

bullx B500 System

Installation Guide

extreme computing



REFERENCE
86 A1 48FB 06

bullx B500 System

Installation Guide

Hardware

September 2011

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FRANCE

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Legal Information

Regulatory Declarations and Disclaimers

Declaration of the Manufacturer or Importer

We hereby certify that this product is in compliance with:

- European Union EMC Directive 2004/108/EC, using standards EN55022 (Class A) and EN55024 and Low Voltage Directive 2006/95/EC, using standard EN60950
- International Directive IEC 60297 and US ANSI Directive EIA-310-E

Safety Compliance Statement

- UL 60950 (USA)
- IEC 60950 (International)
- CSA 60950 (Canada)

European Community (EC) Council Directives

This product is in conformity with the protection requirements of the following EC Council Directives:

Electromagnetic Compatibility

- 2004/108/EC

Low Voltage

- 2006/95/EC

EC Conformity

- 93/68/EEC

Telecommunications Terminal Equipment

- 1999/5/EC

Neither the provider nor the manufacturer can accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product.

Compliance with these directives requires:

- An EC declaration of conformity from the manufacturer
- An EC label on the product
- Technical documentation

Mechanical Structures

- IEC 60297
- EIA-310-E

FCC Declaration of Conformity

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.

Federal Communications Commission (FCC) Statement

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. Neither the provider nor the manufacturer are 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.

Pursuant to Part 15.21 of the FCC Rules, any changes or modifications to this equipment not expressly approved by the manufacturer may cause harmful interference and void the FCC authorization to operate this equipment. An FCC regulatory label is affixed to the equipment.

Canadian Compliance Statement (Industry Canada)

This Class A digital apparatus meets all requirements of the Canadian Interference Causing Equipment Regulations.

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

This product is in conformity with the protection requirements of the following standards:

- ICES-003
- NMB-003

VCCI Statement

This equipment complies with the VCCI V-3/ 2008-4 requirements.

この装置は、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。 **VCCI- A**

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions. A VCCI regulatory label is affixed to the equipment.

Laser Compliance Notice (if applicable)

This product that uses laser technology complies with Class 1 laser requirements.

A CLASS 1 LASER PRODUCT label is affixed to the laser device.

Class 1 Laser Product
Luokan 1 Laserlaite
Klasse 1 Laser Apparat
Laser Klasse 1

Safety Information

Definition of Safety Notices



DANGER

A *Danger* notice indicates the presence of a hazard that has the potential of causing death or serious personal injury.



CAUTION

A *Caution* notice indicates the presence of a hazard that has the potential of causing moderate or minor personal injury.



WARNING

A *Warning* notice indicates an action that could cause damage to a program, device, system, or data.

Electrical Safety

The following safety instructions shall be observed when connecting or disconnecting devices to the system.



DANGER

The Customer is responsible for ensuring that the AC electricity supply is compliant with national and local recommendations, regulations, standards and codes of practice. An incorrectly wired and grounded electrical outlet may place hazardous voltage on metal parts of the system or the devices that attach to the system and result in an electrical shock. It is mandatory to remove power cables from electrical outlets before relocating the system.



CAUTION

This unit has more than one power supply cable. Follow procedures for removal of power from the system when directed.

Laser Safety Information (if applicable)

The optical drive in this system unit is classified as a Class 1 level Laser product. The optical drive has a label that identifies its classification.

The optical drive in this system unit is certified in the U.S. to conform to the requirements of the Department of Health and Human Services 21 Code of Federal Regulations (DHHS 21 CFR) Subchapter J for Class 1 laser products. Elsewhere, the drive is certified to conform to the requirements of the International Electrotechnical Commission (IEC) 60825-1: 2001 and CENELEC EN 60825-1: 1994 for Class 1 laser products.



CAUTION

Invisible laser radiation when open. Do not stare into beam or view directly with optical instruments.

Class 1 Laser products are not considered to be hazardous. The optical drive contains internally a Class 3B gallium-arsenide laser that is nominally 30 milliwatts at 830 nanometers. The design incorporates a combination of enclosures, electronics, and redundant interlocks such that there is no exposure to laser radiation above a Class 1 level during normal operation, user maintenance, or servicing conditions.

Data Integrity and Verification



WARNING

Products are designed to reduce the risk of undetected data corruption or loss. However, if unplanned outages or system failures occur, users are strongly advised to check the accuracy of the operations performed and the data saved or transmitted by the system at the time of outage or failure.

Waste Management

This product has been built to comply with the Restriction of Certain Hazardous Substances (RoHS) Directive 2002/95/EC.

This product has been built to comply with the Waste Electrical and Electronic (WEEE) Directive 2002/96/EC.

Safety Recommendations

Danger and Warning Notices



DANGER

Only hot-pluggable components can be serviced (added, removed, replaced) without powering down the equipment.

If the component is NOT hot-swappable, the equipment must be powered down PRIOR to servicing and the AC power cables must be disconnected from the electrical outlet.



DANGER

Failure to disconnect AC power cables before servicing the equipment may result in personal injury and damage to equipment.

It is mandatory to remove AC power cables from electrical outlets before relocating cabinets and systems.



DANGER

Hazardous voltage, current, and energy levels are present inside the power supply. Hazardous electrical conditions may be present on power, telephone, and communication cables.

Energy hazard:

Remove all jewelry before servicing.



DANGER

The Ultracapacitor may retain a charge after power is removed. This charge may result in personal injury and damage to equipment.

It is mandatory not to touch any parts until the Ultracapacitor has fully discharged.

A faulty Ultracapacitor may release electrolyte fluid.

It is mandatory to wear protection gloves and protection glasses to avoid contact with skin and eyes when handling the Ultracapacitor.



DANGER

The onboard battery should be replaced regularly. It must be replaced with the same or an equivalent type recommended by the manufacturer. There is a danger of explosion if another type is used. Dispose of used batteries according to the manufacturer's instructions.



DANGER

Basic electrical safety precautions should be followed to protect yourself from harm and the drawer from damage.

If an electrical accident occurs, shutdown the power by removing the power cord from the server.



WARNING

Optimum cooling and airflow is ensured when cabinets and systems are closed.

Once the maintenance / service intervention has been completed, all cabinet and system covers and doors should be refitted and closed rapidly.

Important Notices



Important LABELING

Use labels to note the orientation and position of any cables, components, shielding or connectors removed.



Important HANDLING STATIC-SENSITIVE DEVICES

The following precautions must be taken when handling static-sensitive devices:

- Systematically wear an antistatic wriststrap when handling components.
 - Touch the cabinet frame to release static before handling boards.
 - Hold cards, boards and drives by the edges.
 - Only remove the device from the antistatic container when you are ready to install it.
 - If you need to lay the device down while it is out of the antistatic container, lay it on the conductive foam pad.
-

Preface

This guide explains how to install and start the bullx blade system for the first time.

Note The Bull Support Web site may be consulted for product information, documentation, updates and service offers:

<http://support.bull.com>

Intended Readers

This guide is intended for use by qualified personnel in charge of installing the bullx blade system in a Bull Cabinet.

Highlighting

The following highlighting conventions are used in this guide:

| | |
|---|---|
| Bold | Identifies the following: <ul style="list-style-type: none">• Interface objects such as menu names, labels, buttons and icons.• File, directory and path names.• Keywords to which particular attention must be paid. |
| <i>Italics</i> | Identifies references such as manuals or URLs. |
| <code>monospace</code> | Identifies portions of program codes, command lines, or messages displayed in command windows. |
| < > | Identifies parameters to be supplied by the user. |
|  | Identifies the FRONT of a component. |
|  | Identifies the REAR of a component. |

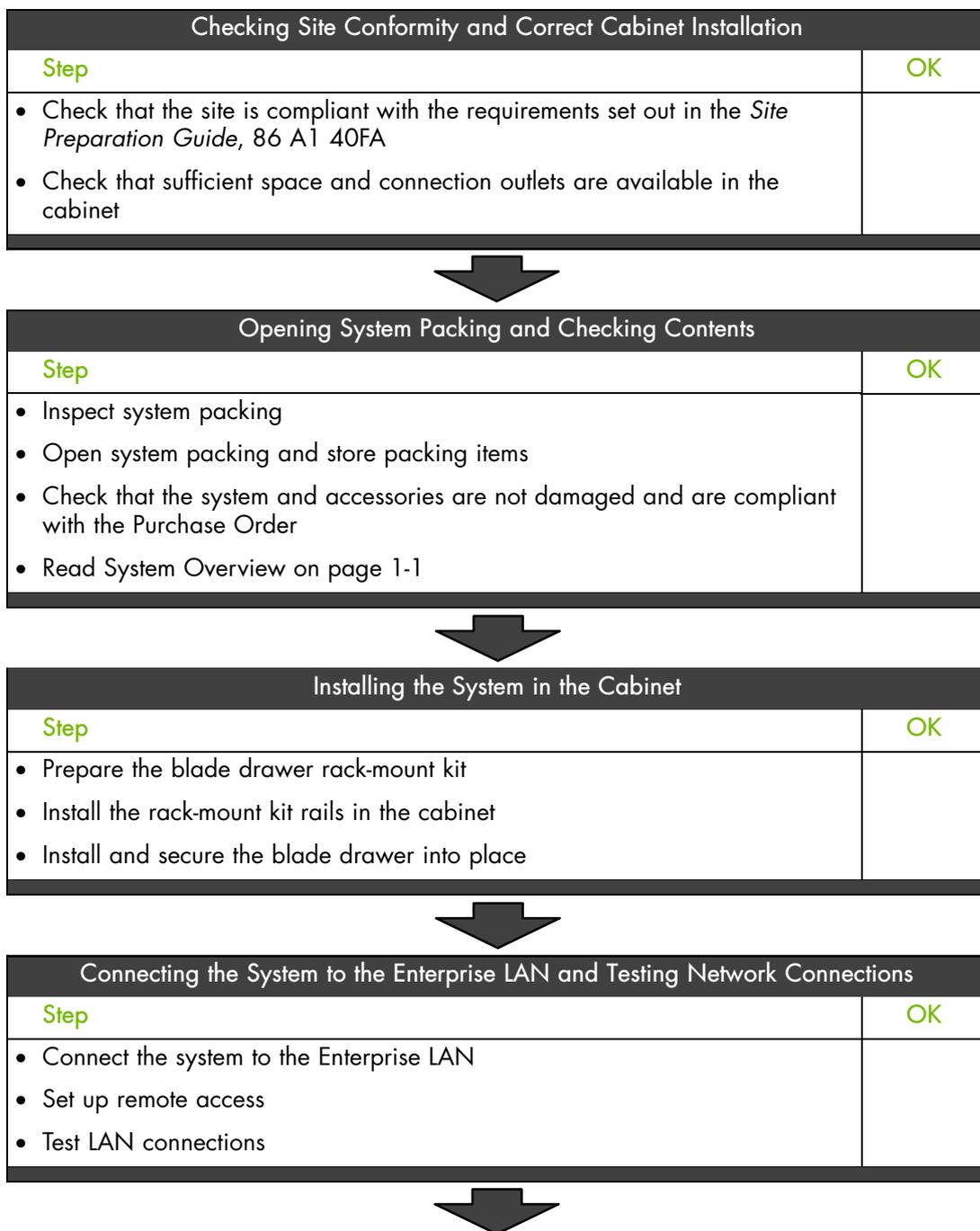
Related Publications

This list is not exhaustive. Useful documentation is supplied on the Resource & Documentation CD(s) delivered with your equipment. You are strongly advised to refer carefully to this documentation before proceeding to configure, use, maintain, or update your equipment.

- *Site Preparation Guide, 86 A1 40FA*
explains how to prepare a Data Processing Center for Bull Systems, in compliance with the standards in force. This guide is intended for use by all personnel and trade representatives involved in the site preparation process.
- *R@ck'n Roll & R@ck-to-Build Installation and Service Guide, 86 A1 17FA*
explains how to install and service the cabinets. This guide is intended for use by qualified support personnel.
- *bullx B5xx System Chassis Hardware Console User's Guide, 86 A1 50FB*
explains how to use the Chassis Hardware Console (CHC) to manage the system. This guide is intended for use by blade system administrators and operators.
- *bullx B500 System Blade Hardware Console User's Guide, 86 A1 49FB*
explains how to use the bullx B500 compute blades. This guide is intended for use by customer administrators and operators.
- *bullx B500 System Service Guide, 86 A7 51FB*
explains how to service the system. This guide is intended for use by qualified support personnel.
- *Resource and Documentation CD*
contains the tools and documentation required to configure, operate and maintain the equipment.

Installation Flowchart

This flowchart summarizes the main installation and setup procedures for a system delivered ready to be mounted in a cabinet.



| Completing Installation | |
|--|----|
| Step | OK |
| <ul style="list-style-type: none"> • Start the Chassis Hardware Console and the Blade Hardware Consoles • Power on the system from the Hardware Consoles • Check Hardware status • Power off the system from the Hardware Console • Refer to the <i>bullx blade system Chassis Hardware Console User's Guide</i>, 86 A1 50FB to complete system setup | |

Required Tools

The tools listed below are required to install and commission the system:

Cutter

Flat head screwdriver

Spanner or nut driver for M5 nut

T25 Torx screwdriver



Important

Systematically wear an anti-static wriststrap when installing systems.

Chapter 1. Getting to Know the System

This chapter gives an overview of the blade system and its components. It includes the following topics:

- System Overview, on page 1-1
- Blade system components, controls and LEDs, on page 1-7

1.1. System Overview

This chapter gives an overview of blade system architecture and a high-level description of each of the system components.

The bullx blade system is a high-density server system providing cluster architecture. It can be equipped with eighteen bullx B500 compute blades, making it ideally suited for extreme computing cluster environments requiring a large number of high-performance servers in a small space. The bullx blade chassis provides common resources that are shared by the blades, such as power, cooling, system management, network connections, and I/O switch. The use of common resources reduces blade size, minimizes cabling, and also reduces the time / likelihood of idle resources.

Performance, ease-of-use, reliability, and expansion capabilities were key considerations during the design of the bullx blade system. These design features make it possible for you to customize system hardware to meet the needs of today, while providing flexible expansion capabilities for the future.

This guide provides information on how to:

- install the system
- connect and test the system

Six bullx blade systems can be simultaneously housed in a 42U cabinet. Each bullx blade system comprises the following key hardware components, some of which are optional:

- Up to eighteen dual processor (DP) bullx B500 compute blades (NCB), with two processors, two fans for cooling, and an HDD/SSD disk.
- A Quad Switch Module (QSM).
- An optional Ultra Capacitor Module (UCM).
- A Chassis Management Module (CMM).
- An optional 1 Gigabit Ethernet Switch Module (ESM).
- An optional 10 Gigabit Ethernet Switch Module (TSM).
- A Local Control Panel (LCP) providing an LCD display and power and reset buttons.
- Up to four Power Supply Unit modules (PSU) providing N+1 power redundancy.
- Two fan blades to cool the QSM, CMM, and ESM / TSM modules.

Serial and part numbers are indicated on a label (A) on the top of the chassis. The following table can be used to record system information.

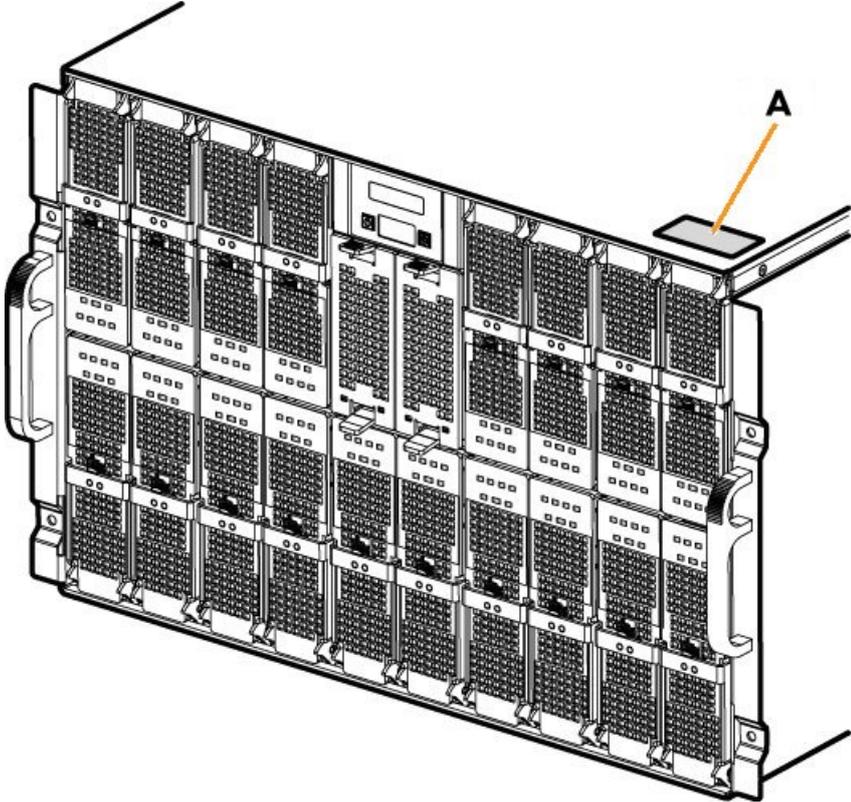


Figure 1-1. bullx information label

| System | Data |
|---------------------|------|
| Product Name | |
| Model Type | |
| Serial Number (XAN) | |

Table 1-1. System product data

1.2. What the Blade System offers

The blade system design takes advantage of advancements in server technology. It houses up to and their shared resources in a single blade chassis. The blade system combines:

Innovative technology

Proven innovative technologies to build powerful, scalable and reliable Intel®-processor-based servers.

Expansion capabilities

Blades can be added to the blade system as needed. The system can be equipped with a maximum of eighteen compute blades / nine accelerator blades / nine dual-node blades. All these blades can be mixed in the same chassis.

Hot-swap / Hot-plug capabilities

The compute, accelerator and dual-node blades, the fan blades, the Chassis Management Module (CMM), the 1 Gigabit Ethernet Switch Module (ESM), the 10 Gigabit Ethernet Switch Module (TSM), the Quad Switch Module (QSM) the Local Control Panel (LCP) and the Power Supply Units (PSU) are hot-pluggable / hot-swappable for optimum uptime and easy maintenance.

Redundancy capabilities

The redundant PSU modules and fan blades ensure continued operation even if a component fails.

Redundant network connection capabilities

The optional 1 Gigabit Ethernet Switch Module (ESM) / 10 Gigabit Ethernet Switch Module (TSM) provides a redundant Ethernet interface to the blades.

System management capabilities

The blade system Chassis Management Module (CMM) is equipped with a service processor, which in conjunction with the system-management firmware provided on the service processor in each blade, allows remote management of system components and blades. The Chassis Management Module (CMM) also multiplexes access to the embedded management controllers on the blades providing them with KVM and Virtual Media capabilities.

Each blade is equipped with a service processor which provides blade system monitoring, event recording, and alert capabilities.

Network environment support

The blade system supports up to two Ethernet Switches, one in the Chassis Management Module (CMM) and the second in the 1 Gigabit Ethernet Switch Module (ESM) / 10 Gigabit Ethernet Switch Module (TSM). The Ethernet Switch Modules are used for blade communication with the network. The Chassis Management Module (CMM) and 1 Gigabit Ethernet Switch Module (ESM) / 10 Gigabit Ethernet Switch Module (TSM) provide internal connections to each blade.

1.3. Reliability, Availability, and Serviceability (RAS)

The following is a list of RAS features that the blade system supports:

- Shared key components, such as power, cooling, and I/O
- All components serviced from the front or rear of the blade chassis
- Built-in monitoring for fan blade, power, temperature, and voltage
- Built-in monitoring for module redundancy
- Error codes and messages
- Fault-resistant startup
- Remote system management through the Chassis Management Module (CMM)
- Remote upgrade of Chassis Management Module (CMM) firmware
- Remote upgrade of blade service processor firmware
- Redundant components:
 - Fan blades
 - Power Supply Unit modules
- Hot-plug / hot-swap components:
 - Compute blades (NCB)
 - Fan blades
 - Chassis Management Module (CMM)
 - 1 Gigabit Ethernet Switch Module (ESM) / 10 Gigabit Ethernet Switch Module (TSM)
 - Quad Switch Module (QSM)
 - Local Control Panel (LCP)
 - Power Supply Unit (PSU)
- Ultra Capacitor Module (UCM) (requires full system power down)

1.4. Features and Specifications

The following is a summary of the features and specifications for the blade system:

- bullx B500 compute blades (NCB)
- AC power redundancy: N+1 (4 PSU modules redundant system, 3 PSU modules non-redundant system)
- Two fan blades cooling the QSM, CMM and ESM / TSM
- Rack-mountable system, using a standard cabinet

1.4.1. Chassis-level Platform Management

The following platform management features are available via the Chassis Hardware Console:

- Embedded web server, compliant with Microsoft Internet Explorer and Firefox browsers
- SNMP, SMASH/CLP, and IPMI Out of Band compliant interface
- Logistic control (thermal, cooling, global power control, and power distribution)
- Hardware health monitoring and alerting

1.4.2. Blade-level Platform Management

The following platform management features are available via the Blade Hardware Console:

- Embedded web server, compliant with Microsoft Internet Explorer and Firefox browsers
- IPMI v2.0, SMASH/CLP Out of Band compliant interface
- Logistic control (thermal, local power control, and power distribution)
- Hardware health monitoring and alerting

1.4.3. External Connections, Interfaces, Indicators, Buttons and Switches

The following external connections, interfaces, indicators, buttons and switches are available:

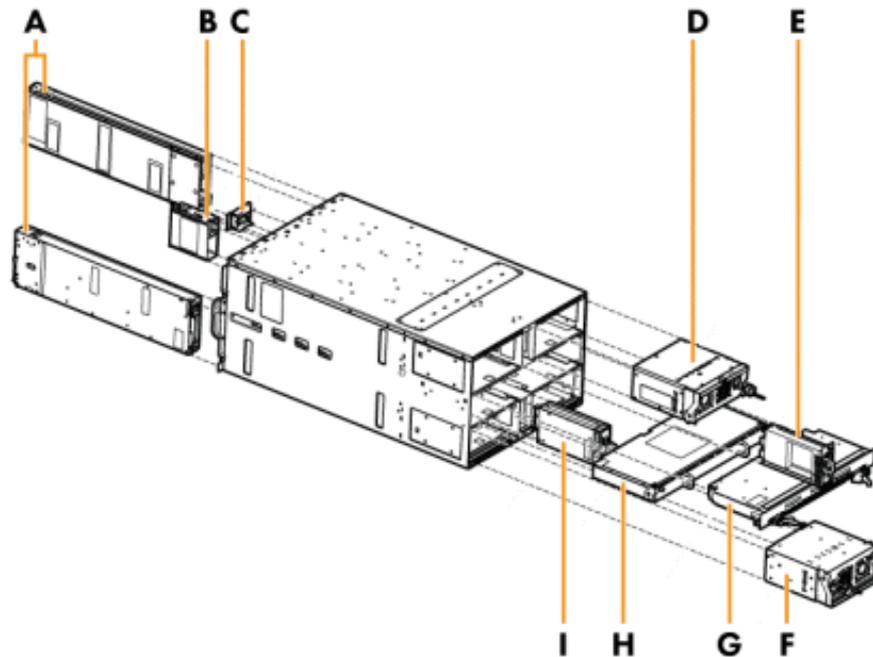
- Eighteen IB QDR connections (QSFP connector with power) on the Quad Switch Module
- Three 1Gb Ethernet ports -RJ45 connectors and a serial COM port for maintenance on the ESM
- Four 10Gb Ethernet ports -SFP+ connectors, One 1Gb Ethernet port & a serial COM port for maintenance -Stacked Dual RJ45 connector on TSM.
- Three 1Gb Ethernet ports -RJ45 connectors and a serial COM port for maintenance on the CMM
- Local Control Panel (LCP)
- Chassis power On/Off switch
- Chassis power indicator LED
- Chassis blue ID indicator LEDs – front LCP indicator LED, rear CMM indicator LED
- Blade indicator LEDs
- Quad Switch Module indicator LED
- Gbit Ethernet switch indicator LED
- Ultra Capacitor Module indicator LED
- CMM reset pushbutton (CMC reset)

1.5. Blade Drawer Components, Controls, LEDS and Ports

This section identifies the components, controls, and LEDS on the front and rear of the blade system.

1.5.1. Components (Exploded view)

The following diagram shows an exploded view of blade system components:



| Mark | Description |
|------|----------------------------------|
| A | Blades |
| B | Fan blade |
| C | Local Control Panel (LCP) |
| D | Power Supply Unit (PSU) (x2) |
| E | Chassis Management Module (CMM) |
| F | Power Supply Unit (PSU) (x2) |
| G | Quad Switch Module (QSM) |
| H | Ultra Capacitor Module (UCM) |
| I | Ethernet Switch Module (ESM/TSM) |

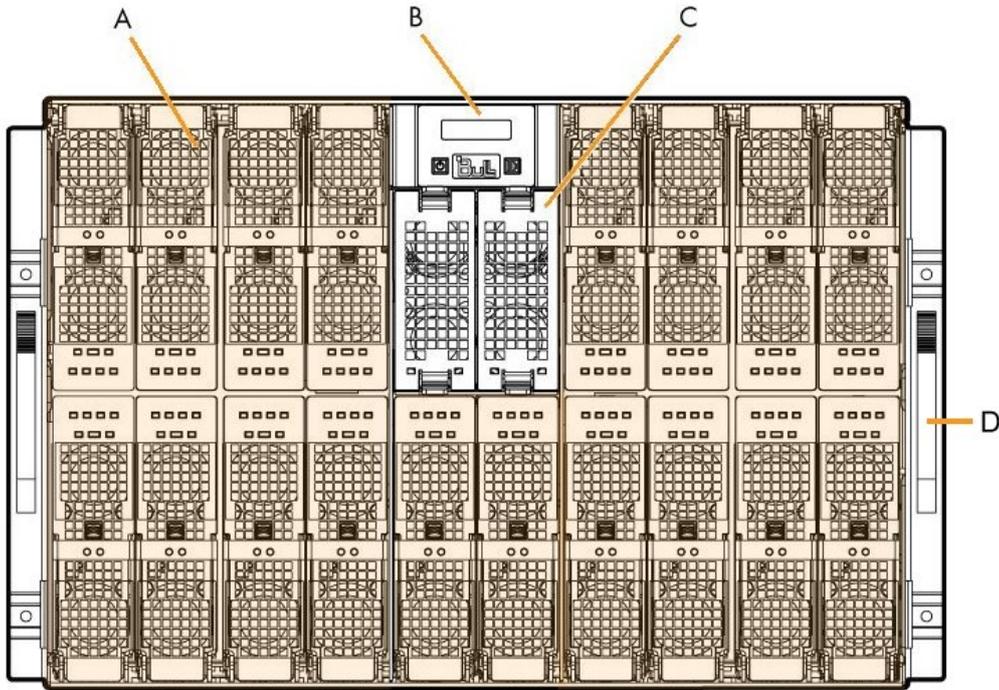
Figure 1-2. Blade drawer components - Exploded view

1.5.2. Blade front components

Blade Chassis

The front of the blade chassis is equipped with an LCP, eighteen bays to house blades, and two bays to house fan blades. The blade chassis is also equipped with two handles for easy handling.

Blade system with compute blades (Front view)

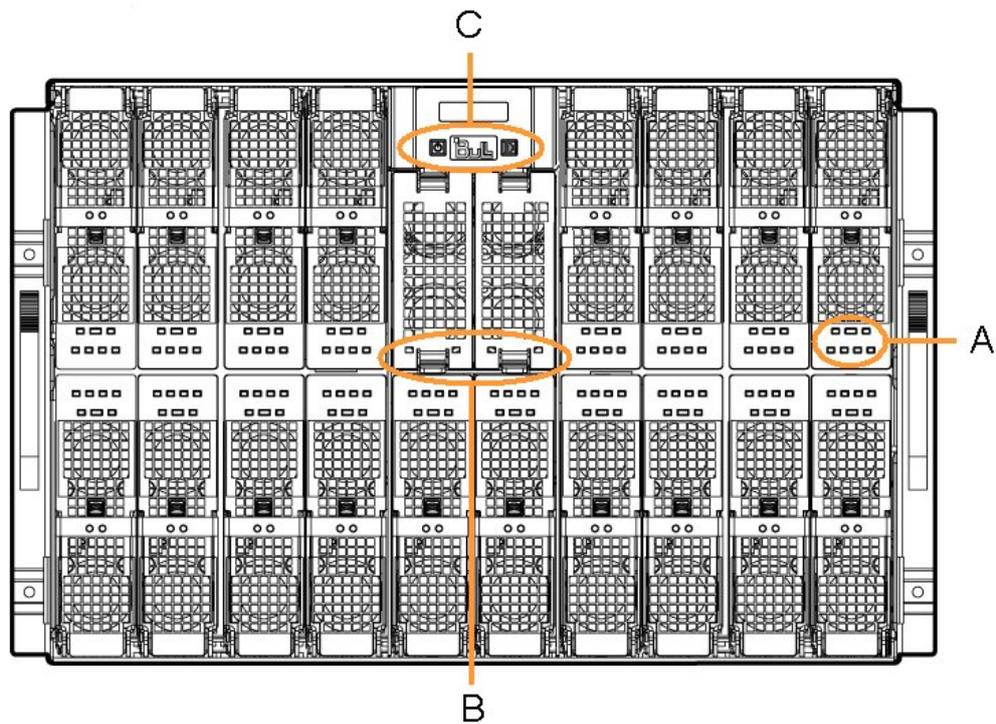


| Mark | Description |
|------|----------------------------|
| A | Compute blades (NCB) (x18) |
| B | Local Control Panel (LCP) |
| C | Fan blade (x2) |
| D | Handles (x2) |

Figure 1-3. Blade system with compute blades - Front view

1.5.3. Controls and LEDs (Front view)

The blade drawer is equipped with LEDs and buttons on both the front and the rear. The following diagram shows the LEDs and buttons on the front of the blade drawer.



| Mark | Description |
|------|-------------------------------|
| A | Blade LEDs |
| B | Fan LEDs |
| C | Power and ID LEDs and buttons |

Figure 1-4. LEDs and buttons - Front view

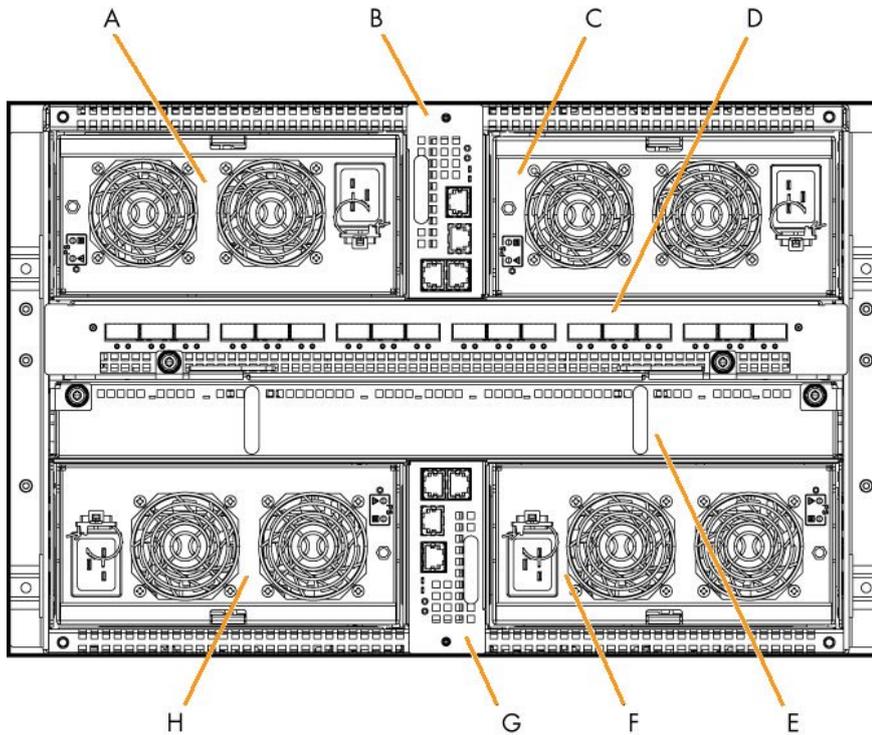
1.5.4. Blade rear components

Blade chassis

The rear of the blade chassis provides bays for blade system PSU, CMM, QSM, UCM, and ESM / TSM modules.

Blade drawer with ESM - Rear view

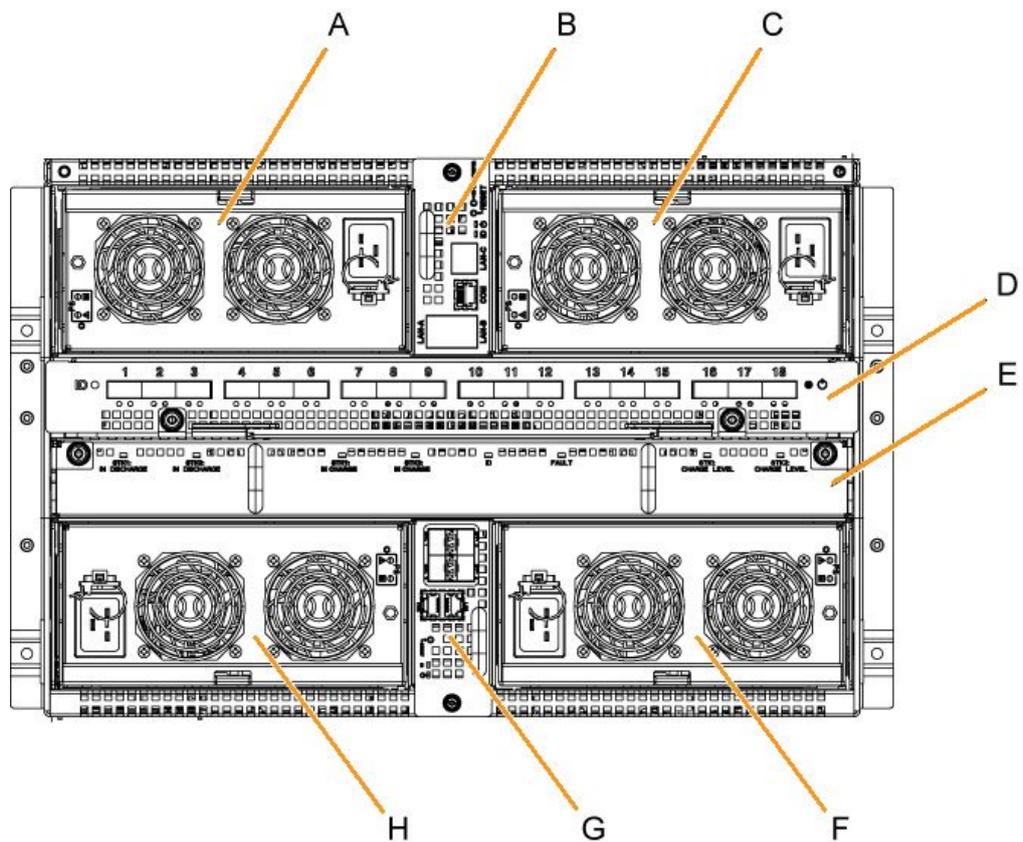
The rear of the blade drawer is equipped with four power supplies, a chassis management module, a Quad Switch Module, an Ultra Capacitor Module, and an Ethernet Module.



| Mark | Description |
|------|-----------------------------------|
| A | Power Supply Unit (PSU) 3 |
| B | Chassis Management Module (CMM) |
| C | Power Supply Unit (PSU) 4 |
| D | Quad Switch Module (QSM) |
| E | Ultra Capacitor Module (UCM) |
| F | Power Supply Unit (PSU) 2 |
| G | 1 Gb Ethernet Switch Module (ESM) |
| H | Power Supply Unit (PSU) 1 |

Figure 1-5. Blade system with ESM - Rear view

Blade system with TSM - Rear view

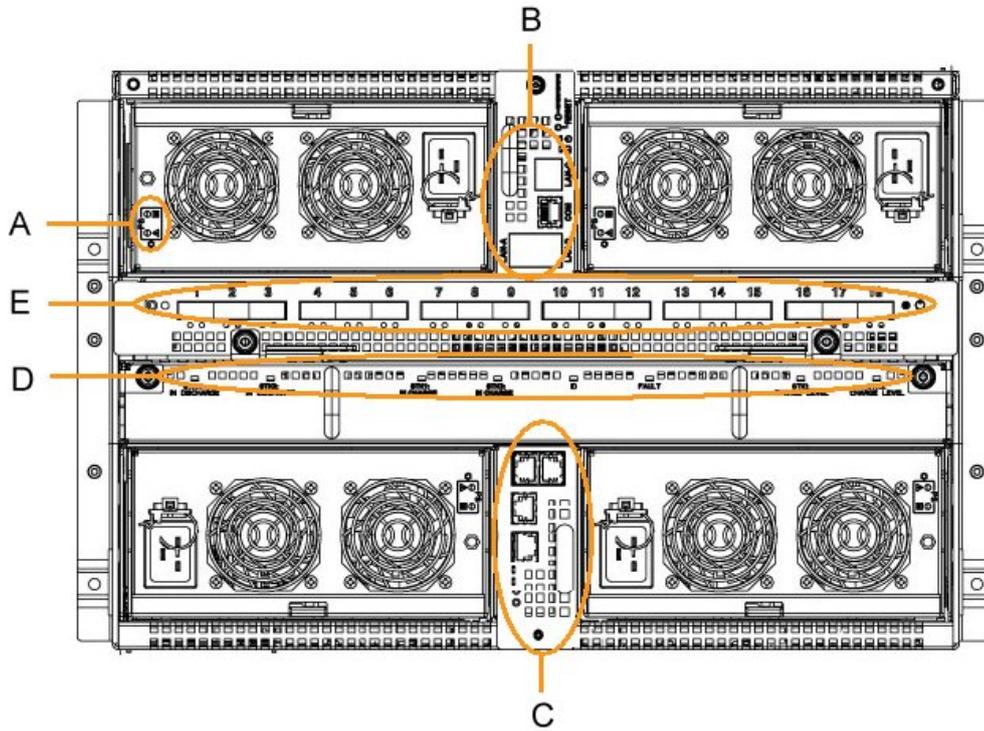


| Mark | Description |
|------|------------------------------------|
| A | Power Supply Unit (PSU) 3 |
| B | Chassis Management Module (CMM) |
| C | Power Supply Unit (PSU) 4 |
| D | Quad Switch Module (QSM) |
| E | Ultra Capacitor Module (UCM) |
| F | Power Supply Unit (PSU) 2 |
| G | 10 Gb Ethernet Switch Module (TSM) |
| H | Power Supply Unit (PSU) 1 |

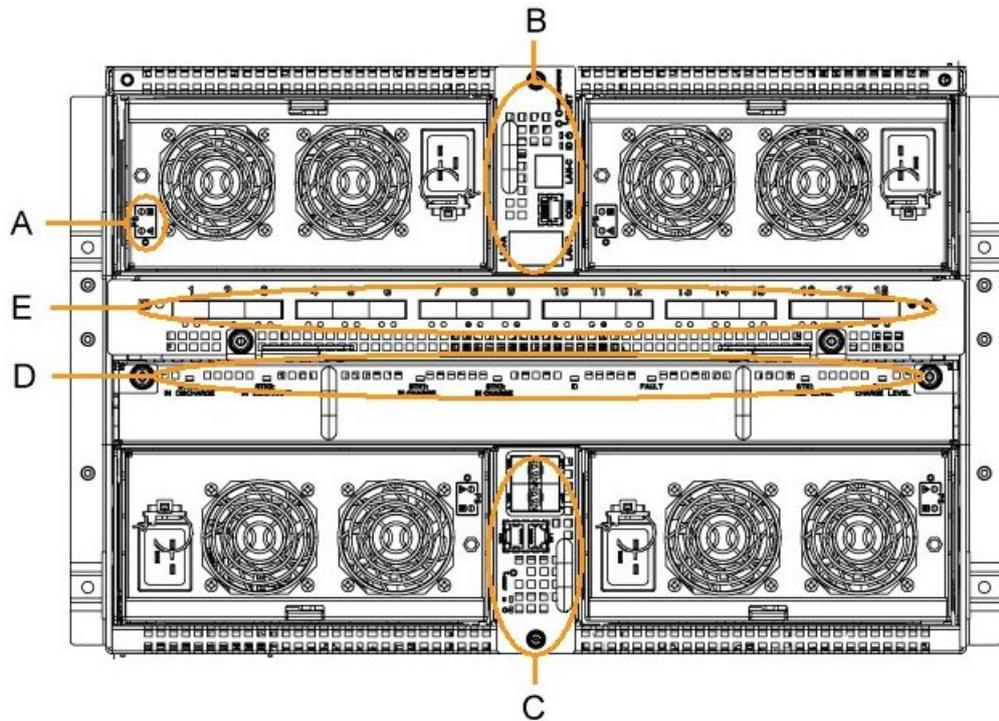
Figure 1-6. Blade system with TSM - Rear view

1.5.5. Controls and LEDs (Rear view)

The blade drawer is equipped with LEDs and buttons on both the front and the rear. The following diagram shows the LEDs and buttons on the rear of the blade drawer.



| Mark | Description |
|------|---|
| A | Power Supply Unit (PSU) LEDs |
| B | Chassis Management Module (CMM) LEDs and controls |
| C | 1 Gb Ethernet Switch Module (ESM) LEDs and controls |
| D | Ultra Capacitor Module (UCM) LEDs |
| E | Quad Switch Module (QSM) LEDs |

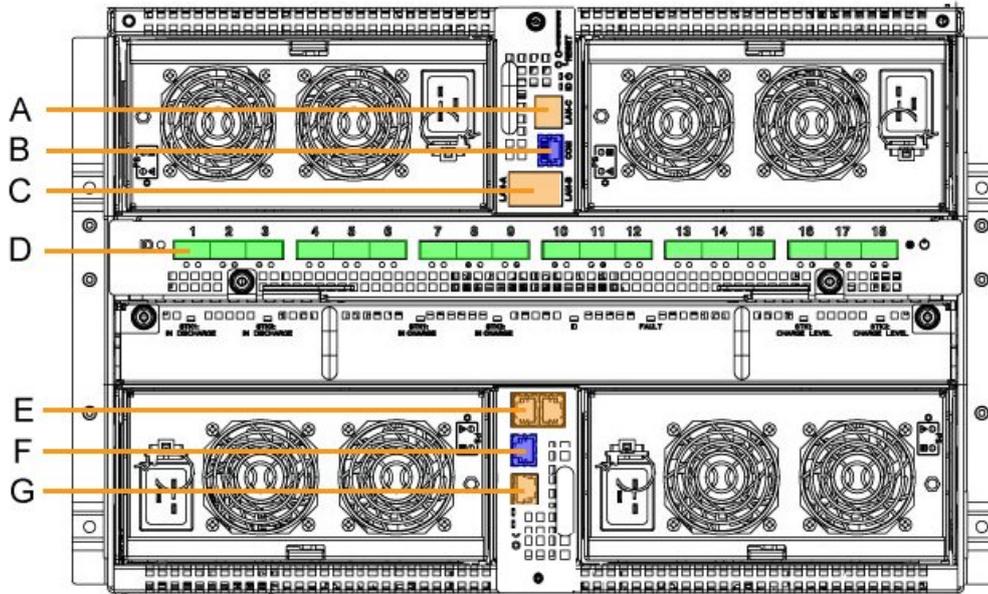


| Mark | Description |
|------|--|
| A | Power Supply Unit (PSU) LEDs |
| B | Chassis Management Module (CMM) LEDs and controls |
| C | 10 Gb Ethernet Switch Module (TSM) LEDs and controls |
| D | Ultra Capacitor Module (UCM) LEDs |
| E | Quad Switch Module (QSM) LEDs |

Figure 1-7. Controls and LEDs - Rear view

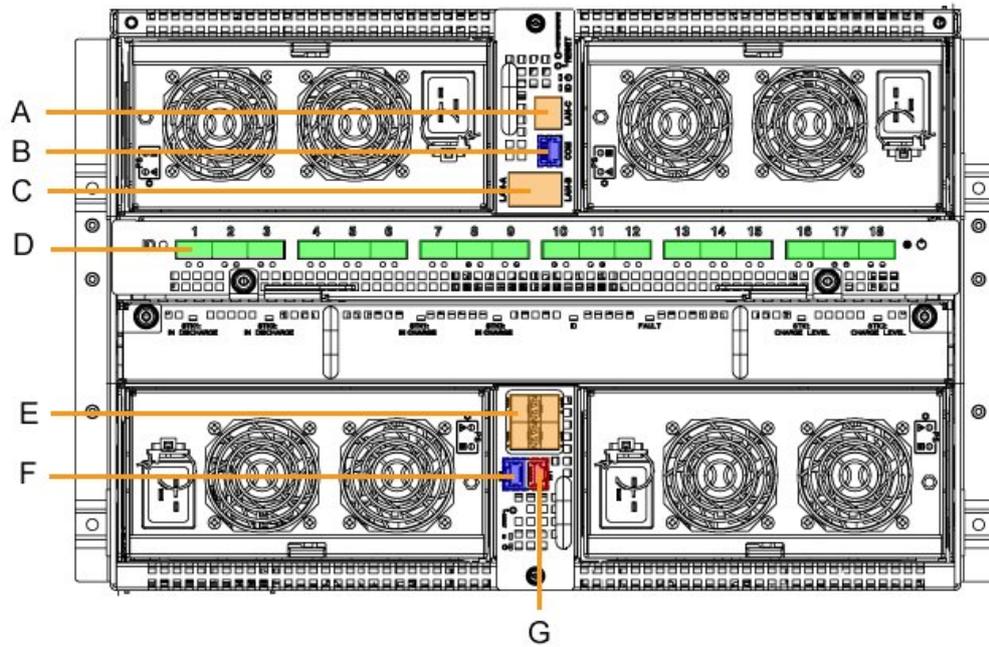
1.5.6. Connection Ports (Rear view)

The following diagrams show the connection ports on the rear of the blade drawer.



| Mark | Description |
|------|---|
| A | CMM dynamically configurable stacking or Ethernet port |
| B | CMM serial port |
| C | CMM dynamically configurable stacking or Ethernet ports |
| D | QSM QSFP ports (1-18) |
| E | ESM dynamically configurable stacking or Ethernet ports |
| F | ESM serial port |
| G | ESM dynamically configurable stacking or Ethernet port |

Figure 1-8. Connection ports - Rear view with ESM module



| Mark | Description |
|------|---|
| A | CMM dynamically configurable stacking or Ethernet port |
| B | CMM serial port |
| C | CMM dynamically configurable stacking or Ethernet ports |
| D | QSM QSFP ports (1-18) |
| E | TSM dynamically configurable stacking or Ethernet ports |
| F | TSM serial port |
| G | TSM 1 Gb Ethernet port |

Figure 1-9. Connection ports - Rear view with TSM module

Chapter 2. Opening Packing and Checking Contents

This chapter explains delivery, unpacking and inspection procedures. It includes the following topics:

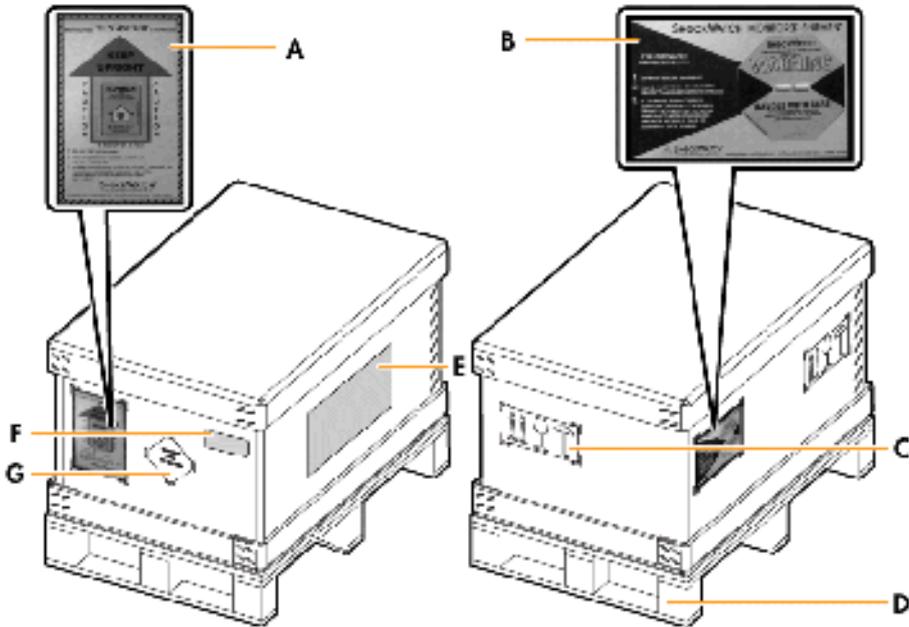
- Inspecting Blade Drawer Packing, on page 2-2
- Unpacking the Blade Drawer, on page 2-3
- Checking the Blade Drawer, on page 2-3



Important Site preparation must be completed by the pre-arranged delivery date. Any delay due to non-completion of the site by the pre-arranged date will be considered as the Customer's responsibility.

2.1. Inspecting Blade Drawer Packing

Before unpacking inspect blade drawer packing for damage. In particular, check shockwatch and tiltwatch label indicators. If one or more indicators are RED, packing contents may be damaged.



| Mark | Item |
|------|----------------|
| A | Tiltwatch |
| B | Shockwatch |
| C | Safety Label |
| D | Wooden stand |
| E | Packing labels |
| F | Product label |
| G | Warning label |

Figure 2-1. Blade drawer packing items

2.2. Unpacking the Blade Drawer

Once you have checked blade drawer packing for damage, you can unpack the drawer and store the packing in an appropriate place.



WARNING

To avoid condensation and incorrect handling, the blade drawer must be removed from its packing by authorized Service personnel **ONLY**, on the scheduled installation date.



WARNING

The blade drawer must not be unpacked before it has reached the room temperature (24 hours in the computer room).

Required Tools

Cutter

Procedure



DANGER

The blade drawer weighs 126 kg when fully populated. 3 people are required to unpack it and install it in the cabinet.

1. Cut the packing straps.
2. Remove the top cover.

The inner foam is now visible and it contains another small box that has a rack-mounting kit and shipping bracket assembly that are needed to install the system in the cabinet.

3. Remove the box containing the rack-mount kit and set aside.
4. Remove the foam protection from the blade drawer.
5. Lift the blade drawer from the packing and set aside on a clean, flat surface.
6. Store packing items.

2.3. Checking the Blade Drawer

Once the blade drawer has been unpacked, a preliminary visual inspection must be performed:

- Check that the blade drawer is compliant with the Purchase Order.
- Check covers for sharp edges, damage or alterations.
- Check internal cables for damage.



WARNING

If the inspection indicates an unacceptable safety condition, the condition must be corrected before powering up the blade drawer.

Chapter 3. Installing the Server in the Cabinet

- Cabinet Requirements, on page 3-1
- Mounting the Rails on the Cabinet Rack, on page 3-2
- Installing and Securing the Blade Drawer in Position, on page 3-6



DANGER

The server weighs 126 kg when fully populated. 2 people are required to unpack it and install it in the cabinet.

3.1. Cabinet Requirements

The blade system is designed to be installed in a 42U cabinet. It requires 7U in the cabinet. If only one blade system is installed, it should be installed in the 22U-28U position.

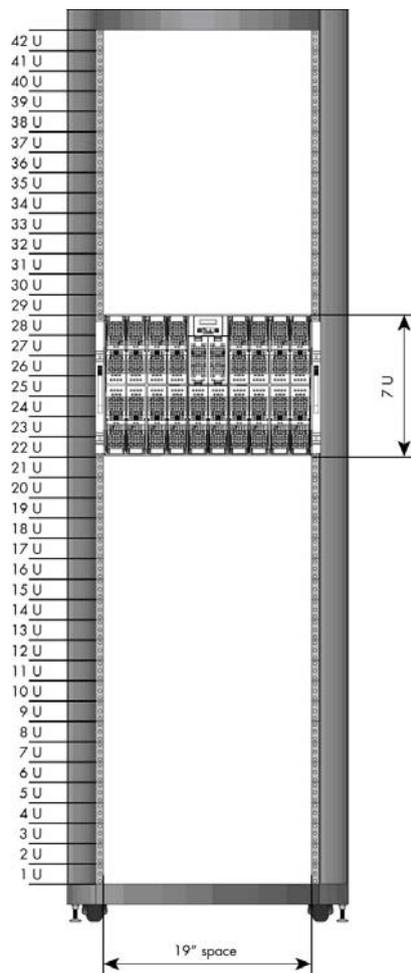


Figure 3-1. Recommended position for a single blade system

3.2. Mounting the Rails on the Cabinet Rack

Note The rack rails comprise a fixed part and a mobile part.

Required Tools

- 1 flat screwdriver (M4 screws)
- 1 T25 Torx screwdriver (M5 screws)

Procedure

1. Fully extend the left rack rail.

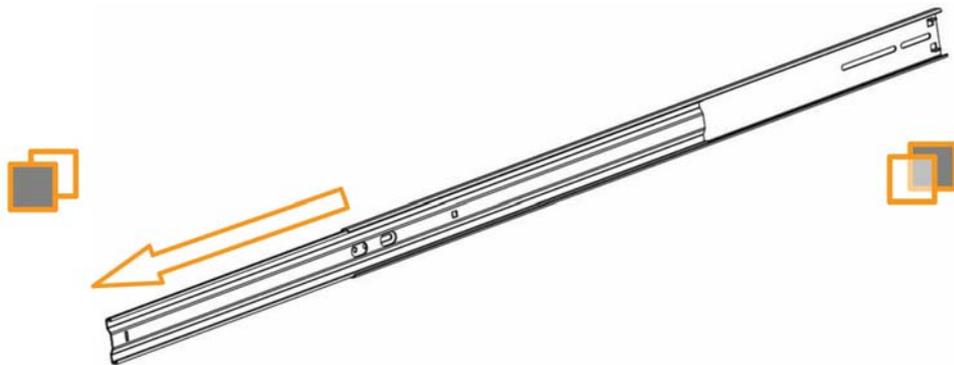


Figure 3-2. Fully extending the left rack rail

2. Prepare two support brackets.
Note the right-angle bracket bend (A).

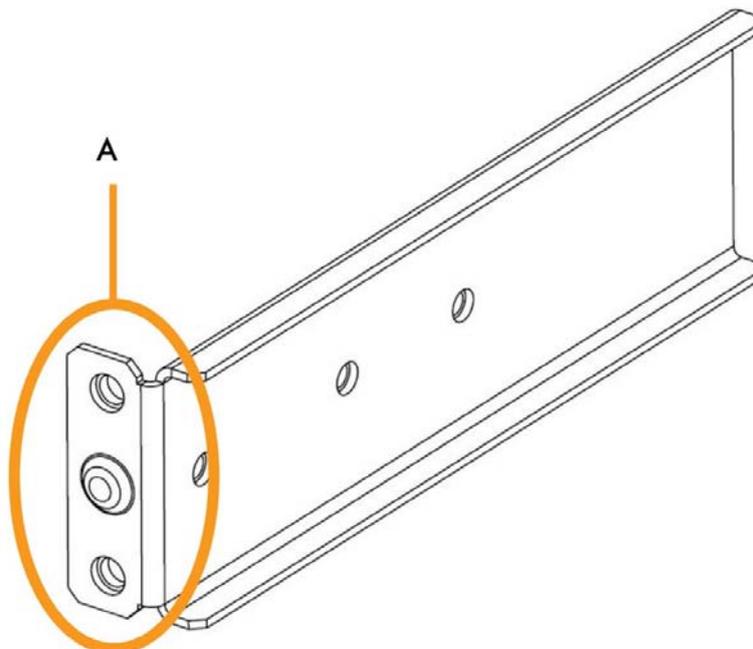


Figure 3-3. Rack rail support bracket

3. Pre-assemble the two brackets on the fixed part of the rack rail, taking care to place the right-angle bracket bends toward the front and rear ends of the fixed part:
 - a. Rear end: insert the two M4x6 slotted head screws without tightening (A) so that the bracket can slide freely.
 - b. Front end: insert and tighten the two M4x6 slotted head screws (B).

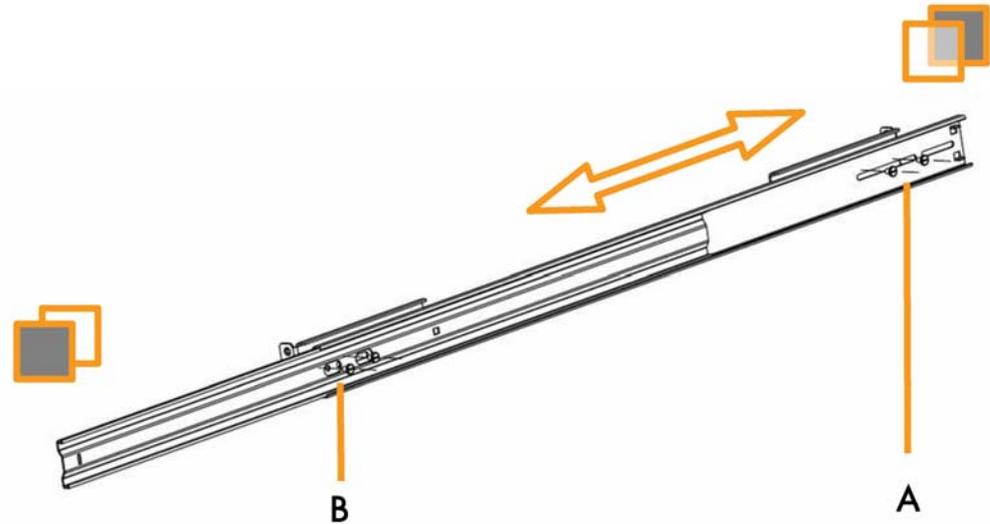


Figure 3-4. Pre-installing support brackets on the fixed part of the rack rail

4. Secure the rack rail into place on the front cabinet rack:
 - a. Insert the bracket stub (A) in the rack mount hole.
 - b. Secure the rail into place by tightening the M5x16 screw and D5 tapered washer (B).

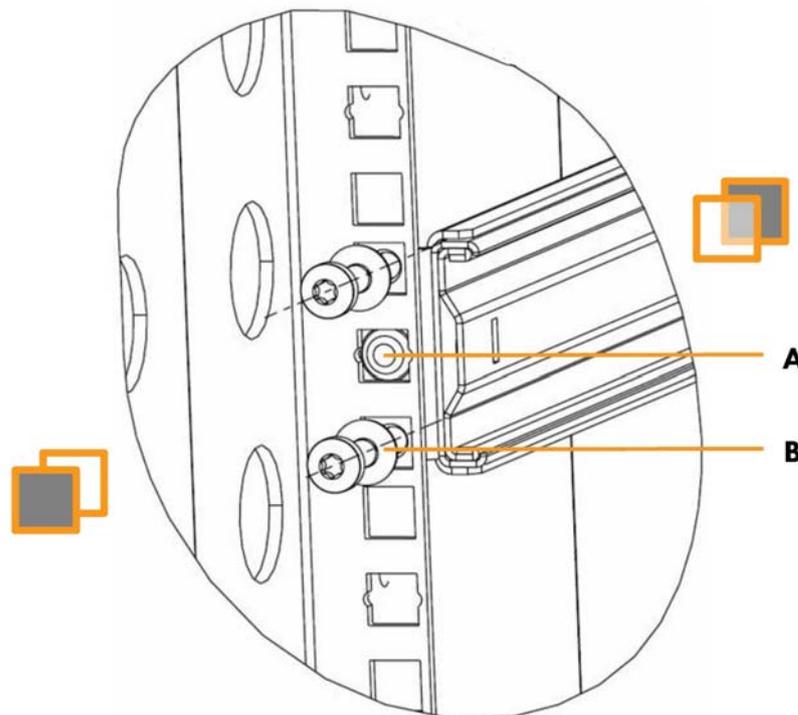


Figure 3-5. Securing the rack rail to the cabinet rack - 1

5. Secure the rack rail into place on the rear cabinet rack:
 - a. With the front bracket secured to the front cabinet rack (A), as explained in Step 4, slide the rear bracket to the rear cabinet rack (B).
 - b. Secure the rear bracket to the rear cabinet rack (C), as explained in Step 4.
 - c. Fully extend the mobile part of the rack rail (D).
 - d. Tighten the two screws securing the rear bracket to the rack rail (E).

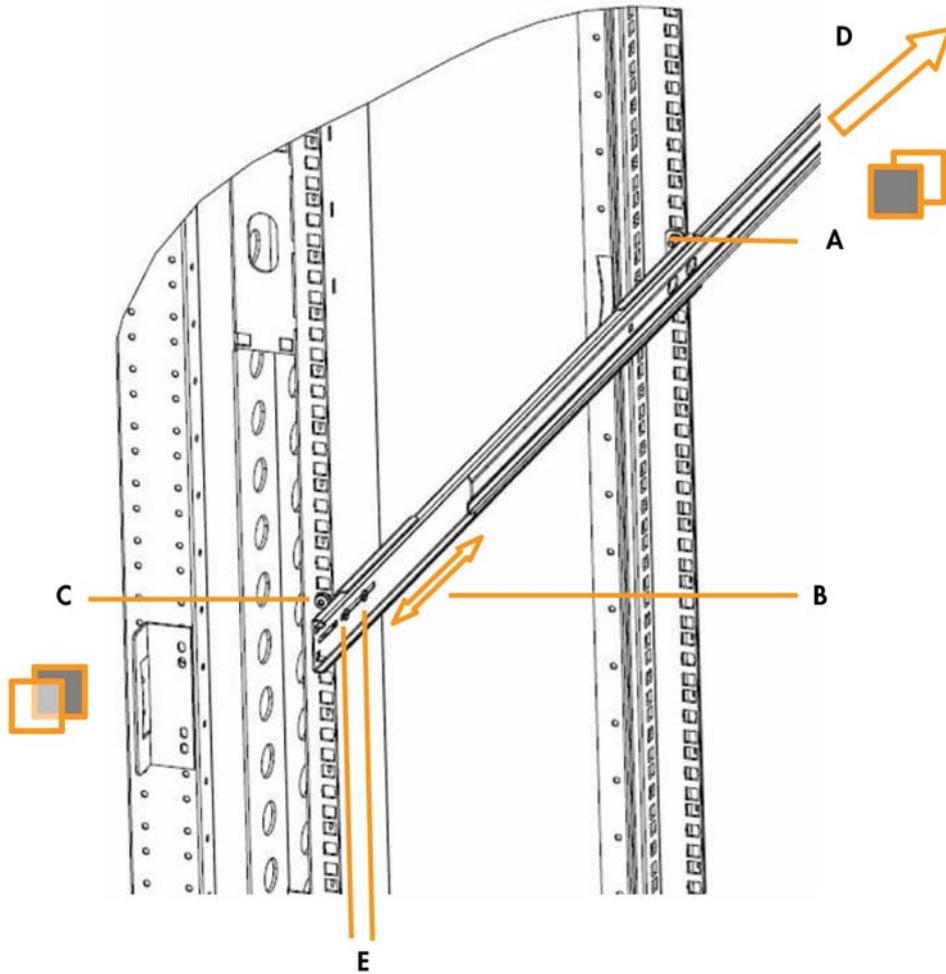
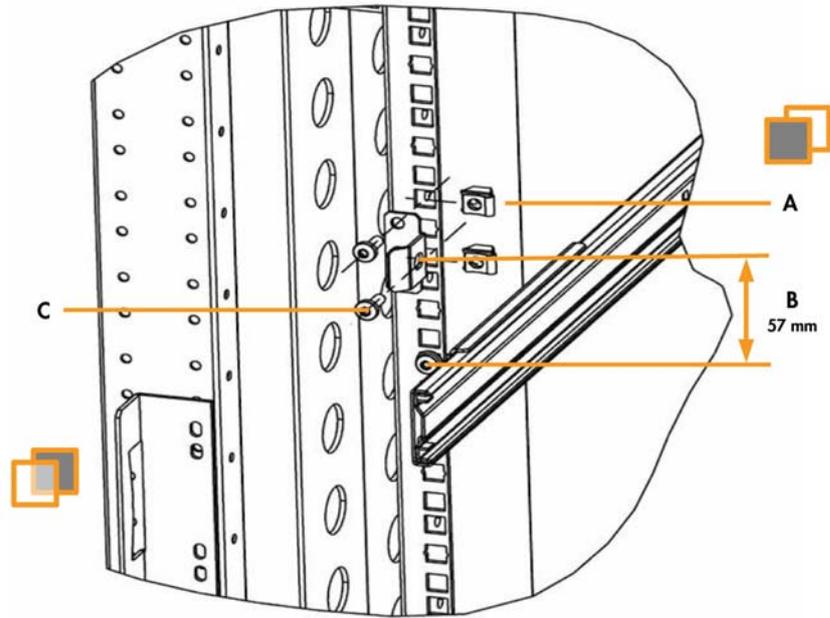


Figure 3-6. Securing the rack rail to the cabinet rack - 2

- Secure the rear cable hanger bracket to the rear cabinet rack with the two M5x16 Torx screws.



| Mark | Description |
|------|---------------------------------------|
| A | M5 cage screw position |
| B | Bracket center to rail center - 57mm. |
| C | M5x16 Torx screws |

Figure 3-7. Installing cable hanger brackets to the rear cabinet rack

- Install the two cage nuts on the front cabinet rack, at the same level as the rear cable hanger brackets (center to center - 57 mm). These cage nuts will be used to lock the drawer into position on the cabinet rack.

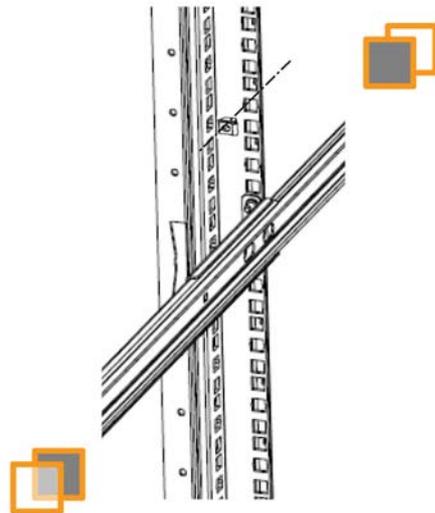


Figure 3-8. Installing the two cage nuts on the front cabinet rack

3.3. Installing and Securing the Blade Drawer in Position



DANGER

The blade system weighs 126 kg. Use suitable lifting equipment to install the blade system in the cabinet.

Procedure

1. Engage the blade drawer into the rack and push to the rear of the cabinet until you hear the two thumb levers on the rail assemblies click. The blade drawer can no longer be freely pulled forward.

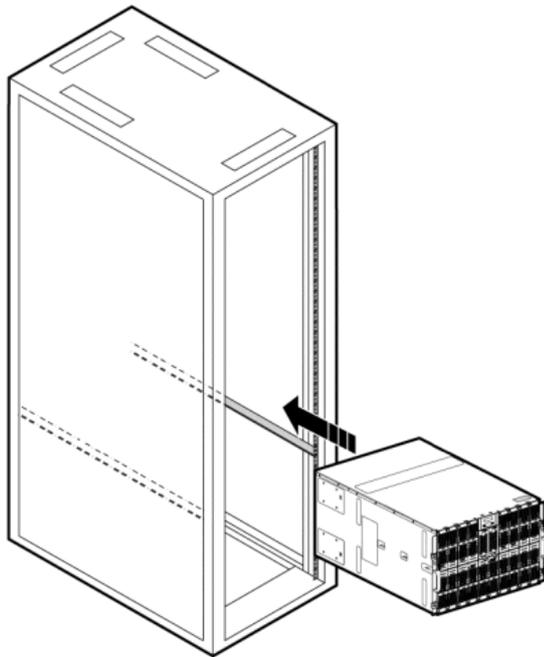


Figure 3-9. Installing the blade drawer in the cabinet

2. Raise the two thumb levers on the rail assemblies.

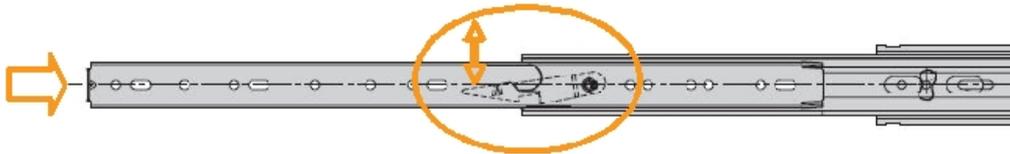


Figure 3-10. Raising the thumb levers

3. Push the blade drawer fully backward until it is flush with the cabinet frame.
4. Tighten the two captive screws securing the blade drawer to the cabinet rack.
5. From the rear of the cabinet, unlock the two red cable hanger stop pins by turning them 90° to the left.

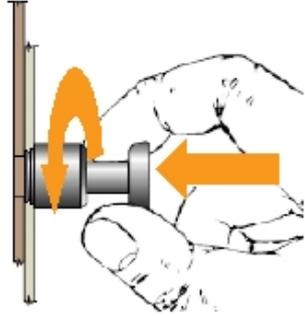


Figure 3-11. Unlocking cable hanger stop pins

Chapter 4. Testing the Blade System

This chapter explains how to connect the blade system to the site power supply and to the Ethernet network and how to power up the blade system for the first time. It includes the following topics:

- Preparing the Ethernet Network, on page 4-2
- Connecting the Blade System to the Site Power Supply, on page 4-3
- Connecting the Blade System to the Ethernet Network, on page 4-4
- Powering the Blade System to Stand-by Power, on page 4-5
- Testing Ethernet Network Connections, on page 4-5
- Powering up the Blade System from the Chassis Hardware Console (CHC), on page 4-6
- Checking Correct Blade System Operation, on page 4-8
- Checking Hardware and Firmware Levels, on page 4-8
- Connecting to a Blade Hardware Console (BHC), on page 4-10
- Powering off the Blade System, on page 4-11
- Completing Installation, on page 4-11

4.1. Preparing the Ethernet Network

By default, the blade system is configured for IP auto-configuration with a DHCP server.

The blade system is delivered with a MAC Address Sheet listing blade system MAC addresses to be used to prepare the Ethernet network.

```
Command Number      : F363730      11. Aug. 2010
Serial Chassis Number : XAN-RY1-10190e
Blades quantity     : 18

CMC      00:0d:5d:07:04:79
ESM      08:00:38:36:ff:18

-----
@MAC_bmc
Blade slot 1      08:00:38:36:9f:fc
Blade slot 2      08:00:38:36:9f:e9
Blade slot 3      08:00:38:36:a0:00
Blade slot 4      08:00:38:36:a0:3c
Blade slot 5      08:00:38:36:a0:65
Blade slot 6      08:00:38:36:a0:3d
Blade slot 7      08:00:38:36:a0:49
Blade slot 8      08:00:38:36:a0:4c
Blade slot 9      08:00:38:36:a0:72
Blade slot 10     08:00:38:36:a0:76
Blade slot 11     08:00:38:36:a0:5e
Blade slot 12     08:00:38:36:a0:71
Blade slot 13     08:00:38:36:a0:67
Blade slot 14     08:00:38:36:a0:66
Blade slot 15     08:00:38:36:a0:38
Blade slot 16     08:00:38:36:a0:4a
Blade slot 17     08:00:38:36:a0:5b
Blade slot 18     08:00:38:36:a0:3f

-----
@MAC_eth0
Blade slot 1      08:00:38:36:d3:f8
Blade slot 2      08:00:38:36:d3:d2
Blade slot 3      08:00:38:36:d4:00
Blade slot 4      08:00:38:36:d4:78
Blade slot 5      08:00:38:36:d4:ca
Blade slot 6      08:00:38:36:d4:7a
Blade slot 7      08:00:38:36:d4:92
Blade slot 8      08:00:38:36:d4:98
Blade slot 9      08:00:38:36:d4:e4
Blade slot 10     08:00:38:36:d4:ec
Blade slot 11     08:00:38:36:d4:bc
Blade slot 12     08:00:38:36:d4:e2
Blade slot 13     08:00:38:36:d4:ce
Blade slot 14     08:00:38:36:d4:cc
Blade slot 15     08:00:38:36:d4:70
Blade slot 16     08:00:38:36:d4:94
Blade slot 17     08:00:38:36:d4:b6
Blade slot 18     08:00:38:36:d4:7e
```

Figure 4-1. MAC Address Sheet - example

1. Request the Ethernet network administrator to update the network DHCP server with blade system MAC addresses.



important

It is recommended to use fixed IP addresses for the 1 Gigabit Ethernet Switch Module (ESM) / 10 Gigabit Ethernet Switch Module (TSM), the Chassis Management Controller (CMC) and the Blade Management Controllers (BMC).

2. Request the Ethernet network administrator to save and print the DHCP server log listing all the allocated IP addresses. These will be needed to connect to the Chassis Hardware Console and the Blade Hardware Console.

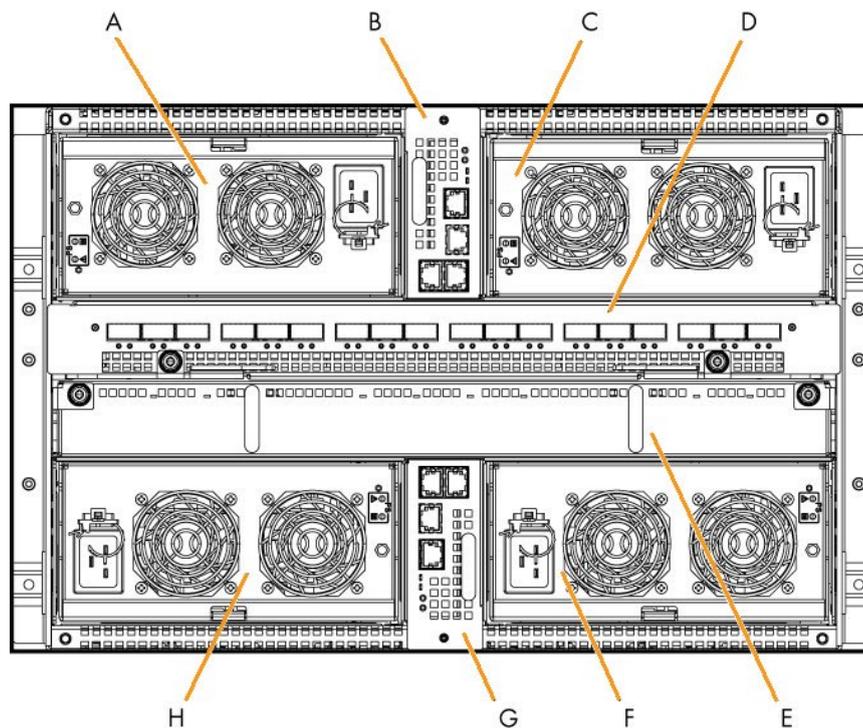
4.2. Connecting the Blade System to the Site Power Supply

 **important** The site power supply breakers must be OFF when the PDU are connected. It is mandatory for the site power supply breakers to REMAIN OFF until the blade system is ready to be powered up.

4.2.1. Connecting the power supplies (PSU) to the Power Distribution Units

The blade chassis is equipped with up to four power supply unit modules (PSU) (for N+1 redundancy). The PSU module connectors are located at the rear of the blade chassis. Proceed as follows to connect the blade system to the site power supply

1. From the rear of the blade system, plug one end of each power cord into a PSU connector and the other end into a Power Distribution Unit (PDU) inside the cabinet.
2. Repeat Step 1 for each PSU.



| Mark | Description |
|------|-------------|
| A | PSU3 |
| C | PSU4 |
| F | PSU2 |
| H | PSU1 |

Figure 4-2. Blade system PSU modules

4.2.2. Connecting the Power Distribution Units to the site power supply

1. Check that the site power supply breakers are OFF.
2. Request the customer to plug each PDU into the site power supply.

4.3. Connecting the Blade System to the Ethernet Network

Important The site power supply breakers must be OFF when the blade system is connected to the Ethernet network. It is mandatory for the site power supply breakers to REMAIN OFF until the system is ready to be powered up.

The blade system can now be connected to the Ethernet network using the Ethernet port on the Chassis Management Module (CMM), as explained below:

1. From the rear of the blade system, connect one end of a Category 5 or higher Ethernet cable to the Ethernet port on the CMM (A).

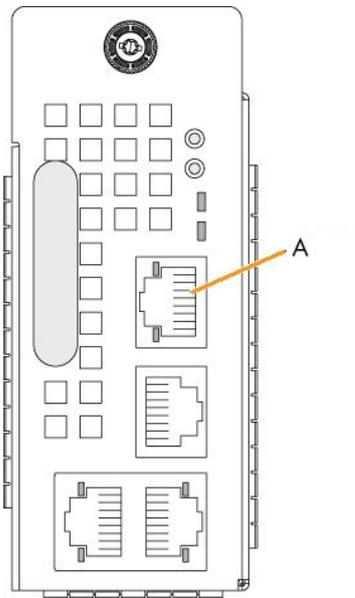


Figure 4-3. Connecting the blade system to the Ethernet network

2. Connect the other end of the Ethernet cable to the Ethernet network.

4.4. Powering the Blade System to Stand-by Power

Note By default, the LCP power button is disabled.

1. Request the customer to turn the site power supply breakers ON.
2. The Chassis Management Controller (CMC) and the Blade Management Controllers power on to stand-by power (3.3 V) and are ready to be powered on to main power (12 V).
3. Check the blade system status display sequence on the LCP screen.
 - Check that the CMM Power LED is **blinking amber** once the firmware is loaded and the connection accessible from a Web browser.
 - Check that the compute blade / accelerator power LEDs are **amber**: 3.3V stand-by power.

4.5. Testing Ethernet Network Connections

LAN connections can be tested from a remote computer connected to the same network by launching a PING command. To test LAN connections you need the IP addresses automatically allocated by the DHCP server.

1. Check that the Ethernet activity LED is blinking to ensure that the network connection is working. For more information about Ethernet LED status, refer to the following table:

| Ethernet link LED | Ethernet activity LED |
|---|---|
| When this green LED is lit, there is an active connection through the port to the network. | When this green LED is blinking, there is activity through the port over the network link. |
| | When this amber LED is blinking, there is a network link |

Table 4-1. Ethernet link and activity LED status indicators

2. Request the Ethernet network administrator to provide you with the IP address allocated to the ESM / TSM and CMM.
3. Using this data, ping the ESM / TSM and the CMM.

If you are successful, you can now connect to the blade system Chassis Hardware Console from the Ethernet network, using a web browser, to power up the blade system.

4.6. Powering up the Blade System from the Chassis Hardware Console (CHC)

The blade system is powered up for the first time from the Chassis Hardware Console.

1. From a remote computer connected to the same network, access the Chassis Hardware Console by launching a web browser and entering the IP address that you have just tested. The authentication page opens.
2. Complete the **Username** and **Password** fields and click **Log On**:
 - Factory-default username: **super**
 - Factory-default password: **pass**



Important It is strongly recommended to change the factory-default super user password once initial setup is completed, taking care to record your new account details for subsequent connections.

Once you are authenticated, the **System Control** tab opens and the **Power Management** page is displayed.

3. Check that all the blades are present and ready to be powered on.

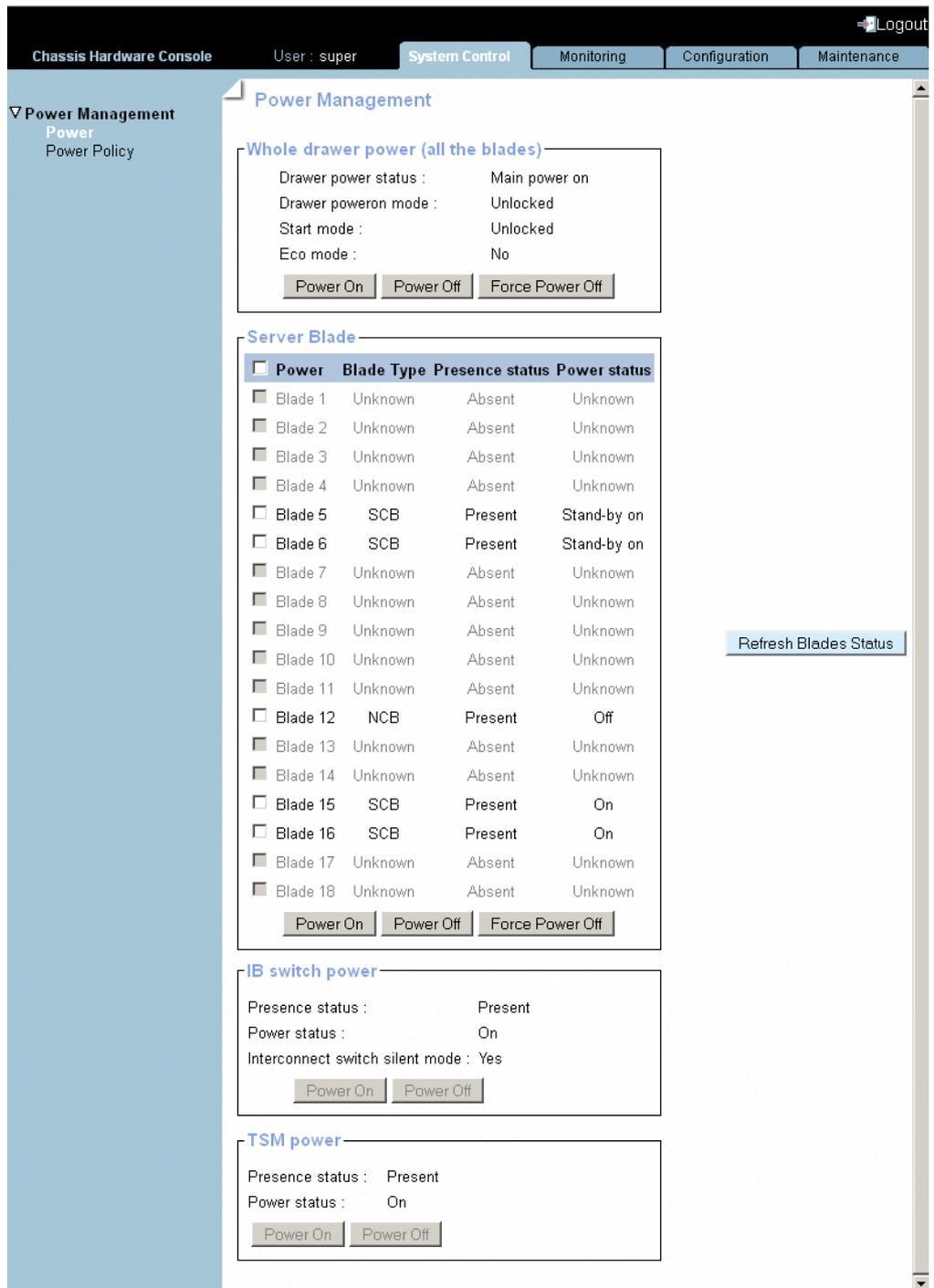


Figure 4-4. Chassis Hardware Console Power Management

4. From the Server drawer power box, select all the blades and click Power On. The blade system (chassis and blades) powers up to main power (12 V).

Note During this operation, three IP addresses are automatically allocated by the DHCP server to the blades:

- BHC IP
- Eth0 IP
- Eth1 IP

4.7. Checking Correct Blade System Operation

The blade system is equipped with LEDs and sensors for easy assessment of system status. LEDs are directly visible on blade system components. Sensor status can be viewed from the Chassis Hardware Console, which also provides event and message logs.

1. Perform a visual check of blade system power LEDs:
 - The CMM power LED should be blinking amber.
 - The compute blade / accelerator power LEDs should turn green once the blades are on.
 - The fan blade power LEDs should turn green.
2. From the Chassis Hardware Console, select the Monitoring tab:
 - Check global blade system status by selecting **Sensor Status**. The global status icon should be green.
 - View the SEL logs by selecting **System Event Log**.
 - View the message logs by selecting **Messages**.

Note For further information, please refer to the documentation delivered on the *Resource and Documentation CD*.

4.8. Checking Hardware and Firmware Levels

The Chassis Hardware Console allows you to collect hardware and firmware level information for the blades, LCP, IB Switch, UCM and ESM / TSM. This information can be viewed online and/or saved to disk for future reference.

1. From the Chassis Hardware Console, display hardware / firmware levels by opening the **Maintenance** tab and selecting **Hardware Information > Force New Drawer Discovery**.

A message is displayed requesting you to wait while your request is processed. Once the request has been processed, the **Drawer Information** page is refreshed and a **Discovery** box displays all the components discovered.

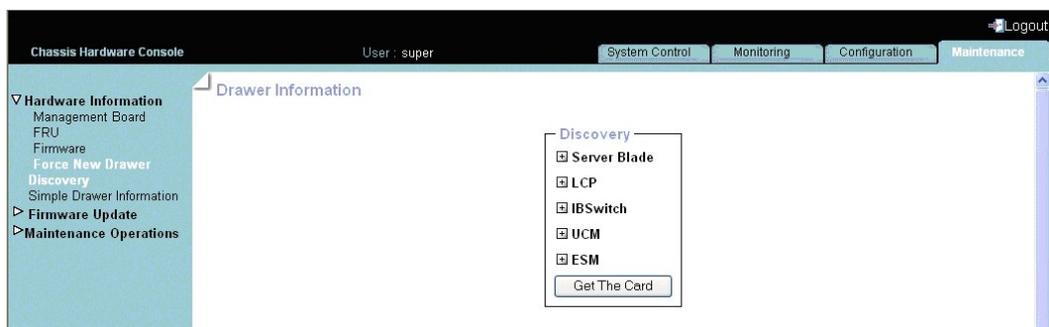


Figure 4-5. Drawer information

- From the Discovery box, expand the component sub-trees to display hardware / firmware levels, as shown below.

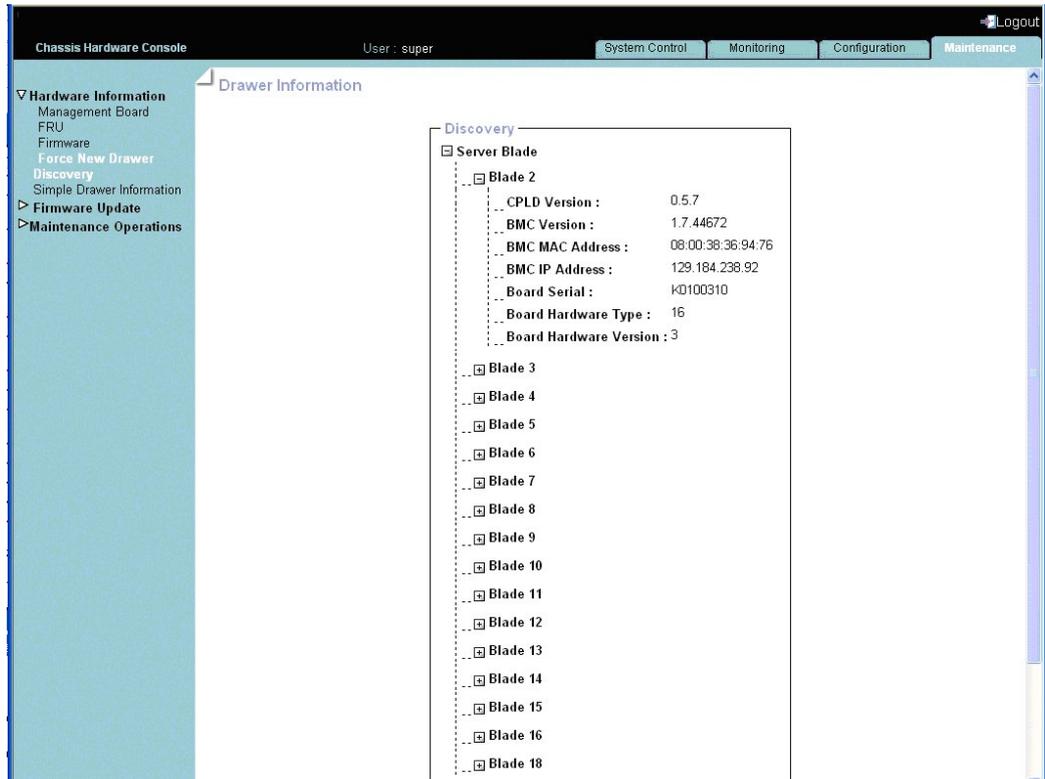


Figure 4-6. Viewing hardware / firmware levels

- Click the Get The Card button to view and save hardware / firmware information in HTML format.

```

.. CPLD Version :      0.5.7
.. BMC Version :      1.7.44672
.. BMC MAC Address :  08:00:38:36:94:76
.. BMC IP Address :   129.184.238.92
.. Board Serial :     K0100310
.. Board Hardware Type : 16
.. Board Hardware Version : 3
.. CPLD Version :      0.5.7
.. BMC Version :      1.7.44672
.. BMC MAC Address :  08:00:38:36:94:7e
.. BMC IP Address :   129.184.238.94
.. Board Serial :     K010031E
.. Board Hardware Type : 16
.. Board Hardware Version : 3
.. CPLD Version :      0.5.7
.. BMC Version :      1.7.44672
.. BMC MAC Address :  08:00:38:36:94:6f
.. BMC IP Address :   129.184.238.95
.. Board Serial :     K0100319
.. Board Hardware Type : 16
.. Board Hardware Version : 3

```

Figure 4-7. Hardware / firmware information file – example

4.9. Connecting to a Blade Hardware Console (BHC)

You can now connect to each Blade Hardware Console using the allocated BHC IP address.

1. Consult the DHCP server log to retrieve the IP addresses allocated to the blades.
2. From a remote computer connected to the same network, access the Blade Hardware Console by launching a web browser and entering the IP address indicated in the DHCP server log. The authentication page opens.
3. Complete the Username and Password fields and click Log On:
 - Factory default user name: root
 - Factory default password: superuser



Important It is strongly recommended to change the factory-default super user password once initial setup is completed, taking care to record your new account details for subsequent connections.

Once you are authenticated, the System Information page opens.

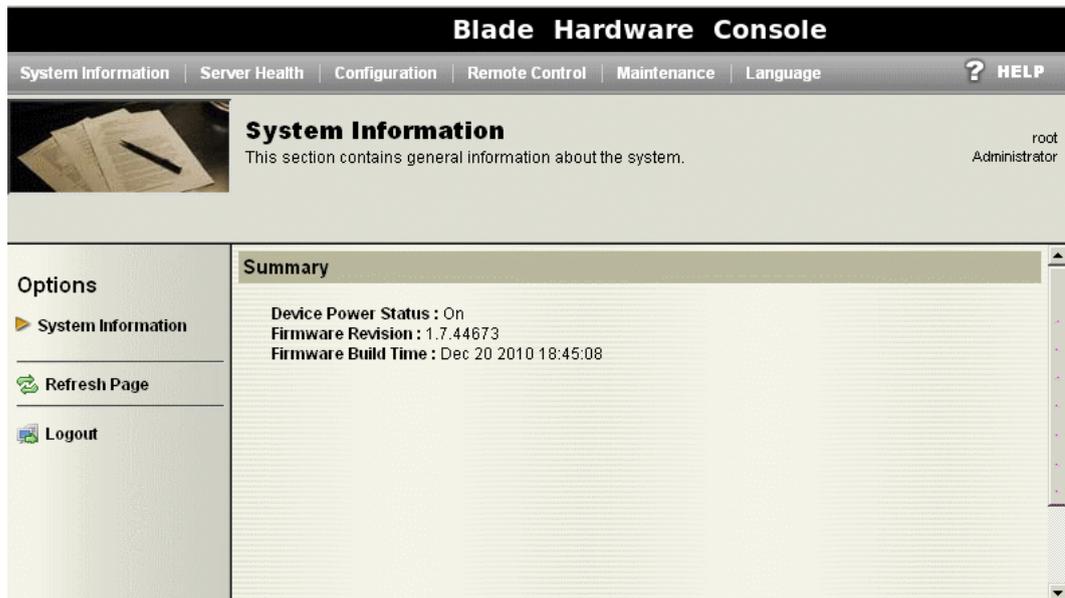


Figure 4-8. Blade Hardware Console System Information

Once you are authenticated, the System Control page opens.

Note If you are unable to connect to a Blade Hardware Console, you may need to check network settings from the Chassis Hardware Console. For more details, refer to the *bullx blade system Chassis Hardware Console User's Guide*.

4.10. Powering off the Blade System

Once you have checked that the blade system is operating correctly and that you can connect to the Blade Hardware Console, you can power down the blade system.

1. Return to the Chassis Hardware Console *Power Management* page.
2. From the Whole drawer power box, click *Power Off* to initiate a graceful shutdown of the Operating System. The blade system (chassis and blades) powers down to stand-by power.
3. Wait at least 30 seconds for the blade system drives to stop spinning.



CAUTION

To completely remove electrical current from the blade system, ensure that all power cords are disconnected from the power source. After you disconnect the blade system from the power source, wait at least five seconds before reconnecting the blade system to the power source. If an Ultra Capacitor Module (UCM) is present, wait until the UCM is fully discharged (approximately one minute) before reconnecting the blade system to the power source.

4.11. Completing Installation

Now that the blade system has been installed and commissioned, you may need to perform a few basic configuration tasks to ensure correct operation and identification by management software. The following configuration options are available from the Blade Hardware Console:

| Options | |
|------------------|--|
| Alerts | Add, edit or remove alert destinations |
| Date & Time | Configure NTP Server or Date & Time Settings |
| LDAP | Configure settings to authenticate and access the LDAP server |
| Active Directory | Configure settings to authenticate and access the Active Directory server |
| Mouse mode | Change the mouse mode |
| Network | See the MAC address or change network settings, including dynamic and static IP assignment |
| Remote Session | Configure Remote session settings |
| SMTP | Configure the SMTP email server |
| SSL Certificate | See the default certificate and private key, or upload an SSL Certificate |
| Users | Add, edit, or remove users |

Figure 4-9. Blade Hardware Console – Configuration options

Please refer to the documentation delivered on the *Resource and Documentation CD*.

Appendix A. Specifications

The values indicated in the following table are provided for informational purposes only. These values are not contractual and are subject to change without prior notice.

| Dimensions/Weight | |
|--|---|
| Height | 7U - 31.1 cm (12.24 in) |
| Width | 48 cm (19 in) |
| Depth | 74 cm (29.13 in) |
| Weight | 126 kg (278 lb) |
| Operating Limits | |
| Dry bulb temperature range | +10° C to +30° C (+50° F to +86° F) |
| Relative humidity (non-condensing) | 8% to 90% (Gradient 5% /h) |
| Maximum wet bulb temperature | +16° C (+60.8° F) |
| Moisture content | 0.019 kg water/kg dry air |
| Pressure / Elevation | Sea level < 2500 m |
| Non-Operating Limits | |
| Dry bulb temperature range | +5° C to +50° C (+41° F to +122° F) |
| Relative humidity (non-condensing) | 5 to 95% (Gradient 30 %/h) |
| Maximum wet bulb temperature | +28° C (+82.4° C) |
| Moisture content | 0.024 kg water/kg dry air |
| Shipping Limits | |
| Dry bulb temperature range | -40° C to +70° C (-40° F to +158° F) (Gradient 25° C (77° F) /h) |
| Relative humidity (non-condensing) | 5 to 95% (Gradient 30% /h) |
| Power Cables | |
| AC (16 A) | 1 per PSU |
| PSU connector type | C19, 250 VAC, 16 A |
| Power cable type | C19, 16A |
| Electrical Specifications | |
| Maximum current draw | 41.4 A |
| Power consumption | Typical: 5.5KW, Maximum: 8.2KW, Idle: <3KW |
| Thermal dissipation | Maximum: 8260 W |
| Nominal voltage | 210-240 VAC |
| Frequency | 50/60 Hz |
| Breaker Protection (Main Power) | |
| PDU | 16 A per PSU |
| Maximum inrush current | 210 A per quarter period |

Table A-1. Specifications

Glossary

A

ABR

Automatic BIOS Recovery.

ACPI

Advanced Configuration and Power Interface.

An industry specification for the efficient handling of power consumption in desktop and mobile computers. ACPI specifies how a computer's BIOS, operating system, and peripheral devices communicate with each other about power usage.

ADM1069

The ADM1069 Super Sequencer® is a configurable supervisory/ sequencing device that offers a single-chip solution for supply monitoring and sequencing in multiple supply systems.

ARU

Add / Removeable Unit. A hardware logical unit, or a group of logical units, that can be viewed / handled by an Operating System, or the BIOS, or the Platform Management Software. An ARU can be nested and is not necessarily separable from other ARUs. An ARU is also known as a PMU.

ASR

Automatic Server Restart.

ASIC

Application Specific Integrated Circuit.

B

Base Operating System

The Operating System that is booted at initialization.

BCS

Bull Coherence Switch. This is the Bull eXternal Node Controller providing SMP upgradeability up to 16 processors. The BCS ensures global memory and cache coherence, with optimized traffic and latencies, in both IPF-preferred and XPF-preferred variants.

BHC

See Blade Hardware Console.

BIOS

Basic Input / Output System. A program stored in flash EPROM or ROM that controls the system startup process.

BIST

Built-In Self-Test. See POST.

Blade Hardware Console

Graphical user interface used to access the management software embedded in the blade module.

BMC

Baseboard Management Controller. See Embedded Management Controller.

BOOTP

Network protocol used by a network client to obtain an IP address from a configuration server.

BT

Block Transfer. One of the three standardized IPMI System interfaces used by system software for transferring IPMI messages to the BMC. A per-block handshake is used to transfer data (higher performance).

C**Chassis Hardware Console**

Graphical user interface used to access the management software embedded in the Chassis Management Module.

CHC

See Chassis Hardware Console.

Clipping

An Event filter criterion. Clipping is defined on a Count / Time basis aimed at routing a pre-defined number of messages only. Identical messages are counted and when the number of messages indicated in the Count field is reached within the period of time indicated in the Time field, no other messages will be selected for routing.

CMB

Chassis Management Board.

CMC

A Corrected Memory Check condition is signaled when hardware corrects a machine check error or when a machine check abort condition is corrected by firmware. See MCA.

CMC

Chassis Management Controller.

CMM

Chassis Management Module.

Core

Core is the short name for the processor execution core implemented on a processor. A core contains one or more threads (logical processors).

CRU

Customer Replaceable Unit. A component (board, module, fan, power supply, etc.) that is replaced or added by the End User as a single entity.

CSE

Customer Service Engineer.

D**DES**

Data Encryption Standard.

DHCP

Dynamic Host Configuration Protocol.

DMA

Direct Memory Access. Allows data to be sent directly from a component (e.g. disk drive) to the memory on the motherboard). The microprocessor does not take part in data transfer enhanced system performance.

DNS

Domain Name Server.

E

EEPROM

Electrically Erasable Programmable Read-Only Memory. A type of memory device that stores password and configuration data.

EFI

Extensible Firmware Interface. A specification for a firmware-OS interface.

EFI Shell

Simple, interactive user interface that allows EFI device drivers to be loaded, EFI applications to be launched, and operating systems to be booted. In addition, the EFI Shell provides a set of basic commands used to manage files and the system environment variables. See Shell.

Embedded Management Controller

Also known as BMC (Baseboard Management Controller). This controller, embedded on the main system board, provides out-of-band access to platform instrumentation, sensors and effectors.

EMM

Embedded Management Module. Software embedded in the server module to implement management functions and accessible from the Hardware Console graphical interface.

EPROM

Erasable Programmable Read-Only Memory. A type of memory device that is used to store the system BIOS code. This code is not lost when the computer is powered off.

ESB

Ethernet Switch Board.

ESM

Ethernet Switch Module.

F

FC-LGA

Flip-Chip Land Grid Array.

Flash EPROM

Flash Erasable Programmable Read-Only Memory. A type of memory device that is used to store the system firmware code. This code can be replaced by an updated code from a floppy disk, but is not lost when the computer is powered off.

FPGA

Field Programmable Gate Array.

FQDN

Fully Qualified Domain Name.

FRU

Field Replaceable Unit. A component (board, module, fan, power supply, etc.) that is replaced or added by Customer Service Engineers as a single entity.

G

GPU

Graphical Processing Unit.

GUI

Graphical User Interface.

H

HA

High Availability. Refers to a system or component that is continuously operational for a desirably long length of time.

Hardware

The physical parts of a system, including the keyboard, monitor, disk drives, cables and circuit cards.

Hardware Partition

A set of hardware components that can boot and run a Base OS image.

Hard Partitioning

Ability to split a platform into a number of independent smaller hardware partitions or to merge multiple independent hardware partitions to form a single larger hardware partition.

HPC

High Performance Computing.

HPC Cluster

High Performance Computing Cluster. A group of computers linked together to form a single computer.

Host Operating System

The Operating System that is booted at initialization and that is a Virtual Machine Monitor (VMM) and a number of guest OS.

Hot-Plugging

The operation of adding a component without interrupting system activity.

Hot-Swapping

The operation of removing and replacing a faulty component without interrupting system activity.

HT

HyperThreading. See Multi-Threading.

I

I2C

Intra Integrated Circuit. The I2C (Inter-IC) bus is a bi-directional two-wire serial bus that provides a communication link between integrated circuits (ICs). The I2C bus supports 7-bit and 10-bit address space devices and devices that operate under different voltages.

IB

InfiniBand.

iBMC

Integrated Baseboard Management Controller. See Embedded Management Controller.

iCare

The iCare Console (insight Care) is a web-based administration application which provides tools for hardware unit maintenance.

ICH

Input/Output Hub. Provides a connection point between various I/O components and Intel processors.

ICMB

Intelligent Chassis Management Bus. Name for the architecture, specifications, and protocols used to interconnect intelligent chassis via an RS-485-based serial bus for the purpose of platform management.

ILB / ILBC

I/O Legacy Board / I/O Legacy Board Controller.

INCA

INtegrated Cluster Architecture.

IOH

Input/Output Hub. An Intel QPI agent that handles I/O requests for processors.

IPMB

Intelligent Platform Management Bus. Abbreviation for the architecture and protocol used to interconnect intelligent controllers via an I2C based serial bus for the purpose of platform management.

IPMI

Intelligent Platform Management Interface. A specification owned by Intel which describes mechanisms and devices to completely offload the task of managing system hardware from the primary CPU.

J**JOEM**

JTAG Over Ethernet Module.

JTAG

Joint Test Action Group.

K

No entries.

L**LAN**

Local Area Network.

LCD

Liquid Crystal Display.

LCP

Local Control Panel. Module consisting of a controller, a LCD color display, a green and a blue LED and a Power ON button.

LDAP

Lightweight Directory Access Protocol.

LED

Light Emitting Diode.

Logical Partition

When the Base Operating System is a Virtual Machine Monitor, a logical partition is the software environment used to run a Guest Operating System.

Logical Processor

See Thread.

M**MAC**

Media Access Control.

MCA

A Machine Check Abort exception occurs when an error condition has arisen that requires corrective action.

MESCA

Multiple Environments on a Scalable Csi-based Architecture.

MIB

Management Interface Base.

MIMD

Multiple Instruction Multiple Data

MMX

MultiMedia eXtensions.

MTB/MTBC

Memory and Tukwila Board / Memory and Tukwila Board Controller.

MTBF

Mean Time Between Failure.

Multicore

Presence of two or more processors on a single chip.

Multi-Threading

The ability of a single processor core to provide software visibility similar to that of several cores and execute several threads in apparent (to software) simultaneity while using limited additional hardware resources with respect to a core without multi-threading.

Depending on core design, the instructions issued for execution by the core at a given cycle may be either **Hyper-Threading (HT)** - from a single thread, switching to another thread upon occurrence of specific events (e.g. cache misses) or **Simultaneous Multi-Threading (SMT)** - from both threads.

MXB/MXBC

Memory and Xeon Board / Memory and Xeon Board Controller.

N**Nehalem**

NEHALEM Intel Xeon Processor (8 cores per die).

NFS

Network File System.

NIC

Network Interface Controller.

NUMA

Non Uniform Memory Access.

NVRAM

Non-Volatile Random Access Memory.

O**Off-Lining**

See On-Lining / Off-Lining.

On-Lining / Off-Lining

On-lining and off-lining are dynamic logical operations. On-lining is the non-physical addition of an ARU to the running OS. The on-lined unit already exists in the configuration as an inactive unit (present and connected). Off-lining is the non-physical removal of an ARU from the running OS. The off-lined unit remains in the configuration as an inactive unit, ready to be on-lined.

OOB

Out Of Band. Access to system platform management that does not go through the OS or other software running on the main processors of the managed system.

OPMA

Open Platform Management Architecture.

P

PCI

Peripheral Component Interconnect. Bus architecture supporting high-performance peripherals.

PCIe

PCI Express. Latest standard in PCI expansion cards.

PDB

Power Distribution Board. Sub-assembly of the Power Supply Module.

PDU

Power Distribution Unit. Power bus used for the connection of peripheral system components.

Platform Event

A platform event is an event that originates directly from platform firmware (BIOS) or platform hardware, independently of the state of the Operating System or System Management Hardware.

PEF

Platform Event Filtering.

A feature in IPMI that enables the BMC to generate a selectable action (e.g. power on/off, reset, send Alert, etc.) when a configurable event occurs on the management system.

PET

The Platform Event Trap format is used for sending a platform event in an SNMP Trap. See Platform Event.

PIROM

The Processor Information ROM contains information about the specific processor in which it resides. This information includes robust addressing headers to allow for flexible programming and forward compatibility, core and L2 cache electrical specifications, processor part and S-spec numbers, and a 64-bit processor number.

PMU

Physically Manageable Unit. A hardware logical unit, or a group of logical units, that can be viewed / handled by an Operating System, or the BIOS, or the Platform Management Software. A PMU can be nested and is not necessarily separable from other PMUs. A PMU is also known as an ARU.

POST

Power On Self Test.

Processor

Each processor contains one or more dies in a single package. Each die contains one or more cores. Each core contains one or more threads (logical processors). Each processor is housed in a processor socket.

PSMI

Power Supply Management Interface.

PSU

Power Supply Unit. Sub-assembly of the Power Supply Module.

PSWB

PCI SWitch Board.

PSWM

PCI SWitch Module.

PWM

Pulse Width Modulation.

Q

QDR

Quad Data Rate. Communication signalling technique where data is transmitted at four points in the clock cycle.

QPI

Quick Path Interconnect. High-speed point-to-point Intel interface, used to interconnect processors and I/O Hubs, and optionally node controllers (BCS).

QSB

Quad Switch Board.

QSFP

Quad Small Form-factor Pluggable. Low-power interconnect technology.

QSMB

Quad Switch Module. InfiniBand Switch.

R

RADIUS

Remote Authentication Dial-In User Service.

RAS

Reliability, Availability, Serviceability.

RMII

Reduced Media Independent Interface. A standard that reduces the number of signals/pins required to connect an Ethernet chip to physical layer transceiver. See MII.

RTC

Real Time Clock.

S

SAS

Serial Attached SCSI. A data transfer technology used to move data to and from computer storage devices such as hard drives and tape drives.

SATA

Serial ATA. A computer bus technology for connecting hard disks and other devices.

SEL

System Event Log. A record of system management events. The information stored includes the name of the event, the date and time the event occurred and event data. Event data may include POST error codes that reflect hardware errors or software conflicts within the system.

A non-volatile storage area into the BMC and associated interfaces for storing System platform Event information for later retrieval.

Server Hardware Console

Graphical user interface used to access the management software embedded in the server module.

SHC

See Server Hardware Console.

Simultaneous Multi-Threading

See Multi-Threading.

SMBIOS

System Management BIOS.

SM-BUS

System Management Bus.

SMI

System Management Interrupt.

SMP

Symmetrical Multi Processor. The processing of programs by multiple processors that share a common operating system and memory.

SMT

Simultaneous Multi-Threading.

SMTP

Simple Mail Transfer Protocol.

SNC

Scalable Node Controller. The processor system bus interface and memory controller for the Intel870 chipset. The SNC supports both the Itanium2 processors, DDR SDRAM main memory, a Firmware Hub Interface to support multiple Firmware hubs, and two scalability ports for access to I/O and coherent memory on other nodes, through the FSS.

SNMP

Simple Network Management Protocol.

SoC

System on Chip.

Socket

Central Processing Unit multicore interface.

SOL

Serial Over LAN. Mechanism that enables the input and output of the serial port of a managed system to be redirected via an IPMI session over IP.

SO-DIMM

Small Outline Dual In-line Memory.

SR

Scratch Register. Internal registers of both the Tukwila processor and the I/O Hub used as scratch area.

SSH

Secured Shell.

SSL

Secure Socket Layer.

T**TELNET**

TELEcommunication NETwork. Protocol used on the Internet or Local Area Networks to provide a bidirectional interactive communications facility.

Thread

A thread or logical processor is the execution context within a single core and the software visibility of multi-threading. A single multi-threaded processor contains two or more threads (or logical processors).

Thresholding

An Event filter criterion. Thresholding is defined on a Count / Time basis aimed at routing significant messages only. Identical messages are counted and when the number of messages indicated in the Count field is reached within the period of time indicated in the Time field, this message is selected for routing.

TKW

TUKWILA Intel Itanium Processor (4 cores per socket).

U

UCM

Ultra Capacitor Module.

UVLO

Under Voltage Latch Output.

V

VMM

Virtual Machine Monitor.

W

WOL

Wake On Lan. A feature that provides the ability to remotely power on a system through a network connection.

X

XCSI

Extended Common System Interface. High-speed point-to-point Bull interface, used to interconnect servers. XCSI ports are located and managed in the BCS (node controller).

XNC

External Node Controller. See BCS.

Y

No entries.

Z

No entries.

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