

novascale Blade BL265

Installation and User's Guide

novascale Blade



REFERENCE
86 A1 44FB 01

novascale Blade

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Installation and User's Guide

Hardware

April 2010

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FRANCE

REFERENCE
86 A1 44FB 01

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Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الأمنية

Antes de instalar este produto, leia as Informações de Segurança.

在安装本产品之前，请仔细阅读 **Safety Information** (安全信息)。

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

Ennen kuin asennat tämän tuotteen, lue turvaohjeet kohdasta Safety Information.

Avant d'installer ce produit, lisez les consignes de sécurité.

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

Πριν εγκαταστήσετε το προϊόν αυτό, διαβάστε τις πληροφορίες ασφάλειας (safety information).

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

Prima di installare questo prodotto, leggere le Informazioni sulla Sicurezza.

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

Пред да се инсталира овој продукт, прочитајте информацијата за безбедност.

Les sikkerhetsinformasjonen (Safety Information) før du installerer dette produktet.

Przed zainstalowaniem tego produktu, należy zapoznać się z książką "Informacje dotyczące bezpieczeństwa" (Safety Information).

Antes de instalar este produto, leia as Informações sobre Segurança.

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si pečítajte Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

Antes de instalar este producto, lea la información de seguridad.

Läs säkerhetsinformationen innan du installerar den här produkten.

Safety statements

Important:

Each caution and danger statement in this documentation begins with a number. This number is used to cross reference an English-language caution or danger statement with translated versions of the caution or danger statement in the *Bull Safety Information* document.

For example, if a caution statement begins with a number 1, translations for that caution statement appear in the *Bull Safety Information* document under statement 1.

Be sure to read all caution and danger statements in this documentation before performing the instructions. Read any additional safety information that comes with your computer or optional device before you install the device.

Statement 1:



DANGER

Electrical current from power, telephone, and communication cables is hazardous.

To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet.
- Connect to properly wired outlets any equipment that will be attached to this product.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.

To Connect:

1. Turn everything OFF.
2. First, attach all cables to devices.
3. Attach signal cables to connectors.
4. Attach power cords to outlet.
5. Turn device ON.

To Disconnect:

1. Turn everything OFF.
2. First, remove power cords from outlet.
3. Remove signal cables from connectors.
4. Remove all cables from devices.

Statement 2:



CAUTION:

When replacing the lithium battery, use only a battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

Do not

- Throw or immerse into water
- Heat to more than 100°C (212°F)
- Repair or disassemble

Dispose of the battery as required by local ordinances or regulations.

Statement 3:



CAUTION:

When laser products (such as CD-ROMs, DVD drives, fiber optic devices, or transmitters) are installed, note the following:

- Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.
- Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.



DANGER

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following.

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

Statement 4:



≥ 18 kg (39.7 lb)



≥ 32 kg (70.5 lb)



≥ 55 kg (121.2 lb)

CAUTION:

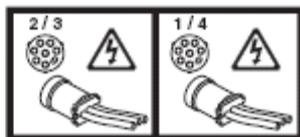
Use safe practices when lifting.

Statement 5:



CAUTION:

The power control button on the device and the power switch on the power supply do not turn off the electrical current supplied to the device. The device also might have more than one power cord. To remove all electrical current from the device, ensure that all power cords are disconnected from the power source.



Statement 8:



CAUTION:

Never remove the cover on a power supply or any part that has the following label attached.



Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

Statement 12:



CAUTION:

The following label indicates a hot surface nearby.



Statement 13:



DANGER

Overloading a branch circuit is potentially a fire hazard and a shock hazard under certain conditions. To avoid these hazards, ensure that your system electrical requirements do not exceed branch circuit protection requirements. Refer to the information that is provided with your device for electrical specifications.

Statement 20:



CAUTION:

To avoid personal injury, before lifting the unit, remove all the blades to reduce the weight.

Statement 21:



CAUTION:

Hazardous energy is present when the blade is connected to the power source. Always replace the blade cover before installing the blade.

WARNING: Handling the cord on this product or cords associated with accessories sold with this product, will expose you to lead, a chemical known to the State of California to cause cancer, and birth defects or other reproductive harm. ***Wash hands after handling.***

ADVERTENCIA: El contacto con el cable de este producto o con cables de accesorios que se venden junto con este producto, pueden exponerle al plomo, un elemento químico que en el estado de California de los Estados Unidos está considerado como un causante de cáncer y de defectos congénitos, además de otros riesgos reproductivos. ***Lávese las manos después de usar el producto.***

Chapter 1. Introduction

The Bull novascale Blade BL265 server is compatible with any Blade Chassis. The novascale Blade BL265 blade server supports up to two multi-core Intel® Xeon® microprocessors and has twelve memory-module slots, two hot-swappable storage-device bays, one Horizontal-compact-form-factor (CFFh) expansion card connector, one Vertical-combination-I/O (CIOv) connector, and one internal USB connector.

Note "Blade Chassis" is a generic term used to indicate both the Bull Blade Chassis-Standard and/or the Bull Blade Chassis-Enterprise.

This *Installation and User's Guide* provides information about:

- Setting up the blade server
- Starting and configuring the blade server
- Installing hardware options
- Installing the operating system
- Performing basic troubleshooting of the blade server

The blade server comes with a limited warranty. For information about the terms of the warranty and getting service and assistance, see the *Bull Hardware Product Warranty* document for your blade server on the *Resource DVD*. You can obtain up-to-date information about the blade server at <http://www.bull.com/support>.

If firmware and documentation updates are available, you can download them from <http://www.bull.com/support/>. The blade server might have features that are not described in the documentation that comes with the blade server, and the documentation might be updated occasionally to include information about those features, or technical updates might be available to provide additional information that is not included in the blade server documentation.

Record information about the blade server in the following table.

Product name	
Model number	_____
Serial number	_____

The model number and serial number are located on the ID label that is behind the control panel door on the front of the blade server, and on a label on the side of the blade server that is visible when the blade server is not in the Blade Chassis.

Note The illustrations in this document might differ slightly from the hardware.

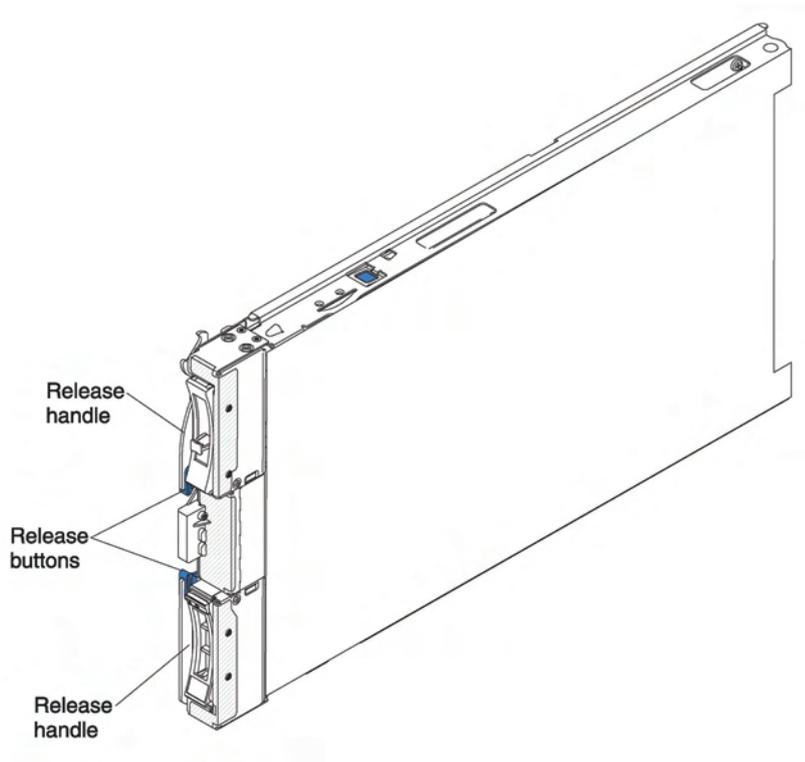


Figure 1-1. Blade server

A set of blank labels comes with the blade server. When you install the blade server in the Blade Chassis, write identifying information on a label and place the label on the Blade Chassis bezel. See the documentation for your Blade Chassis for recommended label placement.



Do not place the label on the blade server itself or in any way block the ventilation holes on the blade server.

1.1 Related documentation

This *Installation and User's Guide* contains general information about the blade server, including how to install supported optional devices and how to configure the blade server. The following documentation also comes with the blade server:

Problem Determination and Service Guide

This document is in Portable Document Format (PDF) on the *Resource DVD*. It contains information to help you solve problems yourself, and it contains information for service technicians.

Safety Information

This document is in PDF on the *Resource DVD*. It contains translated caution and danger statements. Each caution and danger statement that appears in the documentation has a number that you can use to locate the corresponding statement in your language in the *Safety Attention* document.

Bull Hardware Product Warranty

This document is in PDF on the *Resource DVD*. It contains information about the terms of the warranty and getting service and assistance. Depending on your Blade product, additional documents might be included on the *Resource DVD*.

In addition to the documentation in this library, be sure to review the *Bull Blade Planning and Installation Guide* for your Blade Chassis for information to help you prepare for system installation and configuration.

1.2 Notices and statements in this document

The caution and danger statements that appear in this document are also in the multilingual *Safety Attention* document, which is on the *Resource DVD*. Each statement is numbered for reference to the corresponding statement in the *Safety Attention* document.

The following types of notices and statements are used in this document:

Note These notices provide important tips, guidance, or advice.



Important:

These notices provide information or advice that might help you avoid inconvenient or problem situations.



Attention:

These notices indicate possible damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage could occur.



CAUTION:

These statements indicate situations that can be potentially hazardous to you. A caution statement is placed just before the description of a potentially hazardous procedure step or situation.



DANGER:

These statements indicate situations that can be potentially lethal or extremely hazardous to you. A danger statement is placed just before the description of a potentially lethal or extremely hazardous procedure, step, or situation.

1.3 Features and specifications

The following table provides a summary of the features and specifications of the blade server.

Notes

- Power, cooling, removable-media drives, external ports, and advanced system management are provided by the Blade Chassis.
- The operating system in the blade server must provide USB support for the blade server to recognize and use the removable-media drives and front-panel USB ports. The Blade Chassis uses USB for internal communications with these devices.

Blade server features and specifications
<p>Microprocessor: Supports up to two multi-core Intel Xeon microprocessors. Note: Use the Setup Utility to determine the type and speed of the microprocessors in your blade server.</p>
<p>Memory:</p> <ul style="list-style-type: none"> • 12 dual inline memory module(DIMM) connectors. • Type: Very Low Profile (VLP) double-data rate (DDR3) DRAM. • Supports 1 GB, 2 GB, 4 GB, and 8 GB DIMMs with up to 96 GB of total memory on the system board.
<p>Drives: Supports up to two hot-swap, small form factor (SFF) Serial Attached SCSI (SAS) or Serial ATA (SATA) storage drives.</p>
<p>Predictive Failure Analysis® (PFA) alerts:</p> <ul style="list-style-type: none"> • Microprocessor • Memory • Hard disk drive
<p>Electrical input: 12 V dc</p>
<p>Integrated functions:</p> <ul style="list-style-type: none"> • Horizontal-compact-form-factor (CFFh) expansion card interface • Vertical-combination-I/O (CIOv) expansion card interface • Local service processor: Integrated Management Module (IMM) with Intelligent Platform Management Interface (IPMI) firmware • Integrated Matrox G200eV video controller • LSI 1064E Serial Attached SCSI (SAS) controller • Broadcom BCM5709S dual-port Gigabit Ethernet controller • Integrated keyboard/video/mouse (cKVM) controller through IMM • Light path diagnostics • RS-485 interface for communication with the management module • Automatic server restart (ASR) • Serial over LAN (SOL) • Redundant buses for communication with keyboard, mouse, and removable media drives • USB 2.0 for communication with the cKVM and removable media drives (an external USB port is not supported)

<p>Size:</p> <ul style="list-style-type: none"> • Height: 24.5 cm (9.7 inches) (6U) • Depth: 44.6 cm (17.6 inches) • Width: 2.9 cm (1.14 inches) • Maximum weight: 4.8 kg (10 lb.)
<p>Environment (non-NEBS):</p> <ul style="list-style-type: none"> • Air temperature: <ul style="list-style-type: none"> – Blade server on: 10° to 35° C (50° to 95° F). Altitude: 0 to 914.4 m (0 to 3000 ft) – Blade server on: 10° to 32° C (50° to 89.6° F). Altitude: 914.4 to 2133.6 m (3000 to 7000 ft) – Blade server off: 10° to 43° C (50° to 109.4° F). Altitude: 914.4 to 2133.6 m (3000 to 7000 ft) – Blade server shipping: -40° to 60° C (-40° to 140° F) • Humidity: <ul style="list-style-type: none"> – Blade server on: 8% to 80% – Blade server off: 8% to 80% – Blade server storage: 5% to 80% – Blade server shipment: 5% to 100% • Particulate contamination: <p>Attention: Airborne particulates and reactive gases acting alone or in combination with other environmental factors such as humidity or temperature might pose a risk to the server. For information about the limits for particulates and gases, see “<i>Particulate contamination</i>” on page 78.</p>
<p>NEBS Environment:</p> <ul style="list-style-type: none"> • Air temperature: <ul style="list-style-type: none"> – Blade server on: 5° C to 40° C (41° F to 104° F). Altitude: -60 m to 1800 m (-197 ft to 6000 ft) – Blade server on: 5° C to 30° C (41° F to 86° F). Altitude: 1800 m to 4000 m (6000 ft to 13000 ft) – Blade server off: -5° C to 55° C (23° F to 131° F). Altitude: -60 m to 1800 m (-197 ft to 6000 ft) – Blade server off: -5° C to 45° C (23° F to 113° F). Altitude: 1800 m to 4000 m (6000 ft to 13000 ft) – Blade server storage: -40° C to 60° C (-40° F to 140° F). • Humidity: 8% to 85% • Particulate contamination: <p>Attention: Airborne particulates and reactive gases acting alone or in combination with other environmental factors such as humidity or temperature might pose a risk to the server. For information about the limits for particulates and gases, see “<i>Particulate contamination</i>” on page 78.</p>

Table 1-1. Blade server features and specifications

1.4 What your blade server offers

The blade server uses the following features and technologies:

- **Integrated Management Module (IMM)**

The Integrated Management Module (IMM) is on the system board of the blade server. The IMM operates as the service processor for the blade server and performs several tasks, including the following:

 - Provides RS-485 interfaces to the Management Module
 - I²C compatible Two Wire interface
 - Local Environmental Monitoring
 - Local LED control
 - Automatic Server Restart (ASR)
 - One channel 16550 to support ready to send (RTS) and clear to send (CTS) modem control pins (two serial ports)
 - Serial over LAN (SOL)
 - Intelligent Platform Management Interface (IPMI) 2.0 compliant
 - Remote power on/power off of a remote blade server
 - Error logging
 - Remote systems management
 - Blade server oversubscription
 - Blower speed control
 - CPU throttling
 - Memory throttling
 - Integrated keyboard/video/mouse (cKVM)
- **Hard disk drive support**

The blade server supports up to two 2.5-inch hot-swap SAS SFF hard disk drives, RAID 0 and RAID 1 support, up to 300 GB per drive.
- **Integrated network support**

The blade server comes with one integrated Broadcom 5709S dual-port Gigabit Ethernet controller, which support connection to a 10 Mbps, 100 Mbps, or 1000 Mbps network through an Ethernet-compatible switch module in the Blade Chassis. The controller supports Wake on LAN[®] technology.
- **I/O expansion**

The blade server has connectors on the system board for optional expansion cards for adding more network communication capabilities to the blade server.
- **Large system memory capacity**

The blade server system board supports up to 96 GB of system memory. The memory controller provides support for up to twelve industry-standard registered ECC DDR3 on Very Low Profile (VLP) form factor DIMMs installed on the system board.
- **Light path diagnostics**

Light path diagnostics provides light-emitting diodes (LEDs) to help you diagnose problems. For more information, see the *Problem Determination and Service Guide*.

- **PCI Express**
PCI Express is a serial interface that is used for chip-to-chip interconnect and expansion adapter interconnect. With the blade expansion connector you can add optional I/O and storage devices.
- **Power throttling**
Each blade server is powered by two Enterprise Voltage Regulator-Down (EVRD) 11.0 voltage regulators. By enforcing a power policy known as power-domain oversubscription, the Blade Chassis can share the power load between two power modules to ensure sufficient power for each device in the Blade Chassis. This policy is enforced when the initial power is applied to the Blade Chassis or when a blade server is inserted into the Blade Chassis.
The following settings for this policy are available:
 - Redundant without performance impact
 - Redundant with performance impact
 - NonredundantYou can configure and monitor the power environment by using the management module. For more information about configuring and using power throttling, see the management-module documentation.

1.5 Reliability, availability, and serviceability features

Reliability, availability, and serviceability features help to ensure the integrity of the data that is stored in the blade server, the availability of the blade server when you need it, and the ease with which you can diagnose and correct problems.

Three of the most important features in server design are reliability, availability, and serviceability (RAS). These RAS features help to ensure the integrity of the data that is stored in the blade server, the availability of the blade server when you need it, and the ease with which you can diagnose and correct problems.

The blade server has the following RAS features:

- Customer upgrade of Flash ROM-resident code and diagnostics
- Power Policy 24-hour support center
- VPD on Memory
- Processor presence detect
- Advanced Configuration and Power Interface (ACPI)
- Automatic server restart (ASR)
- Built-in monitoring for temperature, voltage, hard disk drives.
- Customer-upgradeable Unified Extensible Firmware Interface (UEFI) code and diagnostics
- Diagnostic support of Ethernet controllers
- ECC protection on the L2 cache
- Error codes and messages
- Hot-swap SAS storage drives
- Integrated Management Module (IMM)
- Light path diagnostics feature
- Memory parity testing
- Registered ECC DDR3 memory
- Microprocessor built-in self-test (BIST) during power-on self-test (POST)
- Microprocessor serial number access
- PCI-PMI 2.2
- PCI Express 1.0a
- POST
- ROM resident diagnostics
- Service processor that communicates with the management module to enable remote blade server management
- System error logging
- Wake on LAN[®] capability
- Wake on PCI (PME) capability
- Wake on USB 2.0 capability

1.6 Major components of the blade server

You must remove the blade server from the Blade Chassis and remove the cover to access the components.

The following illustration shows the major components of the blade server.

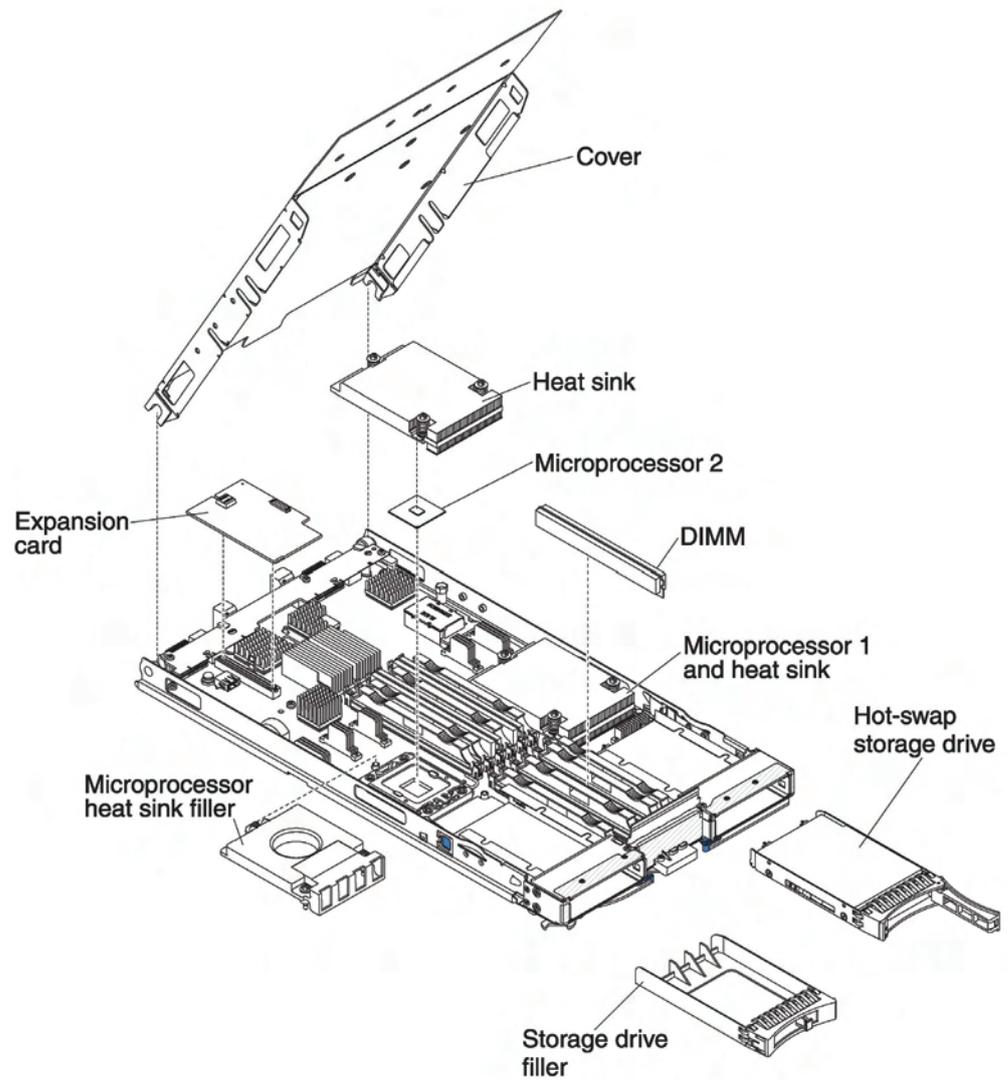


Figure 1-2. Major blade server components

Chapter 2. Power, controls and indicators

This chapter describes the power features, how to turn on and turn off the blade server, and what the controls and indicators mean. This chapter also identifies the system-board connectors.

2.1 Blade server controls and LEDs

This section describes the controls and LEDs on the blade server.

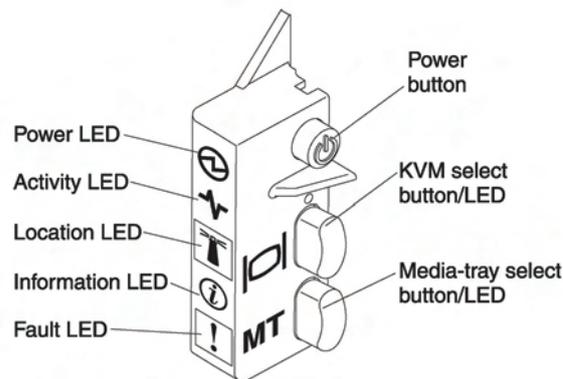


Figure 2-1. Blade server controls and LEDs

Power-on LED:

This green LED indicates the power status of the blade server in the following manner:

- **Flashing rapidly:** The blade server does not have power permissions assigned to it through the Management Module, the Blade Chassis unit does not have enough power to turn on the blade server, or the service processor (IMM) on the blade server is not communicating with the Advanced Management Module.
- **Flashing slowly:** The blade server has power supplied and is ready to be turned on.
- **Lit continuously:** The blade server has power and is turned on.

Activity LED:

When this green LED is lit, it indicates that there is activity on the hard disk drive, external storage device, or network.

Location LED:

The system administrator can remotely turn on this blue LED to aid in visually locating the blade server. When this LED is lit, the location LED on the Blade Chassis unit is also lit. The location LED can be turned off through the management-module Web interface.

Information LED:

When this amber LED is lit, it indicates that information about a system error for the blade server has been placed in the management-module event log. The information LED can be turned off through the management-module Web interface.

Fault LED:

When this amber LED is lit, it indicates that a system error has occurred in the blade server. The blade-error LED will turn off only after the error is corrected.

Power-control button:

This button is behind the control panel door. Press this button to turn on or turn off the blade server.

Note The power-control button has effect only if local power control is enabled for the blade server. Local power control is enabled and disabled through the management-module Web interface.

Keyboard/video/mouse (KVM) select button:

Press this button to associate the shared Blade Chassis keyboard port, video port, and mouse port with the blade server. The LED on this button flashes while the request is being processed, and then is lit when the ownership of the keyboard, video, and mouse has been transferred to the blade server. It can take approximately 20 seconds to switch the keyboard, video, and mouse control to the blade server.

Using a keyboard that is directly attached to the management-module, you can press keyboard keys in the following sequence to switch KVM control between blade servers instead of using the KVM select button:

```
NumLock NumLock blade_server_number Enter
```

Where *blade_server_number* is the two-digit number for the blade bay in which the blade server is installed. A blade server that occupies more than one blade bay is identified by the lowest bay number that it occupies.

If there is no response when you press the KVM select button, you can use the management-module Web interface to determine whether local control has been disabled on the blade server.

Notes

- The operating system in the blade server must provide USB support for the blade server to recognize and use the keyboard and mouse, even if the keyboard and mouse have PS/2-style connectors.
 - If you install a supported Microsoft Windows operating system on the blade server while it is not the current owner of the keyboard, video, and mouse, a delay of up to 1 minute occurs the first time that you switch the keyboard, video, and mouse to the blade server. All subsequent switching takes place in the normal KVM switching time frame (up to 20 seconds).
-

Media-tray select button:

Press this button to associate the shared Blade Chassis media tray (removable-media drives) with the blade server. The LED on the button flashes while the request is being processed, and then is lit when the ownership of the media tray has been transferred to the blade server. It can take approximately 20 seconds for the operating system in the blade server to recognize the media tray.

If there is no response when you press the media-tray select button, you can use the management-module Web interface to determine whether local control has been disabled on the blade server.

Note The operating system in the blade server must provide USB support for the blade server to recognize and use the removable-media drives.

The following illustration identifies the information LEDs on the SAS hot-swap hard disk drive.

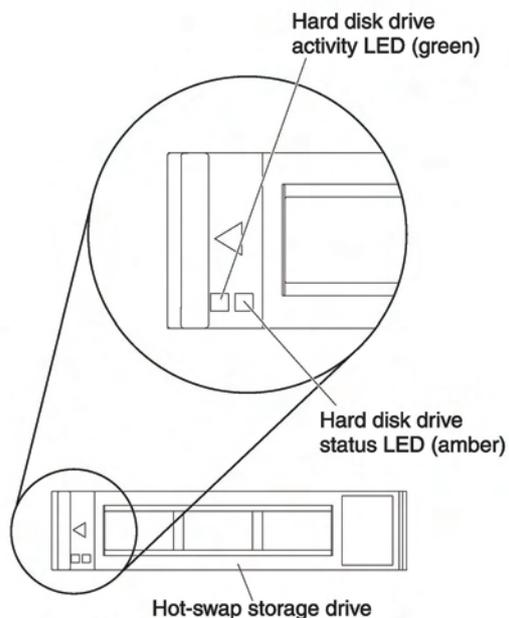


Figure 2-2. Information LEDs on the SAS hot-swap hard disk drive

Hard disk activity LED (green):

When this green LED is lit, it indicates that there is activity on the storage drive.

Hard disk drive status LED (amber):

When this amber LED is lit, it indicates that an error has occurred with the storage drive. The LED turns off only after the error is corrected.

2.2 Turning on the blade server

After you connect the blade server to power through the Blade Chassis, the blade server can start in any of the following ways:

- You can press the power-control button on the front of the blade server (see *Blade server controls and LEDs* on page 11) to start the blade server.

Notes

- Wait until the power-on LED on the blade server flashes slowly before pressing the power-control button. While the service processor in the blade server is initializing and synchronizing with the management module, the power-on LED flashes rapidly, and the power-control button on the blade server does not respond. This process can take approximately two minutes after the blade server has been installed.
 - While the blade server is starting, the power-on LED on the front of the blade server is lit and does not flash. See *Blade server controls and LEDs* on page 11 for the power-on LED states.
-
- If a power failure occurs, the Blade Chassis and the blade server can be configured to start automatically when power is restored through the management module.
 - You can turn on the blade server remotely by using the management module.
 - If the blade server is connected to power (the power-on LED is flashing slowly), the blade server is communicating with the management module, the operating system supports the Wake on LAN feature, and the Wake on LAN feature has not been disabled through the management module, the Wake on LAN feature can turn on the blade server.

2.3 Turning off the blade server

When you turn off the blade server, it is still connected to power through the Blade Chassis. The blade server can respond to requests from the service processor, such as a remote request to turn on the blade server. To remove all power from the blade server, you must remove it from the Blade Chassis.

Shut down the operating system before you turn off the blade server. See the operating-system documentation for information about shutting down the operating system.

The blade server can be turned off in any of the following ways:

- You can press the power-control button on the blade server, see *Blade server controls and LEDs* on page 17). This starts an orderly shutdown of the operating system, if this feature is supported by the operating system.
- If the operating system stops functioning, you can press and hold the power-control button for more than 4 seconds to turn off the blade server.
- The management module can turn off the blade server through the management-module Web interface.
For additional information, see the Bull Blade Management Module documentation.

2.4 Blade server connectors

The following illustration shows the system-board components, including connectors for user-installable optional devices, for the blade server.

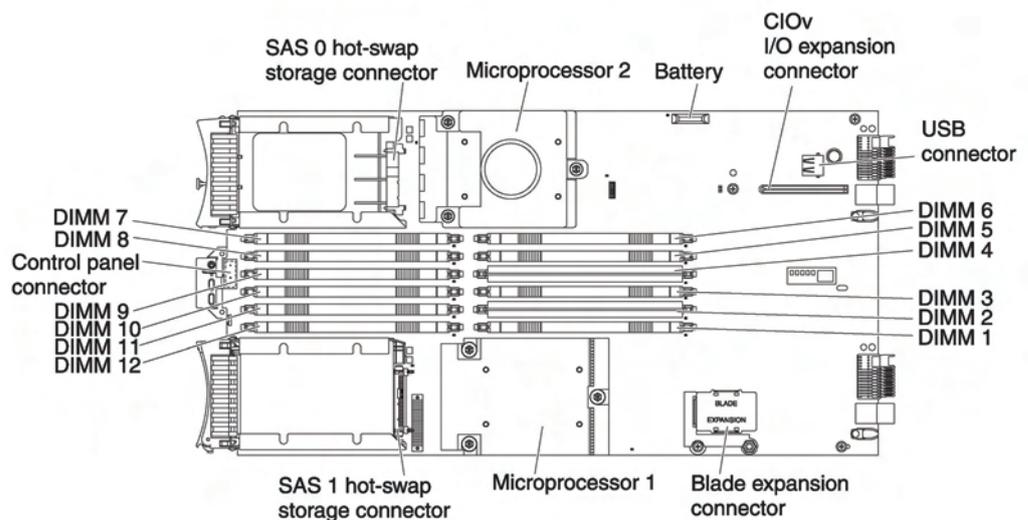


Figure 2-3. Blade server connectors

Chapter 3. Installing Options

This chapter provides instructions for installing optional hardware devices in the blade server. Some option-removal instructions are provided in case you have to remove one option to install another.

3.1 Installation guidelines

Before you install options, read the following information:

- Read the safety information that begins on page ix and the guidelines in *Handling static-sensitive devices* on page 18. This information will help you work safely.
- When you install your new blade server, take the opportunity to download and apply the most recent firmware updates. This step will help to ensure that any known issues are addressed and that your blade server is ready to function at maximum levels of performance. To download firmware updates for your blade server, go to <http://www.bull.com/support/>.
- Observe good housekeeping in the area where you are working. Place removed covers and other parts in a safe place.
- Back up all important data before you make changes to disk drives.
- Before you remove a blade server from the Blade Chassis, you must shut down the operating system and turn off the blade server. You do not have to shut down the Blade Chassis itself.
- Blue on a component indicates touch points, where you can grip the component to remove it from or install it in the blade server, or open or close a latch.
- Orange on a component or an orange label on or near a component indicates that the component can be hot-swapped, which means that if the server and operating system support hot-swap capability, you can remove or install the component while the server is running. (Orange can also indicate touch points on hot-swap components.) See the instructions for removing or installing a specific hot-swap component for any additional procedures that you might have to perform before you remove or install the component.

3.1.1 System reliability guidelines

To help ensure proper cooling and system reliability, make sure that the following requirements are met:

- To ensure proper cooling, do not operate the Blade Chassis without a blade server, expansion unit, or filler blade installed in each blade bay. See the documentation for your Blade Chassis for additional information.
- Each microprocessor socket always contains either a microprocessor dust cover and heat sink filler or a microprocessor and heat sink. If the blade server has only one microprocessor, it must be installed in microprocessor socket 1.
- Each DIMM socket always contains a memory module or filler.
- Each hot-swap SAS bay contains a SAS storage drive or filler.
- Make sure that the ventilation holes on the blade server are not blocked.
- The blade server battery must be operational. If the battery becomes defective, replace it immediately. For instructions, see the *Problem Determination and Service Guide*.

3.1.2 Handling static-sensitive devices



Attention:

Static electricity can damage the blade server and other electronic devices. To avoid damage, keep static-sensitive devices in their static-protective packages until you are ready to install them.

To reduce the possibility of damage from electrostatic discharge, observe the following precautions:

- When you work on a Blade Chassis that has an electrostatic discharge (ESD) connector, use a wrist strap when you handle modules, optional devices, or blade servers. To work correctly, the wrist strap must have a good contact at both ends (touching your skin at one end and firmly connected to the ESD connector on the front or back of the Blade Chassis).
- Limit your movement. Movement can cause static electricity to build up around you.
- Handle the device carefully, holding it by its edges or its frame.
- Do not touch solder joints, pins, or exposed circuitry.
- Do not leave the device where others can handle and damage it.
- While the device is still in its static-protective package, touch it to an *unpainted* metal part of the Blade Chassis or any *unpainted* metal surface on any other grounded rack component in the rack in which you are installing the device for at least 2 seconds. This drains static electricity from the package and from your body.
- Remove the device from its package and install it directly into the blade server without setting it down. If it is necessary to set down the device, put it back into its static-protective package. Do not place the device on the blade server cover or on a metal surface.
- Take additional care when you handle devices during cold weather. Heating reduces indoor humidity and increases static electricity.

3.2 Removing the blade server from the Blade Chassis

The following illustration shows how to remove a blade server or a blade filler from a Blade Chassis. The appearance of your Blade Chassis might be different, see the documentation for your Blade Chassis for additional information.

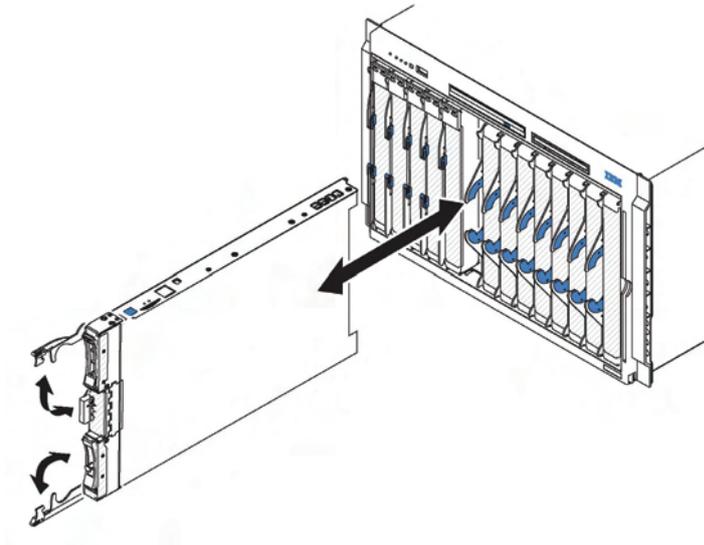


Figure 3-1. Removing the blade server from the Blade Chassis



Attention:

- To maintain proper system cooling, do not operate the Blade Chassis without a blade server, expansion unit, or blade filler installed in each blade bay.
- When you remove the blade server, note the bay number. Reinstalling a blade server into a different bay from the one it was removed from could have unintended consequences. Some configuration information and update options are established according to bay number; if you reinstall the blade server into a different bay, you might need to reconfigure the blade server.

To remove the blade server, complete the following steps:

1. If the blade server is operating, shut down the operating system; then, press the power-control button (behind the blade server control panel door) to turn off the blade server (see *Turning off the blade server* on page 15 for more information).



Attention:

Wait at least 30 seconds, until the hard disk drives stop spinning, before you proceed to the next step.

2. Open the two release handles as shown in the illustration. The blade server moves out of the bay approximately 0.6 cm (0.25 inch).
3. Pull the blade server out of the bay.
4. Place either a blade filler or another blade in the bay within 1 minute.

3.3 Removing the blade server cover

To open the blade server cover, complete the following steps:

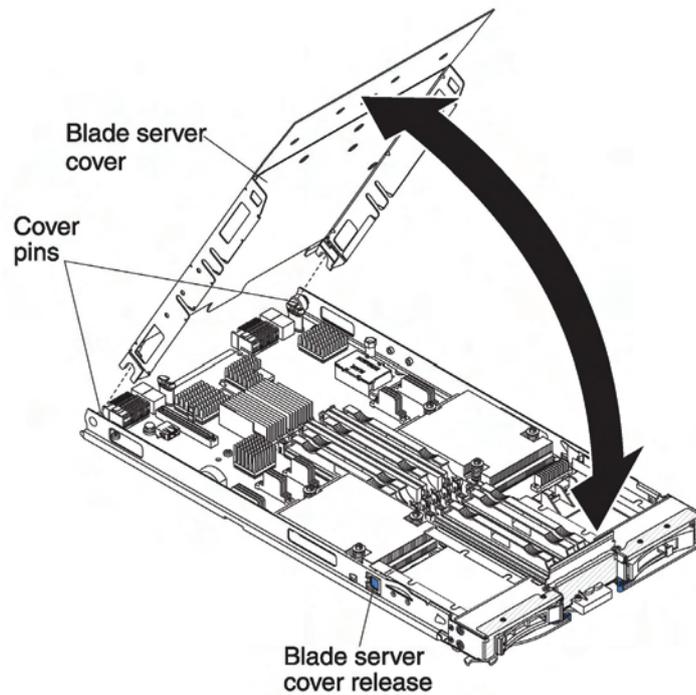


Figure 3-2. Opening the blade server cover

1. Read the safety information that begins on page ix and *Installation guidelines* on page 17.
2. If the blade server is installed in a Blade Chassis, remove it (see *Removing the blade server from the Blade Chassis* on page 19 for instructions).
3. Carefully lay the blade server on a flat, static-protective surface, with the cover side up.
4. Press the blade-cover release on each side of the blade server or expansion unit and lift the cover open, as shown in the illustration.
5. Lay the cover flat, or lift it from the blade server and store for future use.

Statement 21:



CAUTION:

Hazardous energy is present when the blade is connected to the power source. Always replace the blade cover before installing the blade.

3.4 Installing an optional expansion unit

Use these instructions to install an optional expansion unit.

The optional expansion units supported for this blade server are the PCI Express I/O expansion unit.



If a horizontal combination-form-factor (CFFh) expansion card is installed on the blade server system board, you cannot install an optional expansion unit.

- Notes**
- The following illustration shows how to install an expansion unit in a blade server.
 - The illustrations in this document might differ slightly from your hardware.

To install an optional expansion unit, complete the following steps:

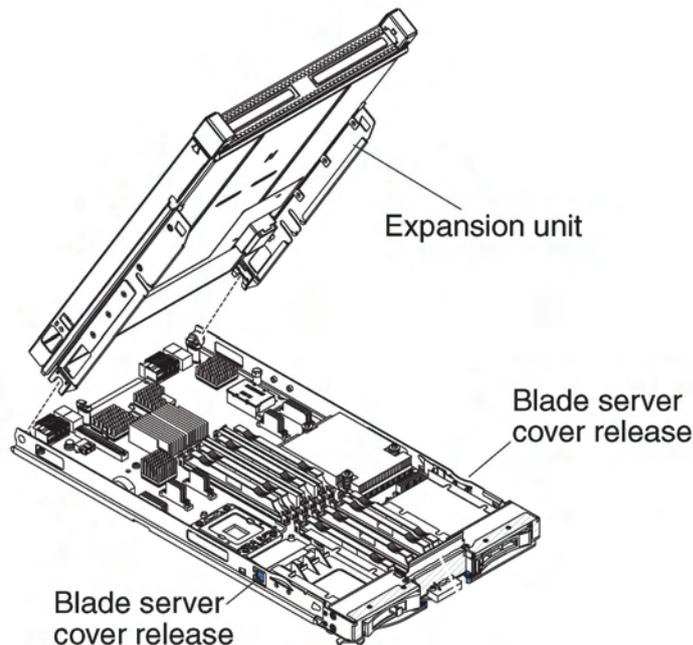


Figure 3-3. Installing an expansion unit

1. Read the safety information that begins on page ix and *Installation guidelines* on page 17.
2. If the blade server is installed in a Blade Chassis, remove it (see *Removing the blade server from the Blade Chassis* on page 19 for instructions).
3. Open the blade server cover (see *Removing the blade server cover* on page 20 for instructions).
4. Locate the blade expansion connector and remove the cover if one is installed (see *Blade server connectors* on page 15).

5. Touch the static-protective package that contains the hard disk drive to any *unpainted* metal surface on the Blade Chassis unit or any *unpainted* metal surface on any other grounded rack component; then, remove the hard disk drive from the package.
6. Orient the optional expansion unit as shown in the illustration..
7. Lower the expansion unit so that the slots at the rear slide down onto the cover pins at the rear of the blade server; then, pivot the expansion unit down onto the blade server.
8. If the expansion unit has an extraction device (such as a thumbscrew or a lever), use it to fully engage the expansion unit on the blade server; otherwise, press the expansion unit firmly into the closed position until it clicks into place.
9. If you have other devices to install or remove, do so now; otherwise, go to *Completing the installation* on page 52.

3.5 Removing an optional expansion unit

- Notes**
- The following illustration shows how to remove an expansion unit from a blade server.
 - The illustrations in this document might differ slightly from your hardware.

To remove the expansion unit, complete the following steps:

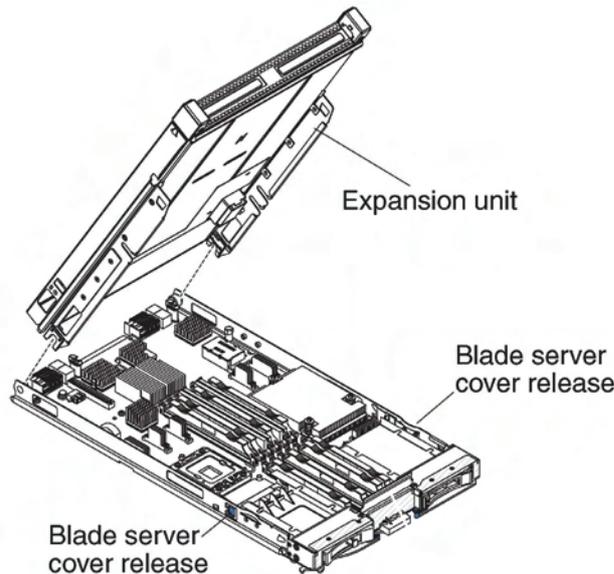


Figure 3-4. Removing an expansion unit

1. Read the safety information that begins on page ix and *Installation guidelines* on page 17.
2. If the blade server is installed in a Blade Chassis, remove it (see *Removing the blade server from the Blade Chassis* on page 19 for instructions).
3. Carefully lay the blade server on a flat, static-protective surface, with the cover side up.
4. Open the blade server cover, if one is installed (see *Removing the blade server cover* on page 20 for instructions).
5. Remove the expansion unit:
 - a. Press the blade server cover release on each side of the blade server.
 - b. If the expansion unit has an extraction device, use the extraction device on the expansion unit, if one is present, to disengage the expansion unit from the system board. These extraction devices can be of several types, including thumbscrews or levers.
 - c. Rotate the expansion unit open; then, lift the expansion unit from the blade server.
6. If you are instructed to return the cover or an optional expansion unit, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.

3.6 Installing a hot-swap storage drive

The blade server has two SAS storage bays for installing hot-swap storage devices, such as a hot-swap SAS hard disk drive.

One storage drive might already be installed in the blade server in storage bay 0. If the blade server is equipped with one storage drive, you can install an additional drive in storage bay 1. The blade server supports using RAID 0 and RAID 1 when two storage drives of the same interface type are installed. See *Configuring a RAID array* on page 65 for information about SAS RAID configuration.

To install a hot-swap storage drive or drive filler, complete the following steps.

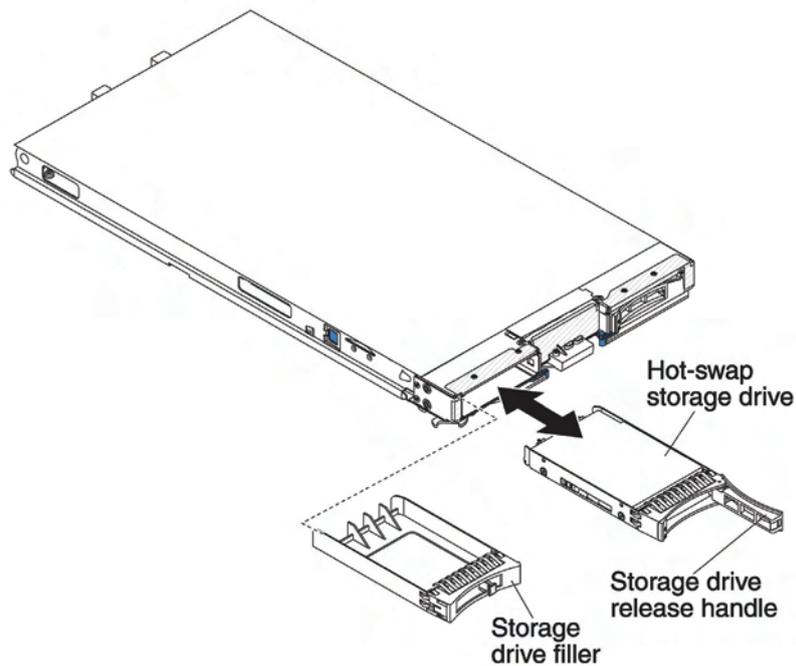


Figure 3-5. Installing a hot-swap storage drive

1. Read the safety information that begins on page ix and *Installation guidelines* on page 17.
2. Identify the SAS storage bay (storage bay 0 or storage bay 1) in which the hot-swap storage drive will be installed (see *Blade server connectors* on page 15).
3. If a storage-bay filler is installed, remove it from the blade server by pulling the release lever and sliding the filler away from the blade server (see *Removing a hot-swap storage drive* on page 25).
4. Touch the static-protective package that contains the hard disk drive to any *unpainted* metal surface on the Blade Chassis unit or any *unpainted* metal surface on any other grounded rack component; then, remove the hard disk drive from the package.
5. Open the release lever on the hot-swap storage drive and slide the drive into the storage bay until it is firmly seated in the connector.

6. Lock the hot-swap storage drive into place by closing the release lever.
7. If you have other devices to install or remove, do so now; otherwise, go to *Completing the installation* on page 52.

3.7 Removing a hot-swap storage drive

Use this information to remove a hot-swap storage drive.

The blade server has two SAS hot-swap storage bays for installing or removing hot-swap storage devices, such as a SAS storage drive. To remove a hot-swap hard disk drive or drive filler, complete the following steps.

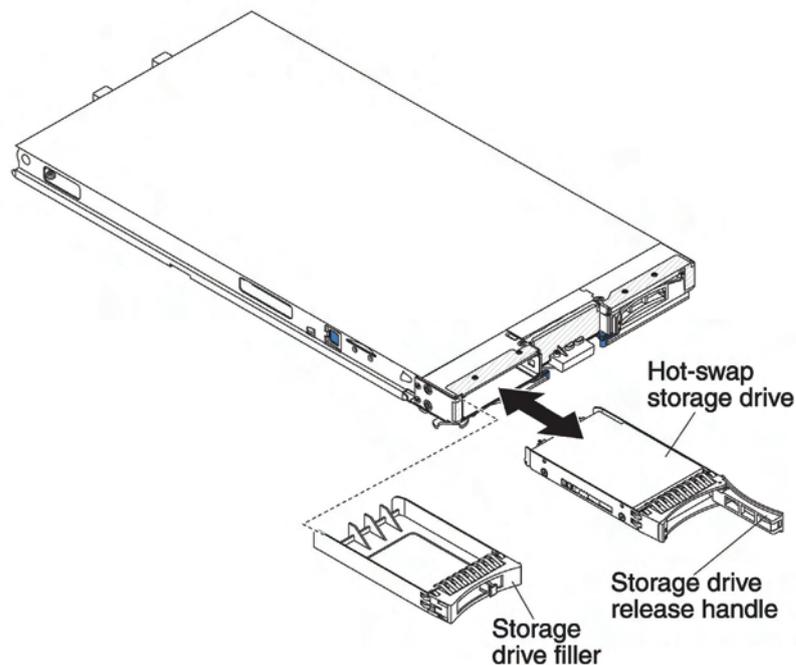


Figure 3-6. Removing a hot-swap storage drive

1. Read the safety information that begins on page ix and *Installation guidelines* on page 17.
2. Press the release latch (orange) on the storage drive to release the drive handle.
3. Pull the release handle to remove the drive from the storage bay.

3.8 Installing a memory module

Use these instructions to install memory modules in the blade server.

The blade server has a total of twelve direct inline memory module (DIMM) slots. The blade server supports very low profile (VLP) DDR3 DIMMs with error code correction (ECC) in 1 GB, 2 GB, 4 GB and 8 GB capacities.

After you install or remove a DIMM, you must change and save the new configuration information by using the Setup utility. When you turn on the blade server, a message indicates that the memory configuration has changed. Start the Setup utility and select **Save Settings** (see *Setup Utility menu* on page 60 for more information) to save changes.

The memory is accessed internally through the system using six channels. Each channel contains two DIMM connectors. The following table lists each channel and which DIMM connectors belong to the channel.

Memory channel	DIMM connector
Channel 0	DIMM connector 1 and 2
Channel 1	DIMM connector 5 and 6
Channel 2	DIMM connector 3 and 4
Channel 3	DIMM connector 7 and 8
Channel 4	DIMM connector 11 and 12
Channel 5	DIMM connector 9 and 10

Table 3-1. Memory channel configuration

Depending on the memory mode that is set in the Setup utility, the blade server can support a minimum of 4 GB and a maximum of 48 GB of system memory on the system board in a blade server with one processor. If two microprocessors are installed, the blade server can support a minimum of 8 GB and a maximum of 96 GB of system memory. There are two different memory modes:

- **Independent channel mode:** Independent channel mode gives a maximum of 48 GB of usable memory with one CPU installed, and 96 GB of usable memory with 2 CPUs installed (using 8 GB DIMMs). The DIMMs can be installed without matching sizes. See the table below for the memory installation order.

Installed memory	DIMM socket											
	1	2	3	4	5	6	7	8	9	10	11	12
2 DIMMs		X		X								
3 DIMMs		X		X		X						
4 DIMMs	X	X		X		X						
5 DIMMs	X	X	X	X		X						
6 DIMMs	X	X	X	X	X	X						

Table 3-2. System memory configuration for independent channel mode (1 microprocessor)

Installed memory	DIMM socket											
	1	2	3	4	5	6	7	8	9	10	11	12
4 DIMMs		X		X				X		X		
5 DIMMs		X		X		X		X		X		
6 DIMMs		X		X		X		X		X		X
7 DIMMs	X	X		X		X		X		X		X
8 DIMMs	X	X		X		X	X	X		X		X
9 DIMMs	X	X	X	X		X	X	X		X		X
10 DIMMs	X	X	X	X		X	X	X	X	X		X
11 DIMMs	X	X	X	X	X	X	X	X	X	X		X
12 DIMMs	X	X	X	X	X	X	X	X	X	X	X	X

Table 3-3. System memory configuration for independent channel mode (2 microprocessors)

- Mirrored channel mode:** In mirrored channel mode, channel 2 is unused. The memory contents on channel 0 are duplicated in channel 1. The effective memory available to the system is only half of that installed. The maximum available memory (with 8 GB DIMMs) is 16 GB for a single CPU system and 32 GB for a dual CPU system. The following table shows the order that memory DIMMs are installed to use a mirrored channel mode.

Installed memory	DIMM socket											
	1	2	3	4	5	6	7	8	9	10	11	12
2 DIMMs		X				X						
4 DIMMs	X	X			X	X						

Table 3-4. System memory configuration for mirrored channel mode (1 microprocessor)

Installed memory	DIMM socket											
	1	2	3	4	5	6	7	8	9	10	11	12
4 DIMMs		X				X		X				X
6 DIMMs	X	X			X	X		X				X
8 DIMMs	X	X			X	X	X	X			X	X

Table 3-5. System memory configuration for mirrored channel mode (2 microprocessors)

To install a DIMM, complete the following steps:

1. Read the safety information that begins on page ix and *Installation guidelines* on page 17.
2. Read the documentation that comes with the DIMMs.
3. If the blade server is installed in a Blade Chassis unit, remove it (see *Removing the blade server from the Blade Chassis* on page 19 for instructions).
4. Carefully lay the blade server on a flat, static-protective surface.
5. Open the blade server cover (see *Removing the blade server cover* on page 20 for instructions).
6. If an expansion unit is installed and you are installing DIMMs on the system board, remove the expansion unit (see *Removing an optional expansion unit* on page 21).
7. Locate the DIMM connectors. Determine which DIMM connector you will be installing memory into.
8. If a DIMM filler or another memory module is already installed in the DIMM connector, remove it (see *Removing a memory module* on page 31).

Note A DIMM or DIMM filler must occupy each DIMM socket before the blade server is turned on.

9. If you are installing a DIMM in DIMM connector seven through twelve, use your fingers to lift the DIMM access door.

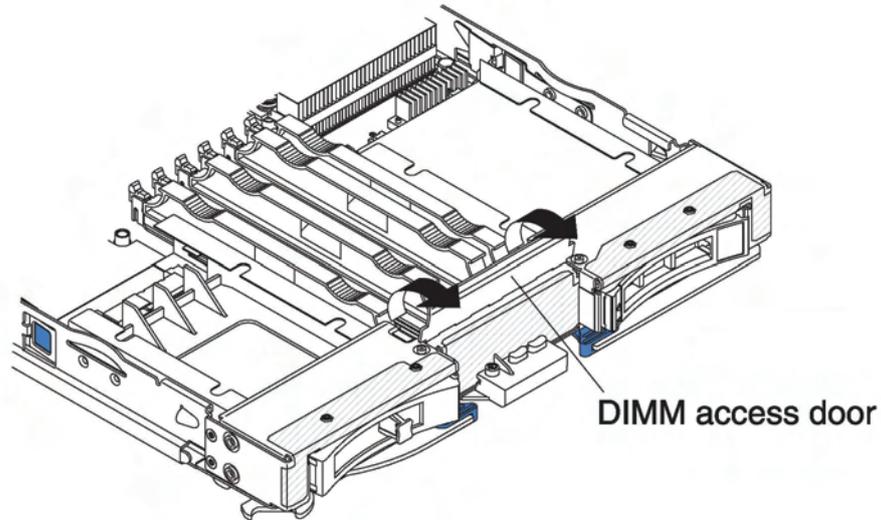


Figure 3-7. DIMM access door

10. Touch the static-protective package that contains the DIMM to any *unpainted* metal surface on the Blade Chassis unit or any *unpainted* metal surface on any other grounded rack component in the rack in which you are installing the DIMM for at least 2 seconds; then, remove the DIMM from its package.
11. To install the DIMMs, repeat the following steps for each DIMM that you install:

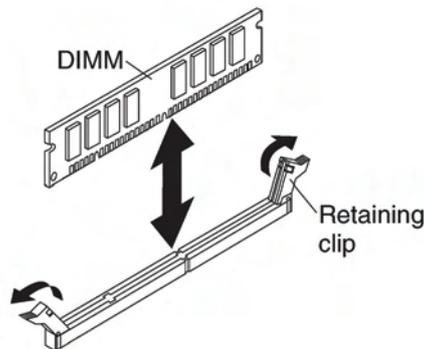


Figure 3-8. Installing a DIMM

- a. Make sure that the retaining clips are in the open position, away from the center of the DIMM connector.
- b. Turn the DIMM so that the DIMM keys align correctly with the connector on the system board.
Attention: To avoid breaking the retaining clips or damaging the DIMM connectors, handle the clips gently.
- c. Press the DIMM into the DIMM connector. The retaining clips will lock the DIMM into the connector.

- d. Make sure that the small tabs on the retaining clips are in the notches on the DIMM. If there is a gap between the DIMM and the retaining clips, the DIMM has not been correctly installed. Press the DIMM firmly into the connector, and then press the retaining clips toward the DIMM until the tabs are fully seated. When the DIMM is correctly installed, the retaining clips are parallel to the sides of the DIMM.
12. If the DIMM access door is open, use your fingers to close it.
 13. If you have other options to install or remove, do so now; otherwise, go to *Completing the installation* on page 52.

3.9 Removing a memory module

Use this information to remove a memory module from the blade server.

The following illustration shows how to remove a DIMM from the blade server. This information also applies to removing a DIMM filler.

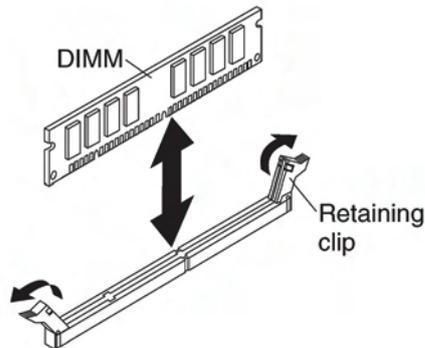


Figure 3-9. Removing a DIMM

To remove a DIMM, complete the following steps:

1. Read the safety information that begins on page ix and *Installation guidelines* on page 17.
2. If the blade server is installed in a Blade Chassis, remove it (see *Removing the blade server from the Blade Chassis* on page 19).
3. Open the blade server cover (see *Removing the blade server cover* on page 20).
4. If an optional expansion unit is installed, remove the expansion unit (see *Removing an optional expansion unit* on page 23).
5. Locate the DIMM connectors (see *Blade server connectors* on page 15). Determine which DIMM you want to remove from the blade server.
Attention: To avoid breaking the retaining clips or damaging the DIMM connectors, handle the clips gently.
6. Move the retaining clips on the ends of the DIMM connector to the open position by pressing the retaining clips away from the center of the DIMM connector.

Note To access DIMM connector seven through twelve, use your fingers to lift the DIMM access door.

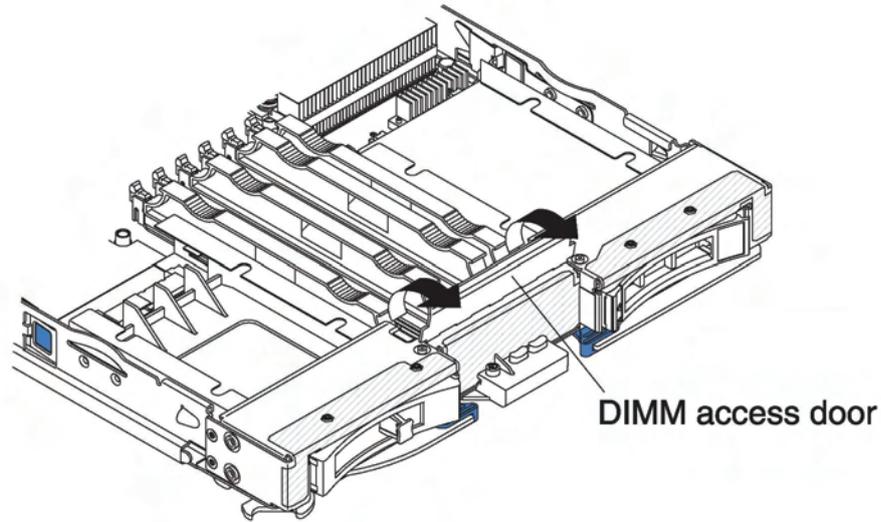


Figure 3-10. DIMM access door

7. Using your fingers, pull the DIMM out of the connector.
8. Install a DIMM or DIMM filler in each empty DIMM connector (see *Installing a memory module* on page 26).

Note A DIMM or DIMM filler must occupy each DIMM socket before the blade server is turned on.

3.10 Installing a microprocessor and heat sink

Use this information to install a microprocessor and heat sink in the blade server.

The following illustration shows how to install a microprocessor and heat sink in the blade server.

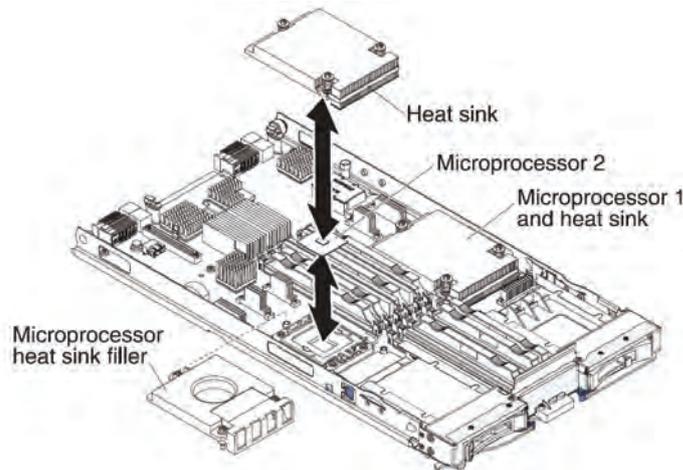


Figure 3-11. Installing the microprocessor

Note If you install an additional microprocessor, it must have the same type, speed, and power specifications as the first microprocessor.

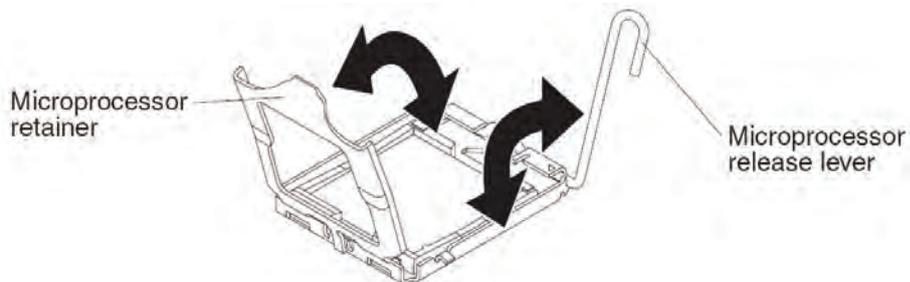
To install a microprocessor and heat sink, complete the following steps:

The following notes describe the type of microprocessor that the server supports and other information that you must consider when you install a microprocessor:

- If you are installing a second microprocessor, make sure that microprocessor 2 is identical to microprocessor 1. Information about the microprocessor installed in your blade server can be viewed in the Setup utility (see *Using the Setup Utility* on page 59).
- For a list of microprocessors that the blade server supports, see <http://www.bull.com/blade/index.html>.
- Before you install a new microprocessor, download and install the most current level of BIOS code (see *Firmware updates* on page 64).
- The microprocessors terminate themselves; therefore, no terminator card is required if microprocessor socket 2 is empty on the blade server or on the MPE. However, for proper airflow, socket 2 must contain a microprocessor heat-sink filler, sometimes called a microprocessor baffle.
- The microprocessor speeds are automatically set for the blade server; therefore, you do not have to set any microprocessor frequency-selection jumpers or switches.

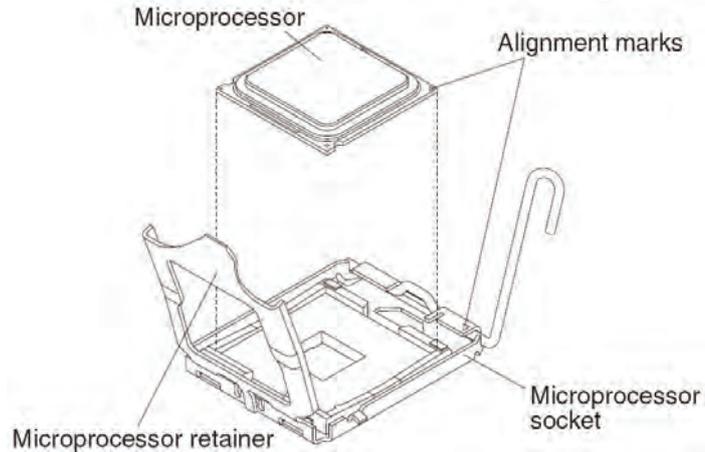
Attention:

- a. Do not use any tools or sharp objects to lift the release lever on the microprocessor socket. Doing so might result in permanent damage to the system board.
 - b. Do not touch the contacts in the microprocessor socket. Touching these contacts might result in permanent damage to the system board.
1. Before you begin, read the safety information that begins on page ix and *Installation guidelines* on page 17.
 2. Shut down the operating system, turn off the blade server, and remove the blade server from the Blade Chassis. See *Removing the blade server from the Blade Chassis* on page 19 for instructions.
 3. Carefully lay the blade server on a flat, static-protective surface.
 4. Open the blade server cover (see *Removing the blade server cover* on page 20 for instructions).
 5. If you are installing a microprocessor in the blade server and an expansion unit is attached to the blade server, remove the device (see *Removing an optional expansion unit* on page 23).
 6. Locate microprocessor socket 2 (see *Blade server connectors* on page 15).
 7. Loosen the four captive screws that secure the heat-sink killer and then remove the filler from the microprocessor socket.
 8. Install the microprocessor and heat sink.



- a. If a protective cover is installed on the microprocessor retainer, use four fingers to remove the protective cover.
- b. Rotate the locking lever on the microprocessor socket from its closed and locked position until it stops in the fully open position (approximately a 135° angle), as shown.
- c. Rotate the microprocessor retainer on the microprocessor socket from its closed position until it stops in the fully open position (approximately a 135° angle), as shown.
- d. If a dust cover is installed over the microprocessor socket, lift the dust cover from the socket.
- e. Touch the static-protective package that contains the microprocessor to any *unpainted* metal surface on the Blade Chassis unit or any *unpainted* metal surface on any other grounded rack component; then, remove the microprocessor from the package.

- f. Remove the dust cover from the bottom of the microprocessor.



- g. Orient the triangle painted on the corner of the microprocessor with the triangle on the microprocessor socket.
- h. Carefully place the microprocessor into the microprocessor socket, using the alignment tabs on the microprocessor with the alignment notches in the microprocessor socket as a guide.

Attention:

- Do not press the microprocessor into the socket.
- Make sure that the microprocessor is oriented and aligned correctly in the socket before you try to close the microprocessor retainer.

- i. Carefully close the microprocessor retainer.
- j. Rotate the locking lever on the microprocessor socket to the closed and locked position. Make sure that the lever is secured in the locked position by pressing the tab on the microprocessor socket.

9. Install a heat sink on the microprocessor.

Attention:

- Do not set down the heat sink after you remove the plastic cover.
- Do not touch the thermal material on the bottom of the heat sink. Touching the thermal material will contaminate it. If the thermal material on the microprocessor or heat sink becomes contaminated, contact your service technician.

- a. Remove the plastic protective cover from the bottom of the heat sink.
- b. Make sure that the thermal material is still on the bottom of the heat sink; then, align and place the heat sink on top of the microprocessor in the retention bracket, thermal material side down. Press firmly on the heat sink
- c. Align the three screws on the heat sink with the holes on the heat-sink retention module.
- d. Press firmly on the captive screws and tighten them with a screwdriver, alternating among the screws until they are tight. If possible, each screw should be rotated two full rotations at a time. Repeat until the screws are tight. Do not overtighten the screws by using excessive force. If you are using a torque wrench, tighten the screws to 8.5 Newton-meters (Nm) to 13 Nm (6.3 foot-pounds to 9.6 foot-pounds).

10. Reinstall the memory module or DIMM filler closest to the microprocessor you installed.
 - a. If you installed microprocessor 1, install the memory module into DIMM connector 1 (see *Installing a memory module* on page 26).
 - b. If you installed microprocessor 2, install the memory module into DIMM connector 6 (see *Installing a memory module* on page 26).
11. If you are using a single microprocessor, make sure that memory modules are installed in DIMM socket 2 and DIMM socket 6. If two microprocessors installed in the blade server, make sure that memory modules are installed in DIMM socket 2, DIMM socket 6, DIMM socket 8, and DIMM socket 12. See *Installing a memory module* on page 26 for more information on installing a memory module.
12. Install the optional expansion unit, if you removed one from the blade server to replace the battery (see *Installing an optional expansion unit* on page 21 for instructions).
13. Install the cover onto the blade server (see *Closing the blade server cover* on page 53).
14. Install the blade server into the Blade Chassis unit (see *Installing the blade server in a Blade Chassis* on page 55)

3.11 Thermal grease

The thermal grease must be replaced whenever the heat sink has been removed from the top of the microprocessor and is going to be reused or when debris is found in the grease.

To replace damaged or contaminated thermal grease on the microprocessor and heat sink, complete the following steps:

1. Place the heat-sink assembly on a clean work surface.
2. Remove the cleaning pad from its package and unfold it completely.
3. Use the cleaning pad to wipe the thermal grease from the bottom of the heat sink.

Note Make sure that all of the thermal grease is removed

4. Use a clean area of the cleaning pad to wipe the thermal grease from the microprocessor; then, dispose of the cleaning pad after all of the thermal grease is removed.

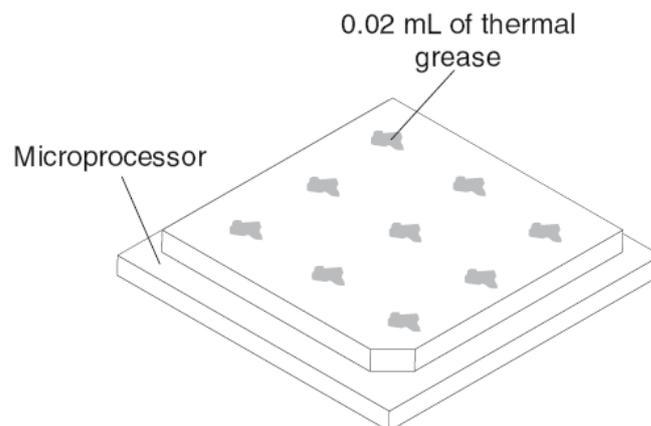


Figure 3-12. Installing thermal grease

- Use the thermal-grease syringe to place nine uniformly spaced dots of 0.02 mL each on the top of the microprocessor.



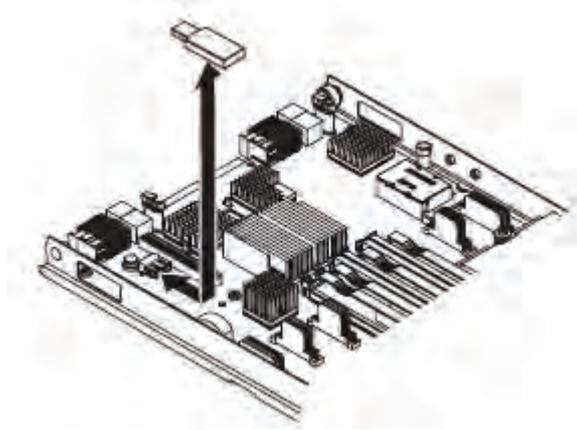
Note 0.01 mL is one tick mark on the syringe. If the grease is properly applied, approximately half (0.22 mL) of the grease will remain in the syringe.

Continue with step 8 on page 34.

3.12 Installing a USB Flash Key

Use these instructions to Install a USB Flash key in the blade server.

The following illustration shows the installation of the USB Flash key.



To install a USB module, complete the following steps:

1. Before you begin, read the safety information that begins on page ix and *Installation guidelines* on page 17.
2. If the blade server is installed in a Blade Chassis, remove it (see *Removing the blade server from the Blade Chassis* on page 19 for instructions).
3. Carefully lay the blade server on a flat, static-protective surface.
4. Open the blade server cover (see *Removing the blade server cover* on page 20 for instructions).
5. If an expansion unit is installed, remove the expansion unit (see *Removing an optional expansion unit* on page 23).
6. If a CIOv expansion card is installed, remove the expansion card (see *Removing a CIOv-form-factor expansion card* on page 43).
7. Locate the USB connector on the blade server (see *Blade server connectors* on page 15).
8. Touch the static-protective package that contains the expansion card to any *unpainted* metal surface on the Blade Chassis or any *unpainted* metal surface on any other grounded rack component for at least 2 seconds, then remove the I/O expansion card from its static-protective package.
9. Orient the connector on the USB Flash key with the USB connector on the blade server.
10. Use your fingers to push the USB Flash key into the USB connector on the blade server.
11. If a CIOv expansion card was removed during the install process, install the expansion card (see *Installing a CIOv-form-factor expansion card* on page 42).
12. If you have other devices to install or remove, do so now; otherwise, go to *Completing the installation* on page 52.

3.13 I/O-expansion cards

The following sections describe how to install an I/O expansion card in the blade server.

The blade server has two I/O expansion connectors on the system board. One connector supports horizontal combination-form-factor (CFFh) expansion cards and the other connector supports vertical-combination-I/O (CIOv) expansion cards.

Make sure that the Blade Chassis and the I/O modules to which the I/O expansion card is mapped support the network-interface type of the I/O expansion card. For example, if you add an Ethernet expansion card to a blade server, the I/O modules in I/O-module bays 3 and 4 on the Blade Chassis unit must both be compatible with the expansion card. All other expansion cards that are installed in other blade servers in the Blade Chassis must also be compatible with these I/O modules. In this example, you can then install two Ethernet switch modules, two pass-thru modules, or one Ethernet switch module and one pass-thru module. Because pass-thru modules are compatible with a variety of I/O expansion cards, installing two pass-thru modules would enable the use of several different types of compatible I/O expansion cards in blade servers within the same Blade Chassis.

3.13.1 Installing a horizontal-compact-form-factor expansion card

Note The horizontal combination-form-factor expansion cards are supported in Bull Blade Chassis-Enterprise only.

Use these instructions to install a compact-form-factor expansion card in the blade server.

The blade server supports a horizontal-combination-form-factor (CFFh) expansion card. The following illustration shows how to install a CFFh expansion card.

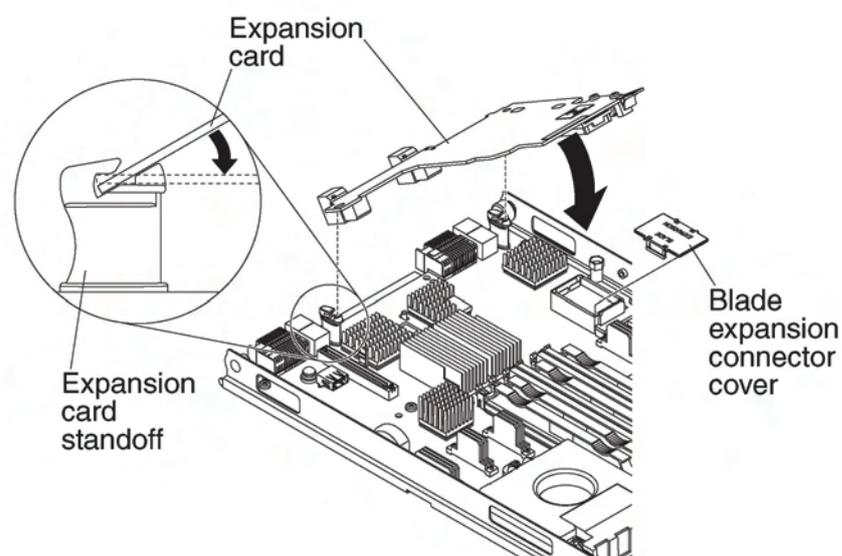


Figure 3-13. Installing a CFFh expansion card

To install a CFFh expansion card, complete the following steps:

13. Read the safety information that begins on page ix and *Installation guidelines* on page 17.
14. Turn off the blade server.
15. If the blade server is installed in a Blade Chassis, remove it (see *Removing the blade server from the Blade Chassis* on page 19 for instructions).
16. Carefully lay the blade server on a flat, static-protective surface.
17. Open the blade server cover (see *Removing the blade server cover* on page 20).
18. Locate the blade server expansion connector (see *Blade server connectors* on page 15).
19. If a cover is installed on the blade expansion connector, remove it by using your fingers to lift the cover from the blade expansion connector.
20. Touch the static-protective package that contains the expansion card to any *unpainted* metal surface on the Blade Chassis or any *unpainted* metal surface on any other grounded rack component for at least 2 seconds, then remove the I/O expansion card from its static-protective package.
21. Orient the expansion card and slide the slots at the back end of the card onto the pins on the expansion-card standoff; then, gently pivot the card into the blade server expansion connector.
22. Firmly press on the indicated locations to seat the expansion card.

Note For device-driver and configuration information to complete the installation of the I/O expansion card, see the documentation that comes with the expansion card.

23. If you have other devices to install or remove, do so now; otherwise, go to *Completing the installation* on page 52.

3.13.2 Removing a horizontal-compact-form-factor expansion card

Use these instructions to remove a compact-form-factor expansion card from the blade server.

The following illustration shows how to remove a horizontal-compact-form-factor (CFFh) expansion card.

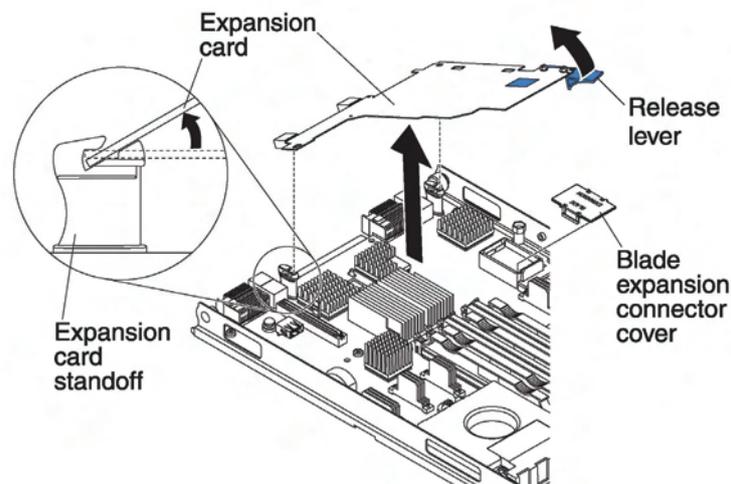


Figure 3-14. Removing a CFFh expansion card

To remove a CFFh expansion card, complete the following steps:

1. Read the safety information that begins on page ix and *Installation guidelines* on page 17.
2. If the blade server is installed in a Blade Chassis, remove it (see *Removing the blade server from the Blade Chassis* on page 19).
3. Carefully lay the blade server on a flat, static-protective surface.
4. Open the blade server cover (see *Removing the blade server cover* on page 20). Locate the CFFh expansion card. The CFFh is installed into the blade expansion connector (see *Blade server connectors* on page 15).
5. Touch the static-protective package that contains the expansion card to any *unpainted* metal surface on the Blade Chassis or any *unpainted* metal surface on any other grounded rack component; then, remove the expansion card from the package
6. Locate the CFFh expansion card. The CFFh is installed into the blade expansion connector (see *Blade server connectors* on page 15).
7. Use your fingers to hold the edge of the CFFh expansion card where it connects to the blade expansion connector; then, lift up on the card.
8. Pull the card away from the expansion card standoff.

3.13.3 Installing a CIOv-form-factor expansion card

Use these instructions to install a CIOv-form-factor expansion card in the blade server.

The blade server supports a vertical-combination-I/O (CIOv) expansion card and a horizontal-combination-form-factor (CFFh) expansion card. The following illustration shows the location and installation of a CIOv expansion card

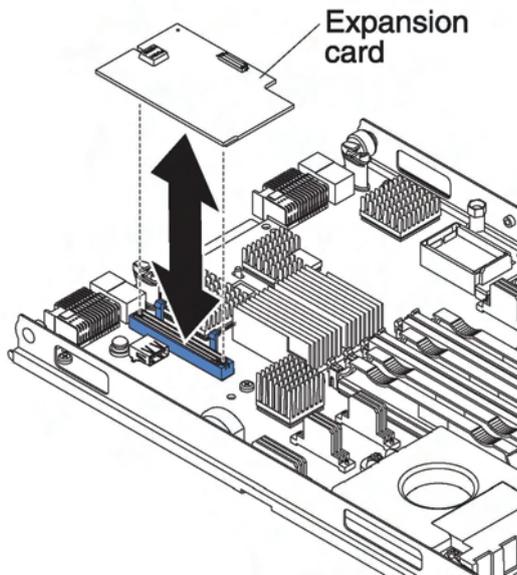


Figure 3-15. Installing a CIOv form-factor expansion card

To install a CIOv expansion card, complete the following steps:

1. Read the safety information that begins on page ix and Installation guidelines on page 17.
2. If the blade server is installed in a Blade Chassis, remove it (see *Removing the blade server from the Blade Chassis* on page 19 for instructions).
3. Carefully lay the blade server on a flat, static-protective surface.
4. Open the blade server cover (see *Removing the blade server cover* on page 20 for instructions).
5. Touch the static-protective package that contains the expansion card to any *unpainted* metal surface on the Blade Chassis or any *unpainted* metal surface on any other grounded rack component; then, remove the expansion card from the package
6. Locate the blade-expansion connector (see *Blade server connectors* on page 15).
7. Orient the connector on the expansion card with the CIOv expansion connector on the system board; then, press the card into the CIOv expansion connector.

8. Firmly press on the indicated locations to seat the expansion card.

Note For device-driver and configuration information to complete the installation of the expansion card, see the documentation that comes with the expansion card

9. If you have other options to install or remove, do so now; otherwise, go to *Completing the installation* on page 52.

3.13.4 Removing a CIOv-form-factor expansion card

Use these instructions to remove a CIOv-form-factor expansion card in the blade server.

The following illustration shows how to remove a vertical-combination-I/O (CIOv) expansion card.

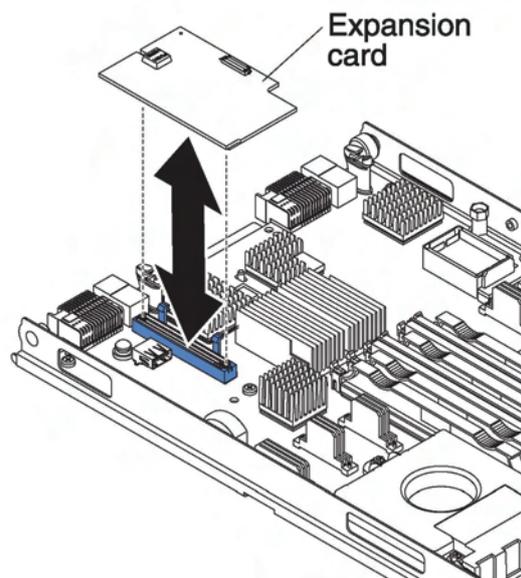


Figure 3-16. Removing a CIOv form-factor expansion card

To remove a CIOv expansion card, complete the following steps:

1. Read the safety information that begins on page ix and *Installation guidelines* on page 17.
2. If the blade server is installed in a Blade Chassis, remove it (see *Removing the blade server from the Blade Chassis* on page 19).
3. Carefully lay the blade server on a flat, static-protective surface.
4. Open the blade server cover (see *Removing the blade server cover* on page 20).

5. Touch the static-protective package that contains the expansion card to any *unpainted* metal surface on the Blade Chassis or any *unpainted* metal surface on any other grounded rack component; then, remove the expansion card from the package.
6. Locate the CIOv expansion connector (see *Blade server connectors* on page 15).

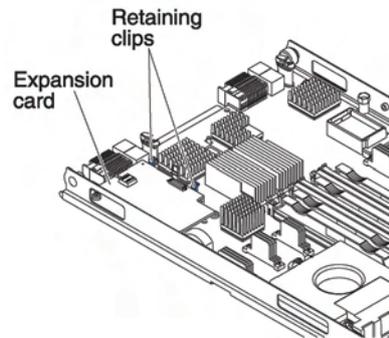


Figure 3-17. CIOv form-factor expansion card retaining clips

7. Using your fingers, move the retaining clips away from the CIOv card; then, lift the card out of the connector.

3.13.5 Installing a storage interface card

Use this information to install a storage interface card in the blade server.

The storage interface card controls the SAS hot-swap storage drives. The following illustrations and installation instructions show how to install a ServeRAID-MR10ie CIOv storage interface card in the blade server. The illustrations and installation instructions are similar for other CIOv storage interface cards.

Note The backup-battery will be installed in DIMM connector seven and might affect how much memory is recognized by the blade server. Review the tables in *Installing a memory module* on page 26 to make sure that your memory configuration will not be affected.

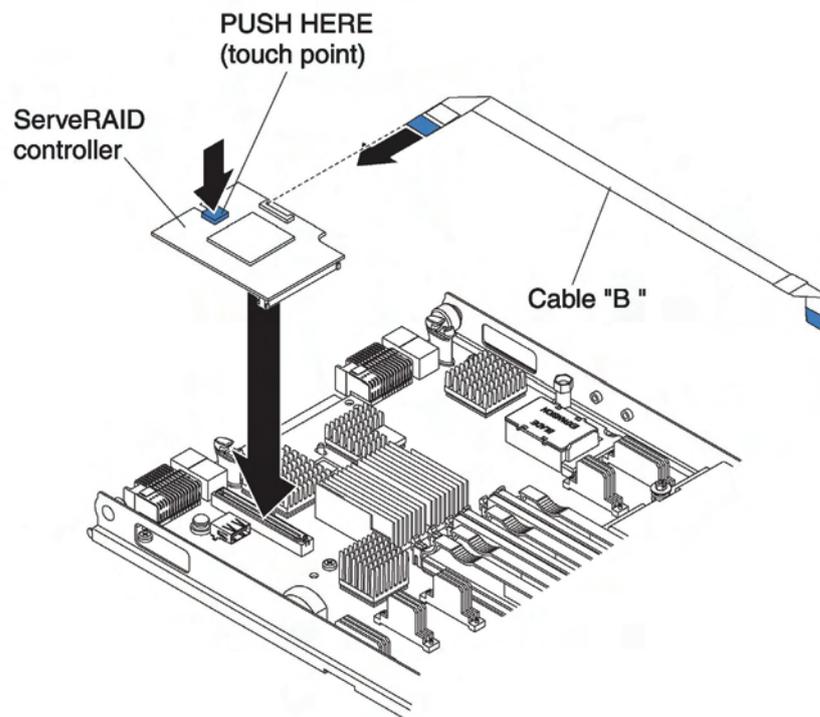


Figure 3-18. Installing a storage interface card

To install a ServeRAID-MR10ie CIOv storage Interface card, complete the following steps:

1. Read the safety information that begins on page ix and *Installation guidelines* on page 17.
2. If the blade server is installed in a Blade Chassis, remove it (see *Removing the blade server from the Blade Chassis* on page 19 for instructions).
3. Open the blade server cover (see *Removing the blade server cover* on page 20).
4. If an optional expansion unit is installed, remove the expansion unit (see *Removing an optional expansion unit* on page 23).
5. Locate the CIOv expansion connector (see *Blade server connectors* on page 15).
6. Touch the static-protective package that contains the expansion card to any *unpainted* metal surface on the Blade Chassis or any *unpainted* metal surface on any other grounded rack component; then, remove the expansion card from the package.
7. If an interposer card is installed on the ServeRAID-MR10ie CIOv storage interface card, remove it.

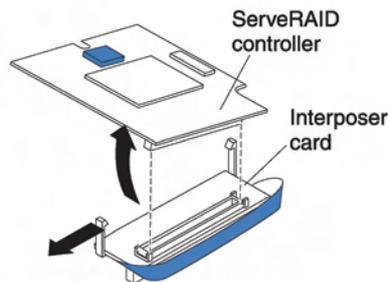


Figure 3-19. Storage interface card interposer

- a. If the interposer has a pull strap, move the pull strap away from the ServeRAID controller. If the pull strap surrounds the ServeRAID controller, the pull strap will interfere with the removal of the interposer card.
 - b. Press out on the plastic latch that holds the interposer card to the ServeRAID controller and simultaneously lift up on the controller, as shown.
 - c. Separate the interposer card from the ServeRAID controller and store the interposer card in a safe place.
8. Install the backup-battery cable to the ServeRAID controller.
 - a. If you are installing a ServeRAID-MR10ie CIOv storage interface card, select cable "B" from the packaging.
 - b. Locate the end of cable marked "EXPANSION CARD"; then, with the blue side of the cable end facing up, carefully insert the cable end into the cable connector on the ServeRAID controller.

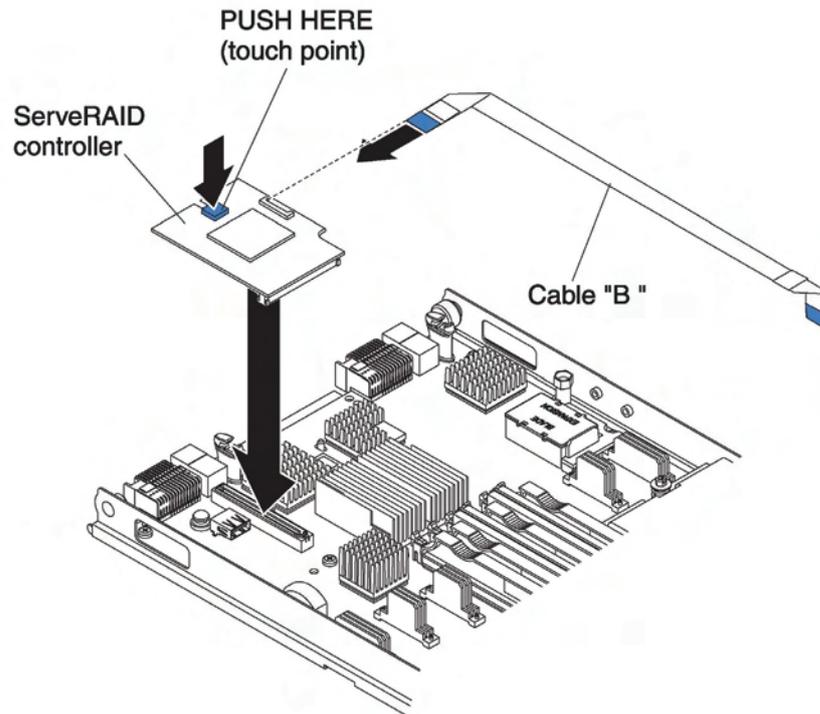


Figure 3-20. Inserting the cable into the cable connector on the storage interface card

9. Orient the connector on the storage interface card with the CIOv expansion connector on the system board; then, press the card into the CIOv expansion connector.
10. Firmly press on the indicated locations to seat the storage interface card.

Note For device-driver and configuration information to complete the installation of the expansion card, see the documentation that comes with the storage interface card.

11. Install the backup battery for the storage interface card into DIMM connector seven (see *Blade server connectors* on page 15 and *Installing a memory module* on page 26).

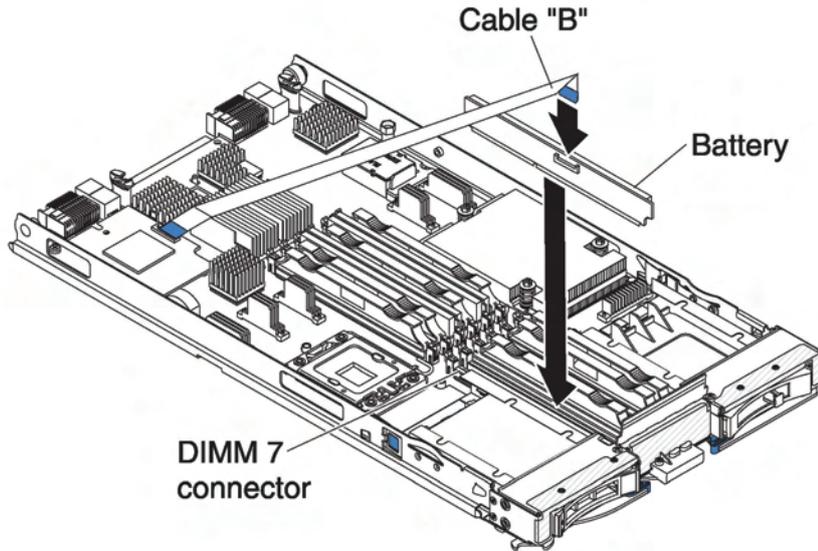


Figure 3-21. Installing the backup-battery cable to the backup battery

12. Install the backup-battery cable to the back-up battery. The side of the cable with the blue touchpoint should be oriented towards the center of the blade server.
13. Orient the backup-battery cable so that it lays flat over the top of the heat sink for microprocessor two.

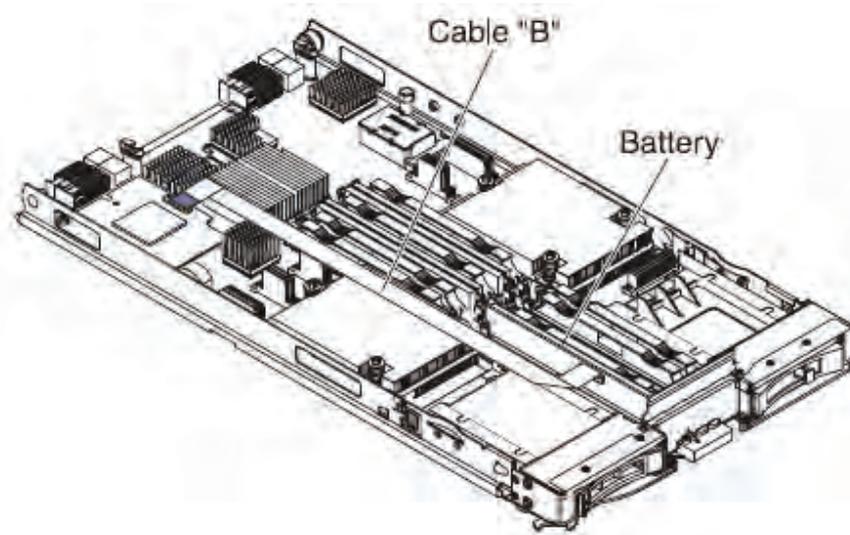


Figure 3-22. Backup-battery cable orientation

14. If you have other expansion units to install, do so now; otherwise, go to *Completing the installation* on page 52.

3.13.6 Removing a storage interface card

Use this information to remove a storage interface card from the blade server.

The storage interface card controls the SAS hot-swap storage drives. The following illustrations and installation instructions shows how to remove a ServeRAID-MR10ie CIOv storage interface card from the blade server. The illustrations and removal instructions are similar for other CIOv storage interface cards.

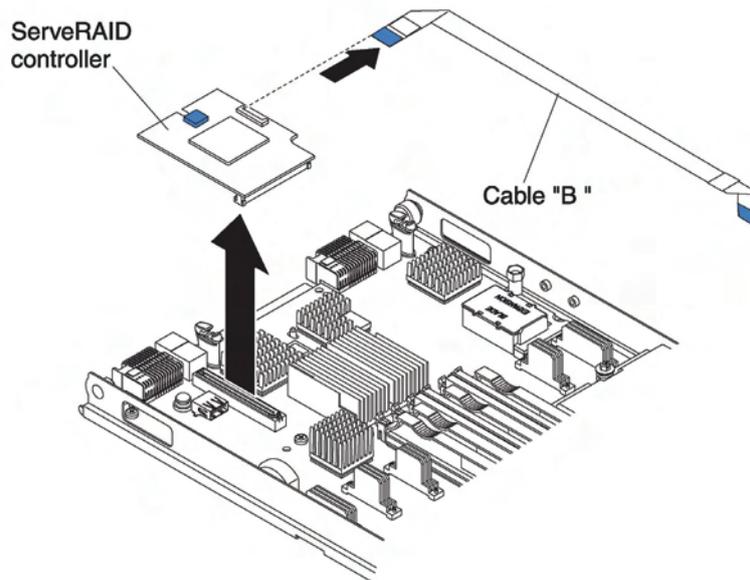


Figure 3-23. Removing a storage interface card

To remove a storage interface card, complete the following steps:

1. Read the safety information that begins on page ix and *Installation guidelines* on page 17.
2. If the blade server is installed in a Blade Chassis, remove it (see *Removing the blade server from the Blade Chassis* on page 19 for instructions).
3. Open the blade server cover (see *Removing the blade server cover* on page 20).
4. If an optional expansion unit is installed, remove the expansion unit (see *Removing an optional expansion unit* on page 23). The storage interface card option includes the storage interface card, backup battery, and backup-battery cable. These parts can be removed separately from each other.

5. To remove the storage interface card, complete the following steps:
 - a. Locate the storage interface card installed in the CIOv connector on the system board (see *Blade server connectors* on page 15).

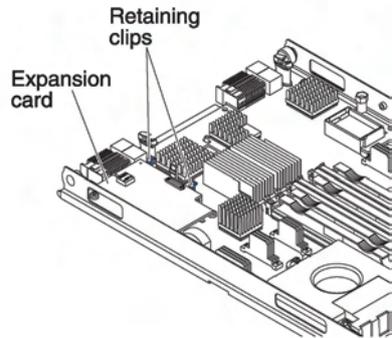


Figure 3-24. Storage interface card location

- b. Gently push the retaining clips away from the expansion card; then, lift the card out of the expansion-card connector.
 - c. Remove the cable from the storage interface card by holding the card in one hand; then, use your other hand to pull the cable away from the card. When pulling the cable, make sure that you hold the cable where there is a blue touchpoint.
6. To remove the backup-battery cable, complete the following steps:
 - a. Remove the cable from the storage interface card by holding the blue touchpoint on the cable; then, pull the cable away from the card.
 - b. Remove the cable from the backup battery by holding the blue touchpoint on the cable; then, pull the cable away from the backup battery.

7. The backup battery is installed in DIMM connector seven. To remove the backup battery, complete the following steps.

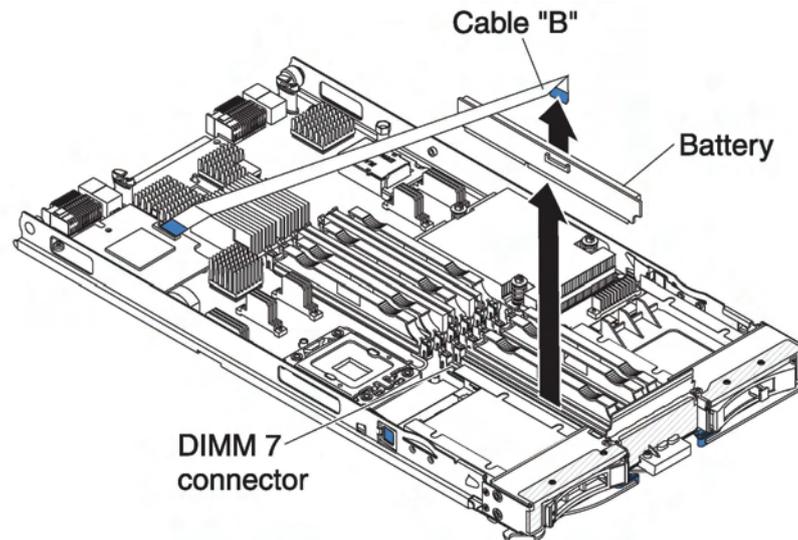


Figure 3-25. Removing the backup battery

- a. If you have not already done so, remove the backup-battery cable from the backup battery by holding the blue touchpoint on the cable; then, pull the cable away from the backup battery.
 - b. Remove the backup battery from the DIMM connector seven by using the instructions to remove a memory module (see *Removing a memory module* on page 31).
8. Remove the backup battery from the DIMM connector seven.

3.14 Completing the installation

To complete the installation, complete the following tasks. Instructions for each task are in the following sections.

1. Reinstall the expansion unit, if you removed it to install other options (see *Installing an optional expansion unit* on page 21 for information on installing an expansion unit).
2. Close the blade server cover, unless you installed an optional expansion unit that has its own cover (see *Closing the blade server cover* on page 53).

Statement 21:



CAUTION:

Hazardous energy is present when the blade is connected to the power source. Always replace the blade cover before installing the blade.

3. Reinstall the blade server into the Blade Chassis (see *Installing the blade server in a Blade Chassis* on page 55).
4. Turn on the blade server (see *Turning on the blade server* on page 14). If you have just connected the power cords of the Blade Chassis to electrical outlets, you must wait until the power-on LED on the blade server flashes slowly before you press the power-control button.
5. For certain optional devices, you might have to run the blade server Setup Utility (see *Chapter 4, Configuring the blade server*, on page 59). See the documentation that comes with your optional device for additional information.

3.14.1 Closing the blade server cover



Attention:

You cannot insert the blade server into the Blade Chassis until the cover is installed and closed or an expansion unit is installed. Do not attempt to override this protection.

The following illustration shows how to close the blade server cover.

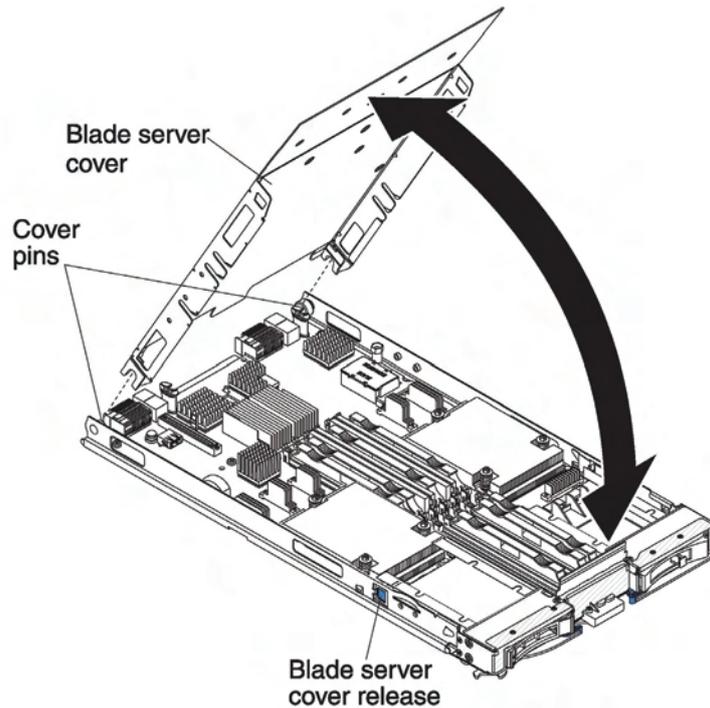


Figure 3-26. Closing the blade server cover

To close the blade server cover, complete the following steps:

1. Read the safety information that begins on page ix and “*Installation guidelines*” on page 17.
2. Close the DIMM access door by rotating the door towards the DIMM connectors.

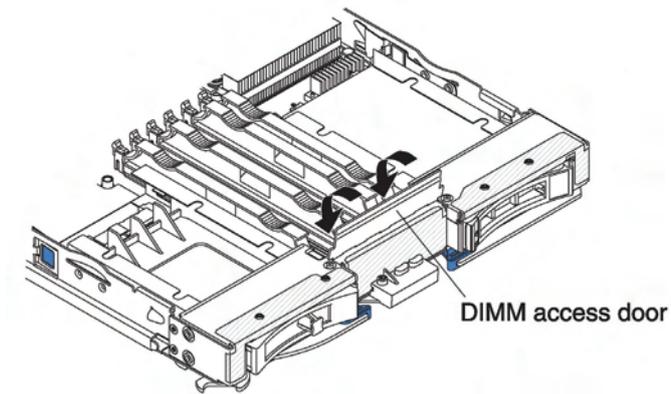


Figure 3-27. Closing the DIMM access door

3. If you removed an expansion unit from the blade server, install it now (see *Installing an optional expansion unit* on page 21).
4. Lower the cover so that the slots at the rear slide down onto the pins at the rear of the blade server, as shown in the illustration. Before you close the cover, make sure that all components are installed and seated correctly and that you have not left loose tools or parts inside the blade server.
5. Pivot the cover to the closed position, as shown in the illustration, until it clicks into place.

3.14.2 Installing the blade server in a Blade Chassis

The following illustration shows how to install a blade server into a Blade Chassis. The appearance of your Blade Chassis might be different, see the documentation for your Blade Chassis for additional information.

To install a blade server in a Blade Chassis, complete the following steps:

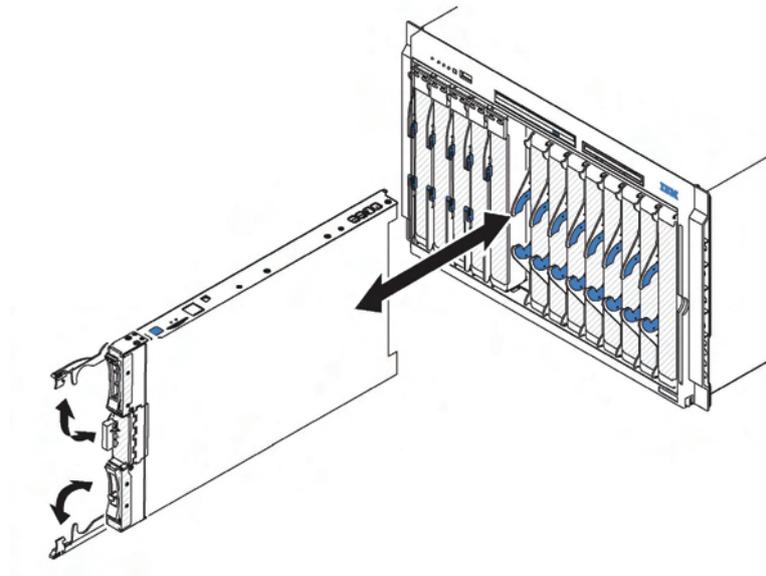


Figure 3-28. Installing the blade server in a Blade Chassis

Statement 21:



CAUTION:

Hazardous energy is present when the blade is connected to the power source. Always replace the blade cover before installing the blade.

1. Read the safety information that begins on page ix and *Installation guidelines* on page 17 through *Handling static-sensitive devices* on page 18.
2. Select the bay for the blade server; at least one blade bay is required.

-
- Notes**
- a. When any blade server or option is in any blade bays 7 through 14, power modules must be present in all four power-module bays. For additional information, see the *Installation and User's Guide* that comes with the Blade Chassis.
 - b. If you are reinstalling a blade server that you removed, you must install it in the same blade bay from which you removed it. Some blade server configuration information and update options are established according to blade server bay number. Reinstalling a blade server into a different blade server bay number from the one which it was removed can have unintended consequences, and you might have to reconfigure the blade server.
 - c. To help ensure proper cooling, performance, and system reliability, make sure that each blade bay on the front of the Blade Chassis contains a blade server, expansion unit, or blade filler. Do not operate a Blade Chassis for more than 1 minute without a blade server, expansion unit, or blade filler in each blade bay.
-

3. Make sure that the release handles on the blade server are in the open position (perpendicular to the blade server).
4. Slide the blade server into the blade bay until it stops.
5. Push the release handles on the front of the blade server to the closed position.

Note After the blade server is installed, the service processor in the blade server initializes and synchronizes with the management module. This process takes approximately two minutes to complete. The power-on LED flashes rapidly, and the power-control button on the blade server does not respond until this process is complete

6. Turn on the blade server (see *Turning on the blade server* on page 14 for instructions).
7. Make sure that the power-on LED on the blade server control panel is lit continuously, indicating that the blade server is receiving power and is turned on.
8. If you have other blade servers to install, do so now.

If this is the initial installation for the blade server in the Blade Chassis, you must configure the blade server through the Setup Utility and install the blade server operating system. See *Updating the blade server configuration* on page 57, and *Chapter 5, Installing the operating system*, on page 71 for details.

If you have changed the configuration of the blade server or if you are installing a different blade server from the one that you removed, you must configure the blade server through the Setup Utility, and you might have to install the blade server operating system. For more information see *Using the Setup Utility* on page 59.

3.14.3 Updating the blade server configuration

When the blade server starts for the first time after you add or remove an internal option, you might receive a message that the configuration has changed. The Setup Utility automatically starts so that you can save the new configuration settings. See *Using the Setup Utility* on page 59 for more information about the Setup Utility.

Some options have device drivers that you must install. See the documentation that comes with each option for information about installing device drivers.

The blade server operates as a symmetric multiprocessing (SMP) server, regardless of how many microprocessors are installed. For optimum performance, you must upgrade the operating system to support SMP. See *Chapter 5, Installing the operating system*, on page 71 for details. and your operating-system documentation for additional information.

3.14.4 Input / output connectors and devices

The input/output connectors that are available to the blade server are supplied by the Blade Chassis. See the documentation that comes with the Blade Chassis for information about the input/output connectors.

The blade server has two selection buttons on the control panel: the media tray select button and the keyboard/video/mouse select button. See *Blade server controls and LEDs* on page 11 for information about these buttons and their functions.

The Ethernet controllers on the blade server communicate with the network through the Ethernet-compatible I/O modules on the Blade Chassis. Network signals to and from the blade server or any expansion cards are automatically routed to a same-network-interface I/O module through circuitry in the Blade Chassis.

Chapter 4. Configuring the blade server

This chapter describes the configuration requirements for the blade server. Before you continue, make sure that the blade server has the latest version of firmware code. For additional information, see *Firmware updates* on page 64.

The following configuration programs come with the blade server:

- **Setup Utility**
The Setup Utility is used to change system settings, such as interrupt requests (IRQ), date and time, and password. See *Using the Setup Utility* for more information.
- **LSI Logic Configuration Utility program**
The LSI Logic Configuration Utility program is stored in the blade server firmware. Use it to set the device scan order and to set the storage drive controller ID. See *Using the LSI Logic Configuration Utility program* on page 66 for more information.
- **Preboot Execution Environment (PXE) boot agent utility program**
The PXE boot agent utility program is part of the blade server firmware. Use it to select the boot protocol and other boot options and to select a power-management option. For information about using this utility program, see *Using the PXE boot agent utility program* on page 63.

4.1 Using the Setup Utility

To start the Setup Utility, complete the following steps:

1. Turn on the blade server (see *Turning on the blade server* on page 14).
2. Immediately give the blade server control of the Blade Chassis shared keyboard, video, and mouse ports.
 - If you are managing the blade server by using the Blade system console, press the KVM select button on the blade server (see *Blade server controls and LEDs* on page 11 for information).
 - If you are managing the blade server from a remote location, see the Management Module documentation for information and instructions.
3. When the prompt `Press <F1> Setup` is displayed, press F1. If you have set an administrator password, you must type the administrator password to access the full Setup-utility menu. If you do not type the administrator password, a limited Setup-utility menu is available.
4. Follow the instructions on the screen.

4.1.1 Setup Utility menu

Use the Setup utility main menu to view and configure blade server configuration data and settings.

The following menu items are on the Setup utility main menu. Depending on the version of the Unified Extensible Firmware Interface (UEFI), some menu items might differ slightly from these descriptions.

- **System Information**

Select this choice to view information about the server. When you make changes through other choices in the Setup utility, some of those changes are reflected in the system information; you cannot change settings directly in the system information. This choice is on the full Setup utility menu only.

 - **System Summary**

Select this choice to view configuration information, including the ID, speed, and cache size of the microprocessors, machine type and model of the server, the serial number, the system UUID, and the amount of installed memory. When you make configuration changes through other options in the Setup utility, the changes are reflected in the system summary; you cannot change settings directly in the system summary.
 - **Product Data**

Select this choice to view the system-board identifier, the revision level or issue date of the firmware, the integrated management module and diagnostics code, and the version and date. This choice is on the full UEFI Setup Utility menu only.
- **System Settings**

Select this choice to view or change the server component settings.

 - **Processors**

Select this choice to view or change the processor settings.
 - **Memory**

Select this choice to view or change the memory settings.
 - **Devices and I/O Ports**

Select this choice to view or change assignments for devices and input/output (I/O) ports. You can configure the remote console redirection, enable or disable integrated Ethernet controllers, and the SAS controller. If you disable a device, it cannot be configured, and the operating system will not be able to detect it (this is equivalent to disconnecting the device).
 - **Power**

Select this choice to view or change power capping to control power consumption and processor performance states.

- **Legacy Support**
Select this choice to view or set legacy support.
 - **Force Legacy Video on Boot**
Select this choice to force INT video support, if the operating system does not support UEFI video output standards.
 - **Rehook INT**
Select this choice to enable or disable devices from taking control of the boot process. The default is **Disable**.
 - **Legacy Thunk Support**
Select this choice to enable or disable UEFI to interact with PCI mass storage devices that are non-UEFI compliant.
- **Integrated Management Module**
Select this choice to view or change the settings for the integrated management module.
 - **POST Watchdog Timer**
Select this choice to view or enable the POST watchdog timer.
 - **POST Watchdog Timer Value**
Select this choice to view or set the POST loader watchdog timer value.
 - **Reboot System on NMI**
Enable or disable restarting the system whenever a nonmaskable interrupt (NMI) occurs. **Disabled** is the default.
 - **Network Configuration**
Select this choice to view the system management network interface port, the IMM MAC address, the current IMM IP address, and host name; define the static IMM IP address, subnet mask, and gateway address, specify whether to use the static IP address or have DHCP assign the IMM IP address, save the network changes, and reset the IMM.
 - **Reset IMM to Defaults**
Select this choice to view or reset IMM to the default settings.
- **System Security**
Select this choice to view or configure security options.
- **Adapters and UEFI Drivers**
Select this choice to view information about the adapters and UEFI drivers installed in the server.
- **Network**
Select this choice to view or configure the network device options, such as iSCSI, PXE, and Broadcom.
- **Trusted Platform Module (TPM)**
Select this choice to view and configure TPM settings.
- **Date and Time**
Select this choice to set the date and time in the server, in 24-hour format (*hour:minute:second*).
This choice is on the full UEFI Setup Utility menu only..

- **Start Options**
 Select this choice to view or change the start options, including the startup sequence, keyboard NumLock state, PXE boot option, and PCI device boot priority. Changes in the startup options take effect when you start the server.
 The startup sequence specifies the order in which the server checks devices to find a boot record. The server starts from the first boot record that it finds. If the server has Wake on LAN hardware and software and the operating system supports Wake on LAN functions, you can specify a startup sequence for the Wake on LAN functions. For example, you can define a startup sequence that checks for a disc in the CD-RW/DVD drive, then checks the hard disk drive, and then checks a network adapter.
 This choice is on the full UEFI Setup Utility menu only.
- **Boot manager**
 Select this choice to view, add, delete, or change the device boot priority, boot from a file, select a one-time boot, or reset the boot order to the default setting.
- **System Event logs**
 Select this choice to enter the System Event Manager, where you can view the error messages in the system event logs. You can use the arrow keys to move between pages in the error log.
 The system event logs contain all event and error messages that have been generated during POST, by the systems-management interface handler, and by the system service processor. Run the diagnostic programs to get more information about error codes that occur. See the *Problem Determination and Service Guide* for instructions on running the diagnostic programs.
Important: If the system-error LED on the front of the server is lit but there are no other error indications, clear the IMM system-event log. Also, after you complete a repair or correct an error, clear the IMM system-event log to turn off the system-error LED on the front of the server.
 - **POST Event Viewer**
 Select this choice to enter the POST event viewer to view the POST error messages.
 - **IMM System Event Log**
 Select this choice to view the IMM system event log.
 - **Clear IMM System Event log**
 Select this choice to clear the IMM system event log.
- **User Security**
 Select this choice to set, change, or clear passwords. See *Using passwords* on page 63 for more information.
- **Save settings**
 Select this choice to save the changes that you have made in the settings.
- **Restore Settings**
 Select this choice to cancel the changes that you have made in the settings and restore the previous settings.
- **Load Default Settings**
 Select this choice to cancel the changes that you have made in the settings and restore the factory settings.

- **Exit Setup**
Select this choice to exit from the Setup utility. If you have not saved the changes that you have made in the settings, you are asked whether you want to save the changes or exit without saving them.

4.1.2 Using passwords

Use this information to set, change, or delete a power-on password.

You can set, change, and delete a power-on password in the Setup/Configuration utility by selecting **System Settings** then **System Security**.

If you set a power-on password, you must type the power-on password to complete the system startup and to have access to the Configuration/Setup Utility menu.

You can use any combination of up to seven characters (A–Z, a–z, and 0–9) for the password. Keep a record of your password in a secure place.

If you forget the power-on password, you can regain access to the blade server in by removing the blade server battery and then reinstalling it or by using the power-on password override switch (see the *Problem Determination and Service Guide* on the *Resource DVD* for instructions).

4.2 Installing the operating system

If you have already configured the blade server hardware, download the latest operating-system installation instructions from the Bull Support Web site:

<http://www.bull.com/support/>.

4.3 Using the PXE boot agent utility program

Use the Preboot Execution Environment (PXE) boot agent utility program to select the boot protocol and other boot options and to select a power-management option.

-
- Notes**
- The blade server does not support Remote Program Load (RPL) selection for the boot protocol option.
 - Enabling PXE might reduce the number of optional expansion modules that your blade server can manage.
-

To start the PXE boot agent utility program, complete the following steps:

1. Turn on the server.
2. When the `Broadcom NetXtreme Boot Agent vX.X.X` prompt is displayed, press `Ctrl+S`. You have 2 seconds (by default) to press `Ctrl+S` after the prompt is displayed.
3. Follow the instructions on the screen to change the settings of the selected items.

4.4 Firmware updates

Bull periodically provides UEFI code, service processor (IMM) firmware, and diagnostic firmware updates available for the blade server. Before you install the blade server in a Blade Chassis, go to <http://www.bull.com/support/> to download the latest firmware for the blade server. Install the updates, using the instructions that are included with the downloaded files.



To avoid problems and to maintain system performance, always make sure that the UEFI code, service processor (IMM) firmware, and diagnostic firmware levels are consistent for all blade servers within the Blade Chassis.

4.5 Configuring UEFI compatible devices

Use this information to configure UEFI compatible devices.

Your novascale BL265 blade server is UEFI compatible. UEFI compatible expansion cards can be configured through the Setup utility. To configure a UEFI compatible expansion card, complete the following steps:

Note Before configuring a UEFI compatible device, it is recommended to update the firmware for your blade server. See *Firmware updates* on page 64 for information on how to update the firmware for your blade server.

1. Run the Setup utility (see *Using the Setup Utility* on page 59).
2. Select **System Settings** → **Adapters and UEFI drivers**.
3. Select **Please refresh this page first** and press `Enter`.
4. Select the device driver that you want to configure and press `Enter`.
5. When you have finished changing settings, press `Esc` to exit from the program; select **Save** to save the settings that you have changed.

4.6 Configuring the Gigabit Ethernet controllers

One dual-port Gigabit Ethernet controller is integrated on the blade server system board. The controller provides a 1000 Mbps full-duplex interface for connecting to one of the Ethernet-compatible I/O modules in I/O-module bays 1 and 2, which enables simultaneous transmission and reception of data on the Ethernet local area network (LAN). The Ethernet controller on the system board is routed to I/O-module bay 1 or bay 2. The logical link of each Ethernet port to an I/O-module bay is assigned by the operating system.

You do not have to set any jumpers or configure the controller for the blade server operating system. However, you must install a device driver to enable the blade server operating system to address the Ethernet controllers. For device drivers and information about configuring the Ethernet controllers, see the *Resource DVD* that comes with the blade server.

4.7 Configuring a RAID array

Use this information to configure a RAID array.

Configuring a RAID array applies only to a blade server in which two or more storage drives are installed.

Note When configuring a RAID array, the storage drives must use the same type of interface. For example, a RAID array can be configured with two SAS storage drives, two SATA storage drives, or two SSD storage drives.

You can use two storage drives in the blade server to implement and manage RAID level-0 (striping) or RAID level-1 (mirror) arrays (see <http://www.support.bull.com> for information). For the blade server, you must configure the RAID by using the LSI Configuration Utility program.

If an optional RAID expansion card is installed, you can use it to control all of the storage drives that are installed in the blade server. See the documentation that comes with the expansion card for information on how to configure the RAID array.



You must create the RAID array *before* you install the operating system on the blade server

You can use the LSI Logic Configuration Utility program to configure the storage drives and the SAS controller. To start the LSI Logic Configuration Utility, see *Using the LSI Logic Configuration Utility program* on page 66.

4.8 Using the LSI Logic Configuration Utility program

You can use the LSI Logic Configuration Utility program to perform the following tasks:

- Set the SAS device scan order.
- Set the SAS ID for the controller.
- Manage the SAS RAID configuration.

To start the LSI Logic Configuration Utility program, complete the following steps:

Note The LSI controller on your blade server is a UEFI compatible device and can also be configured through the Setup utility for your blade server (see *Configuring UEFI compatible devices* on page 64).

1. Turn on the blade server, and make sure that the blade server is the owner of the keyboard, video, and mouse.
2. When the <<<Press Ctrl-C to start LSI Logic Configuration Utility>>> prompt is displayed, press Ctrl-C.
3. Use the arrow keys to select the controller from the list of adapters; then, press Enter.
4. Follow the instructions on the screen to change the settings of the selected items; then, press Enter. If you select **RAID Properties**, **SAS Topology** or **Advanced Adapter Properties**, additional screens are displayed.

4.9 Using LAN over USB to Interface the IMM

Unlike the BMC and RSA-II, the IMM does not require IPMI device drivers or USB daemons for in-band IMM communication. Instead, a LAN over USB interface enables in-band communications to the IMM; the IMM hardware on the system board presents an internal Ethernet NIC from the IMM to the operating system. LAN over USB is also called the "USB in-band interface" in the IMM Web interface.

Typically, the IMM IP address for the LAN over USB interface is set to a static address of 169.254.95.118 with a subnet mask of 255.255.0.0. In the event of an IP address collision on the network, the IMM might obtain a different IP address in the 169.254.xxx.xxx range. The IMM first attempts to use the default static address, 169.254.95.118. If that IP address is already in use, the IMM attempts to randomly obtain an address until it finds one that is not in use.

Because the IMM might obtain a random IP address for the LAN over USB interface, the IBM Advanced Settings Utility (ASU) and firmware flash utilities, DSA, and the IBM Director Agent use the Service Location Protocol (SLP) to discover the IMM IP address. These tools perform an SLP multicast discovery on the LAN over USB interface. When they receive a response from the IMM, they obtain the attributes that contain the IP address the IMM is using for the LAN over USB interface.

4.9.1 Potential conflicts with the LAN over USB interface

In some situations, the IMM LAN over USB interface can conflict with certain network configurations, applications, or both. For example, Open MPI attempts to use all of the available network interfaces on a server. Open MPI detects the IMM LAN over USB interface and attempts to use it to communicate with other systems in a clustered environment. The LAN over USB interface is an internal interface, so this interface does not work for external communications with other systems in the cluster.

4.9.2 Resolving conflicts with the IMM LAN over USB interface

There are several actions that resolve LAN over USB conflicts with network configurations and applications:

1. For conflicts with Open MPI, configure the application so it does not attempt to use this interface.
2. Take the interface down (run `ifdown` under Linux).
3. Remove the driver (run `rmmod` under Linux).
4. Disable the USB in-band interface on the IMM through either the IMM Web interface or the Module Management Web interface.



If you disable the USB in-band interface, you cannot perform an in-band update of the IMM firmware using the Linux or Windows flash utilities. If the USB in-band interface is disabled, use the Firmware Update option on the IMM Web interface to update the firmware.

If you disable the USB in-band interface, also disable the watchdog timeouts to prevent the server from restarting unexpectedly.

- Use the following steps to disable the LAN over USB interface from the IMM Web interface.
 - (a) Log in to the IMM on which you want to disable the USB device driver interface.
 - (b) In the navigation pane, click **System Settings** and scroll down to the **Miscellaneous** area.

- (c) Select the **Do not allow commands on USB interface** check box to disable the USB in-band interface. Selecting this option does not affect the USB remote presence functions (for example, keyboard, mouse, and mass storage). When you disable the USB in-band interface, the in-band systems-management applications might not work.
Note: If you try to use systems-management applications while the in-band interface is disabled, they might not work.
 - (d) Click **Save**.
- Use the following steps to disable the LAN over USB interface from the Management Module Web interface.
 - (a) Log in to the Management Module interface.
 - (b) In the navigation pane, click **Blade Configuration** under the **Blade Tasks** heading.
 - (c) Scroll down to the Service Processor LAN over USB interface are on the Blade Configuration web page. The section lists all blades in the chassis which are capable of enabling and disabling the LAN over USB interface.
 - (d) Select the check boxes next to the blade or blades that you want to enable or disable.
 - (e) Click the **Disable** button to disable the LAN over USB interface on the selected blades.

4.9.3 Configuring the LAN over USB interface manually

The IMM using the LAN over USB interface requires operating-system drivers and other configuration. For more information about LAN over USB configuration on different operating systems, see the white paper *Transitioning to UEFI and IMM* on <http://www.bull.com/support>.

4.9.3.1 Windows IPMI device driver

The Microsoft IPMI device driver is not installed by default on Microsoft Windows Server 2003 R2 operating systems. To install the Microsoft IPMI device driver, complete the following steps:

1. From the Windows desktop, click Start → Control Panel → Add or Remove Programs.
2. Click Add/Remove Windows Components.
3. From the component list, select **Management and Monitoring Tools**, and then click **Details**.
4. Select Hardware Management.
5. Click **Next**. The installation wizard opens and guides you through the installation.

Note The Windows installation disk might be required.

4.9.3.2 LAN over USB Windows Driver Installation

When you install Windows, there will be an unknown RNDIS device in the device manager. A Windows INF file is provided, that identifies this device. The signed version of the INF is included in all of the Windows versions of the IMM, UEFI, and DSA update packages. Perform the following steps to install `ibm_rndis_server_os.inf`.

Note These steps only need to be performed if the server is running a Windows operating system and the `ibm_rndis_server_os.inf` file has not been previously installed. The file needs to be installed only once. It is required by Windows operating systems to detect and use the LAN over USB functionality.

1. Obtain a Windows version of the IMM, server firmware, and DSA update package (see *Firmware updates* on page 64 for more information).
2. Extract the `ibm_rndis_server_os.inf` and `device.cat` files from the firmware update package and copy them to the `\WINDOWS\inf` subdirectory.
3. For Windows 2003: Install the `ibm_rndis_server_os.inf` file by right-clicking on the file and selecting **Install**. This generates a PNF file of the same name in `\WINDOWS\inf`.
For Windows 2008: Go to **Computer Management**, then **Device Manager** and find the RNDIS Device. Select **Properties > Driver > Reinstall driver**. Point the server to the `\Windows\inf` directory where it can find the `ibm_rndis_server_os.inf` file and install the device.
4. Go to **Computer Management** then **Device Manager** and right-click on **Network adapters** and select **Scan for hardware changes**. A small pop-up confirms that the Ethernet device is found and installed. The New Hardware Wizard starts automatically.
5. When you are prompted with the question, "Can Windows connect to Windows Update to search for software?", select **No, not this time**. Click **Next** to continue.
6. When you are prompted with the question, "What do you want the wizard to do?", select **Install from a list or specific location (Advanced)**. Click **Next** to continue.
7. When you are prompted with the statement, "Please choose your search and installation options", select **Don't search. I will choose the driver to install**. Click **Next** to continue.
8. When you are prompted with the statement, "Select a hardware type, and then click Next", select **Network adapters**. Click **Next** to continue.
9. You are prompted with the statement, "Completing the Found New Hardware Wizard". Click **Finish**.

Note A new local area connection appears and might state, "This connection has limited or no connectivity". Ignore this message

10. Go back to the Device Manager. **IBM USB Remote NDIS Network Device** appears under **Network Adapters**.
11. Open a command prompt, type `ipconfig`, and press Enter. The local area connection for the IBM USB RNDIS appears with an IP address in the range of 169.254.xxx.xxx with a subnet mask set to 255.255.0.0.

4.9.3.3 LAN over USB Linux Driver Installation

Current versions of Linux, such as RHEL5 Update 2 and SLES10 Service Pack 2, support the LAN over USB interface by default. This interface is detected and displayed during the installation of these operating systems. When you configure the device, use a static IP address of 169.254.95.130 with a subnet mask of 255.255.0.0.

Note Older Linux distributions might not detect the LAN over USB interface, and might require manual configuration. For information about configuring LAN over USB on specific Linux distributions, see the white paper *Transitioning to UEFI and IMM* on <http://www.bull.com/support>.

The IMM LAN over USB interface requires that the `usbnet` and `cdc_ether` drivers be loaded. If the drivers have not been installed, use `modprobe` to install them. When these drivers are loaded, the IMM USB network interface shows up as a network device in the operating system. To discover the name that the operating system has assigned to the IMM USB network interface, type:

```
dmesg | grep -i cdc ether
```

The interface is configured with `ifconfig` to have an IP address in the range 169.254.xxx.xxx. For example:

```
ifconfig IMM_device_name 169.254.1.102 netmask 255.255.0.0
```

This interface is configured to come up with an IP address in the 169.254.xxx.xxx range each time that the operating system is booted.

Chapter 5. Installing the operating system

To install the operating system on a blade server, download the latest operating-system installation instructions from the Bull Support web site: <http://www.bull.com/support/> and install the operating system.



The operating system in the blade server must provide USB support for the blade server to recognize and use the keyboard, mouse, and removable-media drives. The Blade Chassis uses USB for internal communication with these devices.

Chapter 6. Solving problems

Use these instructions to resolve any problems you may encounter while installing the blade server.

If you install the blade server in the Blade Chassis and the blade server does not start, perform the following actions:

- Make sure that the Blade Chassis is correctly connected to a power source.
- Reseat the blade server in the Blade Chassis (see *Installing the blade server in a Blade Chassis* on page 55).
- If the power-on LED is flashing slowly, turn on the blade server (see *Turning on the blade server* on page 14).
- If you have just added a new optional device or component, make sure that it is correctly installed and compatible with the blade server and its components. If the device or component is not compatible, remove it from the blade server, reinstall the blade server in the Blade Chassis, and then restart the blade server.

If the blade server does not start after you have performed the preceding actions, see the *Problem Determination and Service Guide* for your blade server on the *Resource DVD*.

6.1 Diagnostic tools overview

The following tools are available to help you diagnose and solve hardware-related problems:

- **POST codes, error messages, and error logs**
The POST error codes indicate the detection of a problem. See the *Problem Determination and Service Guide* for more information.
- **Troubleshooting tables**
The troubleshooting tables list problem symptoms and actions to correct the problems. See the *Problem Determination and Service Guide* for your blade server.
- **Light path diagnostics**
Use light path diagnostics LEDs on the system board to diagnose system errors. If the system-error LED on the system LED panel on the front or rear of the Blade Chassis is lit, one or more error LEDs on the Blade Chassis components also might be lit. These LEDs help identify the cause of the problem. Blade server error LEDs are described in the *Problem Determination and Service Guide* for your blade server.
- **Dynamic System Analysis (DSA) Installable and Portable Edition diagnostic program**
DSA tests the major components of the Blade Chassis unit, including the management modules, I/O modules, removable-media drives, and the blade servers, while the operating system is running.
For more information about diagnostic programs and error messages, see the *Problem Determination and Service Guide* for your blade server.

Note If you are unable to find the system-error logs in the blade server firmware code, view the system-event log in the Blade Chassis management module.

- **Dynamic System Analysis (DSA) Preboot diagnostic program**

The DSA Preboot diagnostic programs are stored in read-only memory and collect and analyze system information to aid in diagnosing server problems.

The diagnostic programs collect the following information about the server:

- Drive health information
- Event logs for ServeRAID controllers and service processors
- Hardware inventory, including PCI and USB information
- Light path diagnostics status
- LSI RAID and controller configuration
- Network interfaces and settings
- ServeRAID configuration
- Service processor status and configuration
- System configuration
- Vital product data, firmware, and Unified Extensible Firmware Interface (UEFI) configuration

The diagnostic programs create a merged log that includes events from all collected logs. The information is collected into a file that you can send to support. Additionally, you can view the information locally through a generated text report file. You can also copy the log to removable media and view the log from a Web browser.

Appendix A. Getting help and technical assistance

If you need help, service, or technical assistance or just more information about our products, Bull provides a wide variety of sources to assist you. This appendix indicates where to go for additional information about Bull and Bull products, what to do if you experience a problem with your Bull Blade system, and who to call for service if necessary.

Before you call

Before you call, make sure that you have taken these steps to try to solve the problem yourself:

Check all cables to make sure that they are connected.

Check the power switches to make sure that the system is turned on.

Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system.

Go to <http://www.bull.com/support> and check for information to help you solve the problem.

You can solve many problems without outside assistance by following the troubleshooting procedures that are provided in your system and software documentation. Most systems, operating systems, and programs come with information that contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, refer to the appropriate software documentation.

If you have not been able to solve the problem yourself, contact your Bull Support Representative.

Using the documentation

Information about your Bull Blade system and pre-installed software, if any, is available in the documentation that comes with your system. The documentation can include printed documents, online documents, readme files, and help files. See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you need additional or updated device drivers or other software. Bull maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access these pages, go to <http://www.bull.com/support> and select your system.

Appendix B. Notices

Processor speeds indicate the internal clock speed of the microprocessor; other factors also affect application performance.

CD or DVD drive speeds list the variable read rate. Actual speeds vary and are often less than the maximum possible.

When referring to processor storage, real and virtual storage, or channel volume, KB stands for 1024 bytes, MB stands for 1 048 576 bytes, and GB stands for 1 073 741 824 bytes.

When referring to hard disk drive capacity or communications volume, MB stands for 1 000 000 bytes, and GB stands for 1 000 000 000 bytes. Total user-accessible capacity may vary depending on operating environments.

Maximum internal hard disk drive capacities assume the replacement of any standard hard disk drives and population of all hard disk drive bays with the largest currently supported drives available from Bull.

Maximum memory may require replacement of the standard memory with an optional memory module.

Bull makes no representation or warranties regarding non-Bull products and services, including but not limited to the implied warranties of merchantability and fitness for a particular purpose. These products are offered and warranted solely by third parties.

Bull makes no representations or warranties with respect to non-Bull products. Support (if any) for the non-Bull products is provided by the third party, not Bull.

Some software may differ from its retail version (if available), and may not include user manuals or all program functionality.

Particulate contamination

Use the particulates and gases specifications to create a safe operating environment for your blade server.

Attention: Airborne particulates (including metal flakes or particles) and reactive gases acting alone or in combination with other environmental factors such as humidity or temperature might pose a risk to the server that is described in this document. Risks that are posed by the presence of excessive particulate levels or concentrations of harmful gases include damage that might cause the server to malfunction or cease functioning altogether. This specification sets forth limits for particulates and gases that are intended to avoid such damage. The limits must not be viewed or used as definitive limits, because numerous other factors, such as temperature or moisture content of the air, can influence the impact of particulates or environmental corrosives and gaseous contaminant transfer. In the absence of specific limits that are set forth in this document, you must implement practices that maintain particulate and gas levels that are consistent with the protection of human health and safety. If Bull determines that the levels of particulates or gases in your environment have caused damage to the server, Bull may condition provision of repair or replacement of servers or parts on implementation of appropriate remedial measures to mitigate such environmental contamination.

Implementation of such remedial measures is a customer responsibility.

Contaminant	Limits
Particulate	<ul style="list-style-type: none"> • The room air must be continuously filtered with 40% atmospheric dust spot efficiency (MERV 9) according to ASHRAE Standard 52.2¹. • Air that enters a data center must be filtered to 99.97% efficiency or greater, using high-efficiency particulate air (HEPA) filters that meet MIL-STD-282. • The deliquescent relative humidity of the particulate contamination must be more than 60%². • The room must be free of conductive contamination such as zinc whiskers.
Gaseous	<ul style="list-style-type: none"> • Copper: Class G1 as per ANSI/ISA 71.04-1985³ • Silver: Corrosion rate of less than 300 Å in 30 days
<p>¹ASHRAE 52.2-2008 - <i>Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size</i>. Atlanta: American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.</p> <p>²The deliquescent relative humidity of particulate contamination is the relative humidity at which the dust absorbs enough water to become wet and promote ionic conduction.</p> <p>³ANSI/ISA-71.04-1985. <i>Environmental conditions for process measurement and control systems: Airborne contaminants</i>. Instrument Society of America, Research Triangle Park, North Carolina, U.S.A.</p>	

Table B-1. Limits for particulates and gases

Product recycling and disposal

This unit must be recycled or discarded according to applicable local and national regulations. Bull encourages owners of information technology (IT) equipment to responsibly recycle their equipment when it is no longer needed.



Notice:

This mark applies only to countries within the European Union (EU) and Norway.

This appliance is labeled in accordance with European Directive 2002/96/EC concerning waste electrical and electronic equipment (WEEE). The Directive determines the framework for the return and recycling of used appliances as applicable throughout the European Union. This label is applied to various products to indicate that the product is not to be thrown away, but rather reclaimed upon end of life per this Directive.

注意: このマークは EU 諸国およびノルウェーにおいてのみ適用されます。

この機器には、EU 諸国に対する廃電気電子機器指令 2002/96/EC(WEEE) のラベルが貼られています。この指令は、EU 諸国に適用する使用済み機器の回収とリサイクルの骨子を定めています。このラベルは、使用済みになった時に指令に従って適正な処理をする必要があることを知らせるために種々の製品に貼られています。

Remarque:

Cette marque s'applique uniquement aux pays de l'Union Européenne et à la Norvège.

L'étiquette du système respecte la Directive européenne 2002/96/EC en matière de Déchets des Equipements Electriques et Electroniques (DEEE), qui détermine les dispositions de retour et de recyclage applicables aux systèmes utilisés à travers l'Union européenne. Conformément à la directive, ladite étiquette précise que le produit sur lequel elle est apposée ne doit pas être jeté mais être récupéré en fin de vie.

In accordance with the European WEEE Directive, electrical and electronic equipment (EEE) is to be collected separately and to be reused, recycled, or recovered at end of life. Users of EEE with the WEEE marking per Annex IV of the WEEE Directive, as shown above, must not dispose of end of life EEE as unsorted municipal waste, but use the collection framework available to customers for the return, recycling, and recovery of WEEE. Customer participation is important to minimize any potential effects of EEE on the environment and human health due to the potential presence of hazardous substances in EEE. For proper collection and treatment, contact your local Bull representative.

Electronic emission notices

Federal Communications Commission (FCC) statement

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Bull is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Industry Canada Class A emission compliance statement

This Class A digital apparatus complies with Canadian ICES-003.

Avis de conformité à la réglementation d'Industrie Canada

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

Australia and New Zealand Class A statement

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

United Kingdom telecommunications safety requirement

Notice to Customers

This apparatus is approved under approval number NS/G/1234/J/100003 for indirect connection to public telecommunication systems in the United Kingdom.

European Union EMC Directive conformance statement

This product is in conformity with the protection requirements of EU Council Directive 89/336/EEC on the approximation of the laws of the Member States relating to electromagnetic compatibility. Bull cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-Bull option cards.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to CISPR 22/European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

Attention: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Taiwanese Class A warning statement

警告使用者：
這是甲類的資訊產品，在
居住的環境中使用時，可
能會造成射頻干擾，在這
種情況下，使用者會被要
求採取某些適當的對策。

Chinese Class A warning statement

声 明
此为 A 级产品。在生活环境中，
该产品可能会造成无线电干扰。
在这种情况下，可能需要用户对其
干扰采取切实可行的措施。

Japanese Voluntary Control Council for Interference (VCCI) statement

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に
基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を
引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求
されることがあります。

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