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Preface

About this Manual

This manual is written for professional system integrators, Information Technology professionals, service personnel and technicians. It provides information for the installation and use of Supermicro's 4U SuperBlade system. Installation and maintenance should be performed by experienced professionals only.

Manual Organization

Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the blade system and describes the main features of the mainboard and enclosure. A quick start procedure is also provided for your use.

Chapter 2: System Safety

You should familiarize yourself with this chapter for a general overview of safety precautions that should be followed when installing and servicing the 4U SuperBlade.

Chapter 3: Setup and Installation

Refer here for details on installing the 4U SuperBlade system into a rack.

Chapter 4: System Modules

This chapter covers modules in the 4U SuperBlade system, as well as the CMM module.

Chapter 5: Power Supply Modules

This chapter covers the system power supplies and their installation.

Appendix A: System Specifications

This appendix provides a summary of system specifications.
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Chapter 1
Introduction

1-1 Overview

The 4U SuperBlade is a compact self-contained server that connects to a pre-cabled enclosure that provides power, cooling, management and networking functions. One enclosure can hold up to fourteen blade servers. This new generation of the 4U SuperBlade enclosure is designed to deliver a much higher system density, and to incorporate many latest technologies to satisfy the increasing demands of modern technology and higher computing power.

In this manual, “blade system” refers to the entire system (including the enclosure and blades servers), “blade” or “blade server” refers to a single blade module and “blade enclosure” is the unit that the blades, power supplies and modules are housed in.

Each blade server is optimized to fit into either a specific fourteen-blade enclosure.

Please refer to our web site for information on operating systems that have been certified for use with the 4U SuperBlade at: www.supermicro.com/products/superblade/.

1-2 Quick Start Setup

This section covers how to quickly get your new 4U SuperBlade system up and running. Follow the procedure below to quickly setup your 4U SuperBlade system.

1. Unpack the components of your 4U SuperBlade system and check the packing list for damaged or missing components.
2. Select a setup location for your system. See "Choosing a Setup Location" on page 3-1 for details.
3. Mount the 4U SuperBlade chassis in your server rack. See "Installing the System Into a Rack" on page 3-3 for details.
4. Install the power supply modules into the rear of the 4U SuperBlade chassis. See "Installing a Power Supply" on page 5-3 for details.
5. Install the CMM module and any switch modules into the rear of the 4U SuperBlade chassis.
   a. For the CMM module, see "CMM Module Installation" on page 4-4 for details.
   b. For the Ethernet modules, see the 4U SuperBlade Network Modules User’s Manual for details.
   c. Attach network connections for your Ethernet modules. See the 4U SuperBlade Network Modules User’s Manual for details.
6. Setup your blade modules for use by doing the following:
   a. Open the module case lids of each blade module. Refer to the blade module user’s manual for details.
   b. Install memory into each module. Refer to the blade module user’s manual for details.
   c. Close the module case lids when you have installed your memory for each blade module. Refer to the blade module user’s manual for details.
   d. Install the hard disk drives into each module. Refer to the blade module user’s manual for details.
   e. Install your blade modules into your 4U SuperBlade chassis. Refer to the blade module user’s manual for details.

7. Connect the power cords for your 4U SuperBlade system’s power supply and plug them into your power source ONLY after you have installed and secured all system components.

8. Power up your 4U SuperBlade system. Check to be sure all components are operating right and are not showing any fault LEDs or alarms in their operation.

9. Install your selected operating system for each blade module. Refer to the blade module user’s manual for details.

10. Download a BIOS update for each of your blade modules from the Supermicro website.

1-3 Software Mode Selection

Using the Web-based Management Utility, you can specify your 4U SuperBlade system to use a quiet mode for quieter operation and lower fan speed. See Section 4-1: Chassis Management Module on page 4-2 for further details.
1-4 **Product Checklist of Typical Components**

- Blade Enclosure (x1): SBE-414E (4U, 14 full-height 2-socket blades)
- Blade Unit (minimum of 2, 14 maximum); see the Supermicro website (http://www.supermicro.com/products/superblade/) for a complete list of blades that can be mounted in your system. Some examples are listed below:
  - Dual socket (SP) – SBI-4429P-T2N (for SBE-414E)
  - Power Supplies (up to 4): PWS-2K21A-BR; see the Supermicro website (https://www.supermicro.com/products/SuperBlade/powersupply/) for details of power supplies available
  - CMM Module (x1): MBM-CMM-FIO or MBM-CMM-001; see the Supermicro website (https://www.supermicro.com/products/SuperBlade/management/) for details of the management modules available

Optional components include:

- Blade Add-on Card: AOM-SB414-01 (front control board)
- Ethernet Switches: MBM-XEM-001 (Broadcom 10-Gbps), MBM-XEM-002 (Intel 10-Gbps), MBM-GEM-001 (Intel 1-Gbps), MBM-GEM-004 (Broadcom 1-Gbps)

Additional modules will periodically become available. Please refer to http://www.supermicro.com/products/superblade for the most current list of modules available for the 4U SuperBlades.

Blade systems install into standard racks. Up to ten 4U blade systems may be installed into a 19" industry standard 42U rack.
For some details on the combinations and types of networking modules available, see Table 1-1 below. See the SuperBlade Network Modules User Manual for full details on available modules for the SuperBlade system.

<table>
<thead>
<tr>
<th>Model</th>
<th>Speed</th>
<th>Protocol</th>
<th>Maximum Number</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MBM-XEM-001</td>
<td>10G</td>
<td>Ethernet</td>
<td>Up to 2</td>
<td>56x 10G/2.5G/1G Ethernet downloads, 4x 40G Ethernet uplinks, 1 console port, 1 USB port, PHY: 960G/40G optical/copper QSFP+</td>
</tr>
<tr>
<td>MBM-XEM-002</td>
<td>10G</td>
<td>Ethernet</td>
<td>Up to 2</td>
<td>56x 10G/2.5G/1G Ethernet downlinks, 2x 40G Ethernet QSFP+ or, 1x 40G and 4x 10G Ethernet uplinks, 1 console port, 1 USB port PHY: 1280G/40G optical/copper QSFP+, Optional 10G Ethernet optical/copper SFP+</td>
</tr>
<tr>
<td>MBM-GEM-001</td>
<td>1G</td>
<td>Ethernet</td>
<td>Up to 2</td>
<td>56x 2.5G/1G Ethernet downlinks, 1 Gigabit Ethernet, 2x 40G Ethernet or 8x 10G Ethernet uplinks, 1 console port, 1 USB port PHY: 442G/40G optical/copper QSFP+, 10G optical/copper SFP+, Gigabit Ethernet copper RJ45</td>
</tr>
<tr>
<td>MBM-GEM-004</td>
<td>1G</td>
<td>Ethernet</td>
<td>Up to 2</td>
<td>40x 1G Ethernet downloads, 8x 1G Ethernet RJ45 and optional 4x 10G Ethernet Uplinks, 1 console port PHY: 176G, Optional 10G optical/copper SFP+, Gigabit Ethernet copper RJ45</td>
</tr>
</tbody>
</table>
Chapter 1: Introduction

1-5 Blade Enclosure Features

Supermicro’s 4U blade enclosures are designed to house up to 14 blade units. Each accommodates up to four (4U) power supplies. The enclosure mid-plane allows the blade units to share power, cooling and networking. Table 1-2 below describes the various enclosures, their components and modules. Table 1-3 shows the number of each module that may be installed in the various enclosure models.

Please check the Supermicro website for the latest module and enclosure installation information at http://www.supermicro.com/servers/blade/networking/matrix.cfm for further details.

<table>
<thead>
<tr>
<th>Enclosure Model</th>
<th>Blade Module Capacity</th>
<th>Power Supply Options</th>
<th>Blade Options</th>
<th>Module Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBE-414E-422</td>
<td>14 2-socket</td>
<td>4x2200W</td>
<td></td>
<td>MBM-CMM-FIO</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2x2200W plus 2xCooling Fans</td>
<td>SBI-4429P-T2N</td>
<td>MBM-CMM-001</td>
</tr>
<tr>
<td>SBE-414E-222</td>
<td></td>
<td>4x2000W DC Power Supplies</td>
<td></td>
<td>MBM-XEM-001</td>
</tr>
<tr>
<td>SBE-414E-420D</td>
<td></td>
<td>2x2200W plus 2x1200W BBP</td>
<td></td>
<td>MBM-XEM-002</td>
</tr>
<tr>
<td>SBE-414EB-222</td>
<td></td>
<td></td>
<td></td>
<td>MBM-GEM-001</td>
</tr>
</tbody>
</table>

Table 1-3. Number of Network Modules that May Be Installed in each Enclosure

<table>
<thead>
<tr>
<th>Name (SKU)</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max. CMM Modules supported</td>
<td>1</td>
</tr>
<tr>
<td>1G Ethernet Switch(MBM-GEM-001)</td>
<td>2</td>
</tr>
<tr>
<td>Broadcom 10G Switch (MBM-XEM-001)</td>
<td>2</td>
</tr>
<tr>
<td>Intel 10G Switch (MBM-XEM-002)</td>
<td>2</td>
</tr>
<tr>
<td>Broadcom 1G Switch (MBM-GEM-004)</td>
<td>2</td>
</tr>
</tbody>
</table>

The following sections provide a general outline of the main features for all blade server enclosures.

Power

The typical blade enclosure features a 2200W power system composed of up to four power supply modules for minimum power, power redundancy, or depending upon model selected. This power redundancy feature allows you to replace the failing power module while the backup module takes over to keep the system running. You must have either two or four power supply modules installed in the blade enclosure.
The Chassis Management Module assumes the worst case (maximum) power for any model of blade prior to applying power. If the power supplies cannot supply that amount of the required power for the given load on the power supplies, then the CMM will not allow that unit to power up. After a blade is powered up, the blade’s BIOS calculates the actual power load required by the blade based upon the installed devices and informs the CMM of its requirements. The CMM then adjusts the remaining supply of power for additional blades based upon the actual delta of the total power, minus the amount of power being used by the blades that are powered on.

**Middle Plane**

The middle plane connects the various capabilities of the blades, such as the various speed switch(es) to Network Interface Controller(s), the Chassis Management Module (CMM) to the USB devices to the Host Channel Adapters. These devices all connect to the middle plane through high density connectors that provide both signals and power. This type of configuration reduces the amount of system cabling and simplifies the task of setting up the system. It provides an alternative signals route to support redundant power, CMM, network and IPMI functions.

**NOTE:** Signaling information can NOT be physically routed from one blade to another.

**LEDs**

Two LEDs are located at the right top of the enclosure above the last or right most blade. The left LED provides Power Status information and the right LED is the Fault LED.

**Enclosure Cooling**

The cooling for the entire blade system is provided by the fans in the power supply modules and system fans that are installed in the bottom of the rear enclosure. If a power supply fails, its fans will continue to operate to provide continuous cooling. For this reason, a failed power supply should remain installed in the enclosure until a replacement unit is ready.

**NOTE:** Fans are controlled by Auto Mode or User Mode (User Mode from level 1 to 10).

**WARNING:** The fans are very noisy at full speed and it is recommended that they not be run at full speed when in use in an office or near populated workstations.

For SBE-414E-222 enclosures, additional cooling fan modules, each with two cooling fans, can be added in place of power supplies in the rear of the enclosure.

**NOTE:** In order to prevent air flow leaks that would reduce cooling efficiency in the blade system’s enclosure, install dummy blades to close off any blade slots that do not have active blade modules installed in them.

For overheat problems, check that there are no obstructions (such as poorly routed cables), check that all fans are operating normally and make sure the ambient room temperature is not too warm (refer to Section A-2: Environmental Specifications on page A-2 for the maximum operating temperature). You can also use either of the blade management software utilities to increase the fan speed and maximize system cooling.
In the event of a power overload, you will have to add additional power supply modules to take up the load. Otherwise, you will not be able to power up all the blade modules. The blade BIOS plus CMM firmware calculates the load to determine if the power supplies can adequately handle the total system configuration.

1-6 Power Supply Features

The 4U SuperBlade enclosure comes standard with one CMM module and up to four power supplies, depending on model selected. Information on the power supplies is summarized below. See Section 4-1: Chassis Management Module on page 4-2 for details on the CMM module and Chapter 5 for details on the power supplies.

The power supply units should be installed from right to left (behind slot 1 to slot 7) in the enclosure. See the table below for details on the power supplies for the different models of enclosures.

<table>
<thead>
<tr>
<th>Enclosure Model</th>
<th>Power Supplies and Fan Combinations</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBE-414E-422</td>
<td>Four 2200W power supplies</td>
</tr>
<tr>
<td>SBE-414E-222</td>
<td>Two 2200W power supplies plus two cooling fans</td>
</tr>
<tr>
<td>SBE-414E-420D</td>
<td>Four 2000W DC Power Supplies</td>
</tr>
<tr>
<td>SBE-414EB-222</td>
<td>Two 2200W power supplies plus two 1200W BBP’s</td>
</tr>
</tbody>
</table>

Table 1-5. Power Supply Population

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4 Power Supplies</td>
<td>PSU</td>
<td>PSU</td>
<td>PSU</td>
<td>PSU</td>
</tr>
<tr>
<td>2 Power Supplies</td>
<td>Dummy Fan</td>
<td>PSU</td>
<td>PSU</td>
<td>Dummy Fan</td>
</tr>
<tr>
<td>Battery Backup</td>
<td>BBP</td>
<td>PSU</td>
<td>PSU</td>
<td>BBP</td>
</tr>
</tbody>
</table>

NOTE 1: PSU = Power Supply Unit present in this location.

NOTE 2: BBP = Battery Backup Power module present in this location.
Power Supply Modules

Each power supply module has its own power cord. Four modules are required when the full complement of blade units are installed into an enclosure. An LED on the back of a power supply will be red when AC power is present and green when the power is on.

Supermicro’s high-efficiency blade system power supplies deliver continuous redundant power up to 96% peak efficiency. Each power supply module includes a management module that monitors the power supplies and the power enclosure.

See Chapter 5 for specifications and details on the power supplies available for the SuperBlade system.

Power Cord

Each power supply module has a C-14 type socket (IEC-60320-C14) for AC power and the power cord must have a C-13 type connector (IEC-60320-C13) to connect to the power supply.

Refer to Appendix A for power/amperage calculation tables. Refer to the supermicro web site for further details on power cords.

Power Supply Failure

If a power supply or a fan in a power supply fails, the system management software will notify you of the situation. In either case, you will need to replace the power supply module with another identical one. Please note that if a power supply fails, its fans will continue to operate to provide system cooling. For this reason, a failed power supply should remain installed in the enclosure until a replacement unit is ready.

See Chapter 5 for the procedure on replacing power supplies.

1-7 Special Design Features

Supermicro’s 4U SuperBlade offers special design features, some of which no other blade server can duplicate. These features give you extraordinary flexibility in configuring a blade system for your own particular needs.

Operating System Support

Please check with the SMC web page for certified OS at: https://www.supermicro.com/support/resources/OS/OS_Certification_Intel.cfm.

Remote Management

The Chassis Management Module (CMM) can manage the whole enclosure and any individual blade module by switching around to it.

NOTE: Some Blade modules already have onboard BMC.
Computing Density/Power

Dual core processors are supported in the blade module systems. Each 4U SuperBlade mainboard supports two processors and up to 384 GB of main memory. This translates to a maximum potential of up to 28 processors and 5.376 TB of memory per 14-blade enclosure, or 280 processors and 53.76 TB of memory for a 42U rack of ten 4U enclosures.

High-Efficiency Power Supplies

A reliable source of power is critical in server systems and even more so in a blade system, where up to fourteen systems (blades) share the same power source. 4U SuperBlade power supplies have been designed to operate at up to 96% peak efficiency and provide redundancy. Using high-efficiency power supplies results in a measurable reduction in wasted energy consumption and generated heat.

Returning Merchandise for Service

A receipt or copy of your invoice marked with the date of purchase is required before any warranty service will be rendered. You can obtain service by calling your vendor for a Returned Merchandise Authorization (RMA) number. When returning to the manufacturer, the RMA number should be prominently displayed on the outside of the shipping carton, and mailed prepaid or hand-carried. Shipping and handling charges will be applied for all orders that must be mailed when service is complete.

This warranty only covers normal consumer use and does not cover damages incurred in shipping or from failure due to the alteration, misuse, abuse or improper maintenance of products.

During the warranty period, contact your distributor first for any product problems.

For faster service, RMA authorizations may be requested online at:

http://www.supermicro.com/support/rma/
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Email: support@supermicro.com.tw
Chapter 2

Standardized Warning Statements

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

この警告信号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。

此警告符号代表危险。

您正处于可能受到严重伤害的工作环境中，在您使用设备开始工作之前，必须充分意识到触电的危险，并熟练掌握防止事故的程序。请按照每项警告的号找到此设备的安全性警告说明的翻译文本。

此警告符号代表危险。

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的號碼找到相關的翻譯說明內容。
Warnung

WICHTIGE SICHERHEITSHINWEISE


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.
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BELANGRIJKE VEILIGHEIDSSINSTRUCTIES

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.

¡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.

يش لكونه آت موراتا مهكشة لفني هوبر ممعرقة لموكر موه.
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.

This product is required to have a circuit breaker installed in the building’s electrical system for short-circuit protection. Ensure that the protective device does not exceed: 250 V, 20 A.

¡Advertencia!
Este equipo utiliza el sistema de protección contra cortocircuitos (surtension) 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.
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.

警告
在你打开机箱并安装或移除内部器件前，必须将系统完全断电，并移除电源线。
¡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 système.

장고!
시스템에 부품들을 장착하거나 제거하기 위해서는 새시 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.
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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.

警告
此部件应安装在限制进出的场所, 限制进出的场所指只能通过使用特殊工具、锁和钥匙或其它安全方式进出的场所。

警告
此装置仅限安装在限制进出的场所，限制进出的场所指只能通过使用特殊工具、锁和钥匙或其它安全方式进出的场所。

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).

警告
此装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、鎖頭及鑰匙或其它安全方式才能進入的區域。

警告
此装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、鎖頭及鑰匙或其它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.

警告用エンジンモニタ

¡Atención!

La unidad ha sido diseñada para instalación en áreas con acceso restringido. Sólo se puede obtener acceso a estas áreas mediante el uso de herramienta especial, cerradura con llave u otro medio de seguridad.

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、破壊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
电池更换不当会有爆炸危险。请只使用同类电池或制造商推荐的功能相当的电池更换原有电池。请按制造商的说明处理废旧电池。

Warnung

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.

警告
电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

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.
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らない。
警告
此部件连接的电源可能不止一个，必须将所有电源断开才能停止给该部件供电。
警告
此装置连接的电源可能不只一个，必须切断所有电源才能停止对该装置的供电。

Warnung
Dieses Gerät kann mehr als eine Stromzufuhr haben. Um sicherzustellen, dass der Einheit kein Strom 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!
ליחיה יש יותר מחיבור אחד של ספק. יש להפר את כל המובieurs שלת לאספק.

אותה!
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Backplane Voltage

Warning!

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

Waarschuwing

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

警告

当系统正在进行时，背板上有危险的电压或能量，进行维修时务必小心。

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.

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。

警告

当系统正在进行时，背板上有危险的电压或能量，进行维修时务必小心。
Warning!
Installation of the equipment must comply with local and national electrical codes.

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

Warnung
Die Installation der Geräte muss den Sicherheitsstandards entsprechen.

¡Advertencia!
La instalación del equipo debe cumplir con las normas de electricidad locales y nacionales.

警告
设备安装必须符合本地与本国电气法规。

Attention
警告
設備安裝必須符合本地與本國電氣法規。

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

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

警告
警告
設備安装必须符合本地与本国电气法规。
Product Disposal

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

警告
本产品的废弃处理应根据所有国家的法律和规章进行。

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。

Warning
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.

 sikayem mofrad

אזהרה!
סיכום סופי של פוצר זה должен להימצאות במסמכים הלאומיים והחוקיים המ ..........
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.

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.
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.
Warnung


¡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 cables 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 cables certifiés qui ont UL ou CSA indiqué sur le code pour tous les autres appareils électriques que les produits désignés par Supermicro seulement.

הטלית מתחים AC

אזהרה!

כאשר מתקינים את המוצר, יש להשתמש בכבלים, ספקים ומתחים_AC ומתחים_ACир נוגע לספקיםüşפ. שימור שבל כל ואיתור צין עבור ספקים ה-AC ואת התחלא או צין שולחן. לתוך שולחן. DPI תקופות מביתים תקופות ב-UL/CSA (בשאם מפורטים למעט ב-UL/CSA) או ב-UL/CSA. זרור לכ-AC או צינן bezאו צול על ידי תקופות בממבר. UL/CSA

אכזריה!

ליד תקופת הליד קיים אכזריה! כאשר מתקינים את המוצר, יש להשתמש בכבלים, ספקים ומתחים_AC או מצינים ACир נוגע לספקים-usp. שימור שבל כל ואיתור צין עבור ספקים ה-AC ואת התחלא או צין שולחן. לתוך שולחן. DPI תקופות מביתים תקופות ב-UL/CSA (בשאם מפורטים למעט ב-UL/CSA) או ב-UL/CSA. זרור לכ-AC או צינן bezאו צול על ידי תקופות בממבר. UL/CSA

אכזריה!

ליד תקופת הליד קיים אכזריה! כאשר מתקינים את המוצר, יש להשתמש בכבלים, ספקים ומתחים_AC או מצינים ACיר נוגע לספקים-usp. שימור שבל כל ואיתור צין עבור ספקים ה-AC ואת התחלא או צין שולחן. לתוך שולחן. DPI תקופות מביתים תקופות ב-UL/CSA (בשאם מפורטים למעט ב-UL/CSA) או ב-UL/CSA. זרור לכ-AC או צינן bezאו צול על ידי תקופות בממבר. UL/CSA

אכזריה!

ליד תקופת הליד קיים אכזריה! כאשר מתקינים את המוצר, יש להשתמש בכבלים, ספקים ומתחים_AC או מצינים ACיר נוגע לספקים-usp. שימור שבל כל ואיתור צין עבור ספקים ה-AC ואת התחלא או צין שולחן. לתוך שולחן. DPI תקופות מביתים תקופות ב-UL/CSA (בשאם מפורטים מעט ב-UL/CSA) או ב-UL/CSA. זרור לכ-AC או צינן bezאו צול על ידי תקופות בממבר. UL/CSA

אכזריה!

ליד תקופת הליד קיים אכזריה! כאשר מתקינים את המוצר, יש להשתמש בכבלים, ספקים ומתחים_AC או מצינים ACיר נוגע LID תקופת הליד קיים אכזריה! Gainesworth מחשבים באמצעות AC או מצינים ACיר Nogouy לספקים-usp. שימור שבל כל ואיתור צין עבור S 및 מקראות AC ואת התחלא או צין שולחן. לתוך שולחן. DPI תקופות מביתים תקופות ב-UL/CSA (בשאם Mפורטים מעעט ב-UL/CSA) או ב-UL/CSA. זרור לכ-AC או צינן bezאו צול על ידי תקופות בממבר. UL/CSA

אכזריה!

ליד תקופת הליד קיים אכזריה! Gainesworth מחשבים באמצעות AC או מצינים ACיר Nogouy לספקים-usp. שימור שבל כל ואיתור צין עבור S 및 מקראות AC ואת התחלא או צין שולחן. לתוך שולחן. DPI תקופות מביתים תקופות ב-UL/CSA (בשאם Mפורטים מעעט ב-UL/CSA) או B UL/CSA. Zeror לכ-AC או צינן bezאוב צול על ידי תקופות בממבר. UL/CSA
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警告！

 제품을 설치할 때에는 제공되거나 지정된 연결케이블과 전원케이블, AC 어댑터를 사용해야 합니다. 그 밖의 다른 케이블이나 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 UL 또는 CSA 에서 인증한 케이블 (전선 위에 UL/CSA 가 표시) 등의 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.
Chapter 3
Setup and Installation

3-1 Overview
This chapter provides a quick setup procedure for your 4U SuperBlade. Following these steps in the order given should enable you to have the system operational within a minimum amount of time. This quick setup assumes that the processor(s) and memory have already been installed. If not, please turn to Chapter 4 for details on installing specific components.

3-2 Unpacking the System
You should inspect the box the 4U SuperBlade was shipped in and note if it was damaged in any way. If the server 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 the 4U SuperBlade. 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. You will also need it placed near a grounded power outlet. Read the "Rack Precautions" and "Server Precautions" in the next section.

The box the 4U SuperBlade was shipped in should include two sets of rail assemblies, two handles and the mounting screws you will need to install the system into the rack. Follow the steps in the order given to complete the installation process in a minimum amount of time. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

Choosing a Setup Location
The following are important considerations for choosing a setup location:

• Leave enough clearance in front of the rack to enable you to remove the blade units (~25 inches).
• Leave approximately 30 inches of clearance behind or to the rear of the rack to allow for sufficient airflow and ease in servicing, as well as clearance for electrical power connections.
• This product is intended for installation only in a Restricted Access Location (dedicated equipment rooms, service closets and the like). This is because the 4U SuperBlade enclosure does not provide any physical security measures.
• This product is not suitable for use with visual display work place devices according to §2 of the German Ordinance for Work with Visual Display Units.

WARNING: Please read the following important Warnings and Precautions!
Rack Precautions
The following are important precautions concerning rack setup:

- The enclosure unit is heavy and requires at least two people to lift it.
- 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 installation, stabilizers should be attached to the rack.
- In multiple rack installations the racks frames should be grounded to the same earth ground as the electrical source for the power supplies by means of a grounding strap.

Server Precautions
The following are important precautions concerning server setup:

- Review the electrical and general safety precautions in Chapter 2.
- 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 up.
- Use a regulating uninterrupted 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 units 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
Below are listed important considerations for rack mounting.

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. Refer to Appendix E for operating temperature specifications.

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.
Chapter 3: Setup and Installation

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 over-current protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern. See the power calculation tables in Appendix A.

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 (such as the use of power strips and so on).

NOTE: It is recommended that you seek the advice and assistance of a licensed electrician that can advise you on best practices for ensuring that the electrical supply and the rack are joined to a Common Bonding Network.

Professional documents on grounding techniques include:
• ANSI/TIA-942 – Telecommunications Infrastructure Standard for Data Centers
• J-STD-607-A-2002 – Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications

Installing the System Into a Rack

This section provides information on installing the 4U SuperBlade into a rack. There are a variety of rack units on the market, meaning the procedure may differ slightly. Refer to the Enclosure Template that was included with the system for help.

Rack Mounting Hardware

The following is a list of rack mounting hardware you will need for rack setup and installation:
• Two rail assemblies (one for each side of the enclosure)
• Two handles
• Four roundhead screws for fastening the enclosure ears to the rack
• Eight flathead screws and washers for mounting the rails to the rack
Installation

Use the procedure below for installing an enclosure in a rack.

Installing an enclosure:

1. Decide where you want to place the blade enclosure into the rack (see "Rack Mounting Considerations" in the previous section).

2. The two enclosure rail sections are screwed together to keep them immobile during shipping. Release these screws just enough to allow the rails to slide apart. Note the arrow on the rail, which indicates the end that attaches to the front of the rack.

3. Slide the rails apart far enough to match the depth of the rack. Position the rails with the template and secure the front of each to the front of the rack with two flathead screws, then secure the back of each rail to the rear of the rack with two flathead screws (see Figure 3-1). Note that the rails are left/right specific and very heavy.

4. (Optional step) Add the front left and right handles to the enclosure using five screws to secure each handle. Install a thumbscrew through the bottom hole of each handle (see Figure 3-2).

**NOTE:** These handles are optional and need only be installed when mounting the system into a short rack. When mounting into a deep rack, they are unnecessary and regular screws should be used instead of thumbscrews.

Be aware that these handles are not to be used for lifting the system, they are only to be used to slide the system within the rack.

5. With one person on either side (see the descriptive label on the side of the enclosure), lift the enclosure and slide it into the installed rails.

**WARNING:** Be sure that the enclosure is empty of all blades, power supplies, switches and management modules BEFORE lifting. These should be installed AFTER the enclosure is mounted in the rack. Injury and damage may occur if components are not removed from the rack prior to installation.

6. After pushing the enclosure all the way into the rack, use two roundhead screws on each side of the server to lock it into place.
Chapter 3: Setup and Installation

7. The enclosure is now securely installed in the rack (see Figure 3-3).

Figure 3-2. Attaching the Optional Handles

Figure 3-3. Enclosure Installed into Rack

4U Enclosure in Rack
Chapter 4
System Modules

In addition to the blade units, your blade system comes equipped with one or more system modules. The modules fit into the rear of the enclosure into bays above and/or below the power supplies. This chapter describes the various blade modules that may be part of your blade system. Module configurations can be customized; you can install two of the same type module for redundancy purposes or you may omit a module altogether (except for the CMM, which is a required module). Figure 4-1 shows a typical module configuration in a 4U blade system. See Chapter 5 for information on power supply modules.

**WARNING:** All module bays must be populated either with a module or a dummy module cover to maintain proper airflow.

![Figure 4-1. 4U SBE-414E Enclosure Rear View](image)

<table>
<thead>
<tr>
<th>Item#</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>These bays can hold any of the following: 1Gb Ethernet Switch Module or a 1/10Gb Ethernet Switch Modules</td>
</tr>
<tr>
<td>2</td>
<td>CMM (Chassis Management Module)</td>
</tr>
<tr>
<td>3</td>
<td>Triple System Fan Modules</td>
</tr>
<tr>
<td>4</td>
<td>2200W Power Supplies (x2 required, x2 optional depending upon system requirements); these bays can also install house fan modules instead of power supplies</td>
</tr>
</tbody>
</table>
4-1 Chassis Management Module

The Chassis Management Module (CMM) (Figure 4-2) is a required module in a blade system. This "command" module communicates with the blade units, the power supplies and the blade switches. Used in conjunction with the Web Interface or IPMI View management software, the CMM provides administrator control over individual blade units, power supplies, cooling fans and networking switches and monitors onboard temperatures, power status, voltage levels and fan speeds. The standard CMM module for the SuperBlade system is the MBM-CMM-FIO or MBM-CMM-001.

NOTE: Using the MBM-CMM-FIO in the enclosure allows the use of the two front mounted RJ45 ports on the enclosure, however using the MBM-CMM-001 does not allow these ports to function.

The CMM provides a dedicated, remote KVM (keyboard/video/mouse) connection over an out of band TCP/IP Ethernet network during any server state (functioning, blue-screen, powered down, BIOS and so on). It also supports Virtual Media (VM) redirection for CD, floppy and USB mass storage devices and configures such information as the switch IP addresses. A summary of CMM features is shown in Table 4-3.

Figure 4-2. Chassis Management Module MBM-CMM-FIO

<table>
<thead>
<tr>
<th>Item#</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Power LED</td>
</tr>
<tr>
<td>2</td>
<td>Fault LED</td>
</tr>
<tr>
<td>3</td>
<td>Information LED</td>
</tr>
<tr>
<td>4</td>
<td>USB Ports</td>
</tr>
<tr>
<td>5</td>
<td>IPMI Port</td>
</tr>
<tr>
<td>6</td>
<td>Ethernet Ports</td>
</tr>
<tr>
<td>7</td>
<td>Reset Button</td>
</tr>
<tr>
<td>8</td>
<td>Module Release Handle</td>
</tr>
</tbody>
</table>
Table 4-3. MBM-CMM-FIO Module Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management Capabilities</td>
<td>Can manage 14 blade units, network modules and 4 power supplies</td>
</tr>
<tr>
<td>Ports</td>
<td>Two Ethernet ports, one IPMI Ethernet port and two USB ports (for debug only)</td>
</tr>
<tr>
<td>Basic Functions Supported</td>
<td>Remote KVM, remote storage, Serial-over-LAN (SOL), blade monitoring and control</td>
</tr>
<tr>
<td>System Management</td>
<td>System management interface provided via dedicated LAN</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>Approximately 20W</td>
</tr>
<tr>
<td>Operating System</td>
<td>Firmware (upgradable)</td>
</tr>
</tbody>
</table>

Table 4-4. MBM-CMM-001 Module Interface

<table>
<thead>
<tr>
<th>Item#</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Power LED</td>
</tr>
<tr>
<td>2</td>
<td>Fault LED</td>
</tr>
<tr>
<td>3</td>
<td>Information LED</td>
</tr>
<tr>
<td>4</td>
<td>USB Ports</td>
</tr>
<tr>
<td>5</td>
<td>Ethernet Ports</td>
</tr>
<tr>
<td>6</td>
<td>Serial Port</td>
</tr>
<tr>
<td>7</td>
<td>Reset Button</td>
</tr>
<tr>
<td>8</td>
<td>Module Release Handle</td>
</tr>
</tbody>
</table>
CMM Module Installation

Use this procedure to install the MBM-CMM-FIO or MBM-CMM-001 CMM module to the 4U SuperBlade chassis. Make sure the cover to the module has been installed before proceeding. Follow the anti-static precautions described in Chapter 2.

**Installing the Module:**

1. Remove the dummy cover from the bay you want to place the module in.
2. Place the module’s release handle in the open position.
3. Slide the module into the module bay until it stops.
4. Push the release handle to the closed position.
5. After the module has been installed and the handle locked, it will turn on and a POST test will run to verify it is working properly.

**Removing the Module:**

1. Pull out the release handle to the open position.
2. Pull the module out of the bay.
3. Replace immediately with another module or with a dummy module cover to maintain airflow integrity.

**Configuring the CMM**

To access/configure the CMM, you first have to configure the IP settings of the CMM depending on your network environment. The below procedure for this configuration just serves as a reference for getting the CMM setup. If your system has Linux OS, please follow similar instructions to get the CMM setup.

The CMM access topology is as follows:

---

Table 4-5. MBM-CMM-001 Module Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management Capabilities</td>
<td>Can manage 14 blade units, network modules and 4 power supplies</td>
</tr>
<tr>
<td>Ports</td>
<td>Two Ethernet ports, one serial port and two USB ports (for debug only)</td>
</tr>
<tr>
<td>Basic Functions Supported</td>
<td>Remote KVM, remote storage, Serial-over-LAN (SOL), blade monitoring and</td>
</tr>
<tr>
<td>System Management</td>
<td>and control, switch, PWS, monitor, thermal, redundant based on specific</td>
</tr>
<tr>
<td></td>
<td>enclosure model.</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>Approximately 20W</td>
</tr>
<tr>
<td>Operating System</td>
<td>Firmware (upgradeable)</td>
</tr>
</tbody>
</table>

---
Chapter 4: System Modules

**DHCP Access:**
1. Connect a network cable to the CMM module.
2. The DHCP mode will appear on the CLI mode screen.
3. If the DHCP is not active, it will proceed to the next default IP of CMM at https://192.168.100.100.
4. If the CMM cannot enter the default IP, then an RJ45/USB cable can be connected from the CMM's RJ45 Ethernet LAN Port to the Desktop Host using the USB Port in Serial Port mode with a speed set at 115200.

**Default IP Access:**
1. Connect network cable to the network port at CMM.
2. At system Prompt, https://192.168.100.100

Requirements are:
- Computer system with LAN (RJ45) port
- RJ45 Ethernet cable

The default IP of the CMM is https://192.168.100.100. Configure the Computer system (connected through Ethernet-LAN to the CMM) to the same address range (for example https://192.168.100.101). The default mode is the Fail Over mode. If the DHCP fails, then the CMM will automatically default to the IP address of the CMM.

**Configuring the CMM in Windows OS:**
1. Go to **START → CONTROL PANEL → NETWORK CONNECTIONS**
2. Right-click on **LAN** to view properties.
3. Choose "Internet Protocol (TCP/IP)" under the **GENERAL** tab and click on **PROPERTIES** (see **Figure 4-4**).

*Figure 4-4. Choose Internal Protocol*
4. Manually configure the IP address of the computer system to be in the same address range as the CMM (see Figure 4-5).

Example:

- IP address: https://192.168.100.101
- Subnet Mask: 255.255.255.0
- Default Gateway: 192.168.100.1

Figure 4-5. Manually Configure the IP Address

5. Once the IP address for the computer system is configured, the CMM can be accessed through the web browser by entering the default IP address 192.168.100.100 of the CMM into the browser’s address bar.
Chapter 4: System Modules

6. Now, the IP address, subnet mask and default gateway of the CMM can be changed according to the network environment (see Figure 4-6). Please refer to the Web-based Management Utility User’s Manual for more information.

Figure 4-6. Changing Settings

WARNING: Don't change any other setting, unless you are familiar with it.

NOTE: The above screens are examples for purposes of demonstrating this procedure. The screens you actually view may or may not appear the same as those shown above.
CMM Functions

The following sections describe local functions and remote functions of the CMM. With only minor exceptions, all of the remote functions can be performed by one of three mechanisms: web-based access to the CMM module, access to the CMM using IPMIview, a client tool implemented in Java, or via IPMItool commands (DOS commands or shell scripted commands).

When the web based browser is used, the CMM acts as a web server, requiring a higher bandwidth connection to the CMM. If there are any bandwidth constraints, IPMI will provide a superior experience. Additionally, since graphical updates are provided by client-side Java, IPMIview can also be a superior user experience.

IPMItool on the other hand can provide the ability to issue similar/identical commands to many 4U SuperBlade enclosures/CMM’s to manage all of them in a similar way.

Remote KVM over IP

Remote KVM over IP is independent from local KVM. Remote KVM encrypts all communication between the remote user and the CMM.

To Use: Remote KVM over IP is initiated with the management software (IPMI View or Web-based utility). Attach the LAN cable to the LAN port on the CMM module then refer to "Web-based Management Utility" on page 4-11 to login and use either utility.

Remote Storage (Virtual Media)

The Remote Storage function allows the user to connect to a remote storage device (such as a floppy, hard disk, or USB storage device) and access the device as if it were local. This can be used not only to read and write to remote storage devices but to load an operating system from a remote drive.

Serial Over LAN (SOL)

Serial Over LAN allows you to redirect the input and output of a serial port via IPMI in order to manage blade modules from a remote location.

To Use: Serial Over LAN can be activated via the Web-based Management utility. See the Web-based Management Utility User’s Manual for the procedure to initiate SOL.
Chapter 4: System Modules

Monitoring Functions

Used in conjunction with IPMI or the Web-based Management utility, the CMM module can monitor and provide information on the hardware health of the blade modules and the system as a whole. In addition to the monitoring functions, you can remotely power on, power off or reboot a system.

Health information includes:
- Temperature levels
- Fan speeds
- Voltage levels
- Power status

Power Consumption Management

The CMM module’s firmware can also control all power on/off activity in the whole blade system. This is done by using the Power button, onboard BMC or from any other use of remote management software.

Once a blade module is installed in the enclosure the installed CMM immediately receives information on the rated Max Power Consumption value of the new blade module. The CMM then calculates whether there is enough power for this new blade module by comparing the Max Power Consumption value of the new blade module with the calculated Remaining Power value of the system.

If there is enough power, the CMM will power on the blade. However if there is not enough power in the blade system, then the new blade module is not powered on and the front panel LED on the enclosure will blink.

After the blade is powered on, the CMM then collects the actual power consumption of this individual blade and updates the calculated Remaining Power value for the system.

The CMM also reserves power for all the networking and chassis management modules installed on the system.

**WARNING:** One CMM module must be running to control the power systems and prevent overloading.
USB Ports and Reset Button

The USB Ports and Reset Button on the CMM are described below.

Figure 4-7. USB Ports on CMM

USB Ports

The USB ports on both CMM modules are shown in Figure 4-7. They are only used for debugging purposes and not for communication with your system.
Chapter 4: System Modules

Reset Button

The Reset button located on the front of the CMM module is used to reset the following software settings to their defaults:

To reset the CMM to factory defaults, press and hold the Reset button for five seconds.

Table 4-6. CMM Reset Settings

<table>
<thead>
<tr>
<th>Software Setting</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>User Name and Password</td>
<td>Reset to ADMIN and ADMIN (case sensitive)</td>
</tr>
<tr>
<td>IP Address</td>
<td>Reset to <a href="https://192.168.100.100">https://192.168.100.100</a></td>
</tr>
<tr>
<td>Gateway Address</td>
<td>Reset to 0.0.0.0</td>
</tr>
<tr>
<td>Subnet Mask</td>
<td>Reset to 255.255.255.0</td>
</tr>
</tbody>
</table>

Firmware

The firmware for the CMM switch resides in the module. This firmware can be updated with the web-based management utility.

Within the utility, go to the MAINTENANCE > UPDATE FIRMWARE screen in the Web-based Management Utility. Here you can enter the name of the firmware you want to update or click on BROWSE to select the firmware file. Finish by clicking the UPLOAD button.

NOTE: This process is not reversible once the firmware is updated, so proceed with caution. It might take a few minutes to complete this procedure.

Web-based Management Utility

System management may be performed with either of three software packages: IPMiview, SMCIPMItool or a Web-based Management Utility. Any of these utilities are designed to provide an administrator with a comprehensive set of functions and monitored data to keep tabs on the system and perform management activities.

The Web-based Management Utility is a web-based interface that consolidates and simplifies system management for Supermicro 4U SuperBlade systems. The Web-based Management Utility aggregates and displays data from the CMM module.

The Web-based Management Utility provides the following key management features:

- Enables IT administrators to view in-depth hardware configuration and status information using a single intuitive interface.
- Provides an OS-independent, remote graphical console.
- Allows remote users to map local media (floppy, removable disks and hard drives) or ISO images on a shared network drive to a blade server.
Supported Browsers

The following browsers have been tested for use with the Web-based Management Utility. It is recommended that you use the most current revision of the browser you choose. The minimum browser revisions supported by the Web-based Management Utility are shown below:

- Internet Explorer 7
- Firefox 2.0.0.7
- Netscape 9.03b

Network Connection/Login

To log into the Web-based Management Utility:

1. Launch a web browser.
2. In the address field of the browser, enter the IP address that you assigned to the system and hit the <ENTER> key.
3. When the browser makes contact with Supermicro’s Chassis Management Module, enter your [username] and [password], then click LOGIN.
4. The WEB-BASED MANAGEMENT UTILITY HOME PAGE will then display as shown in Figure 4-8.

Address Defaults

Table 4-7 shows the default addresses that are initially set for the CMM. Afterwards, you can change these values within the program (see the Web-based Management Utility User’s Manual M for more details).

Table 4-7. Address Defaults

<table>
<thead>
<tr>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Default IP Address</td>
<td><a href="https://192.168.100.100%C2%B3">https://192.168.100.100³</a></td>
</tr>
<tr>
<td>Default Gateway Address</td>
<td>0.0.0.0</td>
</tr>
<tr>
<td>Default Subnet Mask</td>
<td>255.255.255.0</td>
</tr>
<tr>
<td>Default username</td>
<td>ADMIN</td>
</tr>
<tr>
<td>Default password</td>
<td>ADMIN</td>
</tr>
</tbody>
</table>

Note: The web address must be entered as https://192.168.100.100 in the web browser. Entering only http:// gives you instead an address error.
Chapter 4: System Modules

Home Page

Figure 4-8 displays the Web-based Management Utility Home Page and its controls.

Figure 4-8. Home Page

<table>
<thead>
<tr>
<th>Blade Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blade A1</td>
</tr>
<tr>
<td>Blade A3</td>
</tr>
<tr>
<td>Blade A5</td>
</tr>
<tr>
<td>Blade A7</td>
</tr>
<tr>
<td>Blade A9</td>
</tr>
<tr>
<td>Blade A11</td>
</tr>
<tr>
<td>Blade A13</td>
</tr>
<tr>
<td>Blade A15</td>
</tr>
</tbody>
</table>

NOTE: For more information on the Web-based Management Utility, and a description of its controls, see the Superblade Web-based Management Utility User’s Manual for more details.
Chapter 5
Power Supply Modules

The 4U SuperBlade enclosure comes standard with one CMM module (see the Chapter 4 for details on the CMM module) and either two or four power supplies. See Appendix A for summary specification details on the power supplies available to the 4U SuperBlade enclosure.

5-1 Power Supply Modules

The minimum amount of modules required to power the system depends upon the full complement of blade units installed into an enclosure and the type of switches installed in the enclosure. An LED on the back of a power supply will be amber when AC power is present and green when the power is on.

When installing only a few power supplies in the enclosure, they should be installed first in the lower rather than the upper power bays. This is to provide increased airflow across the memory modules within each blade module.

The 2200W power supply modules require a 200-240V AC input and a C14 socket, which requires a power cord with a C13 connector.

Supermicro’s high-efficiency blade system power supplies deliver continuous redundant power up to 94% peak efficiency. Each power supply module includes a management module that monitors the power supplies and the power enclosure.

The features of these power supplies are shown below.

Table 5-1. Amperage Draw Specifications for the PWS-2K21A-BR Power Supply

<table>
<thead>
<tr>
<th>Watts</th>
<th>Low Volts</th>
<th>High Volts</th>
<th>Low Amps</th>
<th>High Amps</th>
</tr>
</thead>
<tbody>
<tr>
<td>1200W</td>
<td>100</td>
<td>127</td>
<td>11</td>
<td>14</td>
</tr>
<tr>
<td>1980W</td>
<td>220</td>
<td>230</td>
<td>9.8</td>
<td>10</td>
</tr>
<tr>
<td>2090W</td>
<td>230</td>
<td>240</td>
<td>9.8</td>
<td>10</td>
</tr>
<tr>
<td>1800W</td>
<td>200</td>
<td>220</td>
<td>9.5</td>
<td>10</td>
</tr>
<tr>
<td>2200W (UL/cUL only)</td>
<td>220</td>
<td>240</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>2090W (UL/cUL only)</td>
<td>180</td>
<td>220</td>
<td>11</td>
<td>14</td>
</tr>
</tbody>
</table>
### Table 5-2. PWS-2K21A-BR Power Supply Features

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Redundant Module (N+1/N+N)</td>
</tr>
<tr>
<td>+12V</td>
<td>183.33A (2200W), 174.17A (2090W), 165A (1980W), 150A (1800W) or 100A (1200W)</td>
</tr>
<tr>
<td>+12VSB</td>
<td>2A</td>
</tr>
<tr>
<td>PFC</td>
<td>Yes</td>
</tr>
<tr>
<td>Peak Efficiency</td>
<td>96%+ (Titanium Level)</td>
</tr>
<tr>
<td>Operating Conditions</td>
<td>Temp: 0 to 50 C, Humidity: 5 to 95% RH</td>
</tr>
<tr>
<td>Fan Type</td>
<td>80x80mm counter rotating fan</td>
</tr>
<tr>
<td>Dimensions (LxWxH)</td>
<td>245.3 x 106.5 x 84mm</td>
</tr>
</tbody>
</table>
Chapter 5: Power Supply Modules

Power Supply Failure

If a power supply or a fan in a power supply fails, the system management software will notify you of the situation. In either case, you will need to replace the power supply module with another identical one.

NOTE: Refer to www.supermicro/products/superblade for possible updates on part numbers.

Installing a Power Supply

1. Insert a replacement unit into the empty power bay with the handle to the left.

WARNING: This left/right orientation depends on the power supply’s top or bottom location. If you inadvertently put a power supply upside down in the lower slots, it can be VERY difficult to remove the power supply.

2. Push unit all the way in until it is firmly seated.

3. Push the handle back into the closed position until it clicks into the locked position.

4. Move the locking clip away from the socket and reconnect the power cord.

Removing a Power Supply

First, make sure the power supply has been shut down. You can remove power from a power unit via your system management software.

1. Remove the power cord from the power supply unit.

2. Release the locking clip to unlock the power supply module.

3. Pull out the handle and remove the unit: the two-piece handle locks into the closed position. To release the handle, squeeze together the two metal plates of the handle with your thumb and fingers and then pull out.

5-2 Redundant Power Supplies

Each blade enclosure can hold up to four power supplies. Installing the maximum number of power supplies may provide you with redundant power – depending upon the number of blades in the enclosure, the model and power level of the power supplies installed and the power load from modules in your system. In most blade enclosure systems power supplies may be redundant and therefore provide backup in case of power supply failure. The configuration for power redundancy is created using the IPMIView application tool for the system.

For purposes of denoting the amount of redundancy, a server system has $N$ main power supplies to support the whole system working, with a "+" number after the $N$ denoting the number of redundant power supplies. Hence, if there is one power supply for redundancy in a system that has the feature of “redundant power”, the total of power supplies for that server system is denoted as $N+1$. 

5-3
For example, suppose a blade system has four 2200 Watt Power Supply Units (PSU), for a total power supply of 8800 Watts. The maximum power usage of each blade is 375 Watts for a total power demand of 3750 Watts to run the whole system. So in this example there are effectively two redundant power supplies (N+1) over what is needed to power the blades in the system.

In the IPMIView tool you can set the priority (default CPU power usage) of each blade first before any PSU fails (0%->shut down, 50%->throttling, 100%->Running). See Figure 5-2 below for an example.

**Figure 5-2. Power Supply Status**

<table>
<thead>
<tr>
<th>Power Supply</th>
<th>Model Name</th>
<th>Part Number</th>
<th>Temperature</th>
<th>Fan Speed (RPM)</th>
<th>Input Voltage</th>
<th>Max Watt</th>
<th>Input Current</th>
<th>DC Output Current</th>
<th>Fan Power Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power Supply A</td>
<td>PS3-3212-85</td>
<td>9VF35A12001-01</td>
<td>45°C</td>
<td>1025</td>
<td>200V</td>
<td>3600W</td>
<td>4.1A</td>
<td>3.5A</td>
<td>160W</td>
</tr>
<tr>
<td>Power Supply B</td>
<td>PS3-3212-85</td>
<td>9VF35A12001-01</td>
<td>45°C</td>
<td>1025</td>
<td>200V</td>
<td>3600W</td>
<td>4.1A</td>
<td>3.5A</td>
<td>160W</td>
</tr>
<tr>
<td>Power Supply C</td>
<td>PS3-3212-85</td>
<td>9VF35A12001-01</td>
<td>45°C</td>
<td>1025</td>
<td>200V</td>
<td>3600W</td>
<td>4.1A</td>
<td>3.5A</td>
<td>160W</td>
</tr>
<tr>
<td>Power Supply D</td>
<td>PS3-3212-85</td>
<td>9VF35A12001-01</td>
<td>45°C</td>
<td>1025</td>
<td>200V</td>
<td>3600W</td>
<td>4.1A</td>
<td>3.5A</td>
<td>160W</td>
</tr>
</tbody>
</table>

**or Consumption**

| Total Power | Blade Power Reserve | Periphery Power Reserve | Available Power | Power Consumption | Input Power | 555 W | 86-875 W (Region A)
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1300 W</td>
<td>150 W</td>
<td>1137 W</td>
<td>555 W</td>
<td>555 W</td>
<td>555 W</td>
<td>86-875 W region A</td>
<td></td>
</tr>
</tbody>
</table>

**or Supply Redundancy Policy**

- Redundancy Options: 1, 2
- Fan Control Options: On, Off, Auto
Therefore the following redundancies apply to your system when, as an example, 2200W power supplies fail.

- If one PSU fails, then you have 6600 Watts available. The CMM will detect the remaining power left for the whole system. But because the total blade power usage is only 3750 Watts, every blade can still work properly.
- If 2 PSUs fail, then only 4400 Watts are left available to support the blade power usage. The system can still support all ten blades running in it.
- If 3 PSUs fail, then the remaining 2200 Watts available cannot support the whole system. Therefore the CMM will start to shut down or throttle down the load in order to keep blades running based upon the priority settings that were made for each blade using the IPMIView application until the load is enough to power the remaining blade modules.

5-3 Power Supply Fans

Each power supply unit has two to four rear fans. These fans are not hot-swappable. If one fails, the power supply will continue to operate but you should replace the power supply unit at the earliest opportunity. If two or more fans fail, the power supply unit will shut down and the LED on the back will turn amber.
# Appendix A
## System Specifications

### A-1 Enclosure Specifications

Table A-1. 4U Enclosure Specification Features

| Enclosure | SBE-414E rack mount blade enclosures
<table>
<thead>
<tr>
<th></th>
<th>Dimensions: (WxHxD) 7&quot; x 17.6&quot; x 32&quot; (177.8 x 447 x 812.8 mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blade Module Support</td>
<td>Up to 14 two-socket hot-plug blade servers</td>
</tr>
<tr>
<td>System Cooling</td>
<td>Three PWM fan modules in the rear chassis. In addition, up to two (2) optional cooling fan modules can be used in place of four power supplies can be mounted in an enclosure.</td>
</tr>
</tbody>
</table>
| Power Supplies (modules required varies) | Rated Output Power: 2200W (Part# PWS-2K21-BR, C-14 type socket) power supplies  
Rated Output Voltages: +12V (183A), +12Vsb (2A) for 2200W; +12V (174A), +12Vsb (2A) for 2090W; +12V (165A), +12Vsb (2A) for 1980W; +12V (150A), +12Vsb (2A) for 1800W; +12V (100A), +12Vsb (2A) for 1200W  
Power Supply Model Numbers:  
• PWS-2K21A-BR for the SBE-414E-422 enclosure  
• PWS-2K21A-BR and PWS-DF006F for the SBE-414E-222 enclosure |
| System Input Requirements | AC Input Voltage: 220~240V AC auto-range for 2200W; 230~240V AC auto-range for 2090W; 220~230V AC auto-range for 1980W; 200~220V AC auto-range for 1800W; 100-127V AC auto-range for 1200W  
Rated Input Frequency: 50 to 60 Hz |
| Thermal Range | Supermicro’s new 4U SuperBlade Enclosure has a wide thermal support range to incorporate a significant range of CPU TDP, this can range from 85W, 105W, 125W, 130W, 140W, 150W, 155W and165W. For further details, please check with thermal specifications and advisory for conditional thermal support of 15-32° degree ambient and 10-35° degree ambient temperatures. The system will not support 5-45° degree ambient temperatures. |

NOTE: Up to 4x (N+1 or N+N redundant) 2200W Titanium certified (96% efficiency) AC power supplies are required for each enclosure.
A-2 Environmental Specifications

<table>
<thead>
<tr>
<th>Operating Environment</th>
<th>Operating Temperature: 10º to 35º C (50º to 95º F)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Non-operating Temperature: -40º to 70º C (-40º to 158º F)</td>
</tr>
<tr>
<td></td>
<td>Operating Relative Humidity: 8% to 90% (non-condensing)</td>
</tr>
<tr>
<td></td>
<td>Non-operating Relative Humidity: 5 to 95% (non-condensing)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Regulatory Compliance</th>
<th>Electromagnetic Emissions: FCC Class A, EN 55022 Class A, EN 61000-3-2/-3-3, CISPR 22 Class A</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Electromagnetic Immunity: EN 55024/CISPR 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)</td>
</tr>
</tbody>
</table>

| Safety | EN 60950/IEC 60950-Compliant, UL Listed (USA), CUL Listed (Canada), TUV Certified (Germany), CE Marking (Europe) 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 for details. |

A-3 Address Defaults

<table>
<thead>
<tr>
<th>CMM Module</th>
<th>IP Address: 192.168.100.100</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gateway Address: 0.0.0.0</td>
</tr>
<tr>
<td></td>
<td>Subnet Mask: 255.255.255.0</td>
</tr>
<tr>
<td></td>
<td>User Name and Password: ADMIN and ADMIN (case sensitive)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GbE Switch</th>
<th>IP Address: 192.168.100.102</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Gateway Address: 192.168.100.1</td>
</tr>
<tr>
<td></td>
<td>Subnet Mask: 255.255.255.0</td>
</tr>
</tbody>
</table>
## A-4 Power Supply Power Calculations

Table A-4. Power Supply: Power Calculations (PWS-2K21A-BR)

<table>
<thead>
<tr>
<th>Calculation</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Watts</td>
<td>2200</td>
</tr>
<tr>
<td>Volts (High/Low)</td>
<td>240/220</td>
</tr>
<tr>
<td>Amps (High/Low)</td>
<td>12/11</td>
</tr>
<tr>
<td>Efficiency (High)</td>
<td>96%</td>
</tr>
<tr>
<td>Power Factor (High)</td>
<td>98%</td>
</tr>
<tr>
<td>10% Reserve (High)</td>
<td>1.5</td>
</tr>
<tr>
<td>10% Reserve (Low)</td>
<td>1.3</td>
</tr>
<tr>
<td>Amps (Total)</td>
<td>11@240 volts</td>
</tr>
</tbody>
</table>
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