

bullx blade system

Installation Guide

extreme computing



REFERENCE
86 A1 48 FB 05

extreme computing

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Installation Guide

Hardware

March 2011

BULL CEDOC
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Preface

This guide explains how to install your bullx blade system.

Note The Bull Support Web site may be consulted for product information, documentation, downloads, updates, and service offers:
<http://support.bull.com>

Intended readers

This guide is intended for use by qualified support personnel.

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

Related publications

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

- *bullx blade system Maintenance and Troubleshooting Guide, 86 A7 51FB* explains how to maintain, service, and upgrade the bullx blade system. This guide is intended for use by qualified support personnel.
- *bullx blade Chassis Hardware Console User's Guide, 86 A1 50FB* explains how to use the bullx blade Chassis Hardware Console to manage the blade chassis. This guide is intended for use by system administrators and operators.
- *bullx B500 Blade Hardware Console User's Guide, 86 A1 49FB* explains how to use the bullx B500 Blade Hardware Console to manage compute blades. This guide is intended for use by system administrators and operators.
- *bullx B505 Blade Hardware Console User's Guide, 86 A1 49FE* explains how to use the bullx B505 Blade Hardware Console to manage accelerator blades. This guide is intended for use by system administrators and operators.

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

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 60950-1 USA
- EN 60950-1 international
- CSA 60950-1 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 is 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 Bull SAS 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

Laser compliance notice

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

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

<p>Class 1 Laser Product Luokan 1 Laserlaitte Klasse 1 Laser Apparat Laser Klasse 1</p>

Safety information

For your safety, this manual contains important information, required to operate the server safely. Thoroughly review the information in this manual before using the server.

Use the following safety guidelines to ensure your personal safety and to help protect your server from potential damage. Throughout this guide, blocks of text may be accompanied by an icon which needs to be followed for your safety.

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 an action that could cause damage to a program, device, system, or data. A Caution notice may also indicate the presence of a hazard that has the potential of causing moderate or minor personal injury.

Read the installation instructions before connecting the system to the power source. Hazardous current and energy levels are present in areas indicated by this label. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact your service technician.



CAUTION

This unit is intended for installation in restricted access areas. A restricted access area can be accessed only through the use of a special tool, lock and key or other means of security. Only trained and qualified personnel should be allowed to install, replace, or service this equipment.

- This equipment must be grounded. Contact the appropriate electrical inspection authority or an electrician if you are uncertain that suitable grounding is available
- Do not overload the AC supply branch circuit that provides power to the rack. The total rack load should not exceed 80 percent of the branch circuit rating
- Use only power cables that are approved for use in the respective country. The power cable must be rated for the product and for the voltage and current marked on the product's electrical ratings label. The voltage and current rating of the cable should be greater than the ratings marked on the product
- If any of the following conditions occur, unplug the equipment from the electrical outlet and replace the part or contact your trained service technician:
 - The power cable, extension cable, or plug is damaged
 - An object has fallen into the equipment
 - The equipment has been exposed to water
 - The equipment does not operate correctly when you follow the operating instructions

- Allow the equipment to cool before removing covers or touching internal components
- Suitable disconnect device must be provided as part of the building installation. The purpose of the disconnect device is to provide an easy and accessible means for removing power from the product for servicing
- Opening or removing covers that are marked with the triangle symbol with a caution mark may expose you to risk of electrical shock. Components inside these compartments should be serviced only by a trained service technician
- Ensure that the voltage and frequency of your power source match the voltage and frequency inscribed on the equipment's electrical rating label
- Hazardous energy is present when the blade is connected to the power source. Always replace the blade cover before installing the blade
- When removing blade system components, do not insert your hand into the open slots. Doing so may cause electric shock
- Do not operate your equipment with any filler covers removed
- Do not push any objects into the openings of your system components. Doing so can cause fire or electric shock by shorting out interior components
- Do not use the top blade handle to lift the blade chassis. These are used only to install and remove the blade only
- Do not restrict airflow into the equipment by blocking any vents or air intakes
- Cleaning: Unplug your system from wall outlet before cleaning
- Do not spill food or liquids on your system components. Never operate the product in a wet environment



CAUTION

When connecting or disconnecting power to hot-pluggable power supplies observe the following guidelines:

- Install the power supply before connecting the power cable to the power supply
- Unplug the power cable before removing the power supply
- If the equipment has multiple sources of power, disconnect power from the system by unplugging all power cables from the power supplies to reduce shock hazard
- Never open the power supply module for any reason
- The power supplies in your system may produce high voltages and energy hazards. Only trained service technicians are authorized to remove the covers and access any of the components inside the system



CAUTION

Incorrectly installing a battery or using an incompatible battery may increase the risk of fire or explosion. Replace the battery only with the same or equivalent type recommended by the manufacturer, carefully following installation instructions. Dispose of used batteries properly. Handle batteries carefully. Do not disassemble, crush, or puncture batteries.

Electrical safety



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.



CAUTION

For Europe, connect the plug through Pluggable type B inlet only. Do not employ Pluggable type A type Plug in European market. Replacement of power cord shall be done only by Service person and the same type cord and plug configuration shall be utilized.



CAUTION

The following must be applied for, in end-system:

Pluggable Type A Equipment, is only accepted where the installation fuse is limited to 16 A; due to the mains fuse rating of 25 A, the following must be applied for:

- Connection through Pluggable Type B inlet
- Permanent Connection

Laser safety information

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 Electro technical 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



CAUTION

Bull 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.



Chapter 1. Delivery

This chapter explains how to unpack and inspect the blade system.

1.1 Introduction

The bullx blade system is a high-density and high-performance rack-mounted server system developed for medium-to-large businesses. The bullx blade system is delivered in a box that contains all the data and items required for installation. A bullx blade system can be equipped with bullx B500 compute blades or bullx B505 accelerator blades. The following figure shows a system equipped with bullx B500 compute blades.

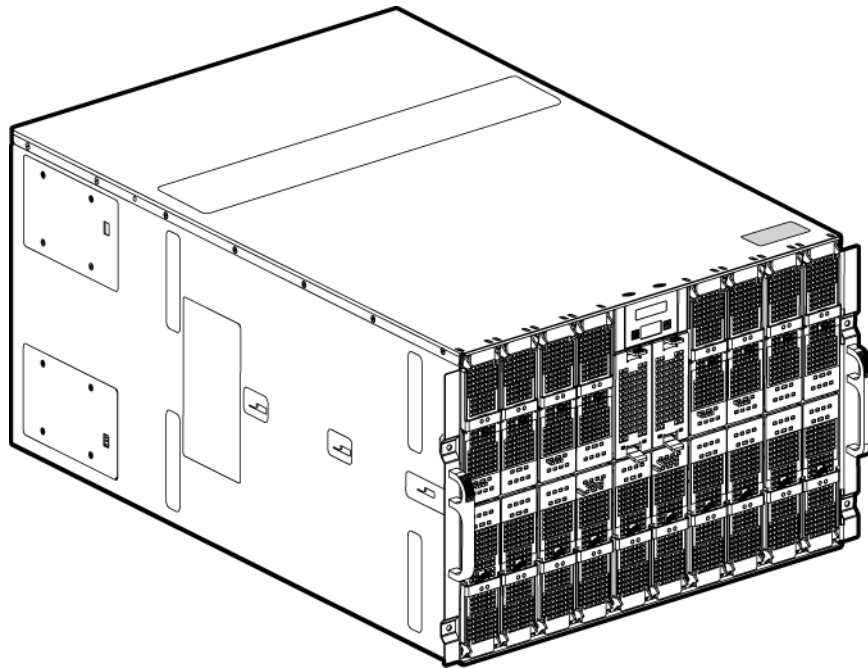


Figure 1-1. bullx blade system



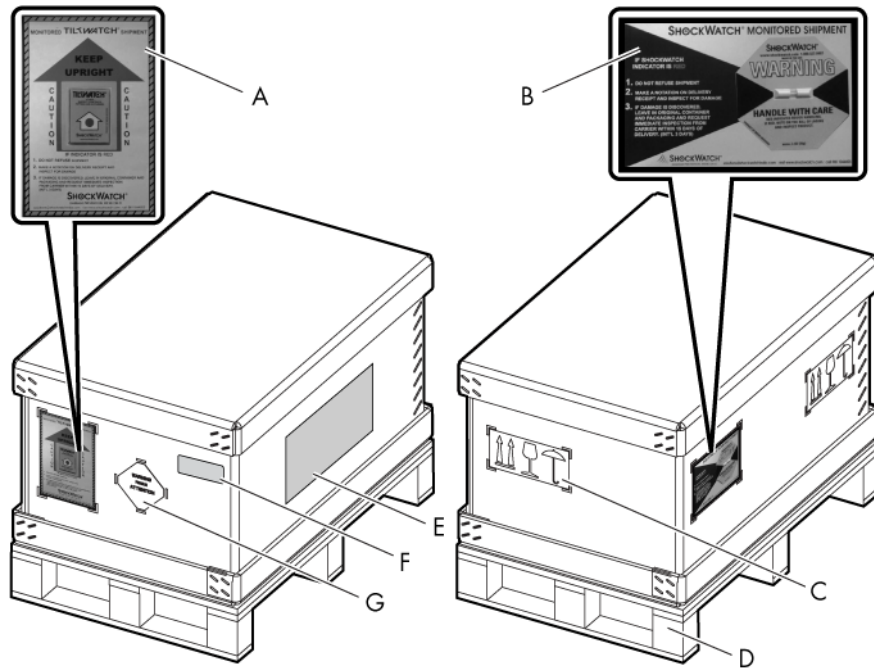
CAUTION

It is mandatory for the blade system to be transported horizontally.

1.2 Inspecting system packing

Before unpacking, inspect system packing to check its condition:

- Check for any damages or any visible defects
- The shockwatch label should be white in color, indicating that the packing has not been damaged during shipping
- The tiltwatch label should not be red
- Note the indicator status on the bill of lading and carefully inspect the system before powering up



A Tiltwatch	B Shockwatch
C Safety label	D Wooden stand
E Packing lists	F Product label
G Warning label	

Figure 1-2. Inspecting system packing

1.3 Unpacking the system

After ensuring that the system packing is not damaged, you can unpack the system



DANGER

Authorized service personnel only may unpack and physically install the system.



CAUTION

To avoid personnel injury, before lifting the system, remove all the blades to reduce weight.

The following steps help you to remove the packing:

1. Cut the straps covering the packing.
2. Remove the top corrugated cover.
The inner foam is now visible and it contains another small package that has a rack-mounting kit and shipping bracket assembly that are needed to install the system in the cabinet.
3. Remove the small package and take out this top foam.
There will be another corrugated sleeve covering the system from outside.
4. Hold the sleeve and lift it up.
5. Remove the inner foams at different ends.
6. Move the system to the required location using suitable lifting equipment.



Important

Store packing in a safe and clean place for possible future use.

1.4 Checking the system

Perform a preliminary visual inspection after unpacking the system, using the following list:

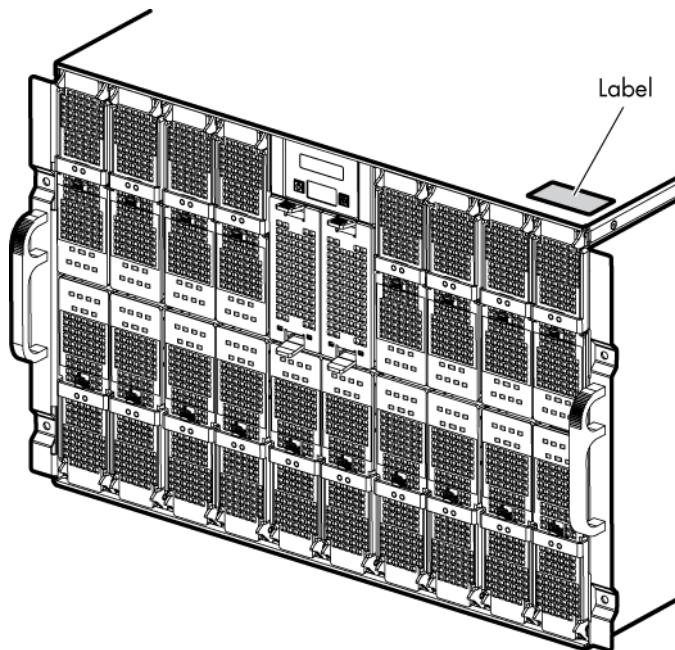
- Check that the system delivered is compliant with the Purchase Order
- Check for internal damage, alterations and obvious safety hazards, such as broken wires, sharp edges, or broken insulation
- Check internal cables for damage



CAUTION

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

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



	bullx blade system
Product Name	
Model Type	
Serial Number (XAN)	

Figure 1-3 System information record

Chapter 2. Getting to know the system

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 / nine bullx B505 accelerator 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 bullx B500 compute blades / bullx B505 accelerator 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/SDD disk.
- Up to nine bullx B505 accelerator blades (GPU), with two processors, two Nvidia cards and four fans for cooling.
- A Quad Switch Module (QSM).
- 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.

2.1 What the blade system offers

The blade system design takes advantage of advancements in server technology. It houses up to eighteen functionally separate compute blades or nine accelerator blades 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

Compute blades / accelerator 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.

Hot-swap / Hot-plug capabilities

The compute and accelerator 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 compute or accelerator blade, allows remote management of system components and blades. The Chassis Management Module (CMM) also multiplexes access to the embedded management controllers on the compute blades / accelerator blades providing them with KVM and Virtual Media capabilities.

Each compute blade / accelerator 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 compute blade / accelerator 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 compute blade/ accelerator blade.

2.2 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 compute blade/ accelerator blade service processor firmware
- Redundant components:
 - Fan blades
 - Power Supply Unit modules
- Hot-plug / hot-swap components:
 - Compute blades (NCB) / accelerator blades (GPU)
 - 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)

2.3 Features and specifications

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

- 7U rack-mountable system chassis with Midplane and LCP display
- bullx B500 compute blades (NCB)
- bullx B505 accelerator blades (GPU)
- 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

Further specifications are given in Appendix A.

2.3.1 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

2.3.2 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

2.3.3 External connections, interfaces, indicators, buttons and switches

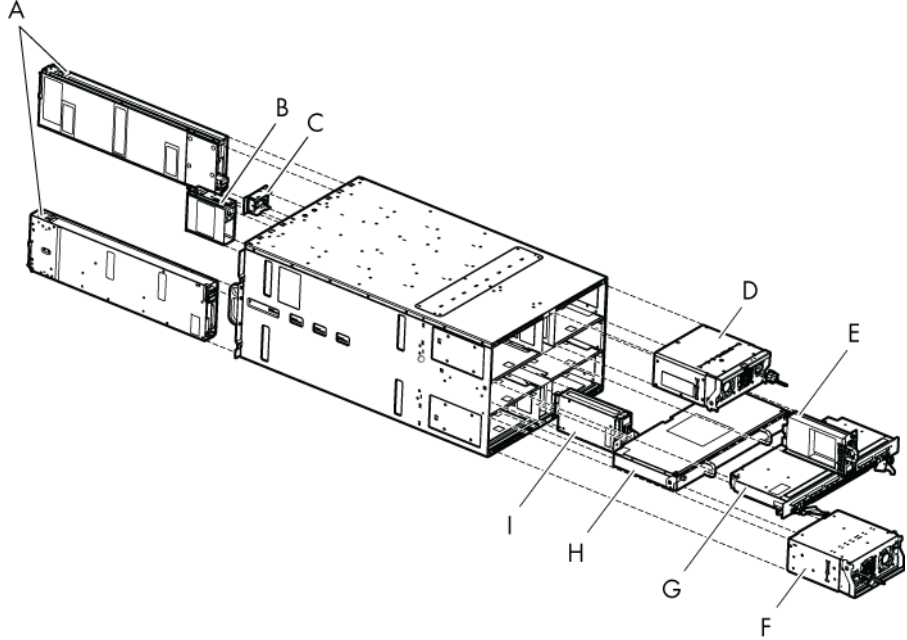
The following external connections, interfaces, indicators, buttons and switches are available:

- 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
- Compute blade (NCB) / accelerator blade (GPU) indicator LEDs
- Quad Switch Module indicator LED
- Gbit Ethernet switch indicator LED
- Ultra Capacitor Module indicator LED
- CMM reset pushbutton (CMC reset)

2.4 System components, controls and LEDs

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

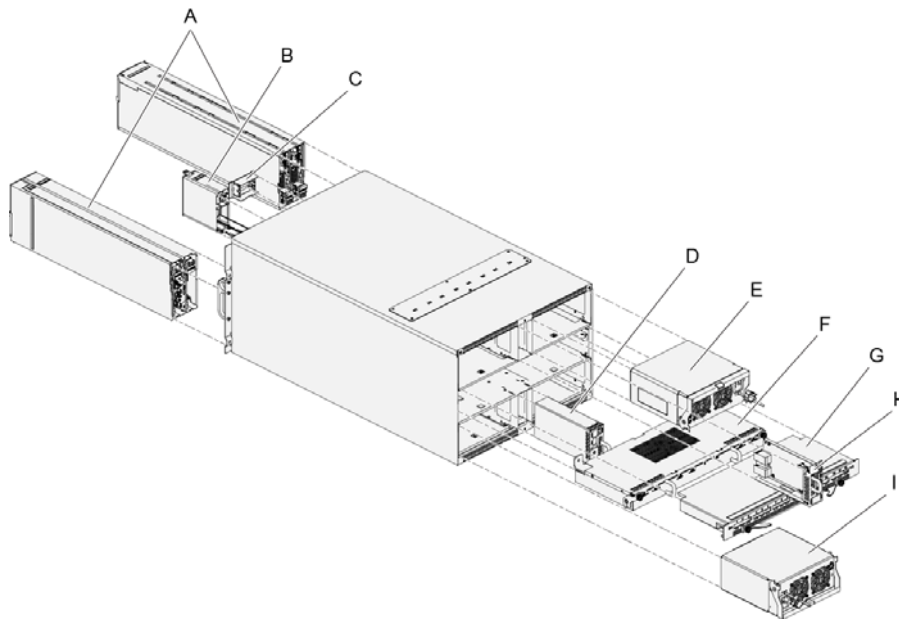
2.4.1 Blade system with compute blades – exploded view



A Compute blades	B Fan blade
C Local Control Panel	D Power Supply Unit module
E Chassis Management Module	F Power Supply Unit module
G Quad Switch Module	H Ultra Capacitor Module
I Ethernet Switch Module (ESM / TSM)	

Figure 2-1. Blade system with compute blades – exploded view

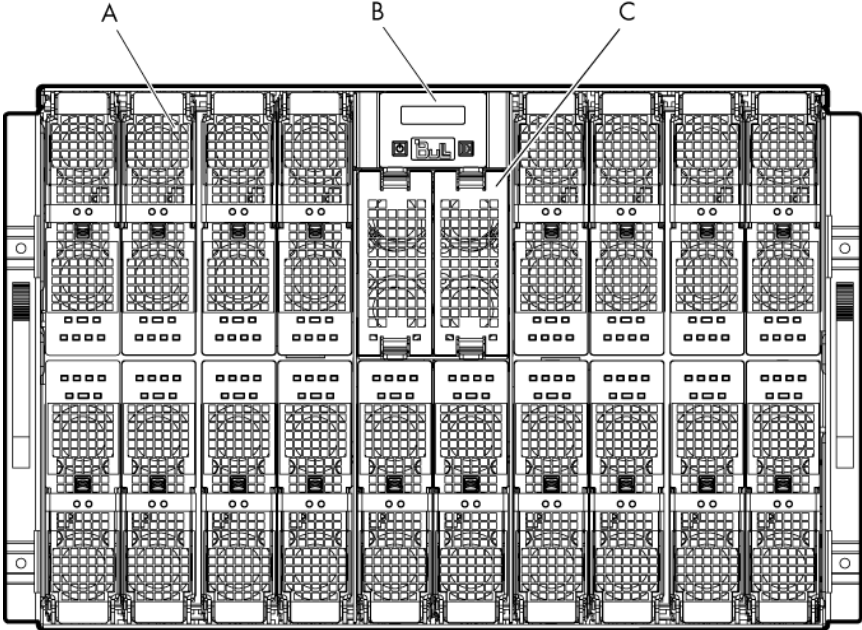
2.4.2 Blade system with accelerator blades – exploded view



A Accelerator blades	B Fan blade
C Local Control Panel	D Ethernet Switch Module (ESM / TSM)
E Power Supply Unit module	F Ultra Capacitor Module
G Quad Switch Module	H Chassis Management Module
I Power Supply Unit module	

Figure 2-2. Blade system with accelerator blades – exploded view

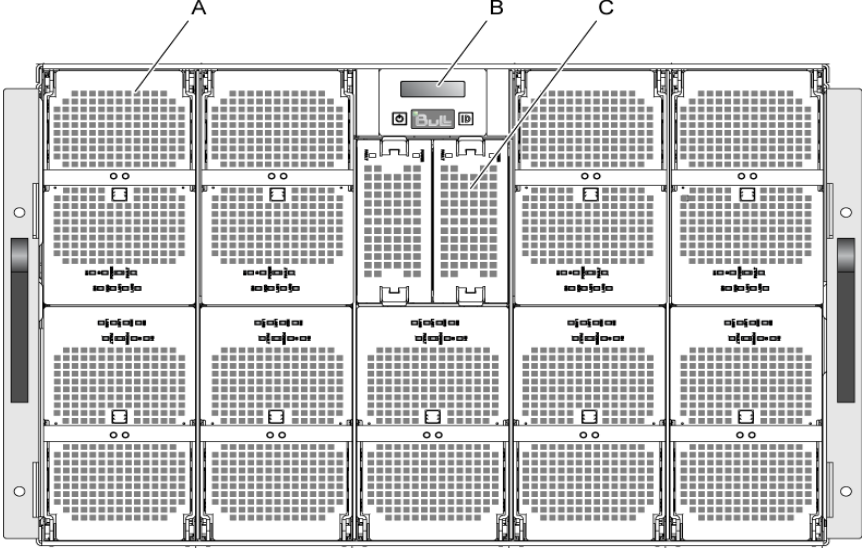
2.4.3 Blade system with compute blades – front view



A Compute blade (NCB)	B Local Control Panel
C Fan blade	

Figure 2-3. Blade system with compute blades – front view

2.4.4 Blade system with accelerator blades – front view



A Accelerator blade (GPU)	B Local Control Panel
C Fan blade	

Figure 2-4. Blade system with accelerator blades – front view

2.4.5 Blade chassis

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

The Midplane, in the center of the blade chassis, provides interconnectivity between blades and the various modules located at the rear of the blade chassis.

2.4.6 Compute blades (NCB)

The eighteen compute blades are distributed in two rows, eight on the top row and ten on the bottom row. All the blades are inserted from the front of the blade system and plugged into the Midplane.

The compute blades provide the server motherboard functionality based on dual Nehalem-EP / Westmere-EP processors from Intel® and ensure maximum performance/watt for datacenter infrastructures and highly dense deployments. Each processor interconnects with the other processors through the Intel Quick Path Interconnect (QPI) feature. Each compute blade interconnects with the other compute blades through an embedded ConnectX QDR component and the Quad Switch Module.

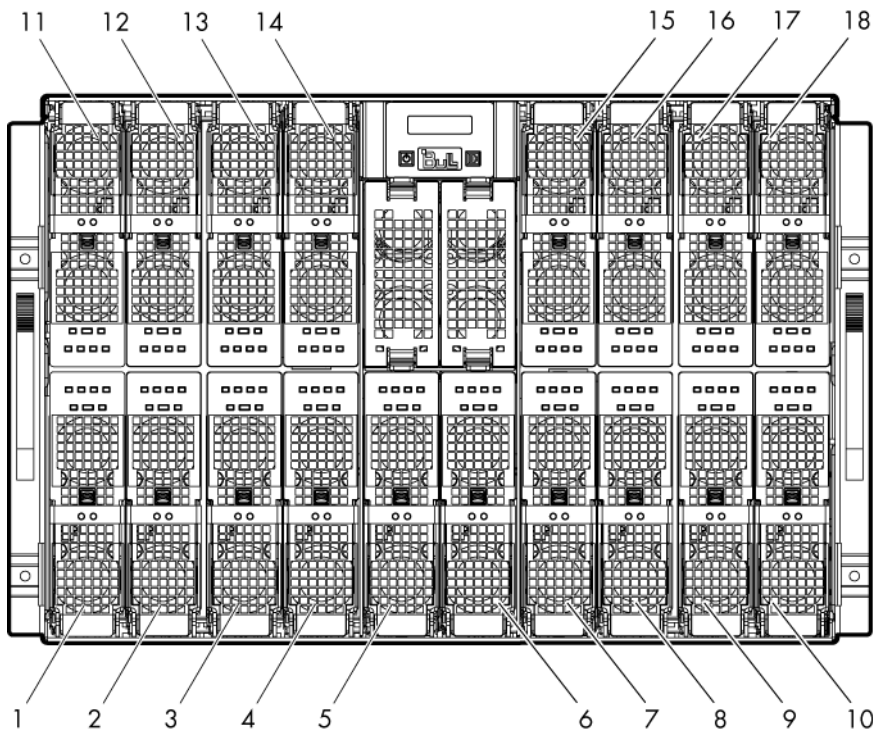


Figure 2-5. Compute blades (NCB)

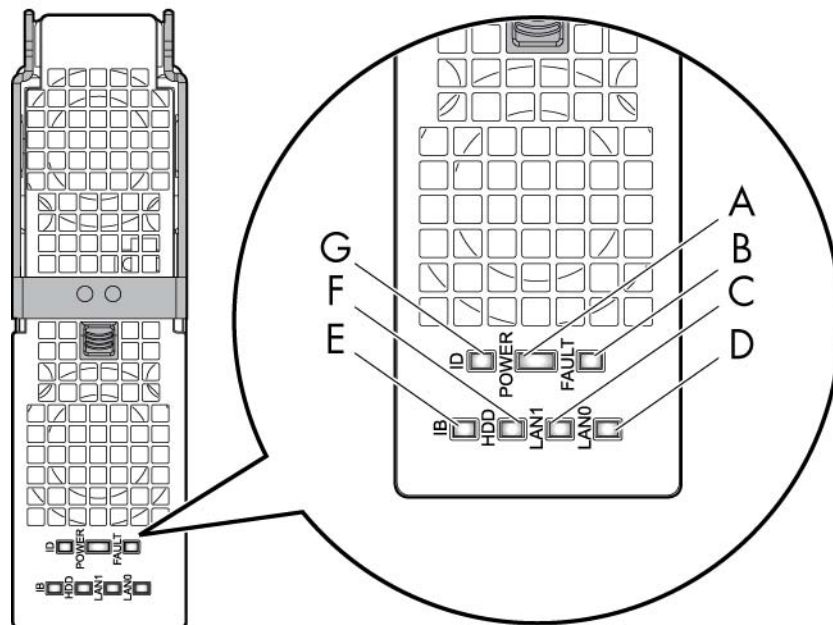
Note Compute blades (NCB) and accelerator blades (GPU) can be installed in the same chassis.

The compute blades present the following features:

- Hot-plug / hot-swap supported
- Dual-processor sockets for up to two processors
- All processor SKUs supported up to 95W
- Twelve DDR3 DIMM slots (6 per socket) at 800, 1066, 1333 MHz
- SATA drive (HDD or SSD) form factor 1.8 inch
- Sleep state four (Suspend to disk) supported on HDD/SSD where available
- Front status LEDs

2.4.6.1 Compute blade (NCB) LEDs

Each compute blade is equipped with the following LEDs:



A Power LED	B Fault LED
C LAN1 LED	D LAN0 LED
E IB activity LED	F HDD activity LED
G Identification LED	

Figure 2-6. Compute blade (NCB) LEDs



DANGER

Hazardous energy is present when the blades are connected to the power source. Never insert a blade into the chassis with its cover removed.

Identification LED

The identification LED indicator is **blue**.

This indicator is a unit identifier dedicated to maintenance operations and used to physically localize a compute blade.

This LED is switched On/Off by the maintenance operator from the Chassis Hardware Console web interface.

Power LED

The power LED indicator is bicolor: **amber/green**.

This indicator provides the compute blade power state:

- **Amber**: 3.3V stand-by power presence (the blade is in stand-by/off power mode)
- **Green**: 12V main power presence (the blade is in main power mode)

This indicator is managed by the hardware.

Fault LED

The fault LED indicator is **red**.

This indicator displays faults detected by the integrated Baseboard Management Controller (iBMC) firmware.

This indicator is managed by the iBMC firmware.

LAN 0 activity LED

The LAN 0 activity LED indicator is **green**.

This indicator flashes On and Off to indicate compute blade traffic (Tx and Rx data) on the Ethernet network channel 0 (to/from CMM).

This indicator is managed by the hardware.

LAN 1 activity LED

The LAN 1 activity LED indicator is **green**.

This indicator flashes On and Off to indicate compute blade traffic (Tx and Rx data) over the Ethernet network channel 1 (to/from ESM / TSM) through the Ethernet component.

This indicator is managed by the hardware.

IB activity LED

The IB activity LED indicator is **amber**.

This indicator flashes On and Off to indicate compute blade traffic over the IB network channel 0 for through the ConnectX component.

This indicator is managed by the hardware

HDD activity LED

The HDD activity LED indicator is **amber**

This indicator flashes On and Off to indicate traffic over the SATA link.

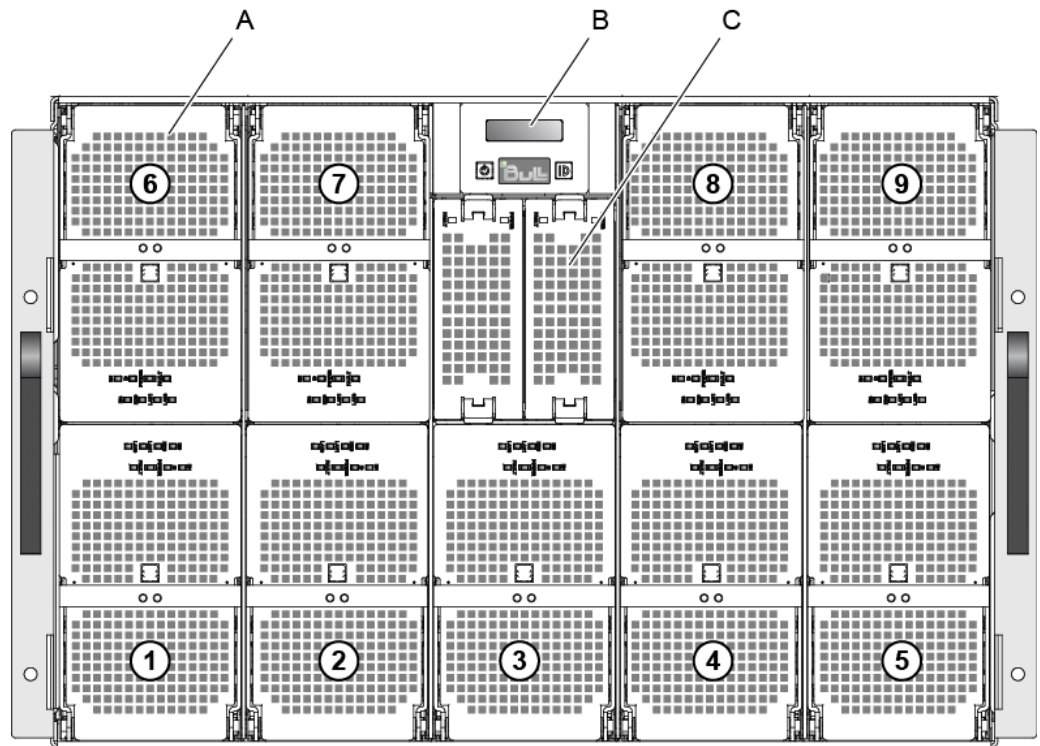
This indicator is managed by the hardware.

2.4.7 Accelerator blades (GPU)

The nine accelerator blades are distributed in two rows, four on the top row and five on the bottom row. All the blades are inserted from the front of the blade system and plugged vertically into the Midplane.

The accelerator blades provide the server motherboard functionality based on dual Nehalem-EP / Westmere-EP processors from Intel® and two Nvidia graphic cards and ensure maximum performance/watt for datacenter infrastructures and highly dense deployments. Each processor interconnects with the other processors through the Intel Quick Path Interconnect (QPI) feature. Each accelerator blade interconnects with the other accelerator blades through an embedded ConnectX QDR component and the Quad Switch Module.

The main accelerator blade components are the SSUPs (SSUP0 and SSUP1) with their processors, IOH and DIMMs, the Planar and two Nvidia graphic cards.



A Accelerator blade	B Local Control Panel
C Fan Blade	

Figure 2-7 Accelerator blades (GPU)

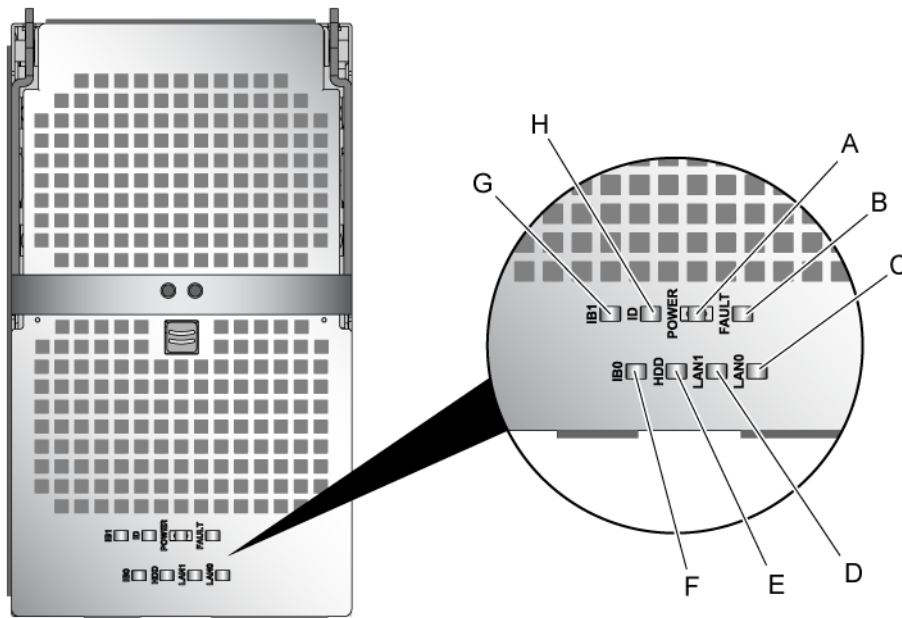
Note Compute blades (NCB) and accelerator blades (GPU) can be installed in the same chassis.

The accelerator blades present the following features:

- Hot-plug / hot-swap supported
- Dual-processor sockets for up to two processors
- All processor SKUs supported up to 80W
- Six DDR3 DIMM slots (3 per socket) at 800, 1066, 1333 MHz
- Two PCI Express Gen2x16 slots
- SATA drive (HDD or SSD) form factor 1.8 inch
- Sleep state four (Suspend to disk) supported on HDD/SSD when available
- Front status LEDs

2.4.7.1 Accelerator blade (GPU) LEDs

Each accelerator blade is equipped with the following LEDs:



A Power LED	B Fault LED
C LAN0 LED	D LAN1 LED
E HDD activity LED	F IB0 activity LED
G IB1 activity LED	H Identification LED

Figure 2-8 Accelerator blade (GPU) LEDs



DANGER

Hazardous energy is present when the blades are connected to the power source. Never insert a blade into the chassis with its cover removed.

Identification LED

The identification LED indicator is **blue**.

This indicator is a unit identifier dedicated to maintenance operations and used to physically localize an accelerator blade.

The LED is switched On/Off by the maintenance operator from the Chassis Hardware Console web interface.

Power LED

The power LED indicator is bicolor: **amber/green**.

This indicator provides the accelerator blade power state:

- **Amber**: 3.3V stand-by power presence (the blade is in the stand-by/off mode)
- **Green**: 12V main power presence

This indicator is managed by the hardware.

Fault LED

The fault LED indicator is **red**.

This indicator displays faults detected by the integrated Baseboard Management Controller (iBMC) firmware.

This indicator is managed by the iBMC firmware.

LAN 0 activity LED

The LAN 0 activity LED indicator is **green**.

This indicator flashes On and Off to indicate accelerator blade traffic (Tx and Rx data) on the Ethernet network channel 0 (to/from CMM).

This indicator is managed by the hardware.

LAN 1 activity LED

The LAN 1 activity LED indicator is **green**.

This indicator flashes On and Off to indicate accelerator blade traffic (Tx and Rx data) over the Ethernet network channel 1 (to/from ESM / TSM) through the Ethernet component.

This indicator is managed by the hardware.

IB0 activity LED

The IB0 activity LED indicator is **amber**.

This indicator flashes On and Off to indicate accelerator blade traffic over the IB0 network channel 0 through the SSUP0 ConnectX component.

This indicator is managed by the hardware

IB1 activity LED

The IB1 activity LED indicator is **amber**.

This indicator flashes On and Off to indicate accelerator blade traffic over the IB1 network channel 1 through the SSUP1 ConnectX component.

This indicator is managed by the hardware

HDD activity LED

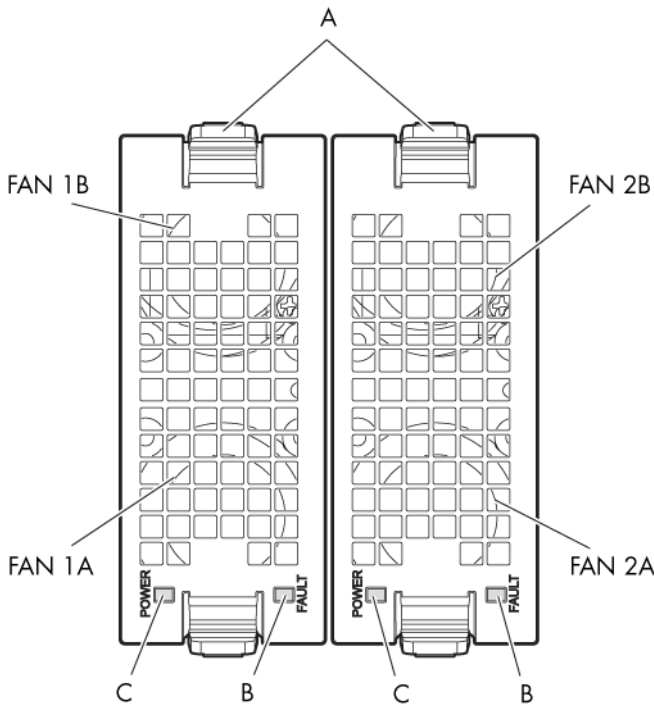
The HDD activity LED indicator is **amber**.

This indicator flashes On and Off to indicate traffic over the SATA link.

This indicator is managed by the hardware.

2.4.8 Fan blades

Two fan blades provide cooling to the QSM, CMM, and ESM / TSM. The fan blades are hot-swappable/hot-pluggable.



A Latch	B Fault LED
C Power LED	

Figure 2-9 Fan blades

2.4.8.1 Fan blade LEDs

Each fan blade is equipped with the following LEDs:

Fault LED

The fault LED indicator is **red**.

When the fans do not rotate as per the expected speed, the fault LED switches On.

Power LED

The power LED indicator is **green**.

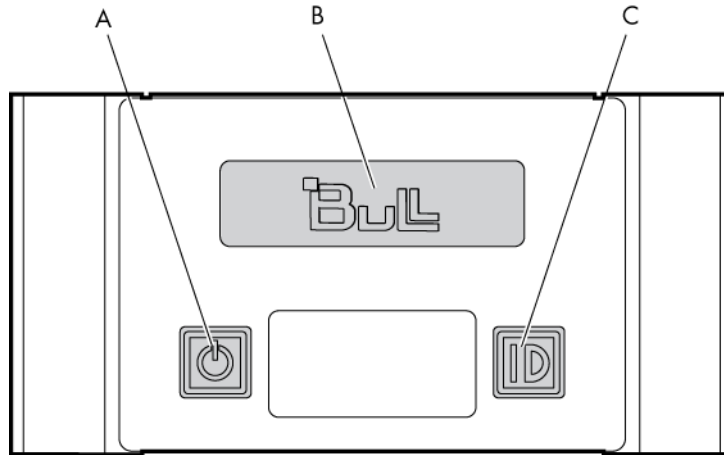
When the fans are rotating as per the expected speed, the power LED switches On.



Important Replace a failed fan blade as soon as possible to restore cooling redundancy. See the *bullx blade system Maintenance and Troubleshooting Guide* on the *bullx blade system Resource and Documentation CD* for instructions.

2.4.9 Local Control Panel

The Local Control Panel (LCP) is on the front of the blade chassis. The Local Control Panel is hot-swappable / hot-pluggable.



A Power On/Off button	B Display screen
C Identification button	

Figure 2-10. Local Control Panel

2.4.9.1 Local Control Panel LEDs

The Local Control Panel is equipped with the following LEDs:

Identification LED

The identification LED indicator is **blue**.

This indicator is a unit identifier dedicated to maintenance operations and used to physically localize a blade chassis from the front of the chassis. This LED turns On simultaneously with the CMM identification LED indicator on the rear of the chassis.

This LED is switched On/Off by the maintenance operator from the Chassis Hardware Console web interface or locally from the LCP ID button (providing this option is enabled from the Chassis Hardware Console web interface).

Power LED

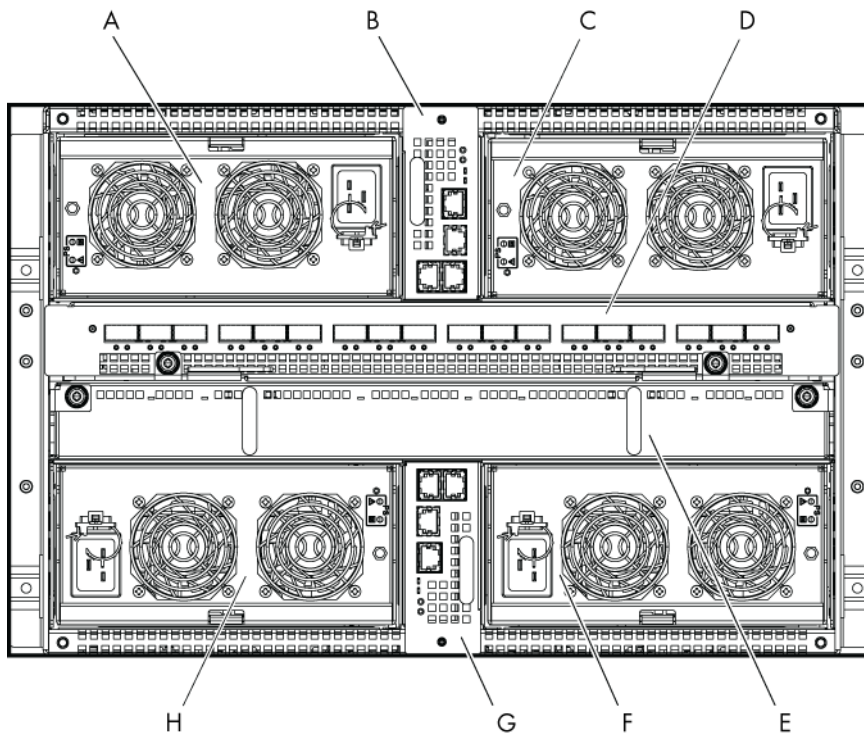
The power LED indicator is **green**.

This indicator indicates 12V main power presence within the blade chassis.

This indicator is managed by the CMC firmware.

2.4.10 Blade system with 1 Gigabit Ethernet Switch Module – rear view

This section identifies the components and LEDs on the rear of the blade system.

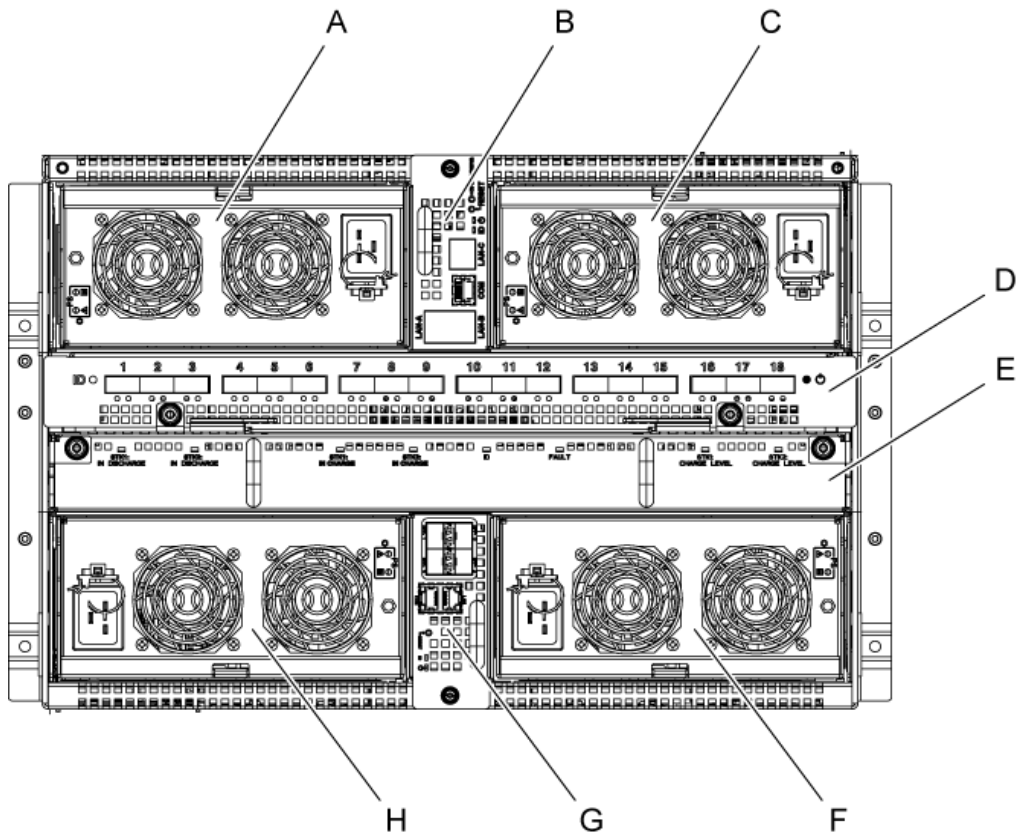


A PSU3	B CMM
C PSU4	D QSM
E UCM	F PSU2
G ESM	H PSU1

Figure 2-11. Blade system with ESM – rear view

2.4.11 Blade system with 10 Gigabit Ethernet Switch Module – rear view

This section identifies the components and LEDs on the rear of the blade system.



A PSU3	B CMM
C PSU4	D QSM
E UCM	F PSU2
G TSM	H PSU1

Figure 2-12. Blade system with TSM – rear view

2.4.12 Blade chassis

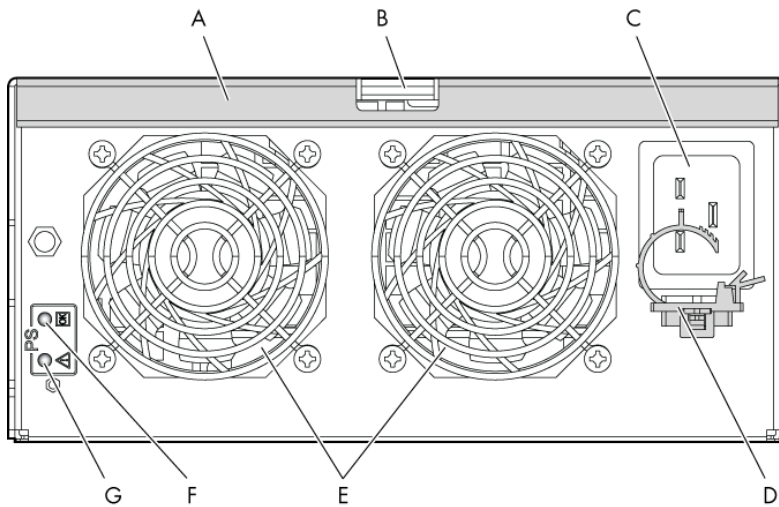
The rear of the blade chassis provides bays for blade system PSU, CMM, QSM, UCM, and ESM / TSM modules.

The Midplane, in the center of the blade chassis, provides interconnectivity between these modules and the blades located at the front of the blade chassis.

2.4.13 Power Supply Unit (PSU) module

There are four x 2900W PSU modules at the rear of the blade system, providing 12V main and 3.3V stand-by outputs. When four PSU modules equip the blade system, they provide N+1 redundancy. Typical system power dissipation is approximately 7900W according to configuration and running applications. High-level PSU module features are:

- Hot-plug / hot swap supported, up to four parallel supplies
- 2900W power supply
- 12V main and 3.3V stand-by outputs
- 210 VAC to 240 VAC corrected AC input power factor
- PSMI compliant



A Handle	B Latch
C Power socket	D Cable retention
E Fans	F Power LED
G Fault LED	

Figure 2-13. Power Supply Unit (PSU) module

2.4.13.1 Power Supply Unit module LEDs

The Power Supply Unit module is equipped with the following LEDs:

Fault LED

The Fault LED indicator is **amber**.

A slow blinking or solid On state indicates that the PSU module has failed or reached a critical state warranting its replacement.

Power LED

The Power LED indicator is **green**.

Slow **blinking green** indicates that AC is being applied to the PSU module and that the 3.3V stand-by voltage is available. Once 12V is enabled this LED becomes **steady**.

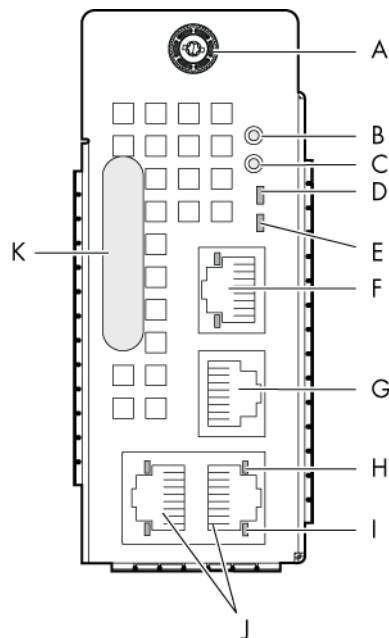
2.4.14 Chassis Management Module (CMM)

The primary function of the CMM is to provide the blade chassis-level management functionality for the blade system, including detection, power On/Off, hardware status monitoring for the compute blades / accelerator blades and other hardware modules within the blade chassis, PSU status monitoring and system fan control. The CMM is also used to manage and display LCP messages.

The CMM is a hot-swappable module which includes of a 24-port 1GbE Ethernet switch and an OPMA daughter card, which is used as a service processor.

The Ethernet logical connections are:

- One Ethernet port to the service processor (internal)
- Eighteen Ethernet ports to the compute blades / accelerator blades through the backplane connector (internal)
- Three Ethernet ports to RJ45 connectors on the rear (external)



A Thumb screw	B Default button
C Reset button	D Power and health status LED
E Identification LED	F Dynamically configurable stacking or Ethernet port
G Serial port	H Activity LED
I Link LED	J Dynamically configurable stacking or Ethernet port
K Handle	

Figure 2-14. Chassis Management Module (CMM)

The CMM presents the following features:

- Hot-plug / hot-swap supported
- Compute blades / accelerator blades can run even when the CMM is down
- Ethernet switch supports VLANs
- Three dynamically configurable stacking or Ethernet ports
- External COM port
- Status LEDs
- Status information displayed on the LCP
- Ethernet switch firmware can be loaded in-band over the Ethernet links

2.4.14.1 Chassis Management Module LEDs

The Chassis Management Module is equipped with the following LEDs:

Identification LED

The identification LED indicator is **blue**.

This indicator is a unit identifier dedicated maintenance operations and used to physically localize the blade chassis from the rear of the chassis. This LED turns On simultaneously with the LCP identification LED indicator on the front of the chassis.

This LED is switched On/Off by the maintenance operator from the Chassis Hardware Console web interface or locally from the LCP ID button.

Power LED

The power LED indicator is **amber**.

This indicator provides the blade chassis power state and CMC activity:

- **Solid amber:** CMM is initializing
- **Blinking amber:** CMC firmware is alive

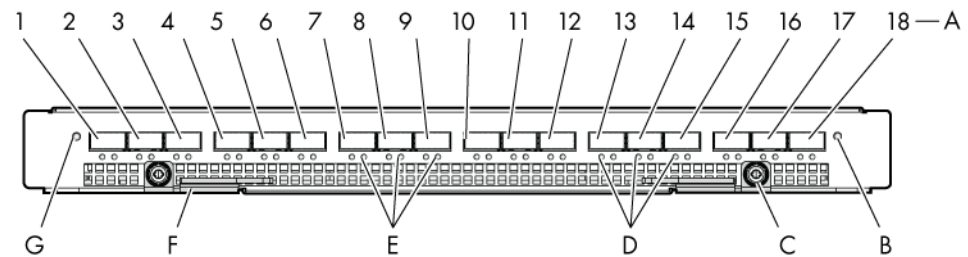
LAN activity and status LED

Two LEDs are integrated in each of the three Ethernet connectors:

- Link status LED
- Link activity LED

2.4.15 Quad Switch Module (QSM)

The blade system supports a QSM, based on a 36 port QDR switch Board (QSB) to provide the quad switching function between the compute blades / accelerator blades and the external QSFP ports. The QSM plugs into the Midplane from the rear of the blade chassis. This module is also known as InfiniBand Switch.



A QSFP ports (1-18)	B Power On/AUX Power LED
C Thumb screw	D Logical link LED
E Physical link LED	F Latch
G Identification LED	

Figure 2-15. Quad Switch Module

The QSM presents the following features:

- Hot-plug / hot-swap supported
- 36 InfiniBand Switch ports:
 - 18 internal ports
 - 18 external ports
- QDR IB support
- Passive and active cable support per IB standard
- Status indication LEDs
- In-band IB connection switch management

2.4.15.1 Quad Switch Module LEDs

The Quad Switch Module is equipped with the following LEDs:

Identification LED

The identification LED indicator is **blue**.

This indicator is a unit identifier dedicated maintenance operations and used to physically localize the module. This LED is switched On/Off by the maintenance operator from the Chassis Hardware Console web interface.

Power LED

The power LED status indicator is bicolor:

- **Amber:** 3.3V stand-by power presence
- **Green:** 12V main power presence

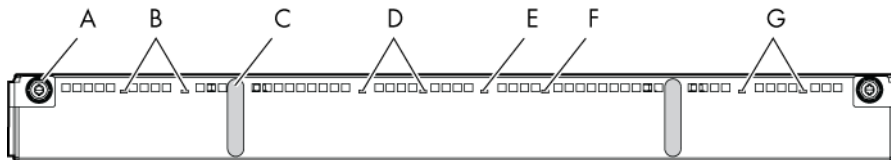
IB link activity LEDs

There are two IB link activity LEDs:

- **Physical link:** -**still green** indicates a good physical link; **blinking green** indicates a physical link problem.
- **Logical link:** **blinking amber** indicates data transfer.

2.4.16 Ultra Capacitor Module (UCM)

The UCM is an optional module that can ride through AC outages of up to 250ms. The UCM connects to the Midplane through bus bars and during normal operation the UCM charges power from the Midplane 12V. This power is stored in the module's Ultra capacitors. During outage, the capacitors discharge to provide the required power to the other components, such as the blades and the Quad Switch Module (QSB). Hold-time under 3V3 stand-by voltage is 1000ms. The UCM is also controlled/monitored by the CMM under 3V3 stand-by voltage.



A Thumb screw	B Discharging LEDs
C Handle	D Charging LEDs
E Identification LED	F Fault LED
G Charge / Discharge LEDs	

Figure 2-16. Ultra Capacitor Module (UCM)

The UCM presents the following features:

- 250 ms power outage offset ability
- 480 ms maximum hold-up time
- Status indication LEDs

2.4.16.1 Ultra Capacitor Module LEDs



DANGER

The UCM must be fully discharged, i.e. CHARGE / DISCHARGE LEDs OFF (G), before servicing the module. DO NOT TOUCH the module until FULLY DISCHARGED.

The Ultra Capacitor Module is equipped with the following LEDs:

Identification LED

The identification LED indicator is **blue**.

This indicator is a unit identifier dedicated to maintenance operations and used to physically localize the module. This LED is switched On/Off by the maintenance operator from the Chassis Hardware Console web interface.

Charging LEDs

There are two charging LEDs, one per Ultra Capacitor stack.

Charging LEDs are **amber** when the UCM is charging.

These indicators are managed by the hardware.

Discharging LEDs

There are two discharging LEDs, one per Ultra Capacitor stack.

Discharging LEDs are **red** when the UCM is charged.

These indicators are managed by the hardware.

Charge LEDs

There are two charge LEDs, one per Ultra Capacitor stack.

Charge LEDs are **green** when the UCM is charged.

Charge LEDs are **Off** when the UCM is fully discharged.

These indicators are managed by the hardware.

Fault LED

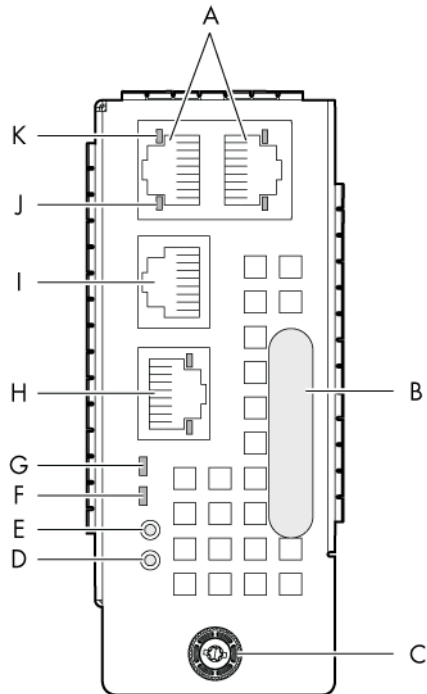
The fault power LED indicator is **amber**.

This indicator displays UCM failure.

This indicator is managed by the CMC firmware.

2.4.17 1 Gigabit Ethernet Switch Module (ESM)

The 1 Gigabit Ethernet Switch Module is an optional module which provides the Ethernet switching function through the three external 1 Gigabit Ethernet ports.



A Dynamically configurable stacking or Ethernet ports	B Handle
C Thumb screw	D Default button
E Reset button	F Power and health status LED
G Identification LED	H Dynamically configurable stacking or Ethernet port
I Serial port	J Activity LED
K Link LED	

Figure 2-17. 1 Gigabit Ethernet Switch Module

The 1 Gigabit Ethernet Switch Module presents the following features:

- Hot-plug / hot-swap supported
- Ethernet switch supports VLANs
- Ethernet has two stacking ports and a switching Ethernet port by default. Ports can be dynamically configured either as stacking ports or as GbE ports
- Status indication LEDs
- Ethernet switch firmware can be loaded in-band over the Ethernet links

2.4.17.1 1 Gigabit Ethernet Switch Module LEDs

The 1 Gigabit Ethernet Switch Module is equipped with the following LEDs:

Identification LED

The identification LED indicator is **blue**.

This indicator is a unit identifier dedicated to maintenance operations and used to physically localize the module. This LED is switched On/Off by the maintenance operator from the Chassis Hardware Console web interface.

Power LED

The power LED indicator is **amber**.

This indicator provides module 3.3V stand-by power status.

This indicator is managed by the hardware.

LAN activity and status LED

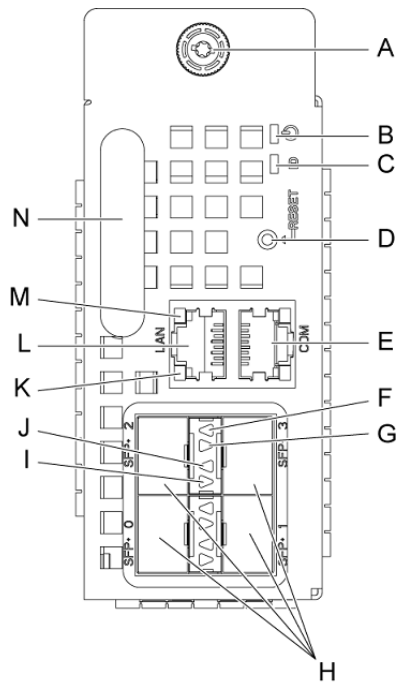
Two LEDs are integrated in each of the three Ethernet connectors:

- Link status LED
- Link activity LED

Note LAN activity for the embedded Ethernet switch links (i.e. between the Ethernet switch and each compute blade / accelerator blade) are displayed on a LED on the front of each compute blade / accelerator blade.

2.4.18 10 Gigabit Ethernet Switch Module (TSM)

The 10 Gigabit Ethernet Switch Module is an optional module which provides the Ethernet switching function through the four external 10Gb Ethernet / Stacking (SFP+ connector) ports.



A Thumb screw	B Power and health status LED
C Identification LED	D Reset button
E Serial port	F 10Gb activity LED for SFP-2 port
G 10Gb activity LED for SFP-3 port	H Dynamically configurable stacking or Ethernet ports
I 10Gb link LED for SFP-3 port	J 10Gb link LED for SFP-2 port
K 1Gb link LED	L 1Gb Ethernet port
M 1Gb activity LED	N Handle

Figure 2-18. 10 Gigabit Ethernet Switch Module

The 10 Gigabit Ethernet Switch Module presents the following features:

- It has four stacking ports and a switching Ethernet port by default. Ports can be dynamically configured either as stacking ports or as Ethernet ports
- Hot-plug / hot-swap supported
- 10 Gigabit Ethernet switch supports VLANs
- Status indication LEDs
- Ethernet switch firmware can be loaded in-band over the Ethernet link

2.4.18.1 10 Gigabit Ethernet Switch Module LEDs

The 10 Gigabit Ethernet Switch Module is equipped with the following LEDs:

Identification LED

The identification LED indicator is **blue**.

This indicator is a unit identifier dedicated to maintenance operations and used to physically localize the module. This LED is switched On/Off by the maintenance operator from the Chassis Hardware Console web interface.

Power LED

The power LED status indicator is bicolor:

- **Amber**: 3.3V stand-by power presence
- **Green**: 12V main power presence

This indicator is managed by the hardware.

LAN activity and status LED

Eight LEDs are integrated in the SFP+ connector which indicates 10Gb port status:

- **Amber**: 10Gb Link status LED
- **Green**: 10Gb Link activity LED

Two LEDs are integrated in the dual RJ45 connector which indicates 1Gb port status:

- **Green**: 1Gb Link status LED
- **Green**: 1Gb Link activity LED

Note LAN activity for the embedded Ethernet switch links (i.e. between the 10 Gigabit Ethernet switch and each compute blade / accelerator blade) are displayed on a LED on the front of each compute blade / accelerator blade.

Chapter 3. Installing the blade system in the cabinet

This chapter explains how to install the blade system in the cabinet.



CAUTION
Ensure that the equipment and cabinet complies with local electric code requirements.
Ensure that only trained service technicians install the system in the cabinet.

3.1 Blade system cabinet requirements

The blade system is designed to be installed in a 42U cabinet.

Note If only one blade system is installed in the cabinet, it should be installed in the 22U-28U position.

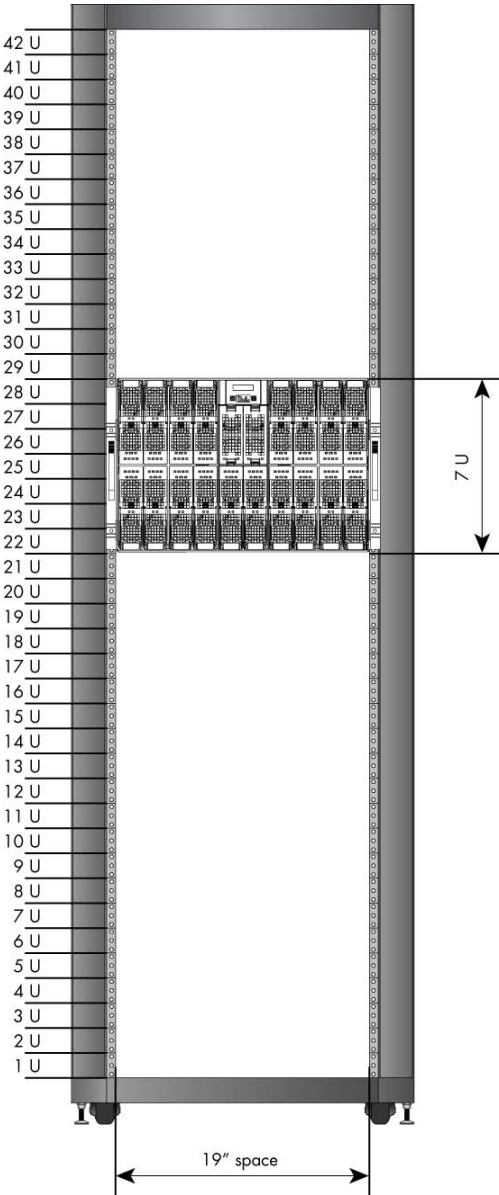


Figure 3-1. Cabinet - recommended position for a single blade system

3.2 Installing the blade system rack-mount kit

The blade system is delivered with a rack-mount kit for installation in the cabinet. The rack-mount kit contains the following items:

- Rack-mount kit-left
- Rack-mount kit-right
- Shipping bracket
- M5X12mm screws
- M5 washers
- M5 nuts

Required tools

The following tools are required to install the blade system rack-mount kit:

- T25 Torx screwdriver for the M5 screws
- Spanner or nut driver the M5 nuts

3.2.1 Installing the rack-mount rails in the cabinet

The rack rails comprise a fixed part and a mobile part. Proceed as follows:

1. Fully extend the rack rail.
2. Prepare two brackets.
3. Assemble the two brackets on the fixed part (vertical rails) of the rack rail, taking care to place the right-angle bracket bends toward the front and rear ends of the fixed part:
 - Front and Rear ends: Insert the two M5X12 screws with M5 washers through the right angled bracket bends and rack vertical rails.

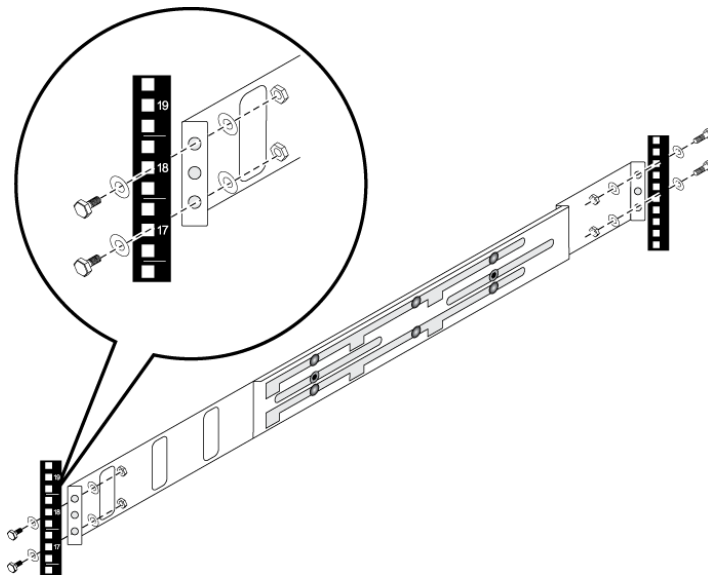


Figure 3-2. Installing the rack-mount rails in the cabinet

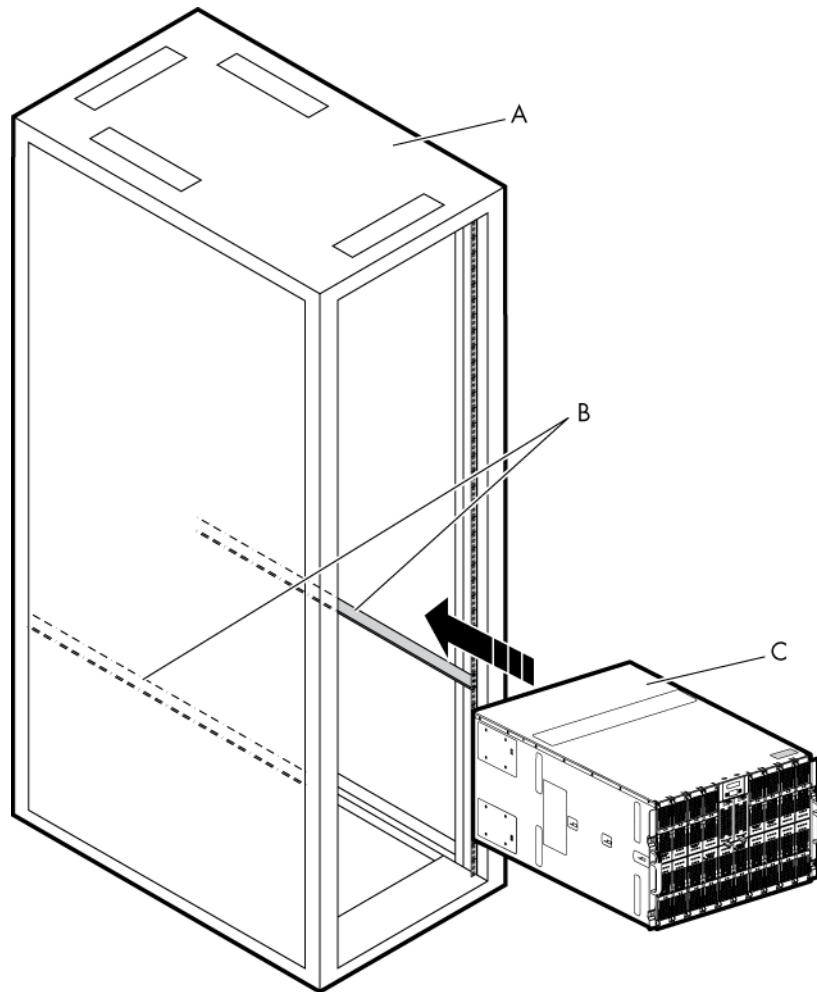
3.2.2 Securing the blade system in the cabinet



DANGER

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

1. From the front of the cabinet, insert the blade system into the cabinet and ensure that it is correctly seated on the Teflon tape on the base of the blade chassis.
2. Push the blade system fully backward until it is flush with the rear cabinet frame.
3. Tighten the two captive screws securing the blade system to the cabinet rack.



A Cabinet	B Rack-mount rails
C Blade system	

Figure 3-3. Securing the blade system in the cabinet

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.

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:d4:8c
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:d4:86
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 and Blade Hardware Consoles.

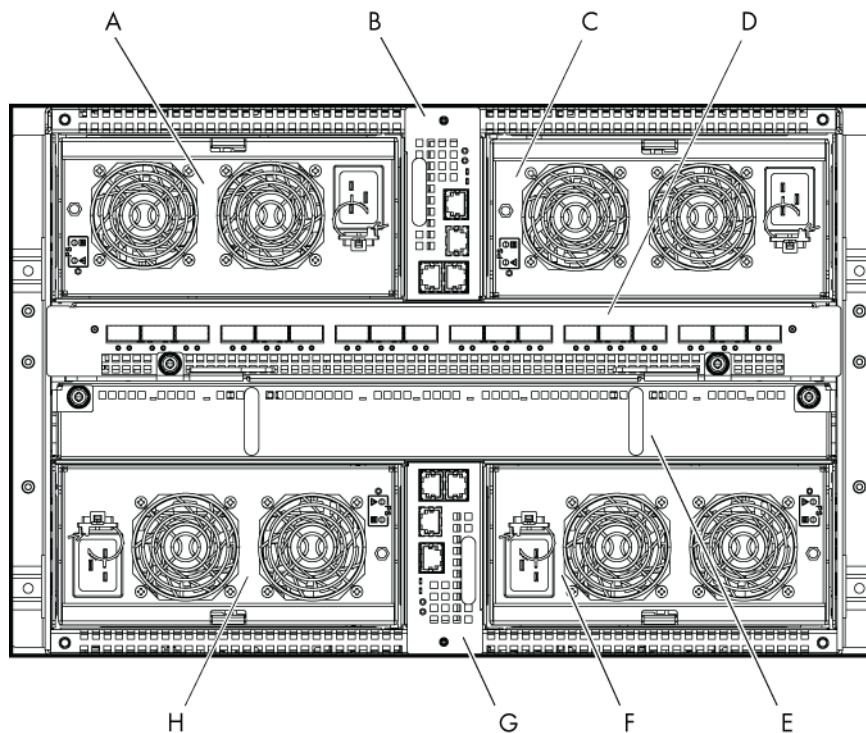
4.2 Connecting the blade system to the Site Power Supply

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.




A PSU3	F PSU2
C PSU4	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 (F).

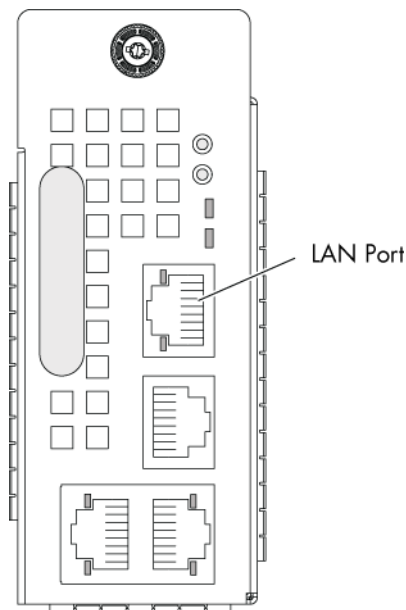


Figure 4-3. Connecting the blade system to the Ethernet network

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.
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.
4. Check that the CMM Power LED is **blinking amber** once the firmware is loaded and the connection accessible from a Web browser.
5. 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.

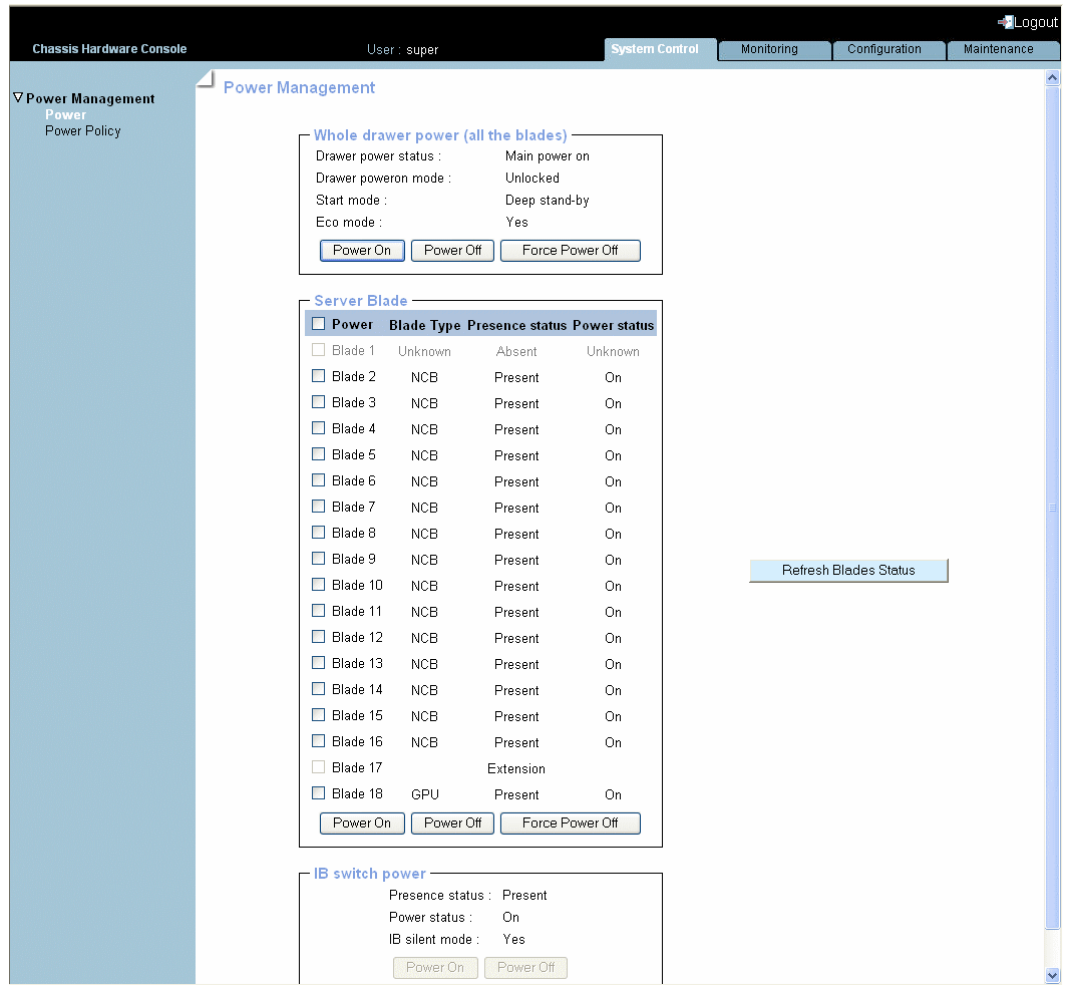


Figure 4-4. Chassis Hardware Console Power Management page

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 *bullx blade system 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.

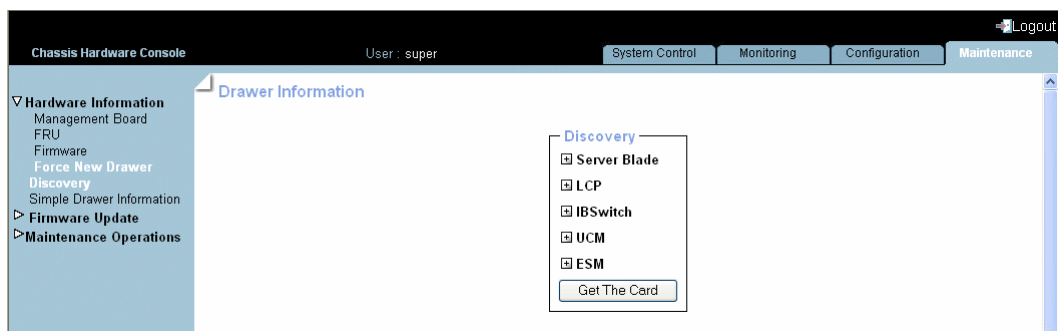


Figure 4-5. Drawer information page

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

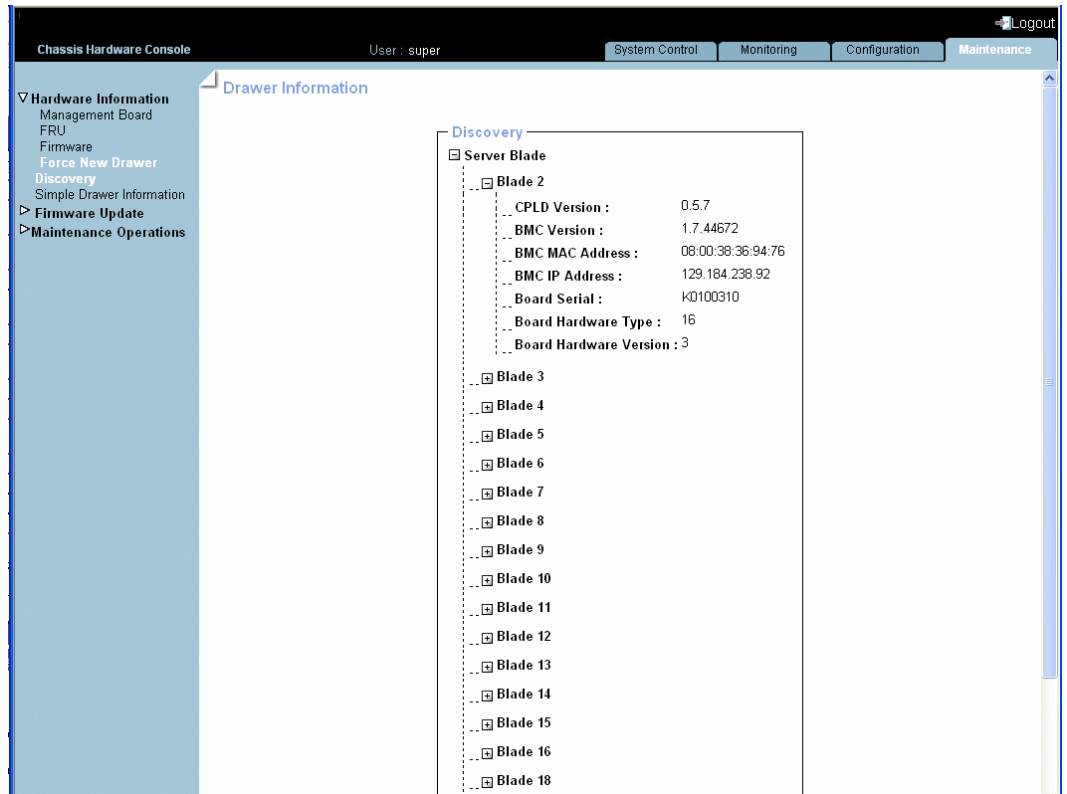


Figure 4-6. Viewing hardware / firmware levels

- 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.

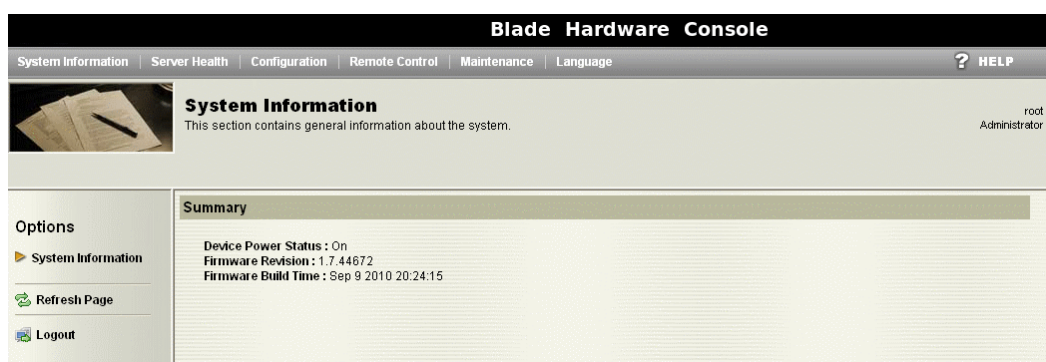


Figure 4-8. Blade Hardware Console System Information page

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 chassis 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 Consoles, 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:

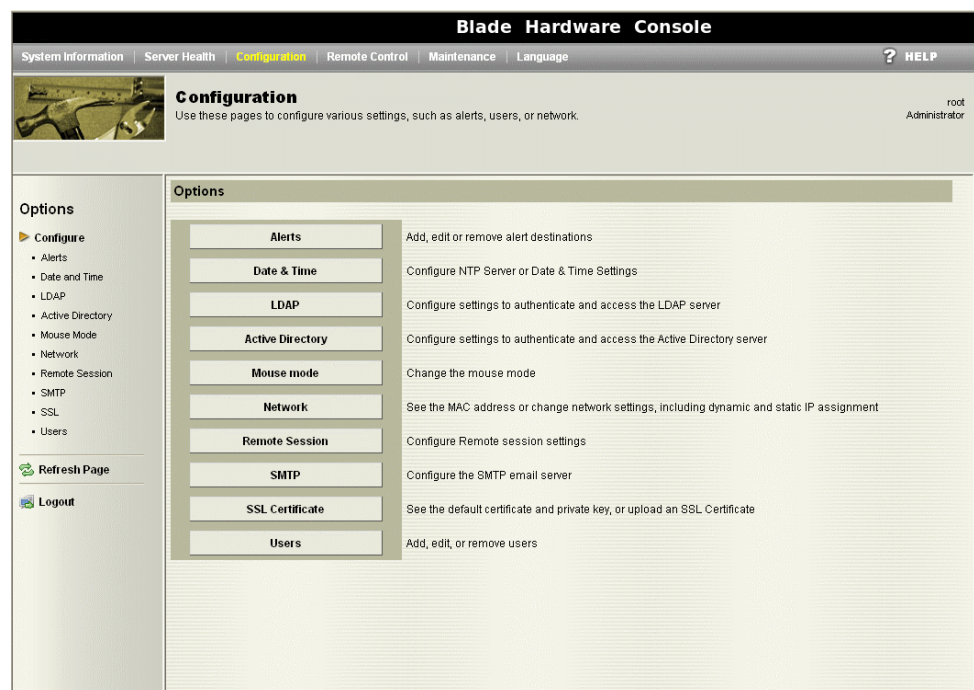


Figure 4-9. Blade Hardware Console – Configuration options

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

Appendix A. Specifications

Dimensions /Weight	
Height	7U – 31.1 cm (12.24 in)
Width	48 cm (19 in)
Depth	74 cm (29.13 in)
Weight (maximum)	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 %)
Maximum wet bulb temperature	+28°C (+82.4°F)
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/h (77° F))
Relative humidity (non-condensing)	5 to 95 % (Gradient 30 %/h)
Power Cables	
AC (16A)	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: 5.5 KW, Maximum: 8.2 KW, Idle: <3 KW
Thermal dissipation	Maximum: 8260 W
Nominal voltage	210-240 VAC
Frequency	50/60Hz
Breaker Protection (Mains Power)	
PDU	16A per PSU
Maximum inrush current	210A / per quarter period

Table A.1. Specifications

BULL CEDOC
357 AVENUE PATTON
B.P.20845
49008 ANGERS CEDEX 01
FRANCE

REFERENCE
86 A1 48 FB 05