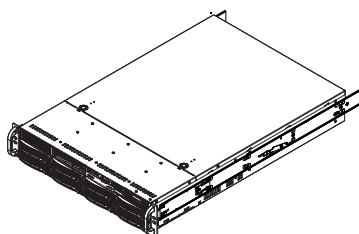
Figure 6-4. Inner Rails Installed on the Chassis
(The chassis above are an example only. Actual chassis may differ slightly)

Installing The Inner Rails on the Chassis

Installing the Inner Rails

1. Confirm that the left and right inner rails have been correctly identified.

2. Place the inner rail firmly against the side of the chassis, aligning the hooks on the side of the chassis with the holes in the inner rail.

3. Slide the inner rail forward toward the front of the chassis until the rail clicks into the locked position, which secures the inner rail to the chassis.

4. Secure the inner rail to the chassis with the screws provided.

5. Repeat steps 1 through 4 above for the other inner rail.

Warning: do not pick up the server by the front handles. They are designed to pull the system from a rack only.
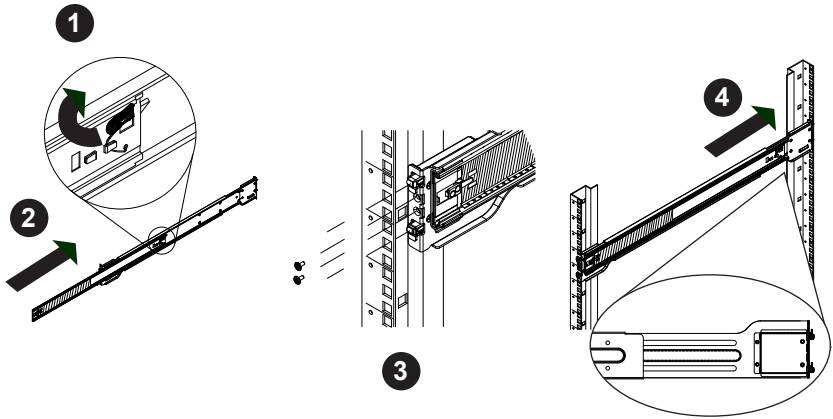
Figure 6-5. Extending and Releasing the Outer Rails

Installing the Outer Rails on the Rack

Installing the Outer Rails

1. Press upward on the locking tab at the rear end of the middle rail.

2. Push the middle rail back into the outer rail.

3. Hang the hooks of the front of the outer rail onto the slots on the front of the rack. If necessary, use screws to secure the outer rails to the rack, as illustrated above.

4. Pull out the rear of the outer rail, adjusting the length until it fits within the posts of the rack.

5. Hang the hooks of the rear portion of the outer rail onto the slots on the rear of the rack. If necessary, use screws to secure the rear of the outer rail to the rear of the rack.

6. Repeat steps 1-5 for the remaining outer rail.

Stability hazard. The rack stabilizing mechanism must be in place, or the rack must be bolted to the floor before you slide the unit out for servicing. Failure to stabilize the rack can cause the rack to tip over.
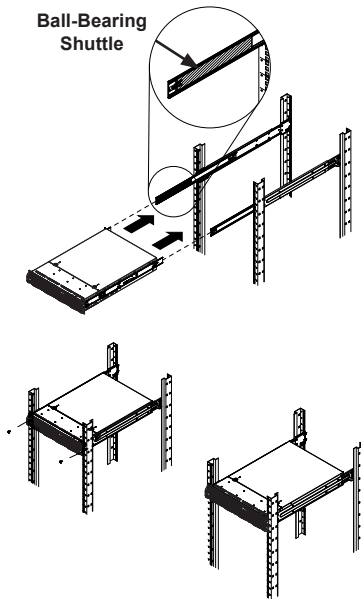
Figure 6-6. Installing into a Rack

Note: Figures are for illustrative purposes only. Always install servers into racks from the bottom up.

Standard Chassis Installation

Installing the Chassis into a Rack

1. Confirm that the inner rails are properly installed on the chassis.

2. Confirm that the outer rails are correctly installed on the rack.

3. Pull the middle rail out from the front of the outer rail and make sure that the ball-bearing shuttle is at the front locking position of the middle rail.

4. Align the chassis inner rails with the front of the middle rails.

5. Slide the inner rails on the chassis into the middle rails, keeping the pressure even on both sides, until the locking tab of the inner rail clicks into the front of the middle rail, locking the chassis into the fully extended position.

6. Depress the locking tabs of both sides at the same time and push the chassis all the way into the rear of the rack.

7. If necessary for security purposes, use screws to secure the chassis handles to the front of the rack.

Optional Quick Installation Method

The following quick installation method may be used to install the chassis onto a rack.

Installing the Chassis into a Rack

1. Install the whole rail assembly onto the rack as described on page 6-7.

2. Release the inner rail without retracting the middle rail.

3. Install the inner rails on the chassis as previously described on page 6-6.

4. Install the chassis onto the middle rail as described in the previous section.

Notes

Appendix A

SC216 Chassis Cables

A-1   Overview

This appendix lists supported cables for your chassis system. It only includes the most commonly used components and configurations. For more compatible cables, refer to the manufacturer of the motherboard you are using and our Web site at: www.supermicro.com.

A-2   Cables Included with SC216 Chassis

SC216A-R900UB, SC216A-R900LPB SC216E1-R900LPB, SC216E2-R900LPB SC216E1-R900UB, SC216E2-R900UB SC216E16-R1010LPB, SC216E16-R1200UB SC216E16-R1200LPB, SC216E26-R1200UB SC216E26-R1200LPB			
Part #	Type	Length	Description
CBL-0217L	Cable	8.7" (22 cm)	16-pin control panel converter cable PBF
CBL-0088	Cord	10.5"	4-pin middle fan power extension (PWM)
CBL-0087	Ribbon, Round	20"	16-pin to 16-pin ribbon cable for control panel

A-3   Compatible Cables

These cables are compatible with the SC216 chassis.

Alternate SAS/SATA Cables

Some compatible motherboards have different connectors. If your motherboard has only one SAS connector that the SAS/SATA cables must share, use one of the following cables. These cables must be purchased separately.

Cable Name: SAS Cable   **Quantity:** 1

Part #: CBL-0175L
Alt. Name: "Big Four"

Description: This cable has one SFF-8484 (32-pin) connector on one end and four SAS connectors (each is a 7-pins) at the other. This cable connects from the host (motherboard or other controller) to the backplane SAS hard drive port.

Cable Name: SAS Cable   **Quantity:** 1

Part #: CBL-0116
Alt. Name: iPass or "Small Four"

Description: This cable has one iPass (SFF-8087/Mini-SAS) connector (36-pin) at one end and four SAS connectors on the other end. This cable connects from the host (motherboard or other controller) to the backplane SAS hard drive port.

Extending Power Cables

Although Supermicro chassis are designed to be efficient and cost-effective, some compatible motherboards have power connectors located in different areas.

To use these motherboards you may have to extend the power cables to the mother boards. To do this, use the following chart as a guide.

Power Cable Extenders		
Number of Pins	**Cable Part #**	**Length**
24-pin	CBL-0042	7.9" (20 cm)
20-pin	CBL-0059	7.9" (20 cm)
8-pin	CBL-0062	7.9" (20 cm)
4-pin	CBL-0060	7.9" (20 cm)

Front Panel to the Motherboard

The SC216 chassis includes a cable to connect the chassis front panel to the motherboard. If your motherboard uses a different connector, use the following list to find a compatible cable.

Front Panel to Motherboard Cable (Ribbon Cable)		
Number of Pins (Front Panel)	**Number of Pins (Motherboard**	**Cable Part #**
16-pin	16-pin	CBL-0049
16-pin	20-pin	CBL-0048
20-pin	20-pin	CBL-0047
16-pin	various*	CBL-0068
20-pin	various*	CBL-0067

* Split cables: Use these cable if your motherboard requires several different connections from the front panel.

Notes

Appendix B

SC216 Power Supply Specifications

This appendix lists power supply specifications for the SC216 chassis.

1K23 Models, such as SC216BE1C4-R1K23LPB	
	1200W
MFR Part #	PWS-1K23A-1R with PDB
AC Input	100-127 V, 15-12A, 50-60 Hz 200-240 V, 8.5-7A, 50-60 Hz
DC Output +12V	75 Amp
+5V standby	4 Amp
+5V	45 Amp
+3.3V	24 Amp
-12V	0.6 Amp

920 Models, such as SC216BAC-R920LPB	
	920W
MFR Part #	PWS-920P-SQ with PDB
AC Input	100-240 V, 4.5-11 Amp, 50-60 Hz
DC Output +12V	75 Amp
+5V standby	4 Amp
+5V	45 Amp
+3.3V	24 Amp
-12V	0.6 Amp

1K28 Models, such as SC216BE16-R1K28LPB	
	1280W
MFR Part #	PWS-1K28P-SQ with PDB
AC Input	1000W Output @ 100-140V, 12-8A, 50-60Hz 1280W Output @ 180-240V, 8-6A, 50-60Hz
DC Output +12V	1000W: 83A 1280W: 106.7A
+5V standby	4 Amp

1200 Models, such as SC216E16-R1200LPB	
	1200W
MFR Part #	PWS-1K21P-1R with PDB
AC Input	100 - 140V, 50 - 60Hz, 8 - 11.5 Amp 180 - 240V, 50 - 60Hz, 5.5 - 8 Amp
DC Output +12V	1000W, 83 Amp @ 100-140V 1200W, 100 Amp @ 180-240V
+5 Standby	4 Amp
+5V	45 Amp
+3.3V	24 Amp
-12V	0.6 Amp

SC216E16-R1010LPB	
	1010W
MFR Part #	PWS-1K11P-1R
DC Input	850W: -36--42V; 30-25Amp 1010W: -43 -76V; 30-17Amp
DC Output +12V	850W, 70 Amp 1010W, 83 Amp
+5 Standby	4 Amp
+5V	50 Amp
+3.3V	30 Amp
-12V	0.6 Amp

900 Models, such as SC216A-R900LPB	
	900W
MFR Part #	PWS-902-1R with PDB
AC Input	100 - 240V, 60-50Hz, 11-4.5 Amp
DC Output +12V	75 Amp
+5V standby	4 Amp
+5V	45 Amp
+3.3V	24 Amp
-12V	0.6 Amp

Appendix C

SAS-216A Backplane Specifications

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

C-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.

C-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.

C-3   A 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.

C-4   Introduction to the SAS-216A Backplane

The SAS-216A 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-216A Revision 1.02, 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.

C-5   Front Connector Locations

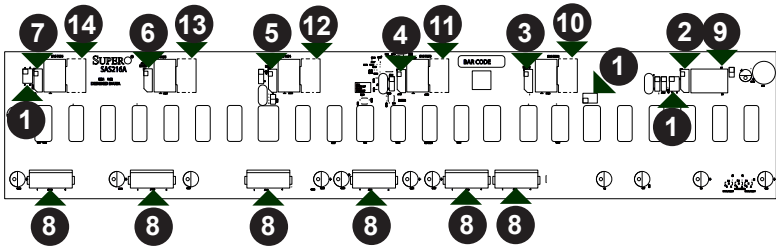

Figure C-1. Front Connectors

Front Connectors

1. Upgrade Connectors: JP69, JP78 and JP115
2. I²C Connector #1: JP37
3. I²C Connector #2: JP95
4. I²C Connector #3: JP52
5. I²C Connector #4: JP96
6. I²C Connector #5: JP116
7. I²C Connector #6: JP117

8. Power Connectors (4-pin): JP10, JP13, JP46, JP48 JP109, JP110
9. SAS IN#1: JSM1
10. SAS IN#2: JSM2
11. SAS IN#3: JSM3
12. SAS IN#4: JSM4
13. SAS IN#5: JSM5
14. SAS IN#6: JSM6

C-6   Front Connectors and Pin Definitions

1. Upgrade Connectors

The upgrade connectors are designated JP69, JP78 and JP115 are used for manufacturer's diagnostic purposes only.

2. - 7. I²C Connectors

The I²C Connectors, designated JP37, JP95, JP52, JP96, JP115 and JP116 are used to monitor HDD activity and status. See the table on the right for pin definitions.

I²C Connector Pin Definitions	
Pin# Definition	
1	Data
2	Ground
3	Clock
4	No Connection

8. Backplane Main Power Connectors

The 4-pin connectors, designated JP10, JP13, JP46, JP48, JP109 and JP110 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

9. - 14. SAS IN Ports (Sideband included)

The SAS ports are used to connect the SAS drive cables. The six SAS IN ports are designated #JSM1 - #JSM6. Each port is also compatible with SATA drives.

| Sideband Definitions			
Pin #	Definition	Pin #	Definition
A11	**SGPIO:** SDIN **I²C:** Backplane Addressing (SB5)	B11	Controller ID (SB6)
A12	**SGPIO:** SDOUT **I²C:** Reset (SB4)	B10	GND (SB2)
A9	GND (SB3)	B9	**SGPIO:** SLOAD **I²C:** SDA (SB1)
A8	Backplane ID (SB7)	B8	**SGPIO:** SCLOCK **I²C:** SCL (SB0)

C-7   Front Jumpers
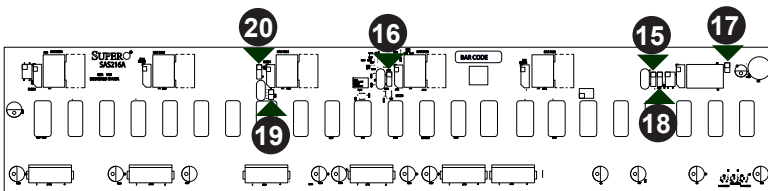
Figure C-2. Front Jumpers

15. Chip Reset JP36 1-2 Reset, 2-3 No Reset (Not populated)
16. Chip Reset JP35 1-2 Reset, 2-3 No Reset (Not populated)
17. Buzzer Reset* JP18
18. JP84 1-2 SGPIO, 2-3 I^{2}C
19. JP80 I^{2}C Addr - On C0, Off C2 (Not populated)
20. JP50 Chip Reset 1-2 Reset, 2-3 No Reset (Not populated)

*The buzzer sound indicates that a condition requiring immediate attention has occurred. It is triggered by the following conditions:

Hard drive failure
Fan failure
System temperature over 45º 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.
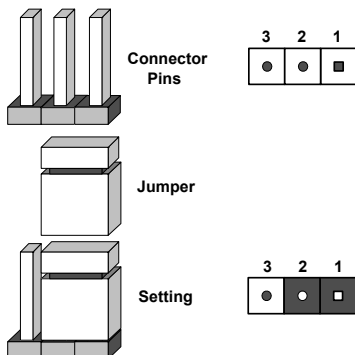
I²C and SGPIO Modes and Jumper Settings

This backplane can utilize I²C or SGPIO. SGPIO is the default mode and can be used without making changes to your jumper. The following information details which jumper must be configured to use SGPIO mode or restore your backplane to I²C mode.

SGPIO Setting (Default)		
Jumper	Jumper Setting	Note
JP84	1-2	SGPIO Mode Setting

I²C Setting		
Jumper	Jumper Setting	Note
JP84	2-3	I²C Setting

Front LED Indicators
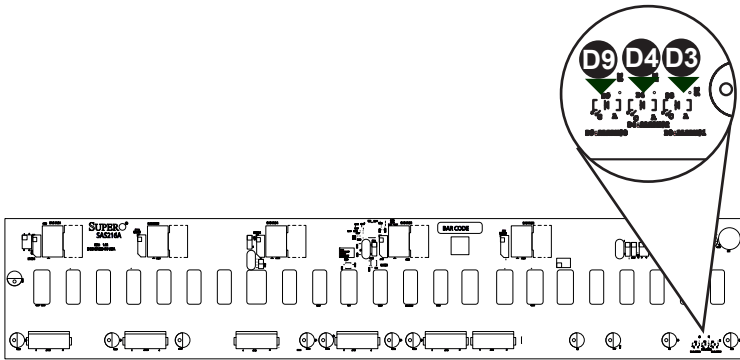
Figure C-3. Front LEDs

Front Panel LEDs		
LED	**State**	**Specification**
D3	On	Alarm #1
D4	On	Alarm #2
D9	On	Alarm #3

C-8   Rear Components, Connectors and LED Indicators

SAS #0 SAS #1 SAS #2 SAS #3 SAS #4 SAS #5 SAS #6 SAS #7 SAS #8 SAS #9 SAS #10 SAS #11 SAS #12 SAS #13 SAS #14 SAS #15 SAS #16 SAS #17 SAS #18 SAS #19 SAS #20 SAS #21 SAS #22 SAS #23
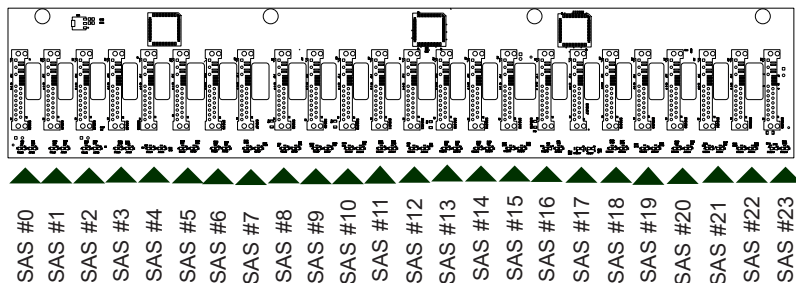
Figure C-4. Rear Components

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 LED	**Hard Drive Activity**	**Failure LED**
SAS #0	D12	D5
SAS #1	D22	D23
SAS #2	D40	D37
SAS #3	D102	D107
SAS #4	D13	D6
SAS #5	D24	D29
SAS #6	D41	D38
SAS #7	D104	D108
SAS #8	D14	D7
SAS #9	D25	D30
SAS #10	D42	D39
SAS #11	D106	D109
SAS #12	D15	D8
SAS #13	D26	D31
SAS #14	D87	D88
SAS #15	D111	D110
SAS #16	D18	D19
SAS #17	D27	D32
SAS #18	D100	D103
SAS #19	D118	D119
SAS #20	D21	D20
SAS #21	D28	D33
SAS #22	D101	D105
SAS #23	D120	D121

Notes

Appendix D

SAS-216EL Backplane Specifications

D-1 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 twenty-four 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.
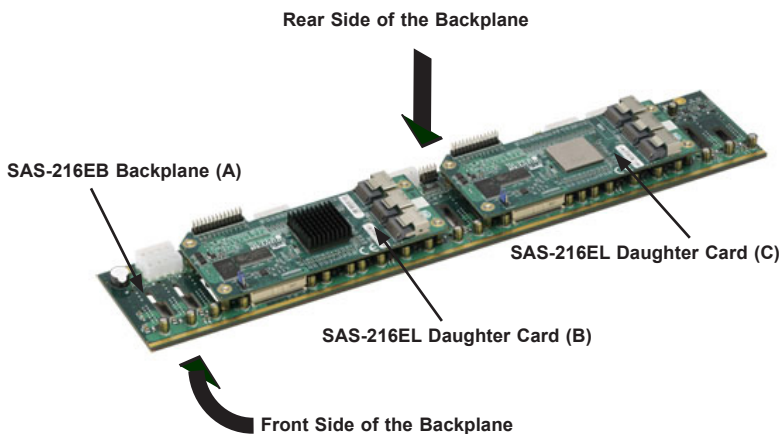

Figure D-1. The SAS-216EL1/EL2 Backplane

D-2   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 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.

D-3   General 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.

- 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.

D-4   An Important Note to Users

At the time of publication, chassis models using this backplane are no longer sold..

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.

D-5   Introduction to the SAS-216EL Backplane

The SAS-216EL 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-216EL 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.

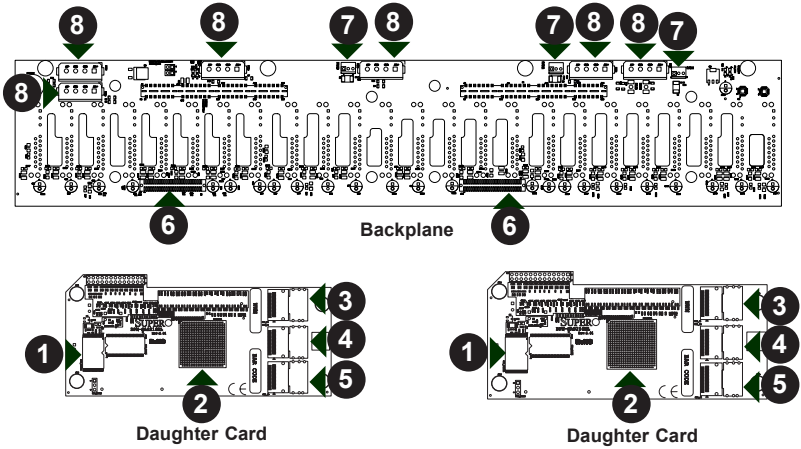# D-6   Rear Components and Connectors

Figure D-2. 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

D-7   Rear Connectors and Pin Definitions

1. Primary Flash Chips

The primary flash chip enhances the back-plane 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 and 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

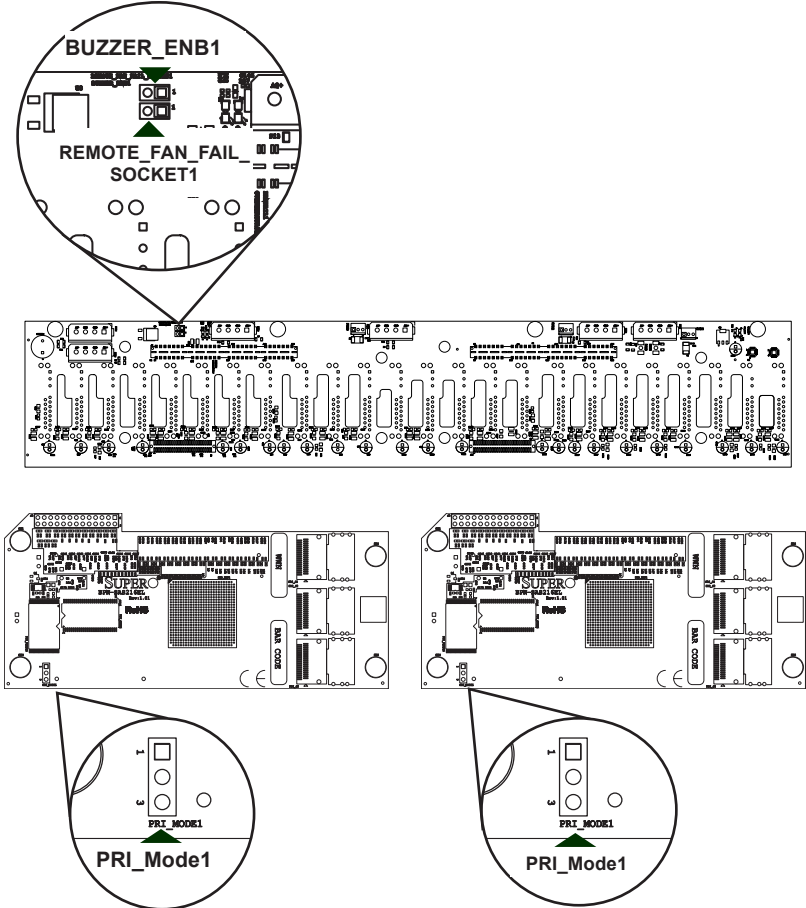## D-8   Rear Jumper Locations and Pin Definitions

Figure D-3. 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.
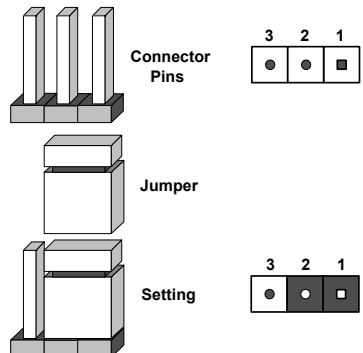
General Jumper Settings		
Jumper	**Jumper Settings**	**Note**
PRI_MODE1	1-2	Factory setting do not change
BUZZER_ENB1	Open: Disable Closed: Enable	Buzzer enable*

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.

*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 45º Celsius.

D-9   Front Connectors and LED Indicators
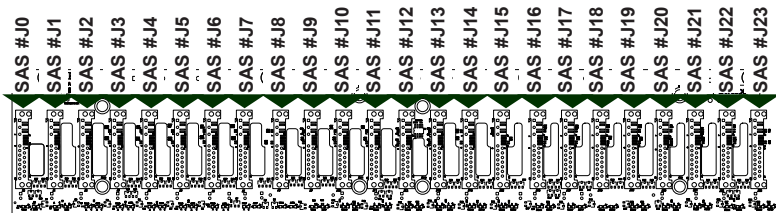
Figure D-4: SAS Connectors

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

D-10 Front Connectors and Jumpers

Front Components

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

Dual Port and Cascading Configurations

D-11 Single and Dual Port Expanders

Single Ports

SAS-216EL1 backplanes have a single-port expander on the daughter card, that accesses all twenty-four drives and supports cascading.
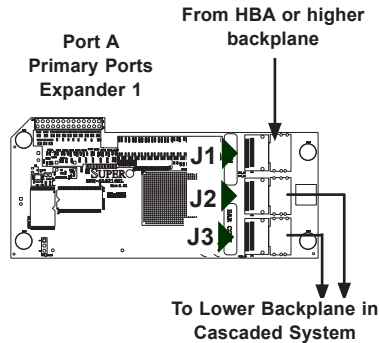
Figure D-5. SAS-216EL2 Single Port Configuration

Dual Ports

SAS-216EL2 backplanes have dual-port expanders on the daughter cards, that access all twenty-four drives. These dual-port expanders support cascading, failover, and recovery.
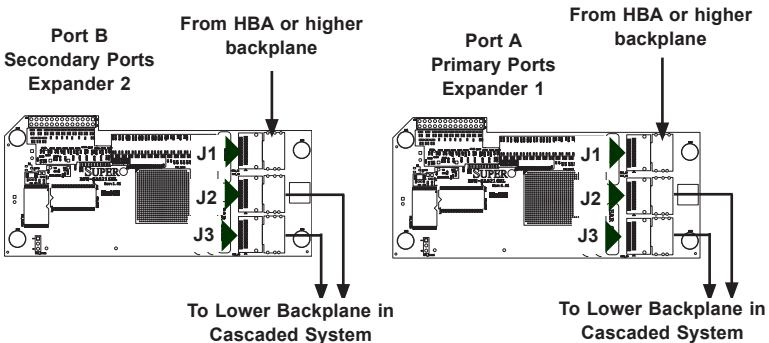
Figure D-6. SAS-216EL2 Dual Port Configuration

D-12 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).
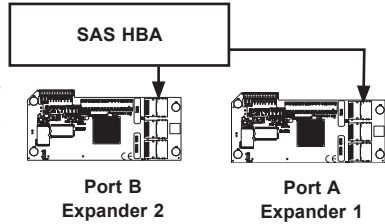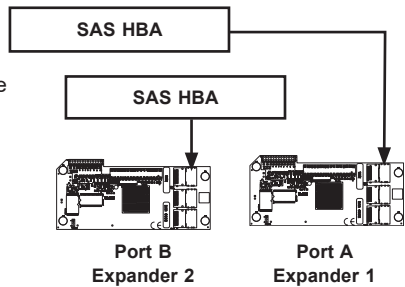

Figure D-7. Single HBA

Single Host Bus Adapter Failover

If the expander or data path in Port A fails, the system automatically switches to Port B.
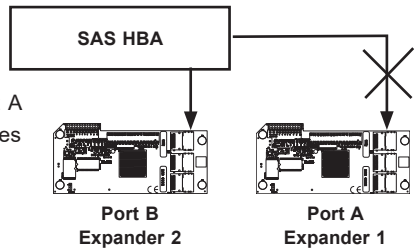
Figure D-8. Single HBA Failover

Dual Host Bus Adapter

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

Figure D-9. 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.
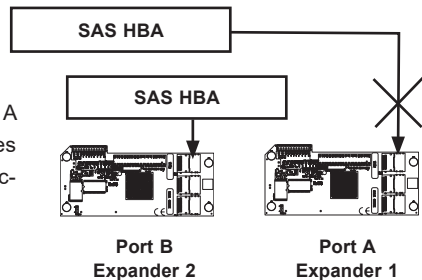
Figure D-10. Dual HBA Failover

D-13 Chassis Power Card and Support Cables

Chassis Power Card

In a cascaded configuration, the first chassis includes a motherboard and at least one HBA. Other servers in this enclosed system, include a power card. This section describes the supported power card for the SAS-216 series backplane.

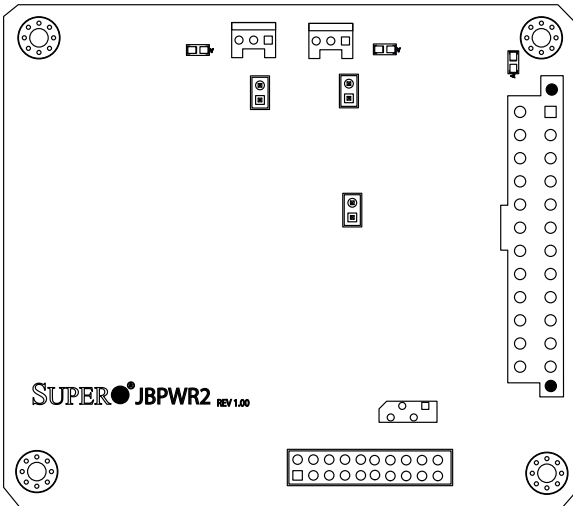For more information, see the Supermicro Web site at http://www.supermicro.com.

Figure D-10. 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

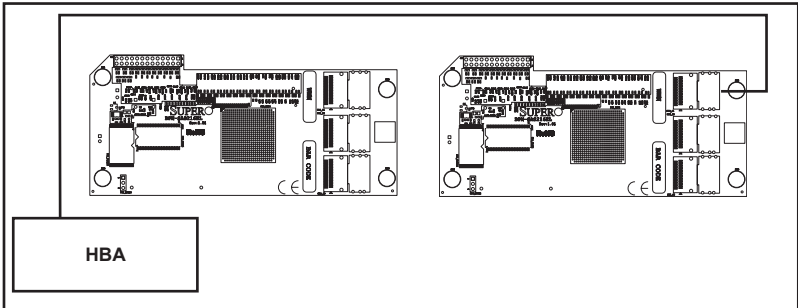The following section lists the most common cables used to connect the HBA to the backplane.

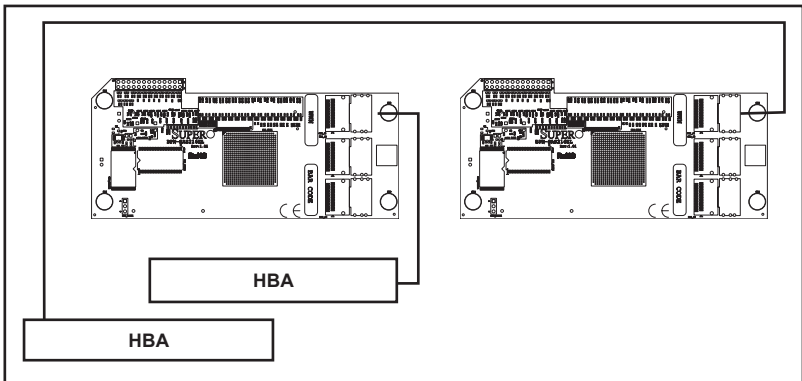**Figure D-11. Single Internal Host Bus Adapter**

Figure D-12. 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 an iPass (SFF-8087/Mini-SAS) connector (36-pin) 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-pin) 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.
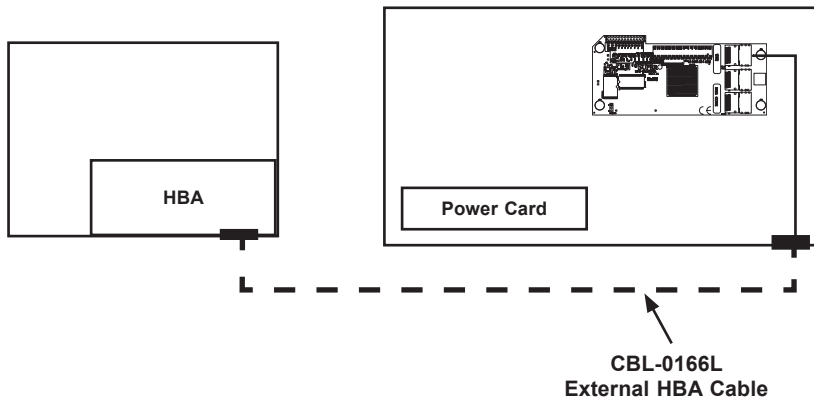
Single External Host Bus Adapter

CBL-0166L
External HBA Cable

Figure D-13. Single External Host Adapter

Dual External Host Bus Adapter

CBL-0166L
External HBA Cables
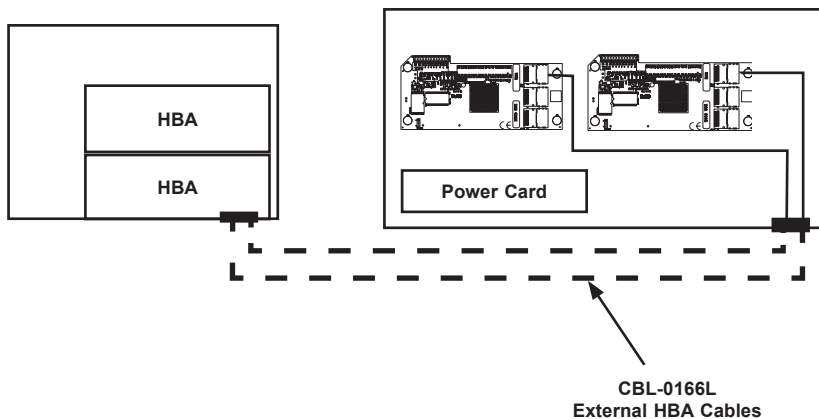
Figure D-14. Dual External Host Bus Adapter

Supported External HBA to Backplane Cable

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

Figure D-15. 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-pin) 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.
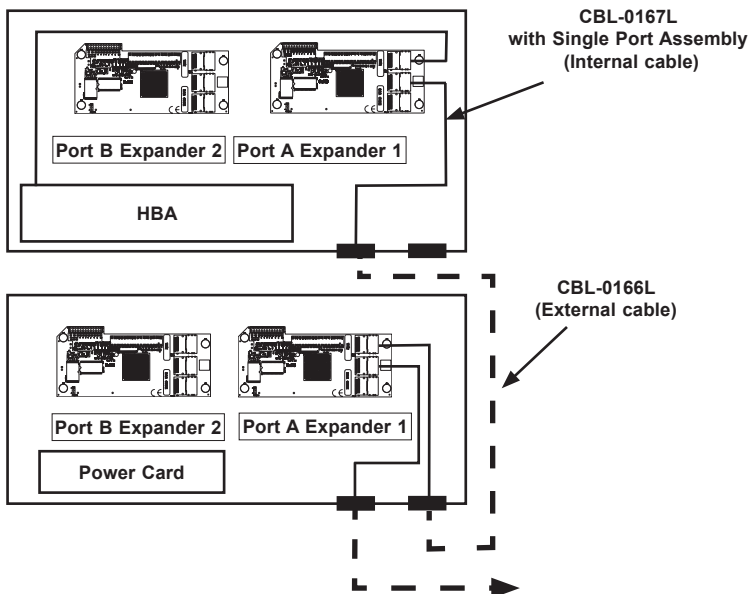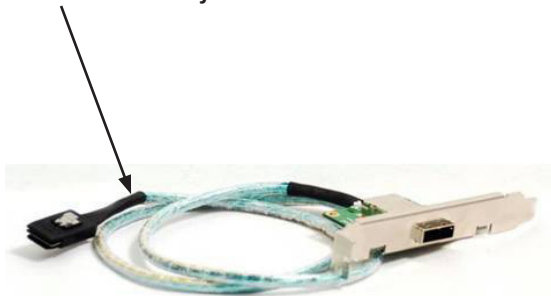

Figure D-16. Single HBA Configuration

Single HBA Configuration Cables

Single Port Cable Assembly

Figure D-17. 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 D-18. 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.
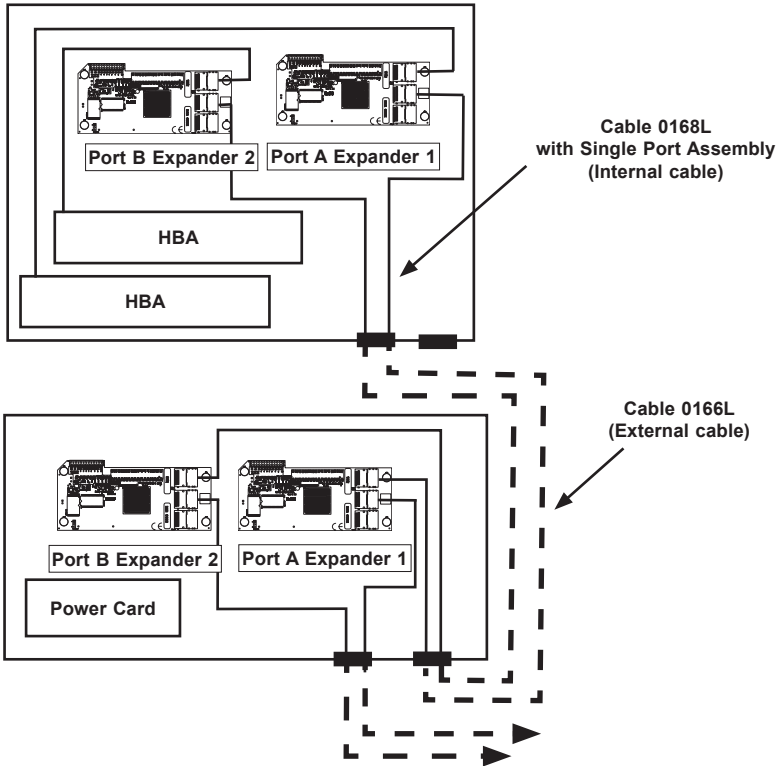

Cable 0168L with Single Port Assembly (Internal cable)

Cable 0166L (External cable)

Port B Expander 2   Port A Expander 1

HBA

HBA

Port B Expander 2   Port A Expander 1

Power Card

Figure D-19. Dual HBA Configuration

Dual HBA Configuration Cables

**Dual Port Cable
Assembly**

Figure D-20. 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 D-21. 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.

D-14 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.
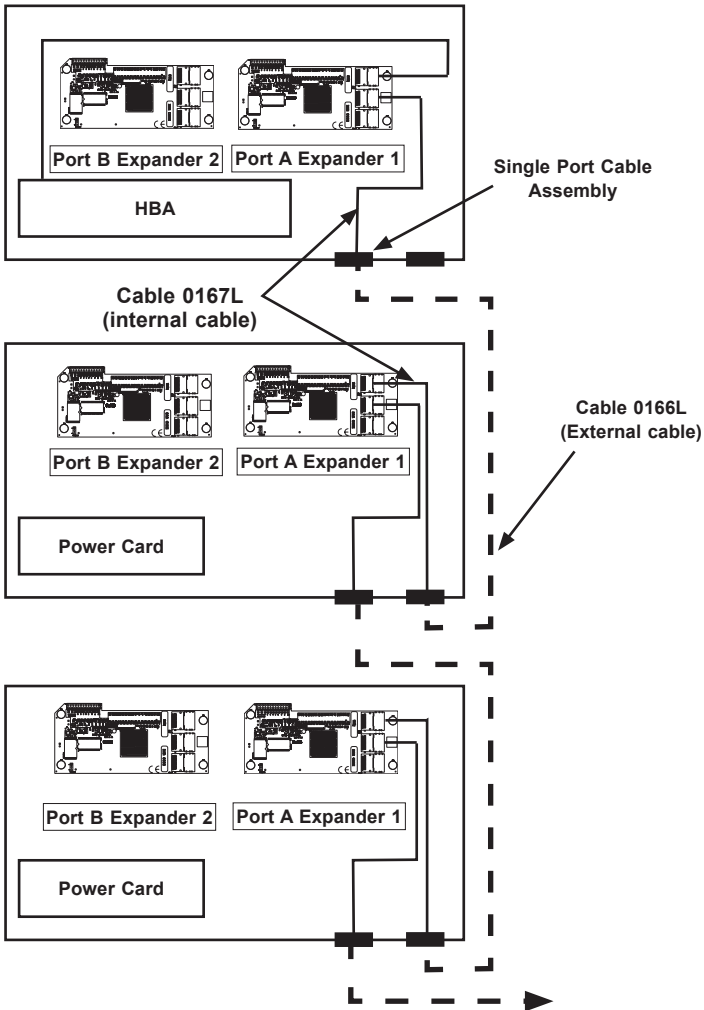

Figure D-22. Simple Cascaded Configuration

Server System with Single SAS HBA

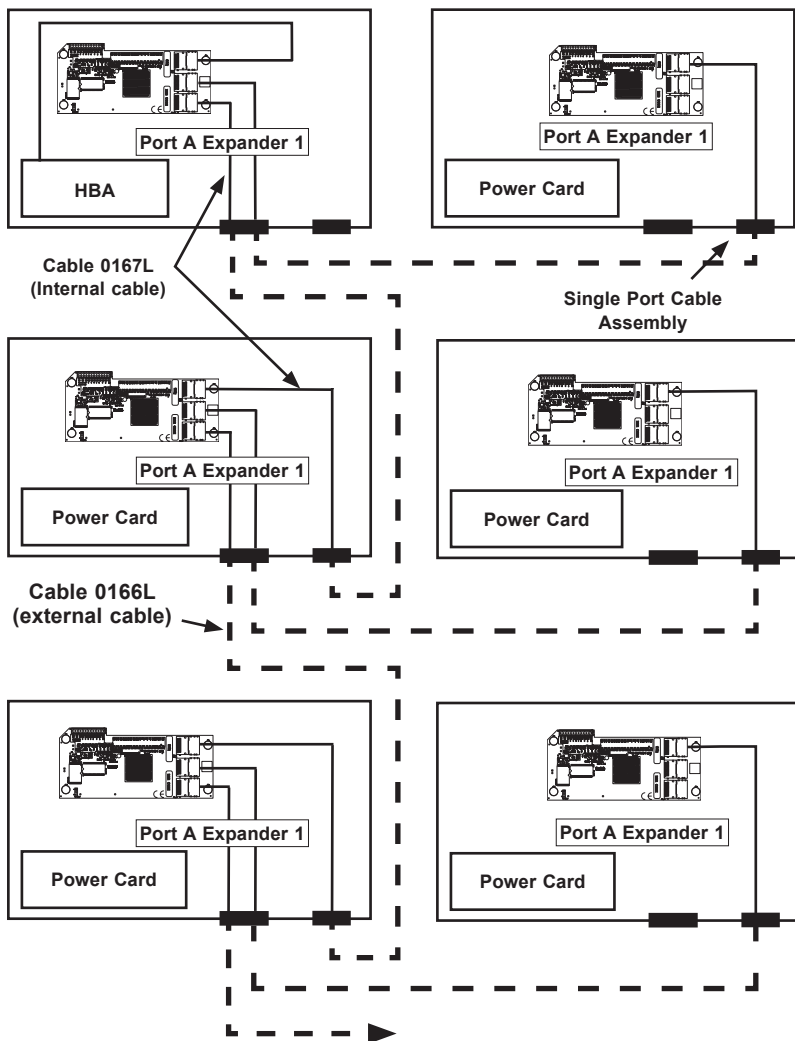The expanders allow horizontal branching. This configuration also applies to dual ports.

Figure D-23. Cascaded Configuration with Horizontal Branching

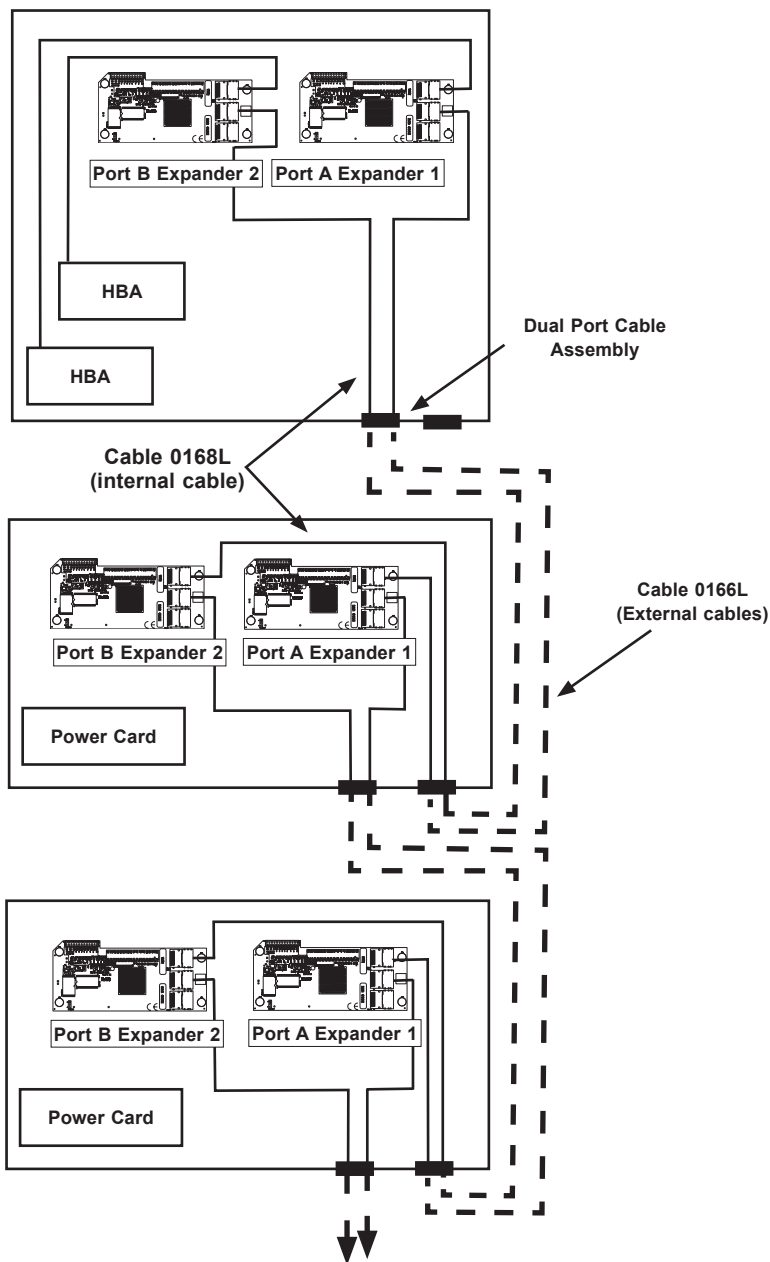## Dual SAS HBA and Cascaded Configuration

Figure D-24. Dual SAS HBA with Cascaded Configuration

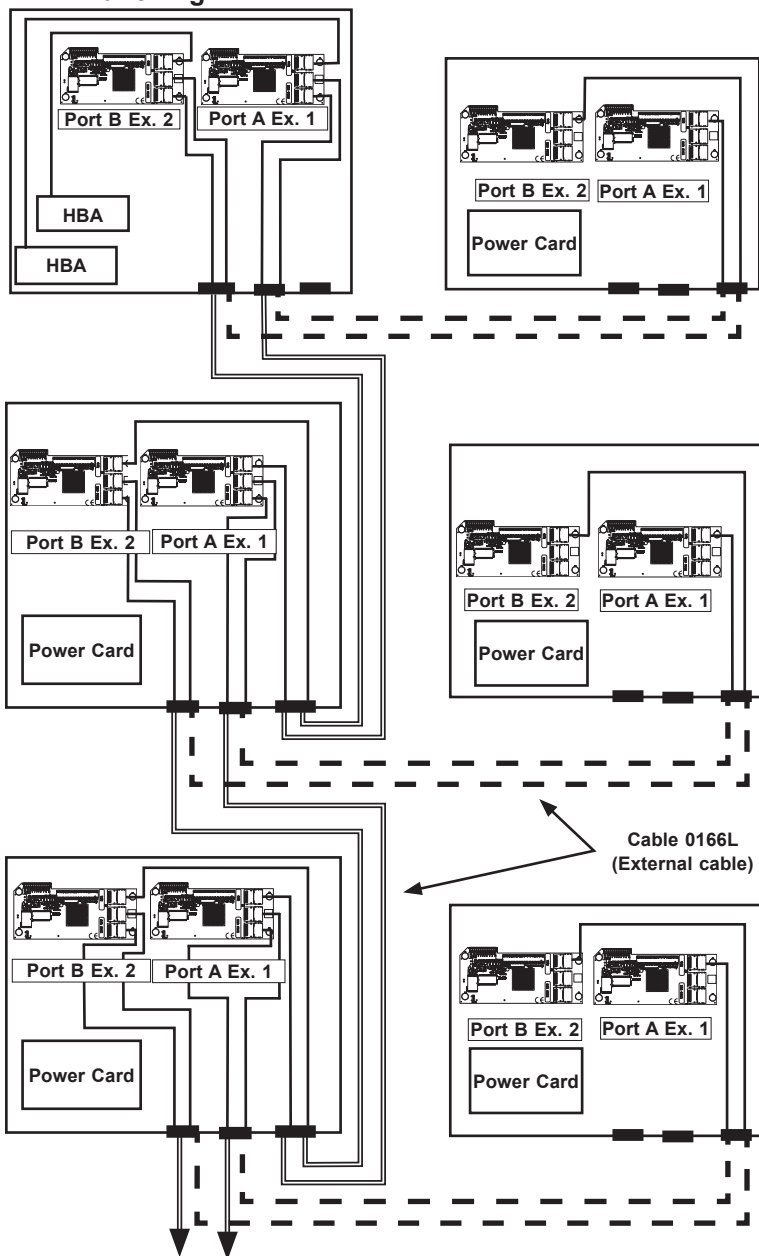## Dual SAS HBA and Cascaded Configuration with Branching

Figure D-25. Dual SAS HBA with Cascaded Configuration and Branching

Appendix E

SAS2-216EL1/EL2 Backplane Specifications

Overview of the SAS2-216EL1/EL2 Backplanes

The SAS2-216EL1/EL2 model backplanes consists of a SAS2-216EB backplane (A) with one or two SAS2-216EL daughter cards (B and C) mounted on the rear of the backplane.

The SAS2-216EL1 model consists of the SAS2-216EB backplane (A) and **one** SAS2-216EL daughter card (B), mounted on the right-hand side of the backplane.

The SAS2-216EL2 model consists of the SAS2-216EB backplane (A), and **two** SAS-216EL daughter cards (B and C), mounted on the rear of the backplane.

Components on the front side of the SAS2-216EB backplane include twenty-four 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.

Rear Side of the Backplane

SAS2-216EB Backplane (A)

SAS2-216EL Daughter Card (B)

SAS2-216EL Daughter Card (C)

Front Side of the Backplane
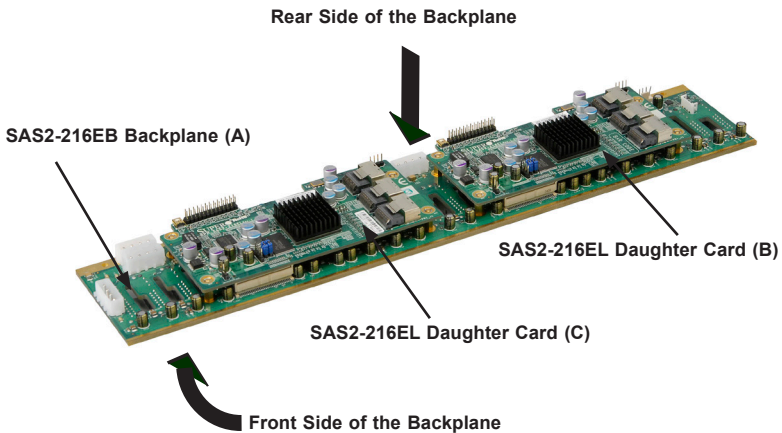
E-1   ESD Safety Guidelines

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.

E-2   General 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.

- 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 mother-board to prevent damage to the system due to power shortage.

E-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.

E-4   Introduction to the SAS2-216EL1/EL2 Backplane

The SAS2-216EL1/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 SAS2-216EL Revision 1.02 backplane, the most current release available at the time of publication.

This manual also describes the SAS2-216EL daughter card, Revision 1.02, 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.

E-5   Connectors
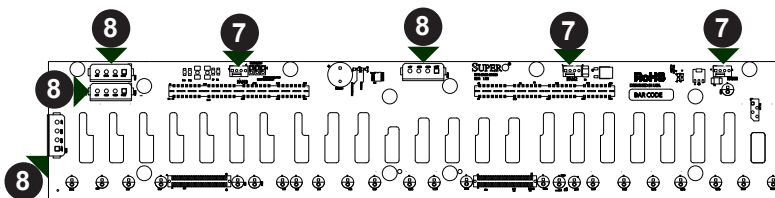
Rear of SAS2-261EB Backplane
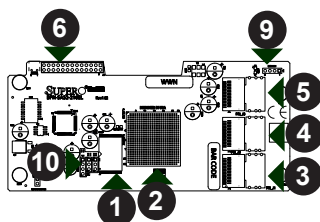
Front of SAS2-2I6EL Daughter Card(s)

Figure E-1: Connectors on the Backplane and Daughter Cards

Connectors

1. Flash Chip

2. Expander Chip

3. SAS Port: PRI_J1

4. SAS Port: PRI_J2

5. SAS Port: PRI_J3

6. EPP Connectors: J2

7. Fan Connectors: Fan1, Fan2, and Fan3

8. Power Connectors: PWR1 - PWR4

9. Debug Connector: EXPDBG1

10. UART Connector: SMART_UART

E-6   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. - 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 are designated PWR1, PWR2, PWR3 and PWR4. 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

9. Debug Connector

The debug connector is designated EX-PDBG1 and is used for manufacturer's diagnostic purposes only.

10. UART Connector

The UART connector is designated SMART_ UART and is used for manufacturer's diagnostic purposes only.
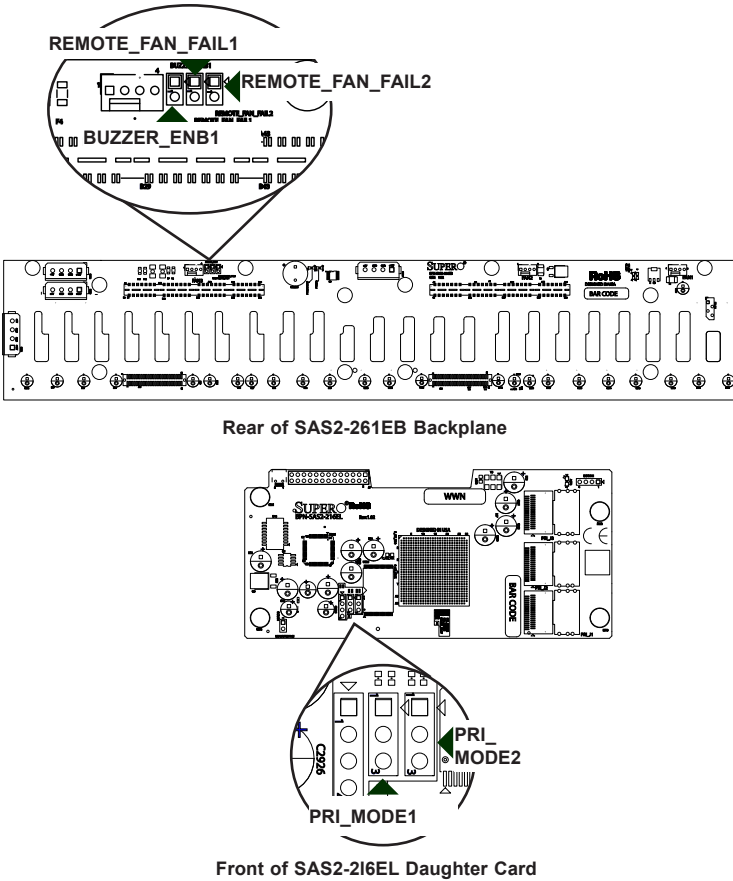
E-7 Jumper Locations and Settings

REMOTE_FAN_FAIL1

REMOTE_FAN_FAIL2

BUZZER_ENB1

Rear of SAS2-261EB Backplane

PRI_MODE2

PRI_MODE1

Front of SAS2-2I6EL Daughter Card

Figure E-2: 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 2-pin jumpers, "Closed" means the jumper is on and "Open" means the jumper is off the pins.

Connector Pins
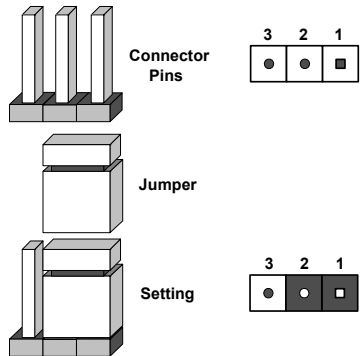
Jumper

Setting

General Jumper Settings		
Jumper	**Jumper Settings**	**Note**
PRI_MODE1	Pins 2-3	Factory setting, do not change
PRI_MODE2	Pins 2-3	Factory setting do not change
REMOTE_FAN_FAIL1	Open: Enable (Default) Closed: Disable	Enables / disables the fan speed reporting.
REMOTE_FAN_FAIL2	Open: Enable (Default) Closed:Disable	Enables / disables the FANFAIL1 LED
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 any of the following conditions:

1. Hard drive failure

2. Fan failure
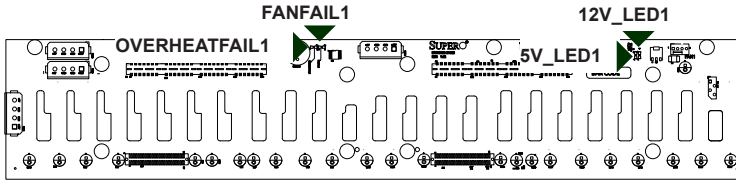
3. System temperature over 45º Celsius.

Figure E-3: Rear LEDs

Rear LEDs		
LED	**Fail State**	**Specification**
12V_LED1	Off	Green LED indicates backplane 12V power. Light is on during normal operation.
5V_LED1	Off	Blue LED indicates backplane 5V power. Light is on during normal operation.
FANFAIL1	On	Red LED indicates a fan failure. Light is off during normal operation
OVERHEATFAIL1	On	Red LED indicates an overheat condition. Light is off during normal operation

E-8   Front Connectors and LED Indicators
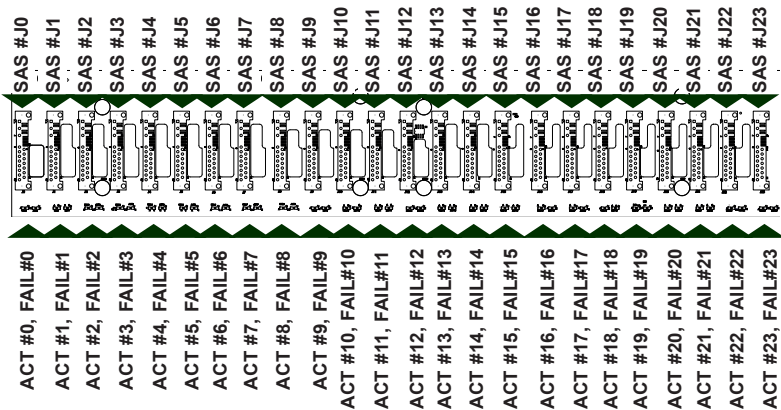
Figure E-4: Front Connectors and LEDs

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

Dual Port and Cascading Configurations

E-9   Single and Dual Port Expanders

Single Ports

SAS2-216EL1 model backplanes have a single-port expander on the daughter card that accesses all of the drives and supports cascading.
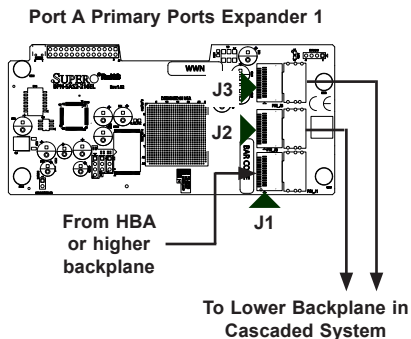

Figure E-5: SAS2-216EL1 Single Port Configuration

Dual Ports

SAS2-216EL2 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.
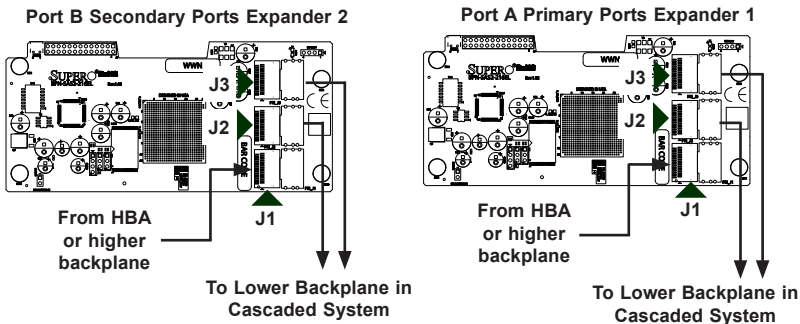

Figure E-6. SAS2-216EL2 Dual Port Configuration

E-10 Failover

The SAS2-216EL2 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).

SAS HBA

**Port B
Expander 2** **Port A
Expander 1**
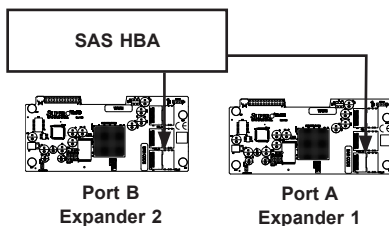
Figure E-7: Single HBA

Single Host Bus Adapter Failover

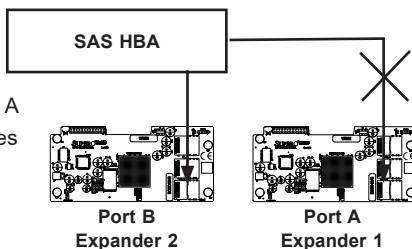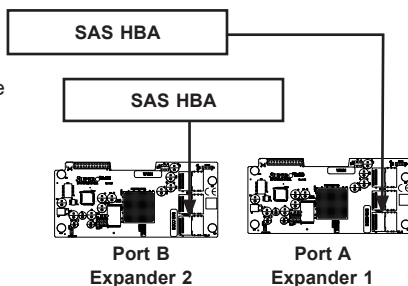If the expander or data path in Port A fails, the system automatically switches to Port B.

SAS HBA

**Port B
Expander 2** **Port A
Expander 1**

Figure E-8. Single HBA Failover

E-11 Failover with RAID Cards and Multiple HBAs

The SAS-216EL backplane may be configured for failover with multiple HBAs using either RAID controllers or HBAs to acheive 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 E-9. 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.
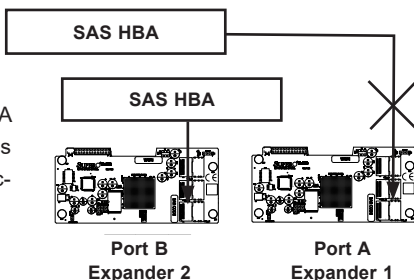

Figure E-10. Dual HBA Failover

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

E-12 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 be equipped with a power card. This section describes the supported power card for the SAS2-216EL series backplane.

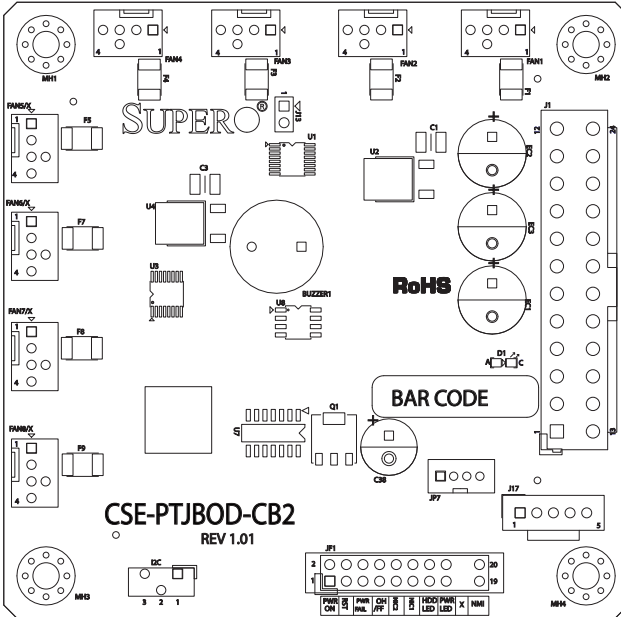For more information, see the Supermicro Web site at http://www.supermicro.com.

Figure E-11. 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 HBA to the Backplane

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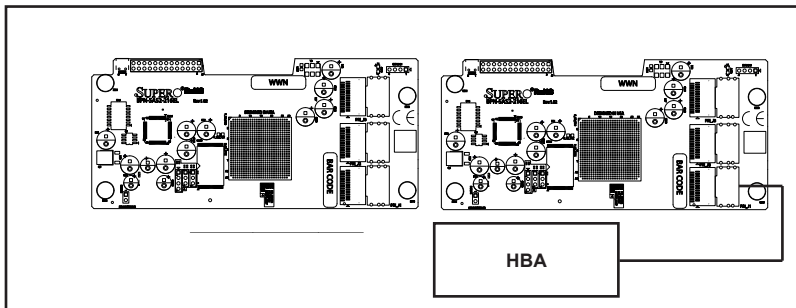

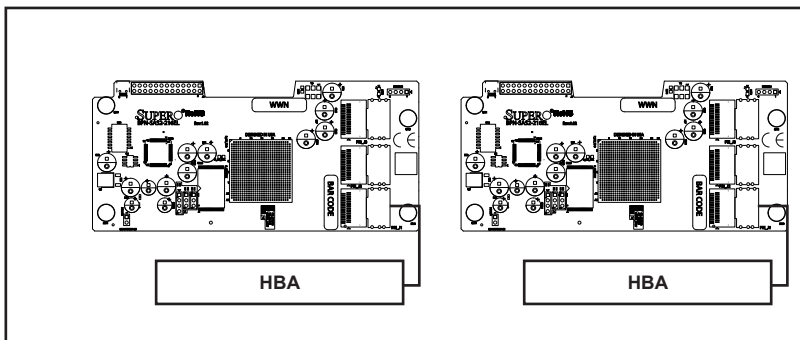**Figure E-12. Single Internal Host Bus Adapter**

Figure E-13. Dual Internal Host Bus Adapter

Supported Internal HBA Cables

Use the following cables to create connections between the internal HBA and SAS2-216EL model 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 at one end and one iPass (SFF-8087/Mini-SAS) connector (36-pin) at the other. This cable connects from the HBA to the SAS2-216EL backplane

IMPORTANT: See Section E-11 of this manual, *Failover with RAID Cards and Multiple HBAs* for important information on supported configurations.

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 SAS2-216EL 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
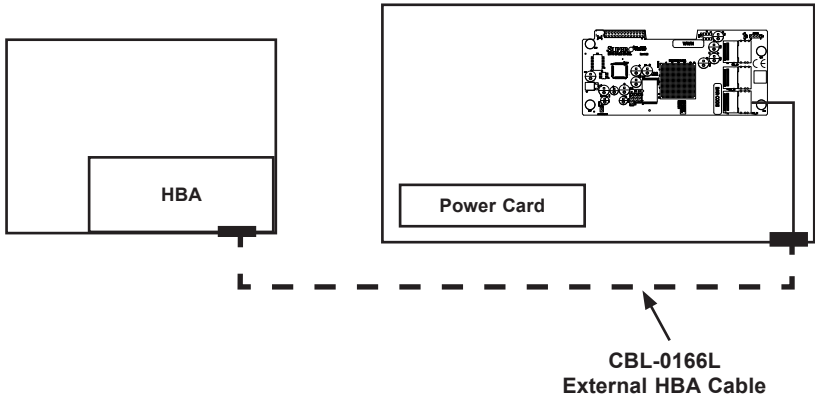
Figure E-14. Single External Host Adapter
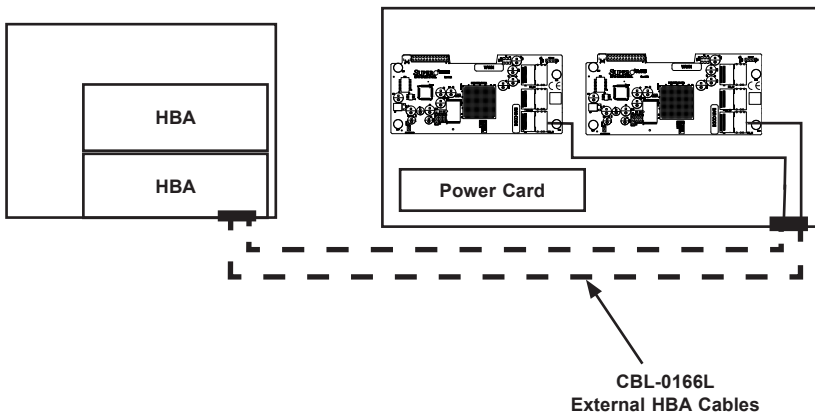
Dual External Host Bus Adapter

Figure E-15. Dual External Host Bus Adapter

IMPORTANT: See Section E-11 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 E-16. 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-pin) connector 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.
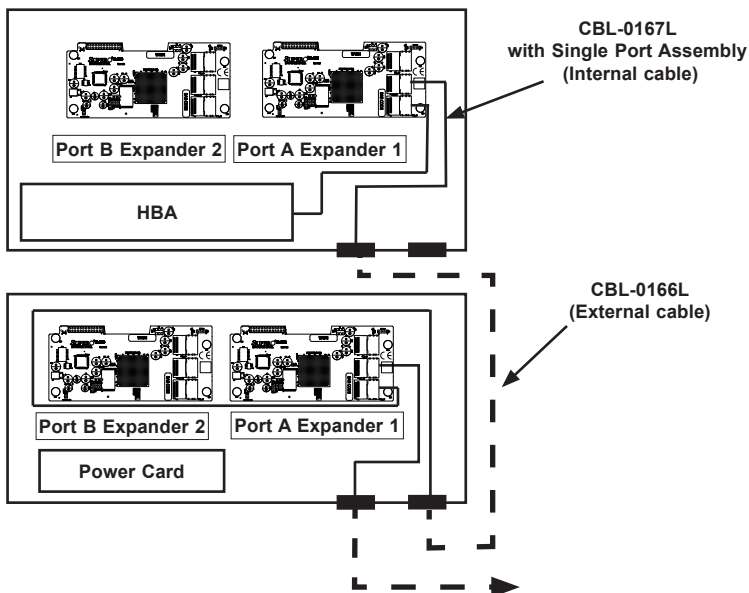
Figure E-17: Single HBA Configuration

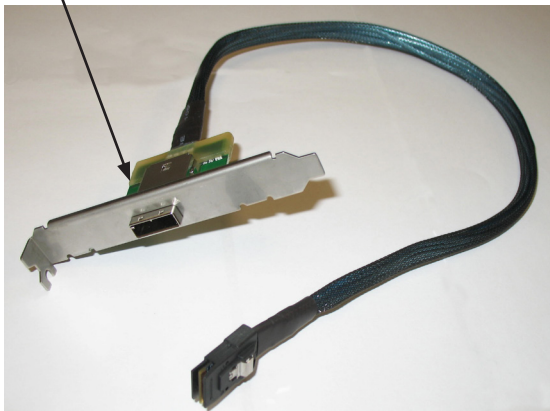## Single HBA Configuration Cables

Single Port Cable Assembly

Figure E-18. 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 E-19. 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.
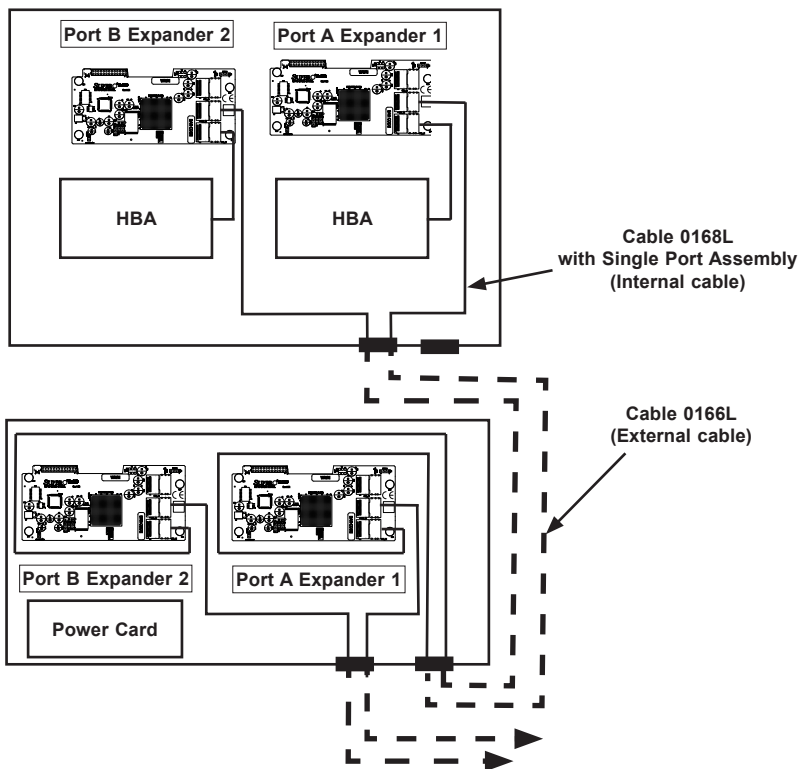

Figure E-20. Dual HBA Configuration

IMPORTANT: See Section E-11 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 E-21. 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 host bus adapter or external port. Used in dual port environments.

Figure E-22. 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.

E-13 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 with no motherboard and no HBA. For more information, specific chassis manuals are available at www.supermicro.com.
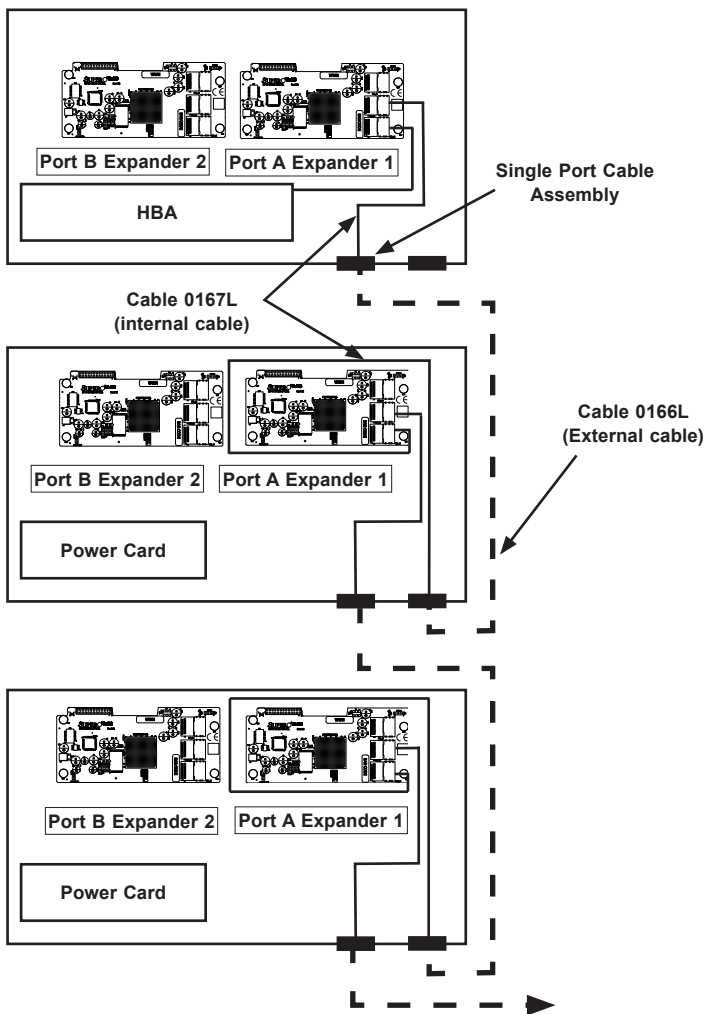

Figure E-23. Simple Cascaded Configuration

Server System with Single SAS HBA

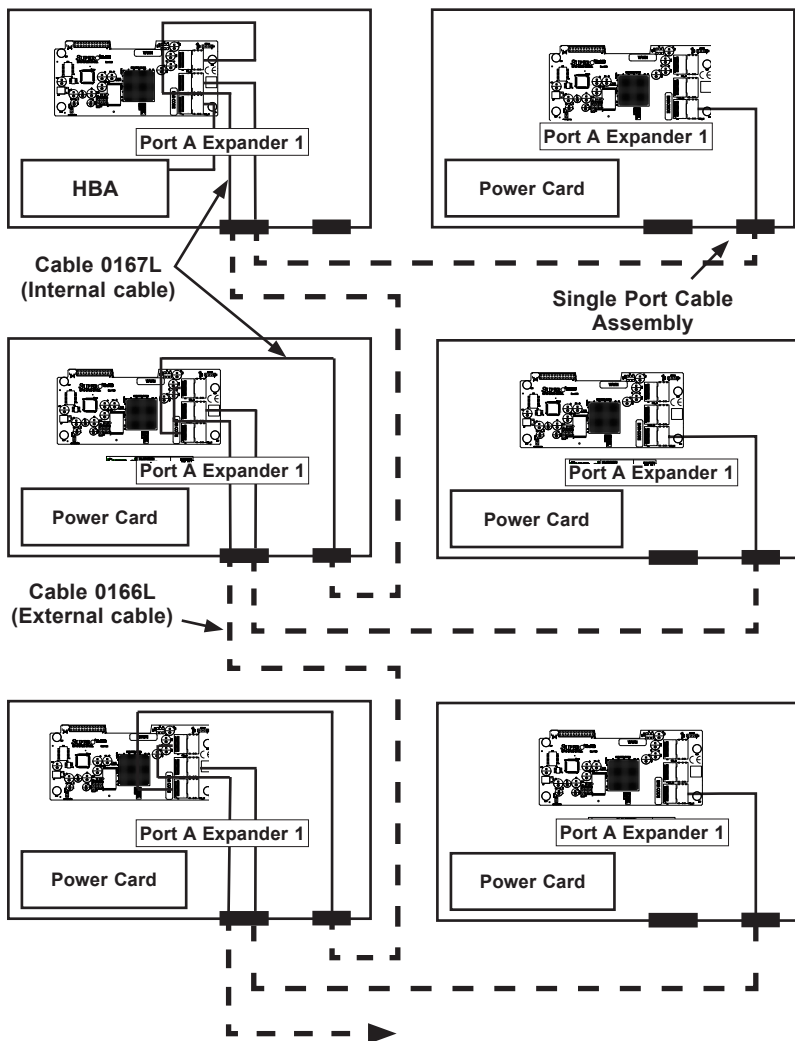The expanders allow horizontal branching. This configuration also applies to dual ports.

Figure E-24. Cascaded Configuration with Horizontal Branching
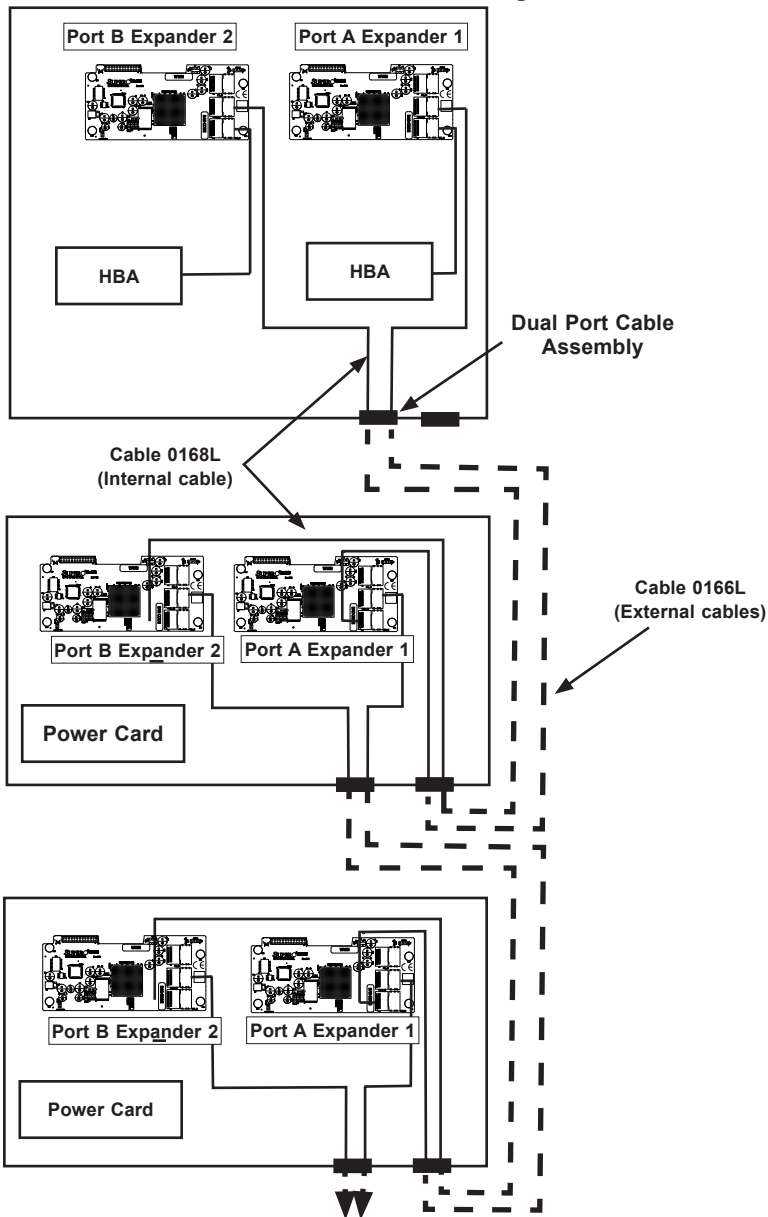
Dual SAS HBA and Cascaded Configuration

Figure E-25. Dual SAS HBA with Cascaded Configuration

IMPORTANT: See Section E-11 of this manual, *Failover with RAID Cards and Multiple HBAs* for important information on supported configurations.
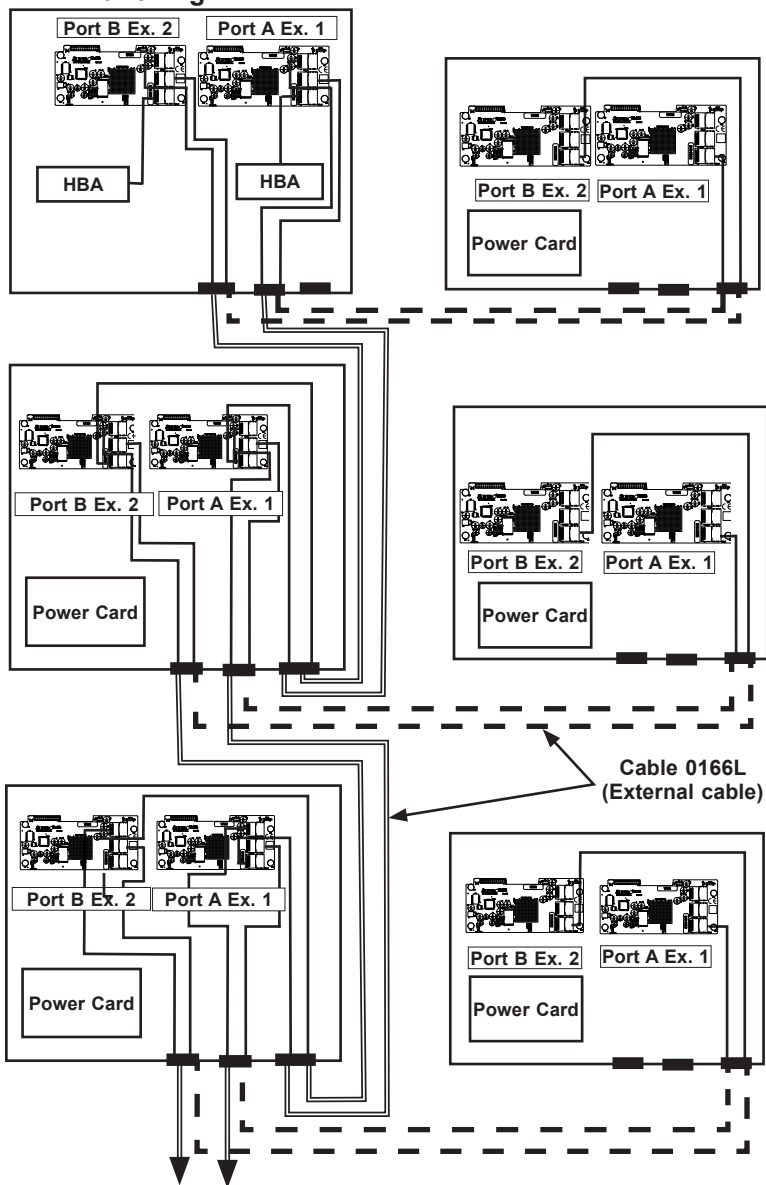
Dual SAS HBA and Cascaded Configuration with Branching

Figure E-26. Dual SAS HBA Cascaded Configuration and Branching

IMPORTANT: See Section E-11 of this manual, *Failover with RAID Cards and Multiple HBAs* for important information on supported configurations.

Appendix F

SAS3-216A Backplane Specifications

F-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.

F-2   General 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.

- 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.

F-3   A Note to Users

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

F-4   Front Connectors and Jumpers
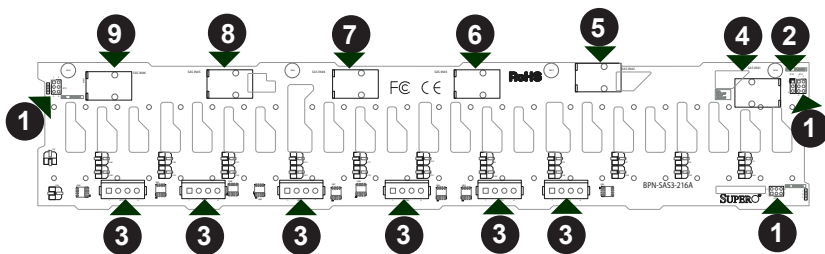
Front Connectors

1. Upgrade Connectors: JP70, JP71 and JP72
2. Jumper: JP35
3. Power Connectors (4-pin): JP10, JP13, JP46, JP48 JP109, JP110
4. SAS IN#1 JSM1
5. SAS IN#2 JSM2
6. SAS IN#3 JSM3
7. SAS IN#4 JSM4
8. SAS IN#5 JSM5
9. SAS IN#6 JSM6

F-5   Front Connector and Pin Definitions

1. Upgrade Connectors

The upgrade connectors are used for manufacturer diagnostic purposes only.

3. Backplane Main Power Connectors

The 4-pin connectors, designated JP10, JP13, JP46, JP48, JP109 and JP110 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. - 9. SAS IN Ports (Sideband included)

The SAS ports are used to connect the SAS drive cables. The six SAS IN ports are designated #JSM1 - #JSM6. Each port is also compatible with SATA drives.

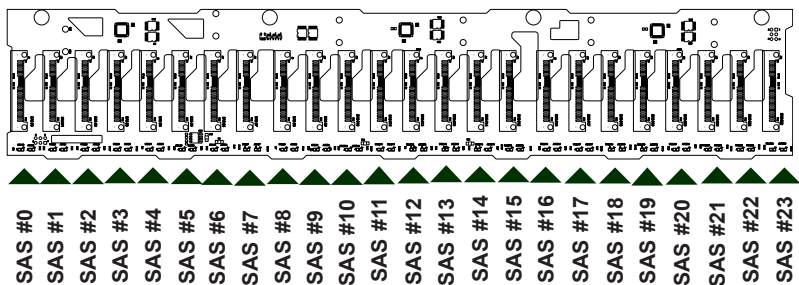| Sideband Definitions (JSM1 - JSM6)			
Pin #	Definition	Pin #	Definition
A0	SB0	C1	SB4
B2	SB1	D1	SB5
C2	SB2	D2	SB6
B1	SB3	A1	SB7

F-6   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.

2. Jumper

Connector Pins
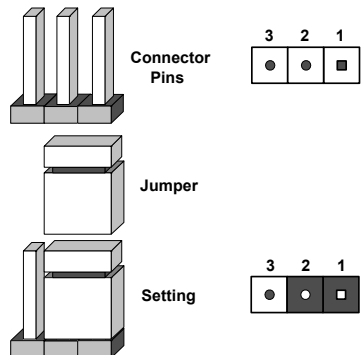
Jumper

Setting

Jumper Settings		
Jumper	Jumper Settings	Notes
JP35	Pins 1-2 Reset Pins 2-3 Normal (default)	ATMEL chip reset

F-7   Rear Components, Connectors and LED Indicators

SAS #0 SAS #1 SAS #2 SAS #3 SAS #4 SAS #5 SAS #6 SAS #7 SAS #8 SAS #9 SAS #10 SAS #11 SAS #12 SAS #13 SAS #14 SAS #15 SAS #16 SAS #17 SAS #18 SAS #19 SAS #20 SAS #21 SAS #22 SAS #23

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 LED	**Hard Drive Activity**	**Failure LED**
SAS #0	D12	D5
SAS #1	D22	D23
SAS #2	D40	D37
SAS #3	D102	D107
SAS #4	D13	D6
SAS #5	D24	D29
SAS #6	D41	D38
SAS #7	D104	D108
SAS #8	D14	D7
SAS #9	D25	D30
SAS #10	D42	D39
SAS #11	D106	D109
SAS #12	D15	D8
SAS #13	D26	D31
SAS #14	D87	D88
SAS #15	D111	D110
SAS #16	D18	D19
SAS #17	D27	D32
SAS #18	D100	D103
SAS #19	D118	D119
SAS #20	D21	D20
SAS #21	D28	D33
SAS #22	D101	D105
SAS #23	D120	D121

Notes

Appendix G

BPN-SAS3-216EL Backplane Specifications

G-1   Overview of the SAS3-216EL1/EL2 Backplanes

The BPN-SAS3-216EL1/EL2 model backplanes consists of a BPN-SAS3-216EB backplane (X) with one or two BPN-SAS3-216EL daughter cards (Y and Z) mounted on the rear of the backplane.

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

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

Components on the front side of the BPN-SAS3-216EB backplane include twenty-four SAS connectors and their respecitve 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.
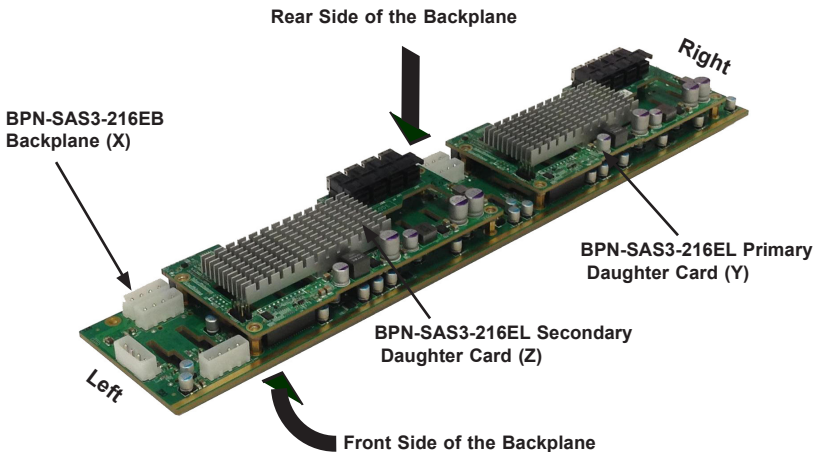
Figure G-1. The SAS3-216EL1/EL2 Backplane

G-2   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 anti-static 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.

G-3   General 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.

- 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.

G-4   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.

G-5   Introduction to the 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 Web site at www.supermicro.com for the latest updates, compatible parts and supported configurations.

G-6   Connectors and Daughter Cards
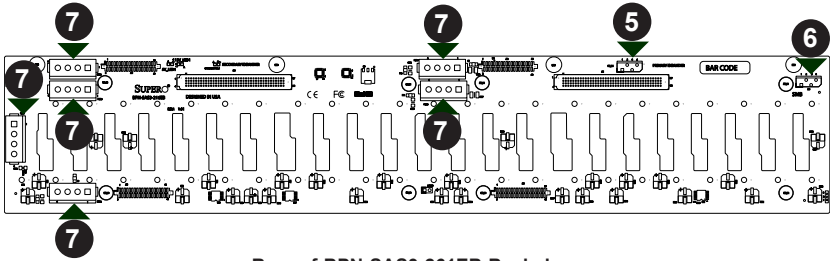
Rear of BPN-SAS3-261EB Backplane
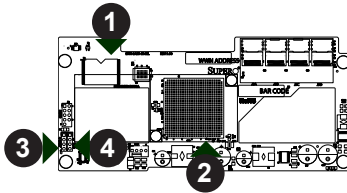
Front of BPN-SAS3-2I6EL Daughter Card(s)

Figure G-2. Connectors and Daughter Cards

Connectors

1. Flash Chip

2. Expander Chip

3. UART Connector: J5

4. SDB Connector: J10

5. Primary Expander Connector: PRI_I2C

6. SMB Expander Connector: J38

7. Power Connectors: PWR1 - PWR6

G-7   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

G-8   Front Connectors and LED Indicators
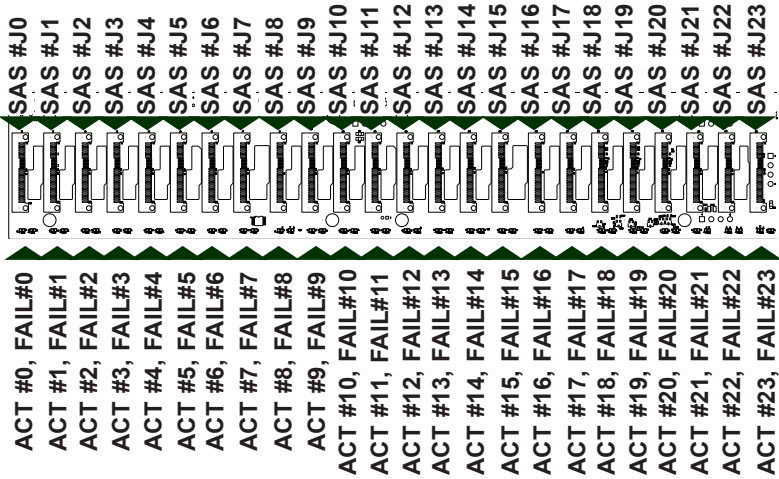
Figure G-3. Front Connectors and LEDs

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

G-9   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.
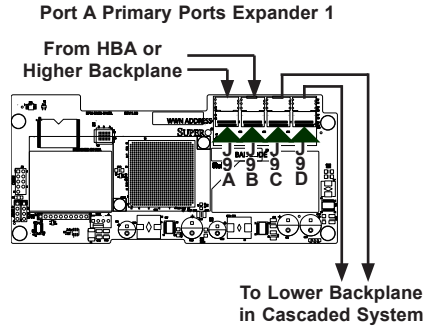
Figure G-4. BPN-SAS3-216EL1 Single Port Configuration

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.
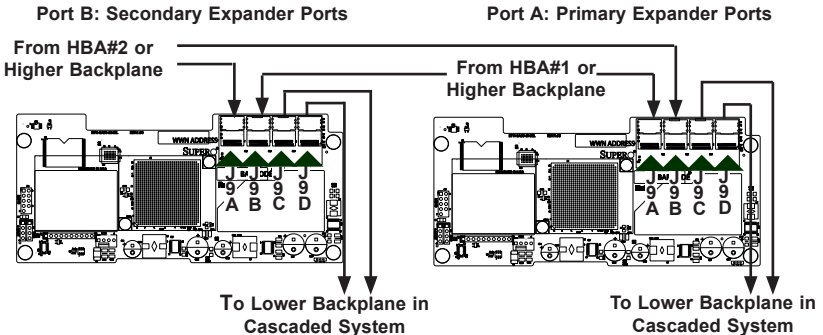
Figure G-5. BPN-SAS3-216EL2 Dual Port Configuration

G-10 Failover

The BPN-SAS3-216EL2 model backplane has two expanders which enable effective failover and recovery.

Single Host Bus Adapter

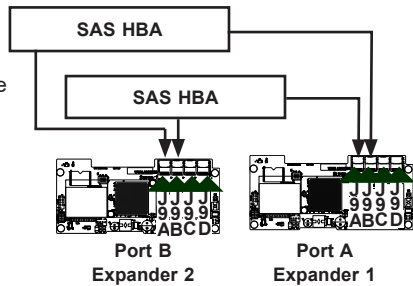In a single host bus configuration, the backplane connects to one Host Bus Adapter (HBA).
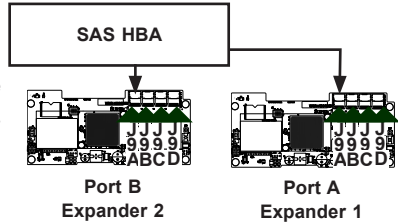
Figure G-6. Single HBA

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.
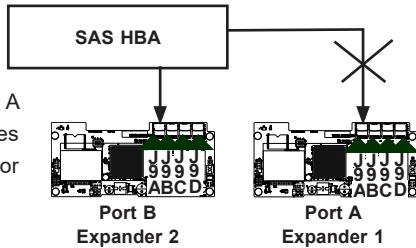
Figure G-7. Single HBA Failover

G-11 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 acheive 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 G-8. 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.
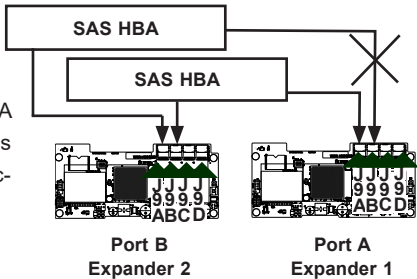
Figure G-9 Dual HBA Failover

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

G-12 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 web site at http://www.supermicro.com.
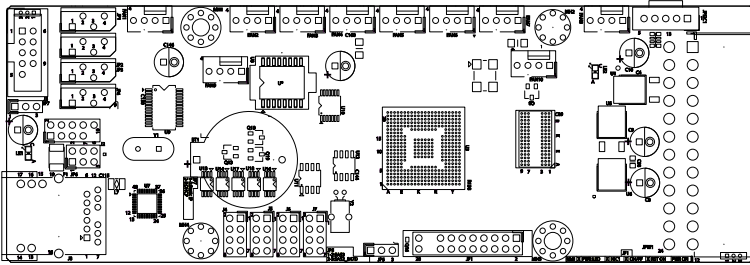
Figure G-10: Chassis Control Card (Sold Separately)

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.
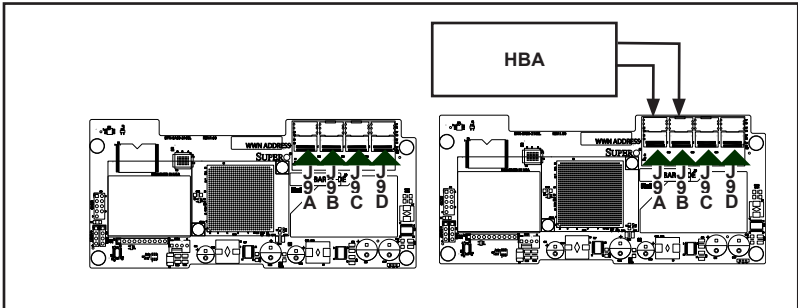
Figure G-11 Single Internal Host Bus Adapter
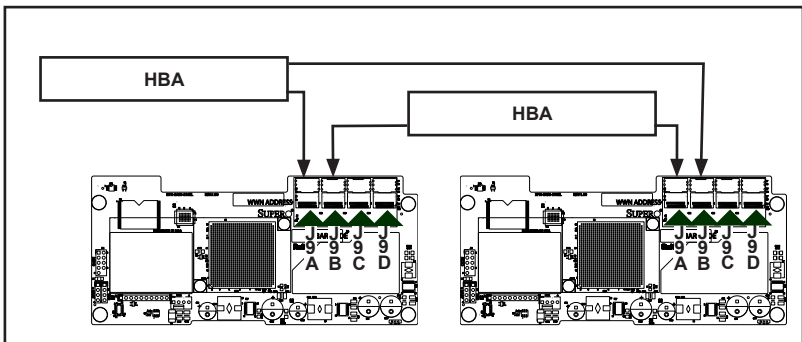
Figure G-12. Dual Internal Host Bus Adapter

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 <update>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.
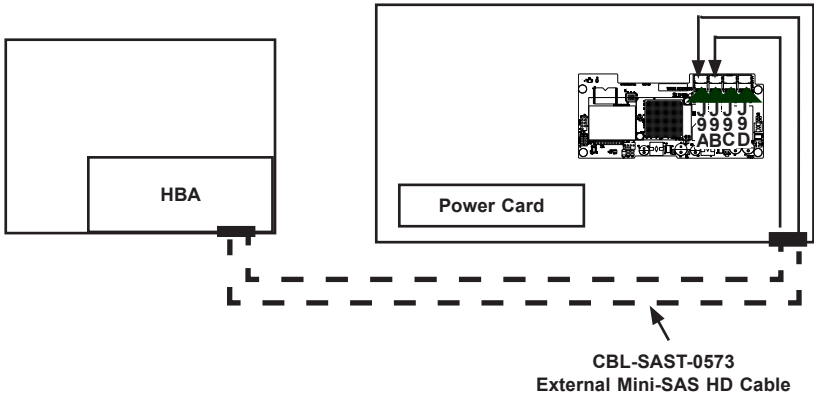
Single External Host Bus Adapter

CBL-SAST-0573
External Mini-SAS HD Cable

Figure G-13. Single External Host Adapter

Dual External Host Bus Adapter

CBL-SAST-0573
External Mini-SAS HD Cable
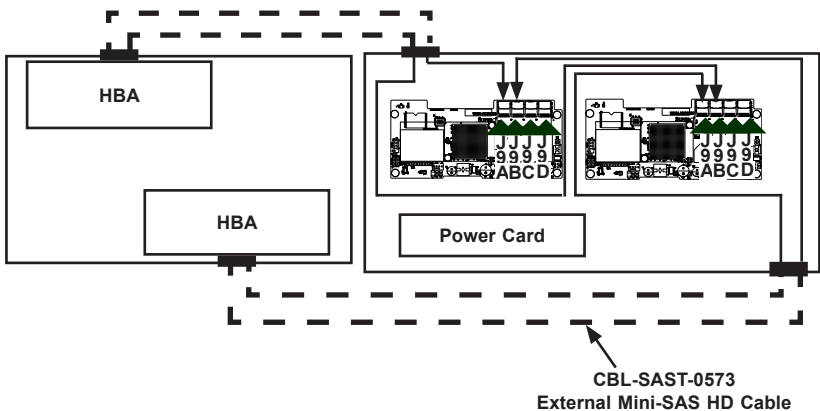
Figure G-15. Dual External Host Bus Adapter

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.
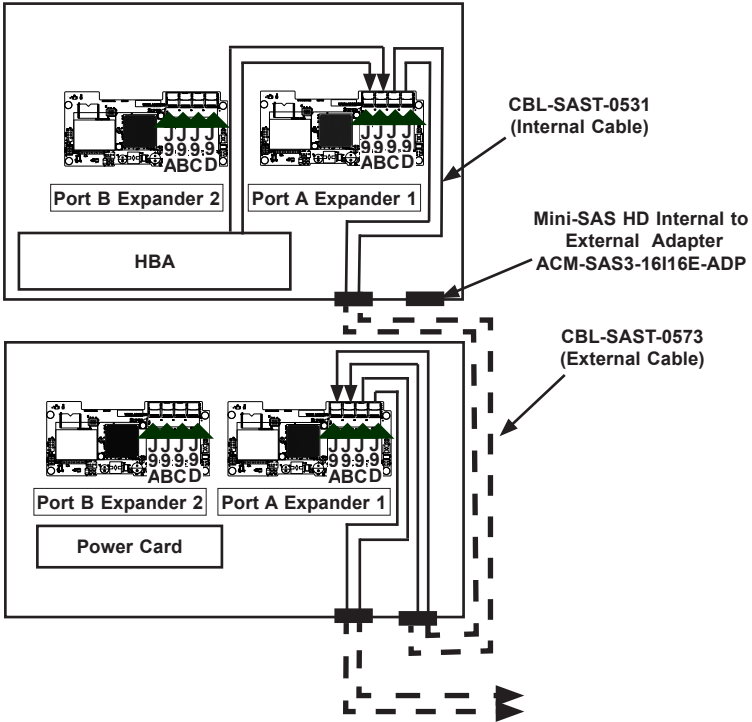
Figure G-16. Single HBA Configuration

Single HBA Configuration Cables

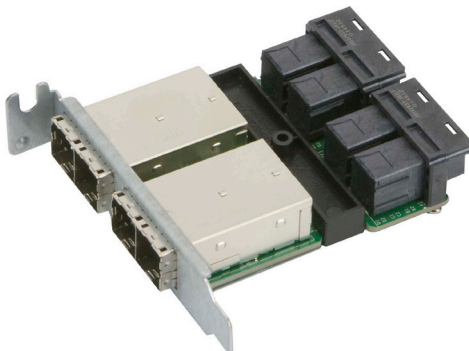**Figure G-17** External Mini-SAS HD to External Mini-SAS HD Cable

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 G-18. 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.
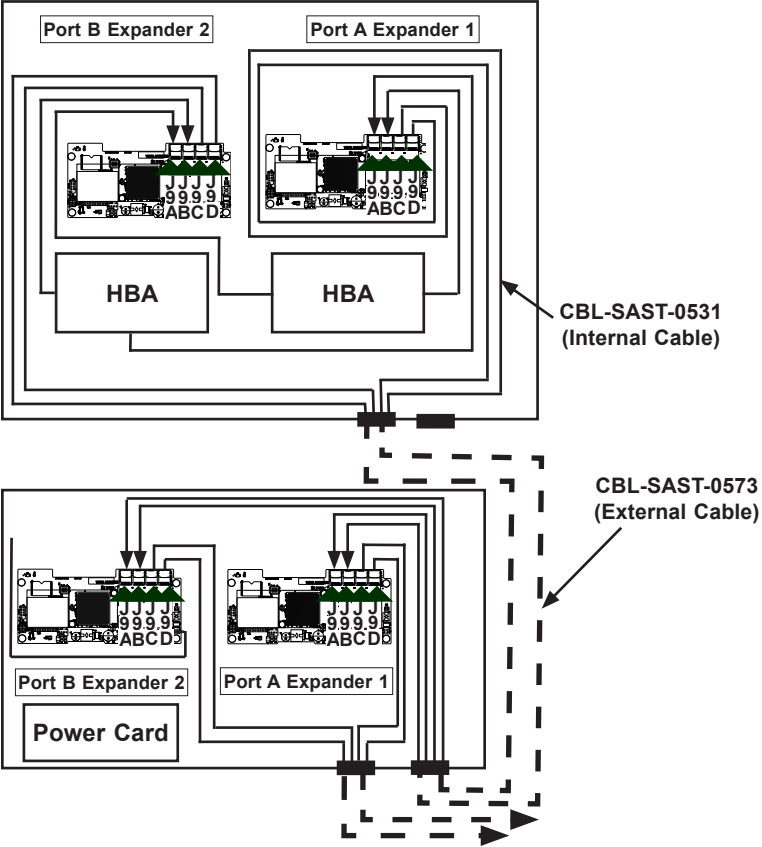

Figure G-19. Dual HBA Configuration

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

G-13 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.
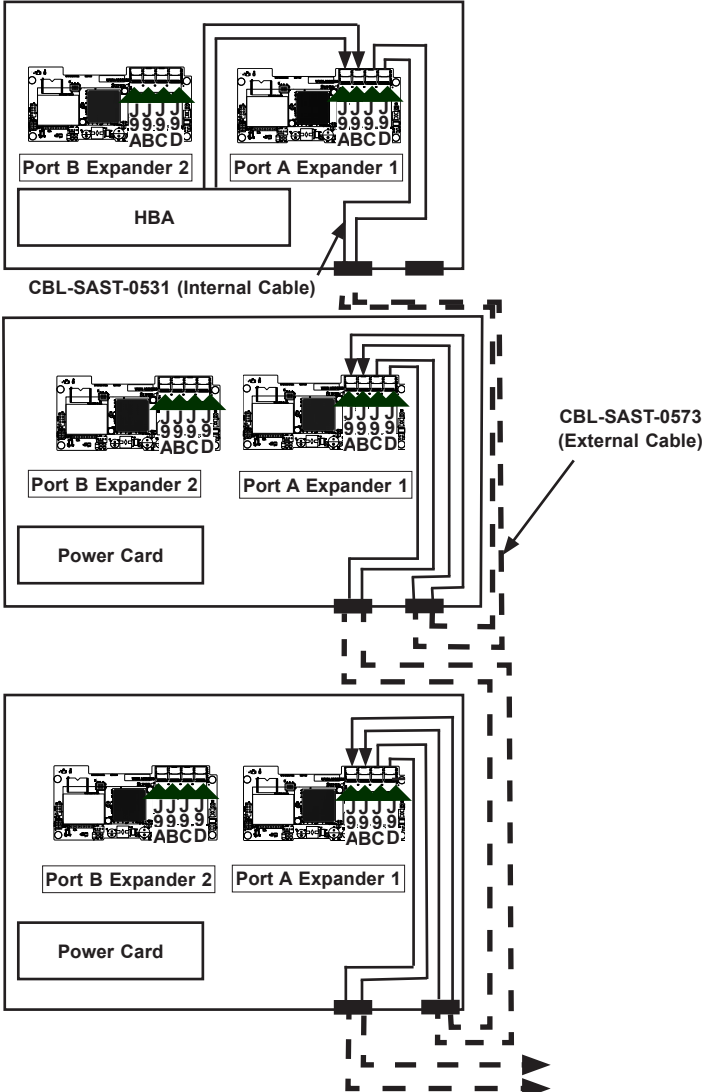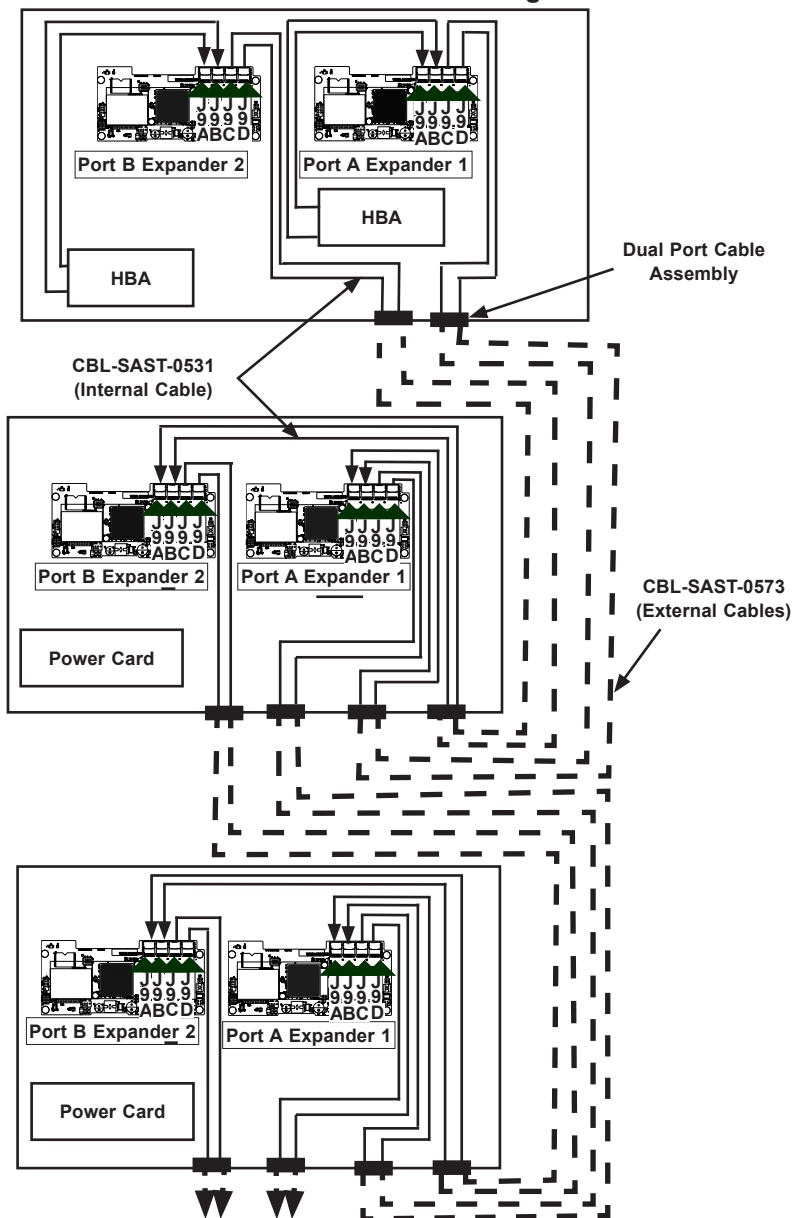

Figure G-20 Simple Cascaded Configuration

Dual SAS HBA and Cascaded Configuration

Figure G-21. 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

Disclaimer (cont.)

The products sold by Supermicro are not intended for and will not be used in life support systems, medical equipment, nuclear facilities or systems, aircraft, aircraft devices, aircraft/emergency communication devices or other critical systems whose failure to perform be reasonably expected to result in significant injury or loss of life or catastrophic property damage. Accordingly, Supermicro disclaims any and all liability, and should buyer use or sell such products for use in such ultra-hazardous applications, it does so entirely at its own risk. Furthermore, buyer agrees to fully indemnify, defend and hold Supermicro harmless for and against any and all claims, demands, actions, litigation, and proceedings of any kind arising out of or related to such ultra-hazardous use or sale.

Appendix H

BPN-SAS3-216EL1-N4 Backplane Specifications

Overview of the SAS3-216EL1-N4 Backplane

The Appendix H BPN-SAS3-216EL1-N4 backplane has been designed to utilize the most up-to-date technology available, providing your system with reliable, high-quality performance.

The Appendix H BPN-SAS3-216EL1-N4 is composed of the backplane model BPN-SAS3-216EB1-N4, Rev 1.01, and the daughter board model BPN-SAS3-216EL1, Rev 1.01. These are the most current releases available at the time of publication. Refer to the Supermicro website at www.supermicro.com for the latest updates, compatible parts and supported configurations.

Connectors, Jumpers and LEDs

This manual covers Appendix H BPN-SAS3-216EL1-N4 with NVMe capabilities.

H-1   Rear Connector Locations

The following connectors are on the side of the backplane that faces the rear of the chassis. They are marked by silkscreen labels.
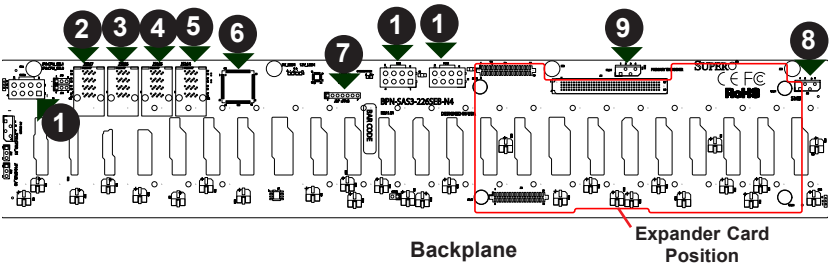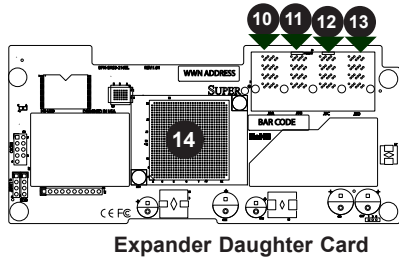

Backplane

Expander Card Position

Figure H-1. Rear Connector Locations

Expander Daughter Card

1. Power Connectors: PWR1-PWR3 (4-pin)

2. NVMe #4 Connector: JSM7

3. NVMe #3 Connector: JSM6

4. NVMe #2 Connector: JSM5

5. NVMe #1 Connector: JSM4

6. CPLD chip

7. CPLD upgrade: J27 (7-pin)

8. SMB: J38 (4-pin)

9. Primary I^2C Connector: PRI_I2C, J31.

10. Cascade In/Out: J9A

11. Cascade In/Out: J9B

12. Cascade In/Out: J9C

13. Expander In/Out: J9D

14. LSI SAS3X40

H-2   Rear Connector Definitions

1. Main Power Connectors

The 4-pin connectors, designated PWR1 through PWR6, provide power to the backplane.

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

2-5. NVMe Connectors

JSM4 through JSM7 provide connections for the NVMe drive cables. Pins are defined according the NVMe standard.

6-7. Complex Programmable Logic Device (CPLD) and Upgrade Header

This programable chip allows the backplane to support NVMe devices.

8. Primary SMB Connector

This header provides a connection with an optional JBOD control board.

9. Primary I²C Connector

This I²C connector is designated J31.

10.-13. SAS Cable Sockets

Cascade in or out: J9A - J9D

14. LSI SAS3X40 Expander chip

Note: Connectors not described are for engineering or manufacturing diagnostics only.
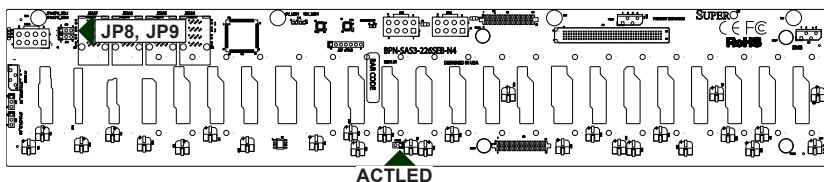
H-3   Rear Jumpers

ACTLED

Figure H-2. Rear Jumpers

Jumper Settings		
Jumper	**Settings**	**Note**
JP8: CPU_SEL0 JP9: CPU_SEL1	See table below	NVMe mapping to CPU

Jumpers		NVMe to CPU Connection	NVMe Cables	
CPU_ SEL0	**CPU_ SEL1**	**NVMe Drive Slots**	**VPP to CPU1**	**VPP to CPU2**
Open	Open	Slot 1-4 connected to one CPU (CPU1 or CPU2)	NVMe #1	NVMe #1
Open	Closed	Slot 1-3 connected to CPU 1 Slot 4 connected to CPU 2	NVMe #1	NVMe #4
Closed	Open	Slot 1-2 connected to CPU 1 Slot 3-4 connected to CPU 2	NVMe #1	NVMe #3
Closed	Closed	Slot 1 connected to CPU 1 Slot 2-4 connected to CPU 2	NVMe #1	NVMe #2

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.
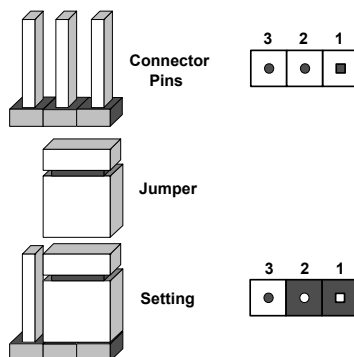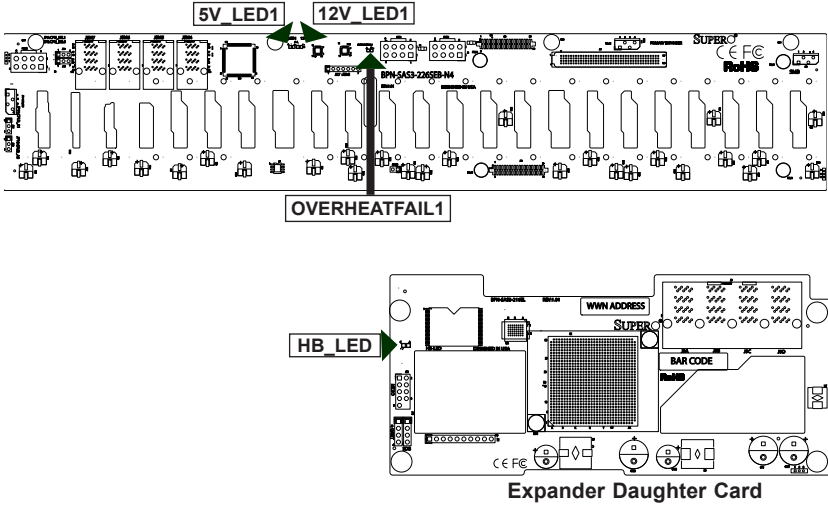
H-4   Rear LED Indicators

Expander Daughter Card

Figure H-3. Rear LEDs

Rear LEDs		
LED	**State**	**Specification**
5V_LED1	On	Indiicates normal operation. Light off indicates a 5V power failure
12V_LED1	On	Indiicates normal operation. Light off indicates a 12V power failure
OVERHEATFAIL1	On	Indicates the temperature exceeds normal operation.
HB_LED	Blinking	Blinking heart beat indicates the expander is running normally with firmware loaded.

H-5   Front Connectors and LED Indicators

The drive slots labeled SAS#0 through SAS#21 are for SAS3 or SATA3 storage devices. Drive slots labeled SAS#22 and SAS#23 are hybrid ports that support SAS3, SATA3 or NVMe.

SAS3/SATA3/NVMe
Hybrid Ports
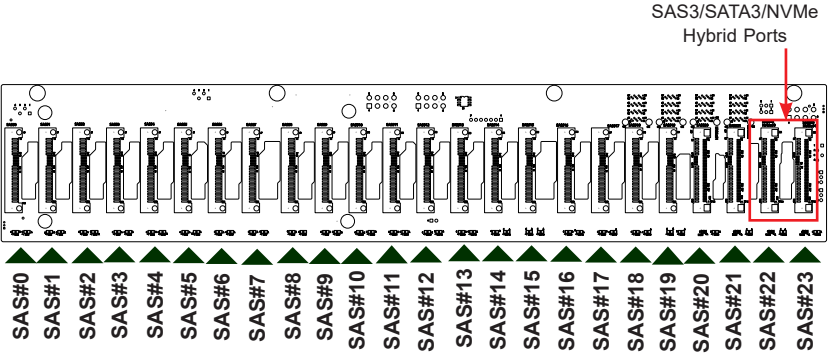
48 LEDs, two per receptacle, indicate activity and failure.
(along the bottom of the backplane)

Figure H-4. Front Connectors and LEDs

(table on following page)

Note: For the hybrid ports, SAS#22 and SAS#23, when using NVMe, it is best to have both of the NVMe cables connected at all times, even if a slot does not have an NVMe device. This is particularly true for the slot that provides the VPP connections, otherwise the other NVMe devices connected to the same CPU will not work.

Front SAS/SATA Connectors and LED Indicators			
Drive Number	Label	HDD Activity LED (blue)	Failure LED (red)
SAS#0	J0	ACT0	FAIL0
SAS#1	J1	ACT1	FAIL1
SAS#2	J2	ACT2	FAIL2
SAS#3	J3	ACT3	FAIL3
SAS#4	J4	ACT4	FAIL4
SAS#5	J5	ACT5	FAIL5
SAS#6	J6	ACT6	FAIL6
SAS#7	J7	ACT7	FAIL7
SAS#8	J8	ACT8	FAIL8
SAS#9	J9	ACT9	FAIL9
SAS#10	J10	ACT10	FAIL10
SAS#11	J11	ACT11	FAIL11
SAS#12	J12	ACT12	FAIL12
SAS#13	J13	ACT13	FAIL13
SAS#14	J14	ACT14	FAIL14
SAS#15	J15	ACT15	FAIL15
SAS#16	J16	ACT16	FAIL16
SAS#17	J17	ACT17	FAIL17
SAS#18	J18	ACT18	FAIL18
SAS#19	J19	ACT19	FAIL19
SAS#20/NVMe#1*	J20	ACT20	FAIL20**
SAS#21/NVMe#2*	J21	ACT21	FAIL21**
SAS#22/NVMe#3*	J22	ACT22	FAIL22**
SAS#23/NVMe#4*	J23	ACT23	FAIL23**

*Hybrid ports; NVMe, SAS, or SATA

**For hybrid ports, this failure LED is multi-color, as described in the table below.

Color and State	Indication
Red, solid	Failure
Red, blinking at 1Hz	Rebuild
Red, blinking at 4Hz	Indentify
Amber, blinking**	Attention! Do not remove NVMe device
Green**	NVMe device ready be removed

Cascading Configurations

H-6   Expander

BPN-SAS3-216EL1 model daughter cards have a single expander that accesses all of the twenty-four SAS ports supporting drives connected through the slots on the baseboard and also sixteen ports of SAS up-links or down-links through four Mini-SAS HD cable sockets.
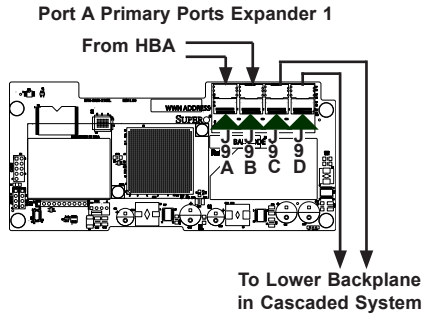
Figure H-5. Port Configuration
(For eight SAS up-links and eight SAS down-links)

H-7   JBOD Control Board and Support Cables

JBOD Control Board

In a cascaded configuration, the first chassis includes a motherboard and at least one host bus adapter (HBA). Other "Just a Bunch Of Disks" (JBOD) chassis in the system must be equipped with a JBOD Control Board (such as CSE-PTJBOD-CB3). This board is available as a separate product and is used to manage the power and IPMI (in place of a motherboard) for the JBOD chassis. For more information, see the Supermicro website (www.supermicro.com).
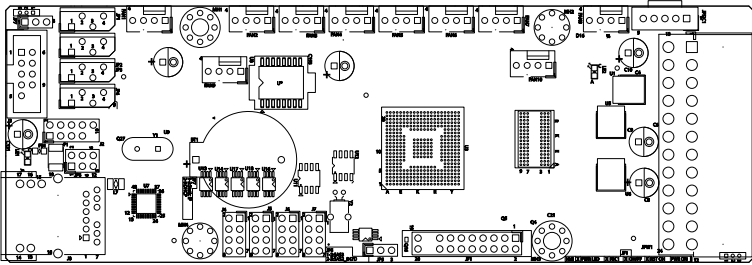
Figure H-6. JBOD Control Board (Sold Separately)

Power Card		
Part Number	**Part Type**	**Where Used**
CSE-PTJBOD-CB3	JBOD Control Board	Allows the chassis to be used as a JBOD system; supports IPMI for remote power control.

Connecting Multiple Internal HBAs to the Backplane

The following section lists the most common cables used to connect the HBA to the backplane.
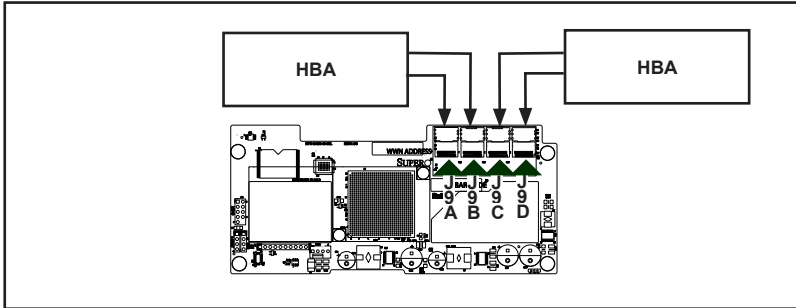
Figure H-7. Internal Host Bus Adapters

Supported Internal HBA Cables

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

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.
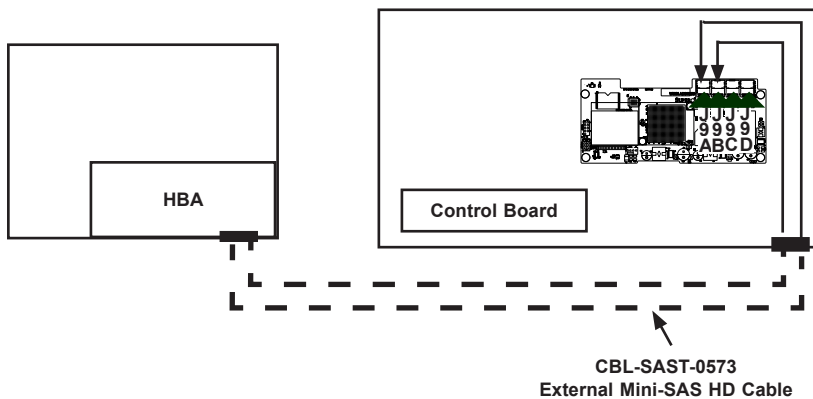
Single External Host Bus Adapter

Figure H-8. Single External Host Adapter

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.
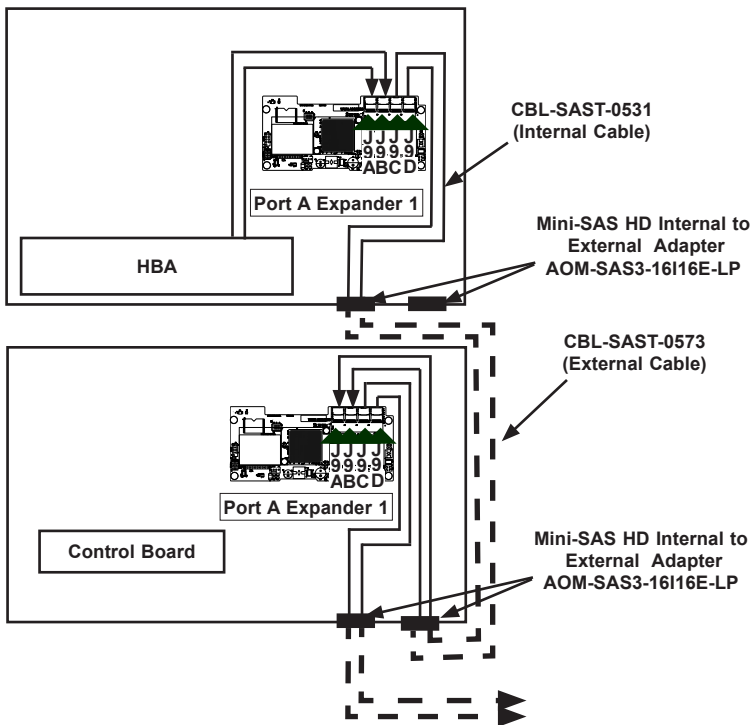
Figure H-9. Single HBA Configuration

Single HBA Configuration Cables

Figure H-10. 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.
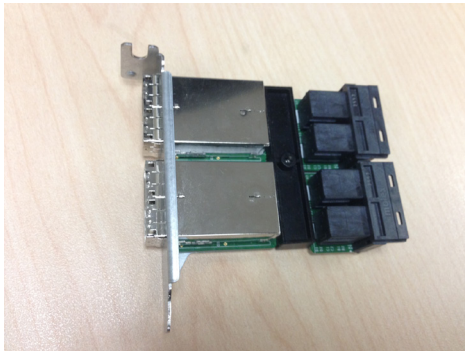
Figure H-11. Mini-SAS HD Internal to External Adapter

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.

H-8   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 JBOD Control Board, but no motherboard and no HBA. For more information, specific chassis manuals are available at www.supermicro.com.
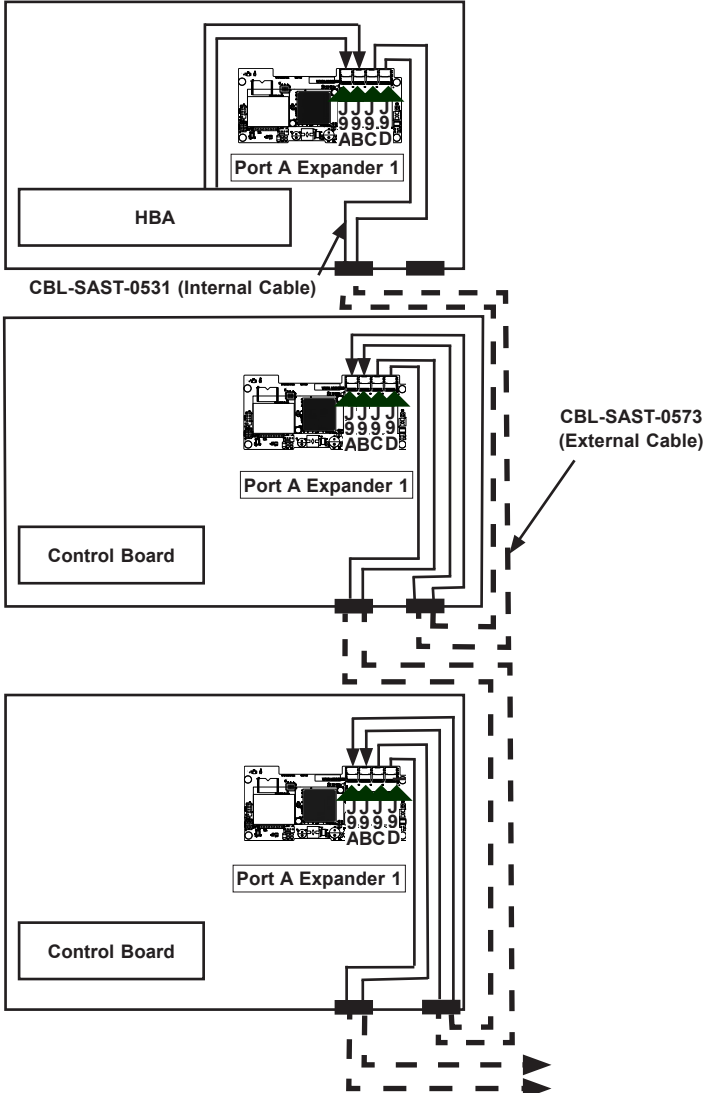

Figure H-12. Simple Cascaded Configuration

Notes