Bull NovaScale 5000 Series

Installation Guide

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Installation Guide

Hardware

February 2004

Trademarks and Acknowledgements

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Regulatory Specifications and Disclaimers

Declaration of the Manufacturer or Importer

We hereby certify that this product is in compliance with European Union EMC Directive 89/336/EEC, using standards EN55022 (Class A) and EN55024 and Low Voltage Directive 73/23/EEC, using standard EN60950. The product has been marked with the CE Mark to illustrate its compliance.

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

- 89/336/EEC

Low Voltage

- 73/23/EEC

EC Conformity

- 93/68/EEC

Telecommunications Terminal Equipment

- 199/5/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

Federal Communications Commission (FCC) Statement

☞ **Note:**

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

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. 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.

Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate the equipment. The customer is responsible for ensuring compliance of the modified product.

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.

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:

Electromagnetic Compatibility

- 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 located on the laser device.

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

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

The optical drive in this system unit is a 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:
Bull NovaScale Servers 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.

Environmental Standards

Climatic and Atmospheric Specifications

Bull NovaScale Servers comply with standards:

- IEC 60068.2.1
- IEC 60068.2.2
- IEC 60068.2.78
- IEC 60529
- IEC 60950
- ISO 7779

Electrical Specifications

Bull NovaScale Servers comply with standards:

- IEC 60038
- IEC 60059
- IEC 60196
- IEC 60364
- IEC 61689

Mains Source Power

- 207–244 VAC, 49 – 61 Hz (single phase Ph / N + PE or Ph / Ph + PE), 20A

Voltage Sag

- 20 ms (IEC 1000–4–11)

Electromagnetic Compatibility

Bull NovaScale Servers comply with standards:

Europe
- EN 55022 Class A
- EN 55024 Class A
- EN 61000–3–2
- EN 61000–3–3

North America
- FCC Part 15 Class A
- ICES–003 Issue 3 Class A

Protection against Electrostatic Discharges

CMOS (Complementary Metal Oxide Semiconductor) technology is highly sensitive to electrostatic discharges. The use of conductive antistatic flooring is strongly recommended.

Maintenance personnel must wear wrist–straps before handling electronic equipment. A ground socket is provided in each cabinet.

Shocks and Vibrations

Bull NovaScale Servers comply with standards:

- IEC 60068–1
- IEC 60068–2–6
- IEC 60068–2–27
- IEC 60068–2–31
- IEC 60068–2–47
- IEC 60068–2–64
- IEC 60050

- ISO 2041
- ISO 5348
- ISO 5344
- ISO 8626

Operating Mode (on levelers)

- Sinusoidal vibrations:
    - Duration: 1 sweep, 1 octave/mn
    - 5 – 16 Hz range: 0.25 mm peak
    - 16 –200 Hz range: 0.25 g peak
- Random excitation:
    - Duration: 15 mn
    - Frequency: 5 – 200 Hz
    - Spectral density: 1.5×10^{-4} g2/Hz
    - Root mean square acceleration: 0.17g RMS

Non–operating Mode (on castors)

- Sweep sine:
    - Duration: 1 sweep, 1 octave/mn
    - 5 – 16 Hz range: 0.25 mm peak
    - 16 – 200 Hz range: 0.25 g peak
- Random excitation:
    - Duration: 15 mn
    - Frequency: 5 – 200 Hz
    - Spectral density: 1.5×10^{-3} g2/Hz
    - Root mean square acceleration: 0.54g RMS

Shock Tests:

- Duration: 11 ms
- Form: 1/2 sinusoidal
- Amplitude: 15 g

Pollution Limits

Bull NovaScale Servers comply with standard:

- NFX44–101, Class 4 000 000

Audio–Noise Limits

Bull NovaScale Servers comply with standards:

- ISO 7779
- ISO 11201
- ISO 7574
- ISO 4871
- ISO 9295
- ISO 9296
- IEC 61260
- IEC 60651

Operating LwAd Acoustical Power

- 7.4 Bel

Operating Lpa Acoustical Pressure

- 60 dBA

Safety Specifications

Bull NovaScale Servers comply with national and international standards:

- IEC 60950
- EN 60950
- UL 60950
- CAN/CSA C22–2 N° 60950–00

Overview

Intended Readers

This guide is intended for use by qualified personnel in charge of setting up and starting Bull NovaScale 5000 Series servers for the first time.

Chapter 1. Delivery
describes server features and explains delivery unpacking and inspection procedures.

Chapter 2. Setup Procedure
explains the procedures required to set up and start the server for the first time.

Chapter 3. Troubleshooting
explains what to do if a problem occurs during installation.

Appendix A. Specifications

Appendix B. Conversion Tables

Appendix C. NovaScale 5080/5160 Server Cabling

Highlighting

The following highlighting conventions are used in this guide:

Bold	Identifies predefined commands, subroutines, keywords, files, structures, buttons, labels, and icons.
Italics	Identifies referenced publications, chapters, sections, figures, and tables.
< >	Identifies parameters to be supplied by the user.

Related Publications

Site Preparation Guide, 86 A1 87EF
explains how to prepare a Data Processing Center for Bull NovaScale Servers, 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.

User's Guide, 86 A1 89EF
explains how to use Bull NovaScale 5000 Series servers. This guide is intended for use by Customer Administrators and Operators.

Maintenance and Service Guide, 86 A7 90EF
explains how to maintain, service, and upgrade Bull NovaScale 5000 Series servers. This guide is intended for use by qualified support personnel.

Troubleshooting Guide, 86 A7 91EF
explains how to diagnose and solve any problems occurring during Bull NovaScale Server operation. This guide is intended for use by qualified support personnel.

Documentation Overview, 86 A2 XXXX
describes the hardware, software and online documentation available for Bull NovaScale Servers, related Operating Systems, and licensed programs.

Installation Flowchart

This flowchart summarizes main installation and setup procedures.

Unpacking the Server

Inspect server packing, unpack and unload the cabinet and accessories, and store packing items.

Installing and Securing the Cabinet

Position the cabinet, secure into place, and remove shipping brackets.

Inspecting the Server

Check that the server is not damaged and is compliant with the Purchase Order.

Connecting the Server to the Power Supply

Connect the server power cables to the dedicated power supply.

Powering up the Server

Power on the server to check operation.

Customizing the Server

Connect the PAP unit to the Enterprise LAN and complete software and operating system configuration.

Connecting the Server to the Customer's Enterprise LAN

Connect the server to the Enterprise LAN and check remote access.

Connecting External Devices

Connect external peripherals (storage, modem, ...).

Confirming Correct Installation

Test network connections and server resources, record site data, and send the Intervention Report.

Chapter 1. Delivery

This chapter explains delivery unpacking and inspection procedures for Bull NovaScale 5000 Series servers. It includes the following topics:

- Introduction, on page 1-2
- Unpacking the Server, on page 1-4
- Inspecting the Cabinet, on page 1-6
- Unloading the Cabinet, on page 1-7
- Installing and Securing the Cabinet, on page 1-11
- Inspecting Internal Components and Cabling, on page 1-14
- Getting to know the Server, on page 1-21

Introduction

The NovaScale 5080/5160 Server is delivered rack–mounted and pre–cabled in one 19" / 36U cabinet.

Figure 1.   Server cabinet

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.

The server is delivered 24 hours in advance of the scheduled installation date. On arrival, it must be placed, in its packing, in the Computer Room so that it reaches room temperature before powering up (optimum operating temperature = 22° C $\pm$ 3° C, hygrometry = 50% $\pm$ 5%).

⚠ **CAUTION:**
It is mandatory for the server to be transported vertically. The server cabinet is extremely heavy and requires the use of an elevator. The Data Processing Site manager must allocate enough personnel to ensure safe handling. See Appendix A. for server specifications.

The server is delivered packed on a pallet with rails for easy unloading. The Data Processing Site manager must set aside the required working area for unpacking as shown in the following figure.

Use the Packing Slip to check the number and condition of the shipping boxes prior to unpacking.

| 200 cm | 130 cm | 122 cm | 50 cm |
| (78.7 in) | (51.2 in) | (48 in) | (19.7 in) |

100 cm
(39.4 in)

80 cm
(31.5 in)

Pallet

Rails   Cabinet

65 cm
(25.6 in)

113 cm
(44.5 in)

100 cm
(39.4 in)
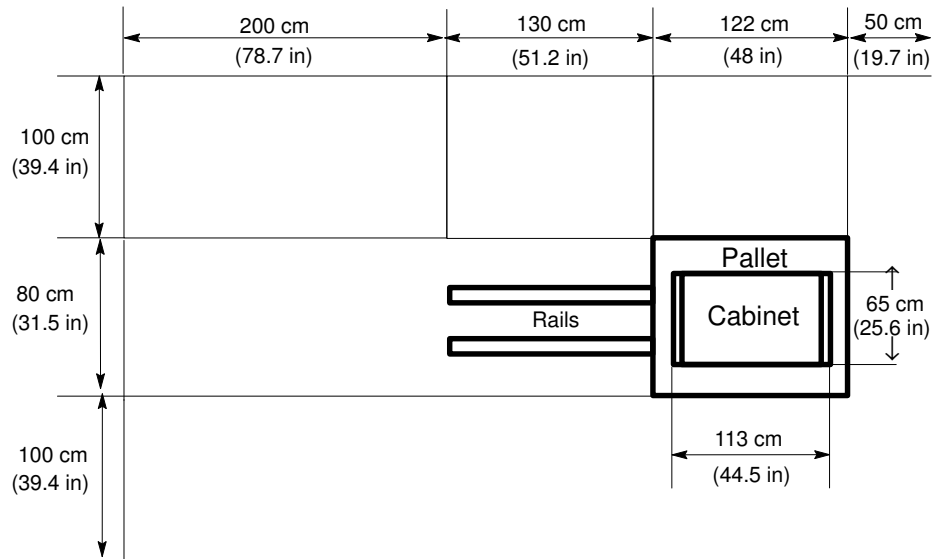
Figure 2.   Required unpacking area

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

Cabinet Packing

The server is delivered with a box labeled *Open Me First* containing all the data and items required for installation.

The following packing items are used to protect the cabinet during shipping:

*   anti–condensation barrier packing,

*   top, front, rear protective covers,

*   pallet,

*   loading / unloading rails and ramp,

*   plastic straps,

*   velcro straps,

*   shockwatch and tiltwatch labels.

Cabinet Packing Size
*   Height: 201 cm

*   Depth: 124 cm

*   Width: 80 cm

DANGER
The server cabinet is extremely heavy. Authorized Service personnel ONLY may unpack and physically install the cabinet. The instructions set out below are to be strictly complied with to avoid serious personal injury.

Unpacking the Server

⚠️ **Warning:**
The cabinet must not be unpacked before it has reached room temperature (24 hours in the Computer Room).

Inspecting Cabinet Packing

Before unpacking, check the indicators on the 2 shockwatch and 4 tiltwatch labels, positioned as follows on the packing:

Shockwatch labels

- 1 on the front cover,
- 1 on the rear cover.

Tiltwatch labels

- 1 on the front cover,
- 1 on the side cover,
- 1 on the outer side of the internal front door cover,
- 1 on the inner side of the internal front door cover.

If one or more of the indicators are RED, the server may be damaged. Note indicator status on the bill of lading and carefully inspect the server before powering up.

Indicators
Indicateurs

NOTE :
Inspecter l'étiquette détectrice de choc de cet envoi **AVANT** d'accepter la marchandise

ATTENTION :
Le TILT est rouge, ne pas refuser le colis, mais notez–le sur le bordereau et vérifiez le contenu

NOTE:	ATTENTION:
Check the Shockwatch label BEFORE accepting the merchandise.	If the Tiltwatch label is red, make a reserve on the delivery slip and check packing contents.

Figure 3.   Packing shockwatch and tiltwatch labels

Removing Cabinet Packing

Tools Required:

- Cutter

- 27 mm wrench

- 17 mm hex wrench

Figure 4.   Removing the top, front, and rear covers

1. Cut the plastic straps with the cutter.

2. Remove the top cover.

3. Remove the rear and front covers by opening the plastic fasteners.

4. Remove the stretch film / condensation barrier packing retaining the loading / unloading rails and ramp.

5. Unfasten and remove the stoppers surrounding the cabinet.

Inspecting the Cabinet

A preliminary visual inspection must be performed once the server has been unpacked and before unloading the cabinet from the pallet.

⚠️ **CAUTION:**
If the inspection indicates an unacceptable safety condition, the condition must be corrected before powering up the server.

1. Check that the server delivered is compliant with the Purchase Order.

2. Check covers and doors for sharp edges, damage or alterations.

3. Check the correct fit of covers and doors.

4. Open the front and rear doors.

☞ **Note:**
Unlock the front door with the key, pull the handle forwards and upwards to disengage the lock.

5. Check for internal damage, alterations and obvious safety hazards such as broken wires, sharp edges, or broken insulation.

6. Check internal cables for damage.

7. Check for dirt, water, and any other form of contamination inside the cabinet.

8. Check the voltage label on the back of the cabinet to ensure that it matches the voltage at the power outlet.

9. Check external power cables for damage.

10. Check correct closure of front and rear doors.

☞ **Note:**
Server components and configuration may differ according to the version chosen.

Unloading the Cabinet

![i] **Important:**

To ensure safe handling, doors and side covers must be removed before unloading the cabinet from the pallet. See *Removing the Front Door*, **on page 1-15,** *Removing the Rear Door*, **on page 1-17, and** *Removing Side Covers*, **on page 1-19.**

Installing the Unloading Rail / Ramp Assembly

Tools Required:

- 17 mm hex wrench

1. Remove the rail fixtures from their packing.

Figure 5.   Rail / ramp assembly

2. Assemble the two rails and tighten the four bolts with the 17 mm hex wrench (A).

3. Insert the pin at the top of each rail into the small holes on both sides of the pallet (B).

4. Insert the pin at the bottom of each rail into the small holes on both sides of the ramp (C).
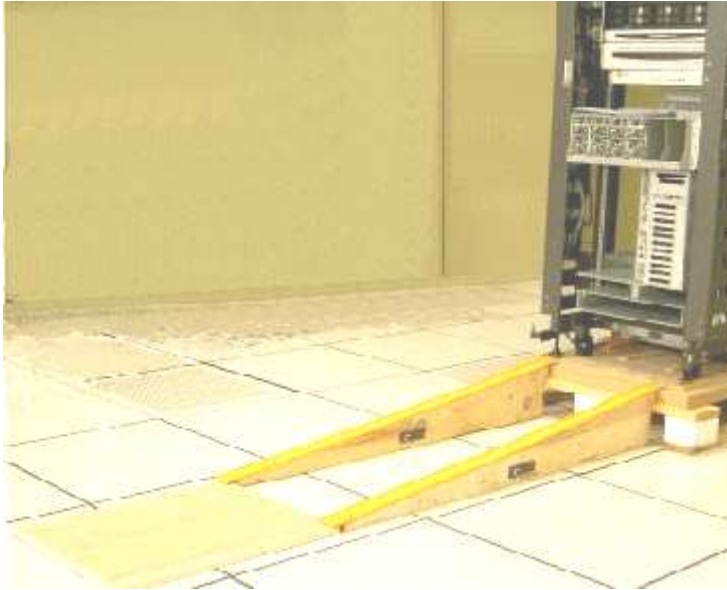
Figure 6.   Assembling / installing unloading rails

5. Manually check that the pallet / rail / ramp assembly is secure.

Removing Cabinet Shipping Brackets

Yellow shipping brackets are used to secure cabinet flanges to the pallet during transport. These brackets must be removed before unloading the cabinet.

Tools Required:

- 27 mm hex wrench

- 17 mm hex wrench

1. Lower the four jacking screws with the 27 mm hex wrench.

Figure 7.   Lowering cabinet jacking screws

2. Use the 17 mm hex wrench to loosen the shipping brackets on either side of the cabinet.

3. Disengage the left shipping bracket from the cabinet by pushing firmly forwards.

4. Remove the left shipping bracket and store in a safe place.
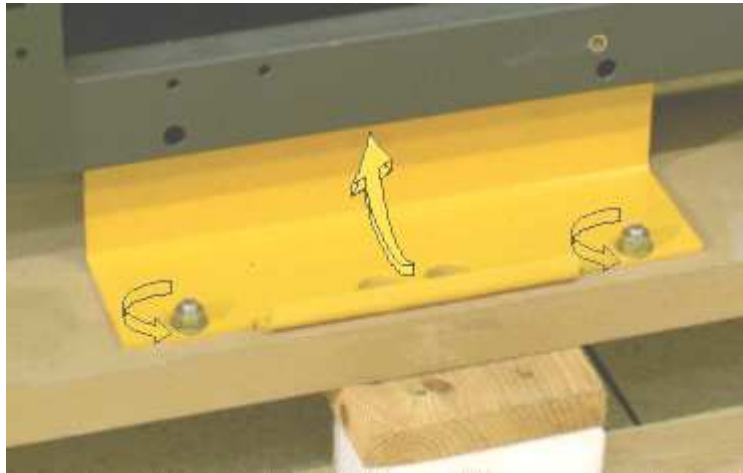
Figure 8.   Removing cabinet shipping brackets

5. Repeat steps 3 and 4 for the right shipping bracket.

6. Position the four cabinet wheels so that they are facing the rear of the cabinet.

Figure 9.   Positioning cabinet wheels

7. Raise the four jacking screws with the 27 mm hex wrench.

Figure 10.   Cabinet jacking screws and retaining brackets

8. Carefully unload the cabinet from the pallet by rolling it slowly down the rail / ramp assembly.

Figure 11.   Unloading the cabinet

9. Roll the cabinet to the location indicated on the Customer's floor plan.

Storing Packing Items

All packing items are to be stored in an ancillary room for re–use in the event of relocation or shipping.

Before proceeding to set up the server, clear and clean the installation area.

Installing and Securing the Cabinet

Tools Required:

- 27 mm hex wrench

- 8 mm hex wrench

1. Check required service clearance at the rear, front and sides of the server. For further information, refer to the *Site Preparation Guide*, 86 A1 87EF.
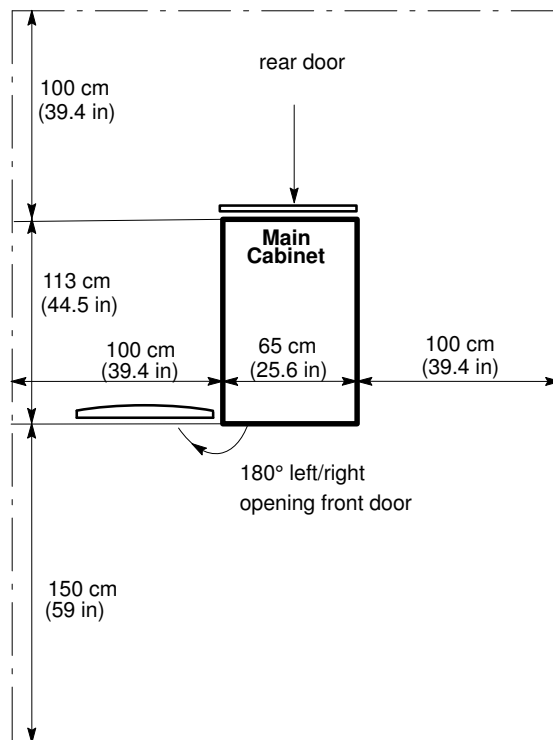
Figure 12.   Server cabinet service clearance
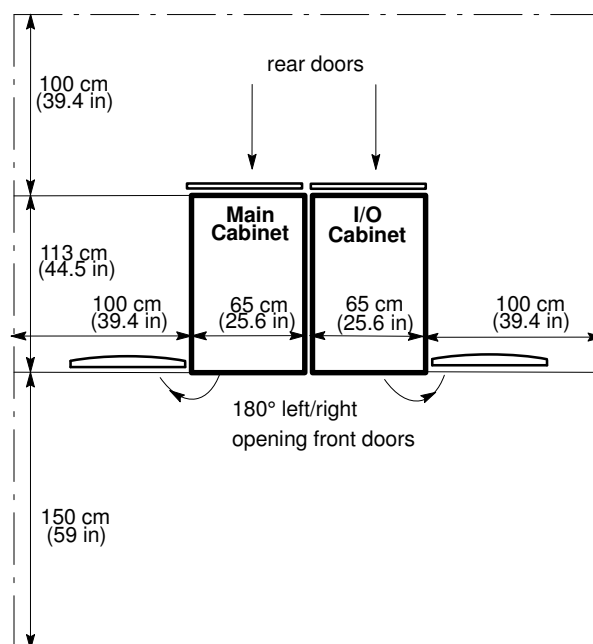
Figure 13.   Dual cabinet service clearance

Important:
The front door opens flush with the front of the cabinet (180° opening angle) and may be fitted on either side of the cabinet frame, according to site requirements. Full access to the cabinet is mandatory for maintenance.
Customers are advised to plan ahead and to provide space for extensions.

2. Take care to leave sufficient access to raised floor cable cut–outs.

REAR

FRONT
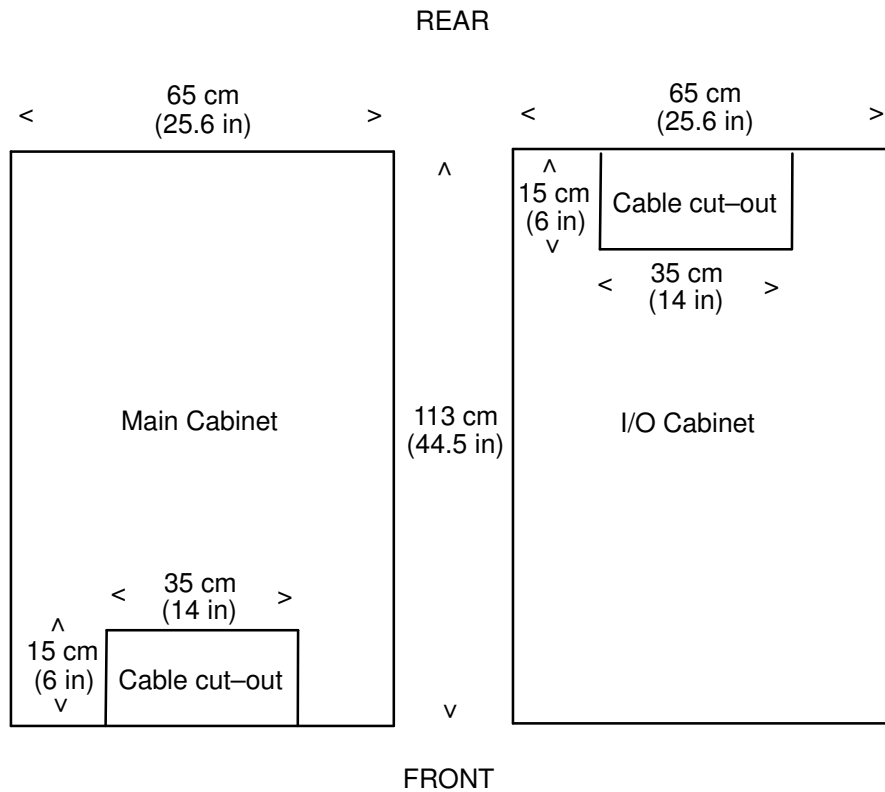
Figure 14.   Cabinet cable cut–outs

3. Lower the four jacking screws with the 27 mm hex wrench and lock firmly into place to secure the cabinet.
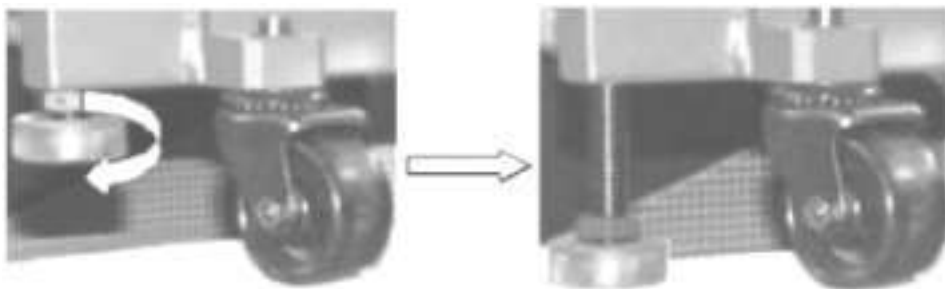
Figure 15.   Locking jacking screws

4. Check cabinet stability and horizontality.

DANGER
The CSS module inside the cabinet is extremely heavy. It is mandatory for cabinet jacking screws to be locked safely into place before use or maintenance. Incorrect installation may result in serious personal injury or damage to components.

Removing CSS Module Shipping Brackets

Each Bull NovaScale Server CSS module is equipped with five yellow shipping brackets at the rear of the cabinet. Once the server has been installed and correctly secured, all shipping brackets must be removed.

Yellow
Shipping
Brackets
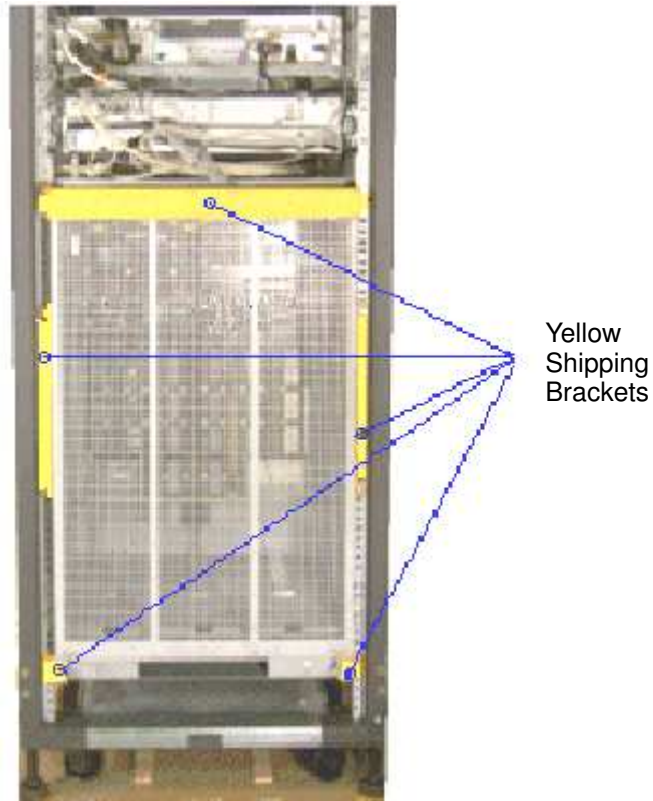
Figure 16.   Removing CSS module shipping brackets – rear

1. Loosen and remove the 4 shipping brackets on either side of the CSS module / cabinet with the 8 mm hex wrench.

2. Loosen and remove the horizontal shipping bracket above the CSS module. The cable retaining plate is no longer secured to the cabinet.

3. Use the 4 bolts from the horizontal shipping bracket to re–secure the cable retaining plate to the cabinet.

Important:
Take care to store shipping brackets and fittings with other packing items.

Inspecting Internal Components and Cabling

The server is delivered pre–tested, pre–cabled, and ready for use.

A general preliminary visual inspection was carried out before unloading the cabinet from the pallet. Now that the cabinet has been secured into place in the Computer Room, a thorough visual inspection of internal components and cabling should be carried out before refitting side covers and doors.

⚠️ **CAUTION:**
If the inspection indicates an unacceptable safety condition, the condition must be corrected before powering up the server.

1. Visually check internal cables for damage.

2. Visually check system components for damage.

3. Manually check internal cable connections.

4. Visually check external power cables for damage.

👉 **Note:**
If you need to check CSS Module components, refer to the *Maintenance and Service Guide*, 86 A7 90EF.
For guidance with cabling, see *Checking Server Cabling*, on page .

ℹ️ **Important:**
Once the inspection is complete, side covers and doors must be refitted before powering up the server. See *Refitting Side Covers*, on page 1-20, *Refitting the Rear Door*, on page 1-18, and *Refitting the Front Door*, on page 1-16.

Removing the Front Door

Tools Required:

- Cabinet key
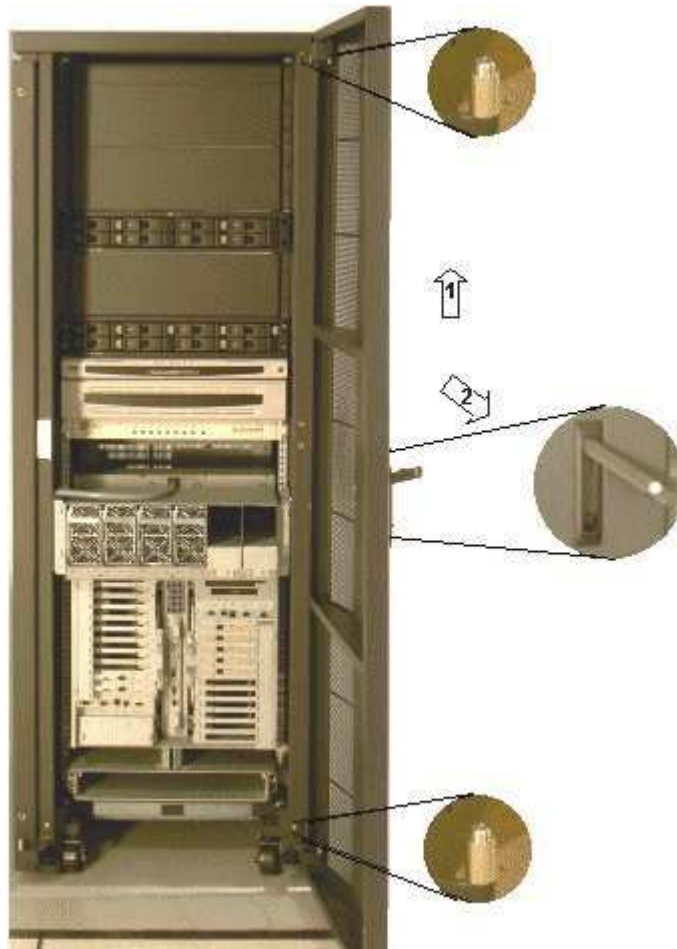
Figure 17.   Removing the front door

1. Unlock the front door with the key, pull the handle forwards and upwards to disengage the lock.

2. Open the front door until it is at a right angle with the front of the cabinet.

3. Firmly grip either side of the door and lift to remove from the hinges (1).

4. Pull the door away from the front of the cabinet (2) and store in a safe place.

Refitting the Front Door

Tools Required:

- Cabinet key
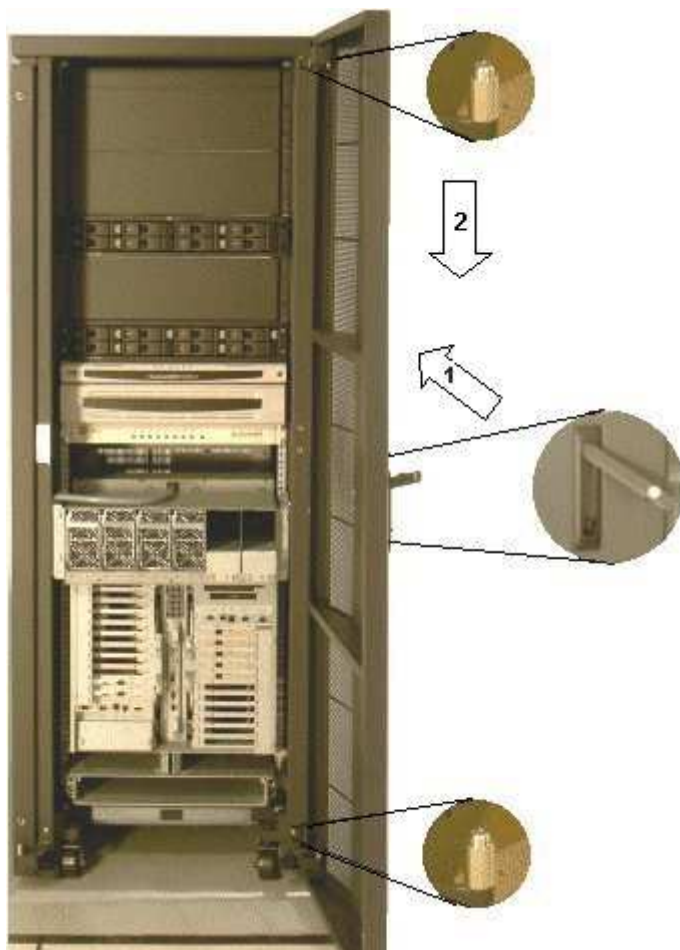
Figure 18.   Refitting the front door

1. Firmly grip either side of the door and place at a right angle with the front of the cabinet.

2. Carefully lower the door onto the cabinet hinges.

3. Close the door and engage the lock by lowering the handle and pushing it back into the recess.

4. Lock the front door with the key.

Removing the Rear Door

Tools Required:

• None
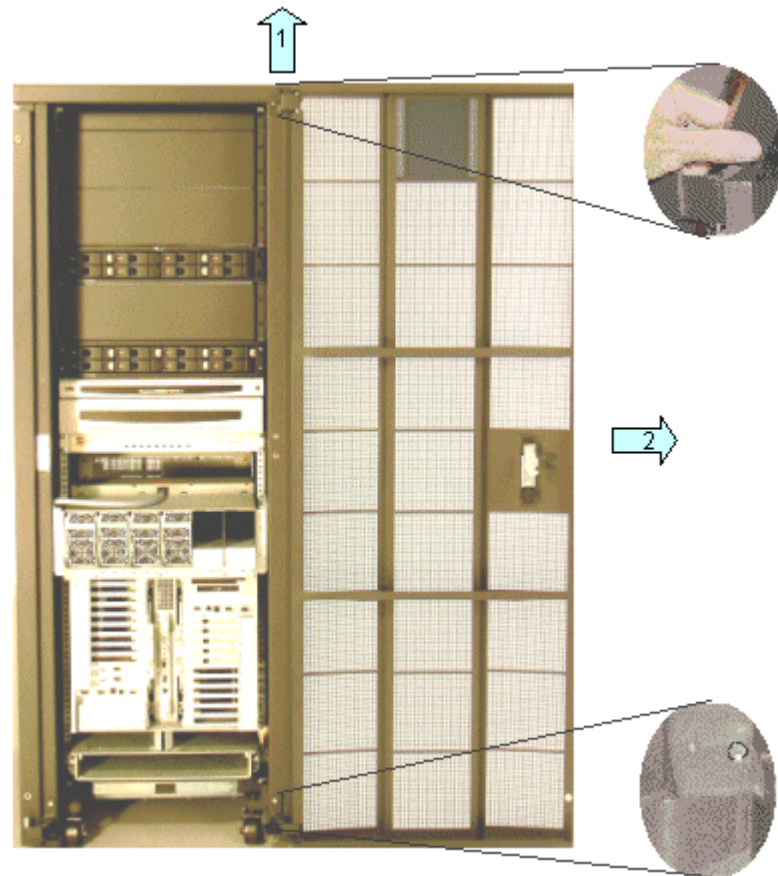
Figure 19. Removing the rear door

1. Open the rear door at an angle of 60° with the rear of the cabinet.

2. Push the tab at the top of the door upwards to release from the top hinge.

3. Gently disengage the top of the door from the top hinge.

4. Grip either side of the door and lift to remove from the hinges (1).

5. Pull the door away from the rear of the cabinet (2) and store in a safe place.

Refitting the Rear Door

Tools Required:

• None
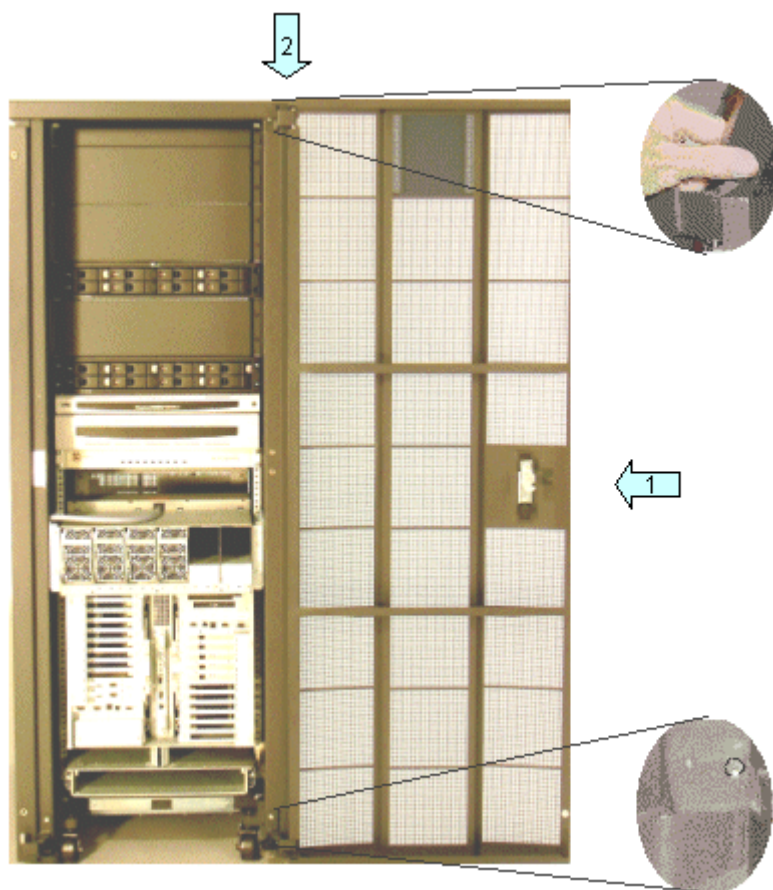
Figure 20.   Refitting the rear door

1. Firmly grip either side of the door and hook carefully onto the bottom hinge.

2. Push the tab at the top of the door upwards and pull the door onto the top hinge.

3. Ease the tab at the top of the door back into place and close the door.

Removing Side Covers

Tools Required:
- None

Figure 21.   Removing side covers

1. Open the rear and front doors.

2. Firmly grip both sides of the side cover.

3. Pull slightly forward (1) and lift to release the side cover from the cabinet fittings (2).

4. Store in a safe place.

Refitting Side Covers

Tools Required:
- None

Figure 22.   Refitting side covers

1. Firmly grip both sides of the side cover.

2. Carefully hook the side cover onto the cabinet fittings (1) and lower into place (2).

3. Close the rear and front doors.

Getting to Know the Server

☞ **Note:**

Abbreviations and acronyms are documented in the *Glossary*.

NovaScale 5080 Server

The cabinet contains the following components:

Front   **Rear**

Figure 23.   NovaScale 5080 Server components (example)

1	CSS module with midplane, redundant power supply and AC power cable		11	Console drawer with monitor, keyboard and mouse
2	DPS units		12	KVM switch
3	1 or 2 IOB (s) with:		13	1 or two SCSI or FC disk rack(s) with RAID controller(s) and disks
	4	IOR	14	PAP unit with CD–ROM drive, FDD and disk(s)
	5	LS240 disk drive (optional)	15	PDU with AC power cable
			16	Ethernet hub with power bar (FC disk rack)
	6	DVD / CD–ROM drive	**Dual IOB configuration:**	
	7	PCI hot plug board (11 slots)	– IOB #0 = Master	
			– IOB #1 = Slave	
8	PMB		**NovaScale 5080 configuration:**	
9	1 or 2 QBB subsets with fan boxes		– QBB #0 and QBB #3	
10	SPS fan boxes		See *Glossary* for abbreviations and acronyms.	

NovaScale 5160 Server

The cabinet contains the following components:

Front   **Rear**

1	CSS module with midplane, redundant power supply and AC power cable		11	Console drawer with monitor, keyboard and mouse
2	DPS units		12	KVM switch
3	1 or 2 IOB (s) with:		13	1 or two SCSI or FC disk rack(s) with RAID controller(s) and disks
	4	IOR	14	PAP unit with CD–ROM drive, FDD and disk(s)
	5	LS240 disk drive (optional)	15	PDU with AC power cable
			16	Ethernet hub with power bar (FC disk rack)
	6	DVD / CD–ROM drive	**Dual IOB configuration:** – IOB #0 = Master – IOB #1 = Slave	
	7	PCI hot plug board (11 slots)		
8	PMB		**NovaScale 5160 configuration:** – QBB #0, QBB #1, QBB #2, and QBB #3	
9	1 up to 4 QBB subsets with fan boxes			
10	SPS fan boxes		See *Glossary* for abbreviations and acronyms.	

Figure 24.   NovaScale 5160 Server components (example)

Server Components

Central Subsystem (CSS) Module

The CSS Module houses core hardware components. The CSS Module is located at the bottom of the cabinet.
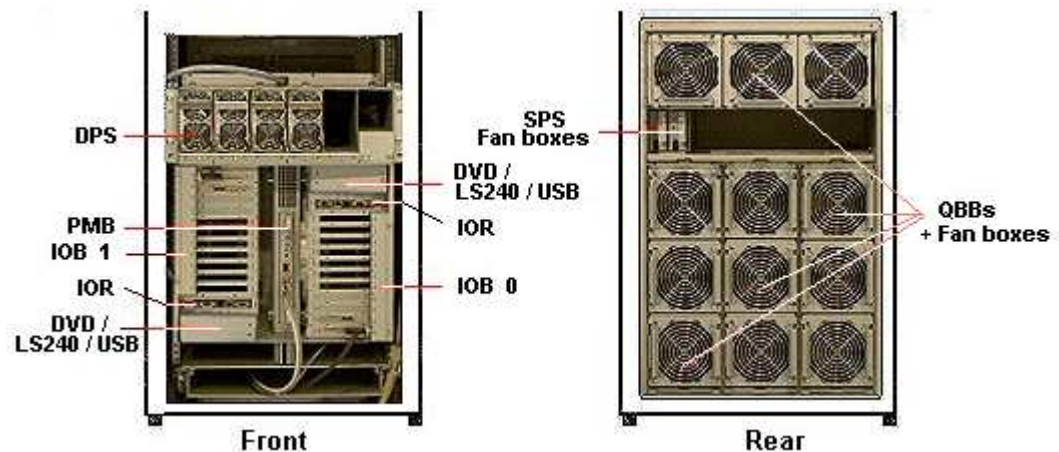
1 MPI (MidPlane) This active board is used to interconnect the QBBs, IOBs and the PMB. **2 SPS fan boxes** Each MPI is equipped with two redundant fan boxes for cooling.

1, 2, 3 or 4 QBB (Quad Brick Board) subsets:
Each QBB subset houses:
    • 1 mother board
    • 2 memory boards
    • 4 processors
    • 16 DIMMs
1, 2, 3 or 4 QBB fan boxes:
Each QBB subset is equipped with a fan box for cooling.

1 or 2 IOBs (Input / Output Box):
Each IOB box houses:
    • 1 IOB (Input / Output Board)
    • 1 PHPB (PCI Hot Plug Board)
    • 11 hot–plug PCI–X (100–133 MHz) slots with optional:
        – 1 SCSI HBA
        – 1 PCI SCSI card
        – 1 PCI FC card
        – 1 PCI Giga Ethernet card
        – 8 free slots
    • 1 IOR (Input / Output Riser):
        – 2 A–type USB ports
    • 1 RJ45 10/100 Mbps Ethernet port
        – 2 DB9–M RS232 serial ports
        – 1 HD15–F VGA port
    • 1 DVD/CD–ROM drive
    • 1 LS240 drive (optional)
Each IOB is cooled by the corresponding QBB fan box.

1 PMB (Platform Management Board): This active board links the server to the Platform Administration Processor (PAP) Unit (via an Ethernet link).

Figure 25.   CSS module features

Console Drawer

The Console Drawer contains the keyboard, monitor and mouse used for local access to the server and to the Platform Administration Processor (PAP) Unit. The Console drawer is located in the center of the cabinet for easy access and comfortable use.

- 1 pull–out table top
- 1 monitor
- 1 QWERTY keyboard and mouse kit
- 1 power cable

Figure 26.   Console drawer features

Keyboard / Video / Mouse (KVM) Switch

The KVM Switch allows the use of a single keyboard, monitor and mouse for the local server and the local Platform Administration and Maintenance console. The KVM Switch is located in the center of the cabinet, above the CSS Module.

Avocent 400 KVM Switch
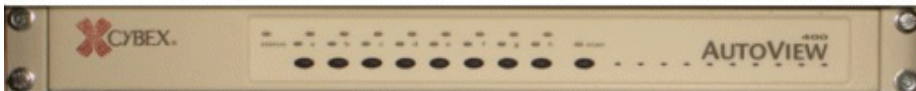
- 8 ports
- 1 power cable

Figure 27.   KVM switch features

SR–0812 Disk Rack

The SR–0812 SCSI Disk Rack is delivered with four system disks (two RAID#1 and two spare disks) and offers four empty slots for Customer data disks. The Disk Rack is located in the center of the cabinet, above the PAP Unit.
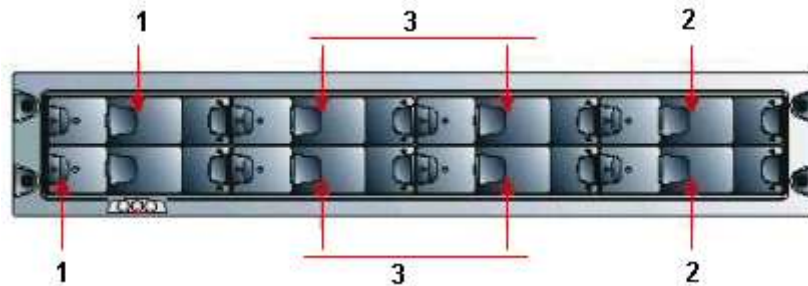
1 OS disks

2 Spare disks

3 Optional data disks

- 8 slots
- 1 RAID controller card
- 4 disks (configuration: 2 in RAID#1 + 2 in pool spare)
- 2 power cables (redundant power supply)

Figure 28.   SR–0812 SCSI disk rack features

SR–1422 Disk Rack

The SR–1422 SCSI Disk Rack is delivered with four system disks (two RAID#1 and two spare disks) and offers ten empty slots for Customer data disks. The Disk Rack is located in the center of the cabinet, above the PAP Unit.
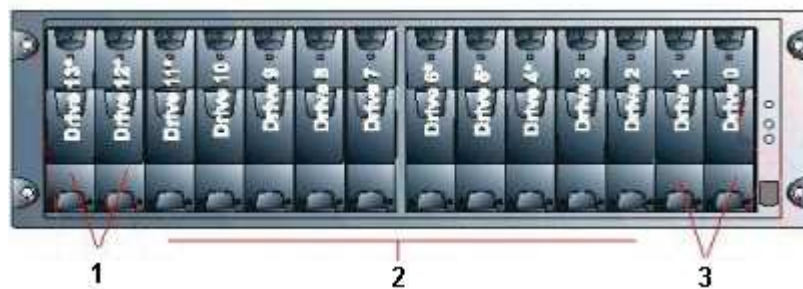
1 OS disks

2 Optional data disks

3 Spare disks

- 14 slots
- 2 RAID controller cards
- 4 disks (configuration: 2 in RAID#1 + 2 in pool spare)
- 2 power cables (redundant power supply)

Figure 29.   SR–1422 SCSI disk rack features

SJ–0812 Extension Disk Rack

The SJ–0812 Extension Disk Rack offers eight empty slots for Customer data disks. The Extension Disk Rack is located in the center of the cabinet, above the Main Disk Rack.
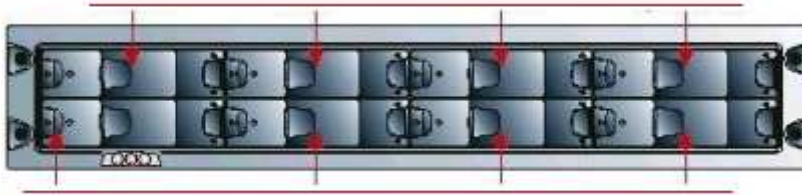
- 8 slots
- 2 power cables (redundant power supply)

Figure 30.   SJ–0812 SCSI extension disk rack features

Storeway FDA 1300 Disk Rack

The Storeway FDA 1300 Disk Rack is delivered with three system disks (two RAID#1 and one spare disks) and offers 12 empty slots for Customer data disks. The Disk Rack is located in the center of the cabinet, above the PAP Unit.
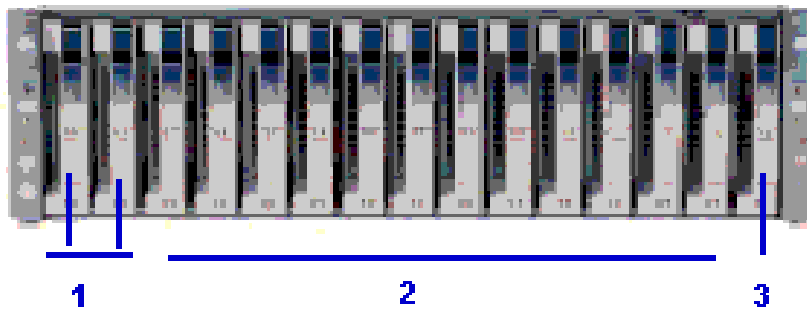
1 OS disks
2 Optional data disks
3 Spare disk

- 15 slots
- 2 FC RAID controller cards, 1 FC port per controller
- 3 disks (configuration: 2 in RAID#1 + 1 spare)
- 2 power cables (redundant power supply)

Figure 31.   Storeway FDA 1300 disk rack features

Storeway FDA 2300 Disk Rack

The Storeway FDA 2300 Disk Rack is delivered with three system disks (two RAID#1 and one spare disks) and offers 12 empty slots for Customer data disks. The Controller Unit and Disk Unit are located in the center of the cabinet, above the PAP Unit.
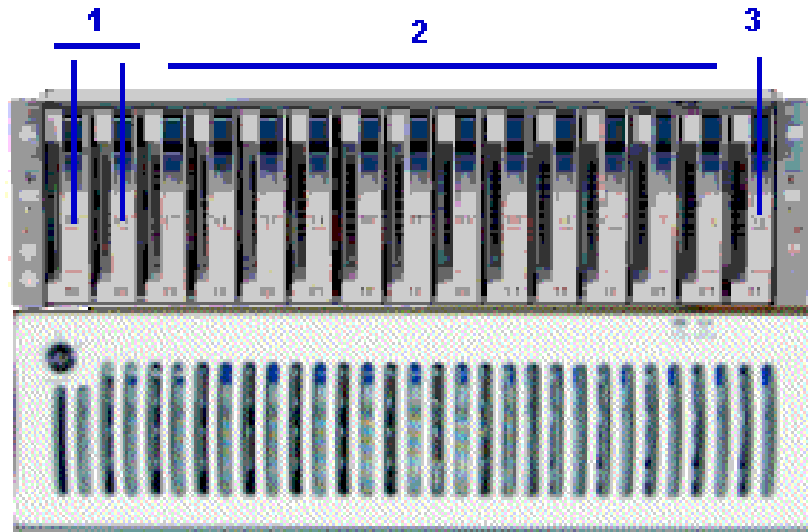
1 OS disks

2 Optional data disks

3 Spare disk

- 1 controller unit & 1 disk unit
- 15 slots
- 2 FC RAID controller cards, 2 FC ports per controller
- 3 disks (configuration: 2 in RAID#1 + 1 spare)
- 2 power cables (redundant power supply)

Figure 32.   Storeway FDA 2300 disk rack features

Storeway FDA 1300/2300 Extension Disk Rack

The Storeway FDA 1300/2300 Extension Disk Rack offers15 empty slots for Customer data disks. The Extension Disk Rack is located in the center of the cabinet, above the Main Disk Rack.
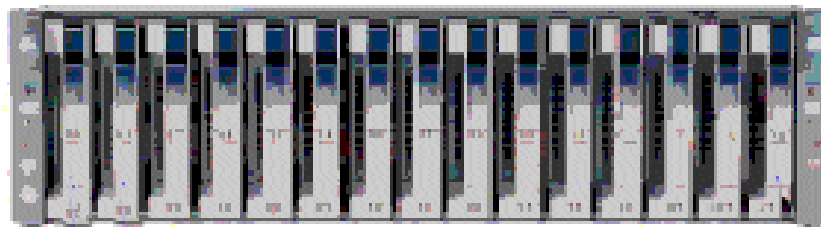
- 15 slots
- 2 power cables (redundant power supply)

Figure 33.   Storeway FDA 1300/2300 extension disk rack features

Platform Administration Processor (PAP) Unit

The PAP unit is linked to the server via the Platform Management Board (PMB). It hosts platform administration software. The PAP unit is located in the center of the cabinet, above the Console Drawer.

- 1 PIII / 1 GHz PC
    - 512 Mo RAM
    - 2 x 36 Gb disks (soft mirrored) (**3**)
    - 1 free disk slot (**4**)
    - 1 CD/DVD–ROM drive (**1**)
    - 1 FDD(**2**)
    - 2 serial ports
    - 2 PCI slots
    - 2 Ethernet ports (1 free)
- Microsoft Windows 2000 Server operating system
- Microsoft Internet Explorer 6 software
- PAM software
- 1 power cable

Figure 34.   PAP unit features

Ethernet Hub

Ethernet Hub	– 8 ports
	– 1 power cable
	– 1 power bar

Figure 35.   Ethernet hub features

Power Distribution Unit (PDU)

The PDU supplies mains power to the PAP unit, the Disk Rack, the KVM Switch, and the Monitor. When the server is equipped with a Storeway FDA 1300 / 2300 disk rack, the PDU also supplies mains power to the Hub Power Bar. The PDU is located in the top left part of the cabinet.

Front   Rear

- 6 (8A) sockets (front):
  - PAP Unit
  - Disk Rack(s)
- 2 (1A) sockets (rear):
  - Monitor
  - KVM Switch
- 1 (20A) power cable

Figure 36.   PDU features

Chapter 2. Setup Procedure

This chapter explains the procedures required to set up and start the server for the first time. It includes the following topics:

- Checking PMB Code Wheels, on page 2-2
- Checking Server Cabling, on page 2-3
- Accessing Server Components, on page 2-4
- Mounting Power Supply Cable Sockets, on page 2-8
- Connecting the Server to the Power Supply, on page 2-12
- Checking Server Operation, on page 2-14
- Launching PAM Software, on page 2-14
- Checking Server Status via PAM, on page 2-16
- Toggling the Local / Integrated Console Display, on page 2-18
- Powering Up / Down the Server Domain, on page 2-19
- Customizing the Server, on page 2-21
- Setting the BIOS Setup Utility Password, on page 2-21
- Completing PAP Unit Configuration, on page 2-22
- Changing the iStorage Manager User Name and Password, on page 2-23
- Connecting the PAP Unit to the Customer's Enterprise LAN, on page 2-24
- Enabling Remote Access to PAM on the Client Computer, on page 2-25
- Enabling Remote Access to iSM on the Client Computer, on page 2-25
- Configuring FTP Parameters for Autocalls, on page 2-26
- Completing Microsoft Windows Setup, on page 2-27
- Completing Linux Setup, on page 2-28
- Preparing SCSI Disk Racks, on page 2-30
- Connecting the Server to the Enterprise LAN, on page 2-31
- Testing Network Connections, on page 2-32
- Testing Autocalls, on page 2-32
- Completing the PAM Installation Intervention Report, on page 2-32

Checking PMB Code Wheels

The PMB links the server to the PAP unit, which displays server status data on the console monitor.

The PMB cabinet and CSS module code wheels are set prior to shipping, according to configuration.

Configuration	Cabinet Hexadecimal Code (0 to F)	CSS Module Hexadecimal Code (0 to F)
NovaScale 5080/5160 Server	0	0

Table 1.   PMB code wheel settings

Important:
Code wheels may change position during shipping. Check code wheel position before powering up the system.
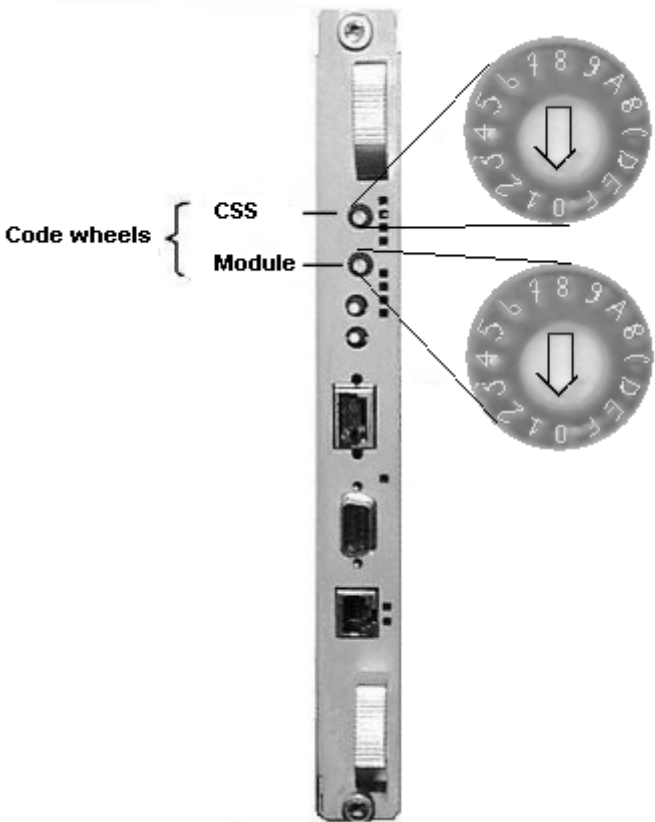
Figure 37.   PMB code wheels

Checking Server Cabling

Important:
Cables to external peripherals must NOT be connected before powering up the server for the first time.
These cables must only be connected once server operation has been checked.

All internal cabinet cables are pre–connected before shipping. However, cables may become loose during shipping and you are advised to check for loose cables before powering up the server.

See Appendix C. *NovaScale 5080/5160 Server Cabling*.

Accessing Server Components

Opening the Front Door

Tools Required:

- Cabinet key
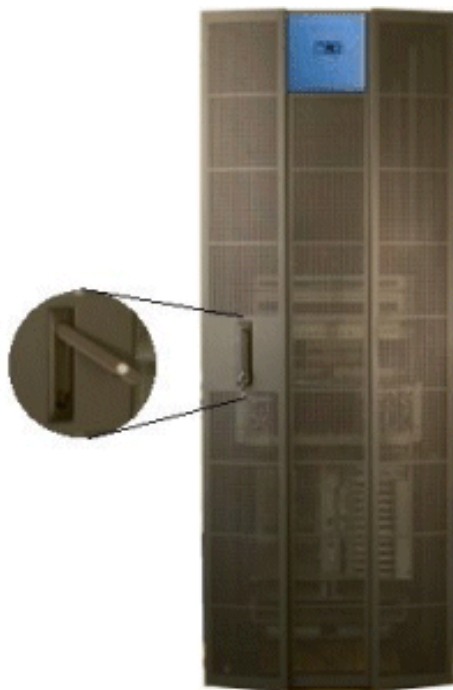
Figure 38.   Opening the front door

1. Unlock the front door with the key.

2. Pull out the locking mechanism and turn to open.

3. Open the door as required (90° / 180°).

Closing the Front Door

1. Close the door.

2. Turn the locking mechanism to close and push back into place.

3. Lock the front door with the key.

Setting up the Console Drawer

The server is equipped with an integrated console for local administration and maintenance operations. This console will be required during the installation procedure to configure the server and to check operational status. To set up the system console, proceed as follows:

Figure 39.   Lowering the console drawer flap

1. Pull out the console drawer and lower the magnetic front flap.

Figure 40.   Extending the mouse tray

2. Pull on the tab to extend the mouse tray.

Figure 41.   Positioning the monitor

3. Manually position the monitor and check that the vacation switch on the right–hand side of the monitor is ON.

Figure 42.   Console ready for use

4. Install the mouse on the extendable tray, ready for use.

Important:
The keyboard and mouse connectors, fitted to the rear of the console drawer with velcro retainers, may become loose during shipping. Once the monitor is positioned, manually check keyboard and mouse cable connections.

Closing the Console Drawer

1. Replace the mouse on the pad inside the drawer and push on the tab to replace the mouse tray in its housing.

2. Raise the magnetic front flap.

3. Manually lower the monitor.

4. Press firmly on the tabs on each side of the drawer and push the drawer back into the cabinet.

(**1**) Tab (1 on each side of the drawer)

Figure 43.   Closing the console drawer

Accessing the PAP Unit CD–Rom and Diskette Drives

Tools Required:
- PAP unit key

The PAP unit CD–Rom and diskette drives are located behind the front bezel. To access the CD–Rom and/or diskette drives, unlock the front bezel with the PAP unit key and remove.

Figure 44.   PAP Unit CD–Rom and Diskette Drives

Mounting Power Supply Cable Sockets

⚠ **CAUTION:**
To be performed by a certified electrician only.

Tools Required
- Multimeter
- Phillips screwdriver
- Velcro fasteners

Europe, Japan, Brazil

The server is equipped with two 20A AC power cables delivered with ready–mounted IEC 309 plugs and dedicated sockets for connection to the Customer's power supply cables.
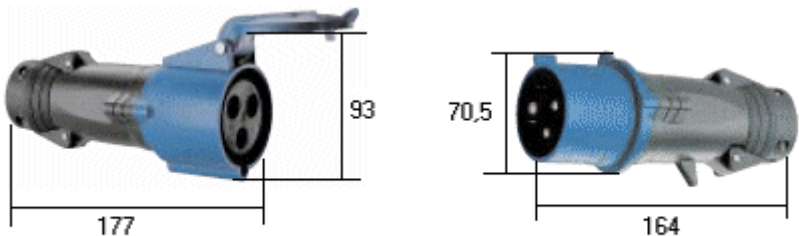
As required in the *Site Preparation Guide*, 86 A1 87EF, the Customer has provided the following power supply cables to the cable cut–outs at the base of the cabinet:

Server	Power Suppy Cable
NovaScale 5000 Series	1 x 20A power supply cable per Power Distribution Unit[1] 1 x 20A power supply cable per Central Subsystem Module

☞ **Note:**
[1]   The Power Distribution Unit (PDU) cable has an extra cable length of 1.5 meters.

United States of America

The server is equipped with two 20A AC power cables delivered with ready–mounted NEMA L6–30P plugs.
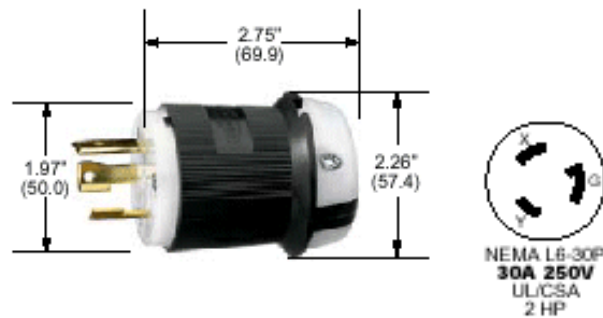
Figure 45.   US plug characteristics

As required in the *Site Preparation Guide*, 86 A1 87EF, the Customer has provided the following power supply cables (and appropriate NEMA L6–30R sockets) to the cable cut–outs at the base of the cabinet:

Server	Power Suppy Cable
NovaScale 5000 Series	1 x 20A power supply cable per Power Distribution Unit[1] 1 x 20A power supply cable per Central Subsystem Module[2]

☞ **Note:**

[1]   The Power Distribution Unit (PDU) cable has an extra cable length of 1.5 meters.

PDU Power Cable Socket

1. Check that the power supply cable is not live with the multimeter.

2. Carefully guide the PDU power supply cable (cable with extra 1.5 meter length) through the left–hand cable inlet at the base of the cabinet.

3. Check that the power supply cable is long enough for connection to the PDU.

4. Remove the power socket from the PDU plug.

5. Unscrew the base of the socket (A), insert the cable through the socket base (B), and wire to the socket head, as shown in Figure 46.

6. Screw the socket base back to the socket head (C).

7. Check for $\leq$ 0.1 ohm resistance between the grounding pin on the power cable plug and the metal frame with the multimeter.

8. Connect the power supply cable socket to the PDU power cable plug.

9. Use velcro fasteners to secure the cable into place along the cabinet frame.

10. Check that the power switches on the peripheral devices are set to ON:

Peripheral Device	Power Switch Location
KVM Switch	1 switch – rear left
Disk Rack	2 switches – rear right and left
PAP Unit	1 switch – front right
Monitor	1 switch – right side

CSS Module Power Cable Socket

1. Check that the power supply cable is not live with the multimeter.

2. Firmly pull on the power socket lever to remove from the CSS module plug.

3. Remove the power socket from the CSS module plug.

4. Unscrew the base of the socket (A), insert the cable through the socket base (B), and wire to the socket head, as shown in Figure 46.

5. Screw the socket base back to the socket head (C).

6. Check for $\leq$ 0.1 ohm resistance between the grounding pin on the power cable plug and the metal frame with the multimeter.

7. Connect the power supply cable socket to the CSS module power cable plug.

8. Use velcro fasteners to secure the cable into place at the base of the cabinet.

9. Carefully place the power supply cable plug/socket assembly in the plenum space at the base of the cabinet.
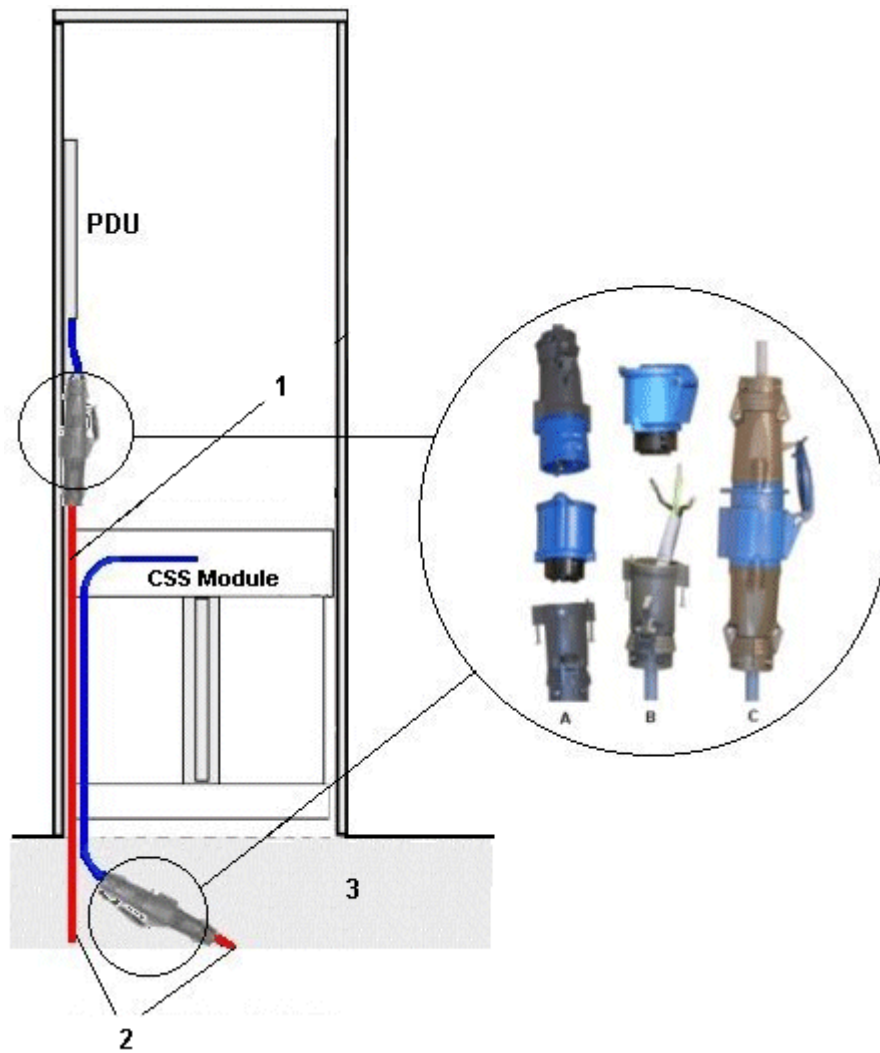
(**1**) Extra 1.5m cable length

(**2**) Power supply cables to be provided by the customer

(**3**) Plenum space

Figure 46.   Power supply cabling

Connecting the Server to the Site Power Supply

Important:
Do NOT connect external data cables before powering up the server for the first time on the Customer's premises.

The Customer is responsible for ensuring that the electrical network is compliant with the standards set out in the *Site Preparation Guide*, 86 A1 87EF.

CAUTION:
Only duly certified electricians may connect the server to the power supply, under the Customer's responsibility. The server is NOT equipped with a circuit breaker. The circuit breakers referred to in this section are the SITE circuit breakers supplied by the Customer.

Safety Recommendations

DANGER
An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the server or the devices that attach to the server. It is the Customer's responsibility to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.
Use one hand, when possible, to connect or disconnect signal cables to prevent a possible shock from touching two surfaces with different electrical potentials.

CAUTION:
The server is equipped with three–wire (phase/phase/ground) power cables for user safety. Use this power cable with a properly grounded electrical outlet to avoid electrical shock.

1. **The server has more than one power supply cable. Follow procedures for removal of power from the server when directed.**
2. **Energy hazard, remove all jewelry before servicing.**
3. **Check that the dedicated power supply circuit breakers are OFF.**

Powering Up the Server

Once the PDU and CSS module cables have been connected to the power outlets at the base of the cabinet, request the Customer to turn the two site power supply circuit breakers ON in the following order:

a. PDU breaker.
b. CSS module breaker.

The Platform Administration Processor (PAP) unit automatically powers up and boots the Microsoft Windows 2000 Server software. The Bull NovaScale Server Platform Management Board (PMB) initializes to the standby mode as soon as power has been applied and boots the embedded MAESTRO software.

Check that the green LED on the monitor is alight. If not, press the power button.

☞ **Note:**

It may take several seconds for something to be displayed on the monitor. If the server does not initialize to standby, or if an incident occurs, see Chapter 3. *Troubleshooting*.

Checking Server Operation

Once the server has been installed and powered up, correct operation must be checked.

⚠ **Important:**
The server must be fully checked with factory default data.

When the server check has been successfully completed, the authorized Customer Service Engineer in charge of installing the system will re–configure the system with Customer data. See *Customizing the Server* on page 2-21.

⚠ **Warning:**
The EFI shell can only manage QWERTY keyboards. If you have an AZERTY keyboard, please refer to the AZERTY/QWERTY keyboard lookup table on page B-3.

Launching PAM Software

The server is equipped with an integrated Platform Administration and Maintenance software package, otherwise known as PAM software.

One part of PAM software is an embedded application (MAESTRO) running on the Platform Management Board (PMB) and the other is an external application running on the Platform Administration Processor (PAP) unit under Microsoft Windows 2000 Server.

You will use the secured PAM Web–based interface to operate, monitor, and configure the server.

Once the Microsoft Windows 2000 Server software has been booted, you will be requested to supply a User Name and Password to open a Windows   session. The server MUST be started for the first time with the following factory default User Name and Password:

User Name	**Administrator**
Password	**administrator**

⚠ **Important:**
The factory default User Name and Password are used by the authorized Customer Service Engineer during the setup procedure ONLY.
Factory default data must be replaced by Customer data once the system check has been successfully completed. See *Completing PAP Unit Configuration* on page 2-21.

To complete installation, you need to open a Customer Administrator and a Support Administrator PAM session.

To open a Customer Administrator PAM session:

1. From the Microsoft Windows 2000 Server desktop, double–click the Microsoft Internet Explorer 6 icon (http://***<papname>***/PAM/).

2. When prompted, request the Customer Administrator to enter the default User Name and Password:

Customer Administrator	
User Name	**Administrator**
Password	**administrator**

The PAM home page appears:
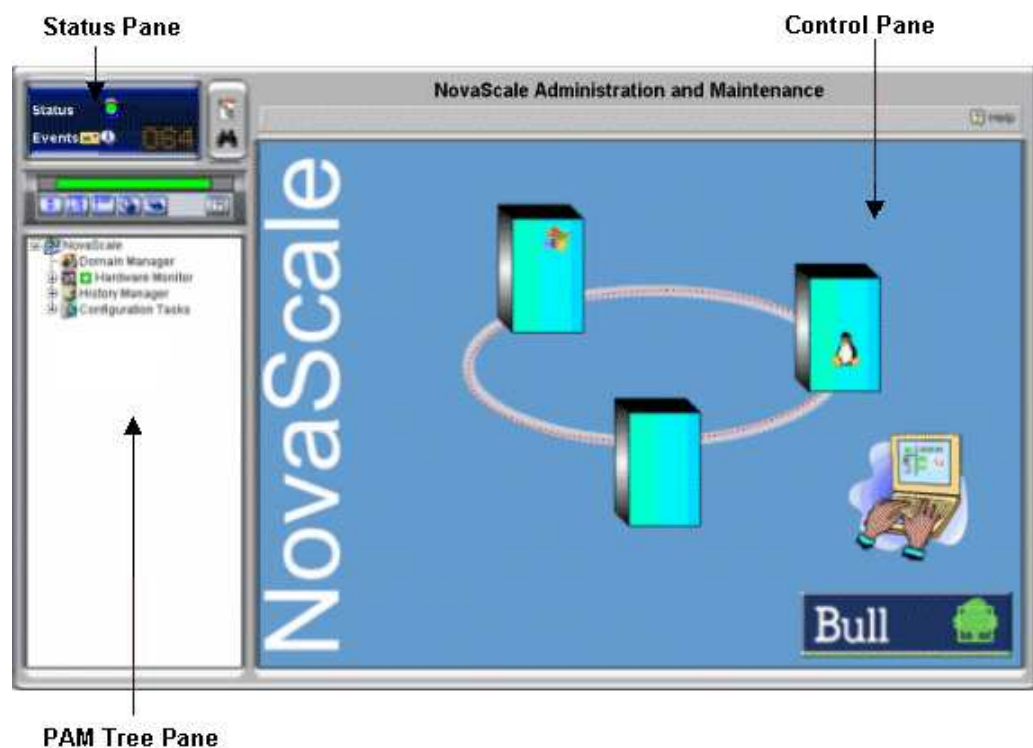
Figure 47.   PAM Home Page

To open a Support Administrator PAM session:

1. From the Microsoft Windows 2000 Server desktop, double–click the Microsoft Internet Explorer 6 icon (http://***<papname>***/PAM/).

2. When prompted, enter the predefined User Name and Password. The PAM home page appears.

☞ **Note:**
If an error dialog box appears, see Chapter 3. *Troubleshooting.*

Checking Server Status via PAM

The PAM user interface is divided into three areas: a **Status** pane, a **PAM Tree** pane, and a **Control** pane.

Status Pane

The **Status** pane provides quick access to the following synthetic information:

- **Functional Status**: if the system is operating correctly, the status icon is green,

- **Event Messages**: shows the number and maximum severity of pending event messages,

- **CSS Availability Statu**s: if the CSS Module is present, configured correctly, and the PMB is ready to operate, the status bar is green.
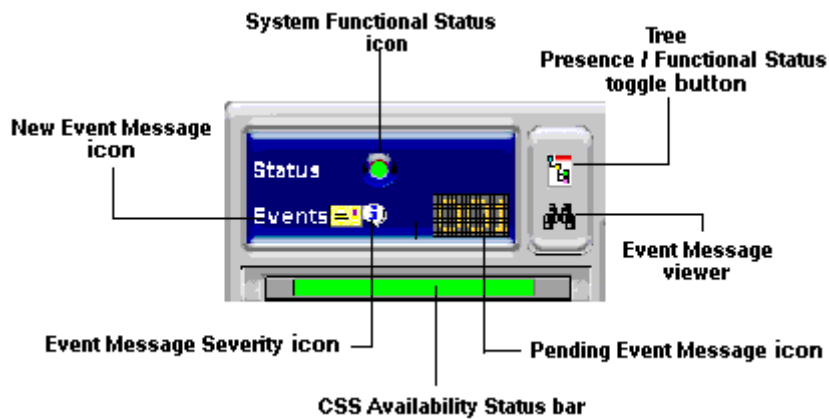
Figure 48.   Status pane

☞ **Note:**

The **Status** pane is automatically refreshed every few seconds.

PAM Tree Pane

The **PAM Tree** pane provides access to server administration and maintenance features:

Menu Nodes	Function
Domain Manager	to power on / off and manage domains.
Hardware Monitor	to display the status of hardware components and assemblies.
History Manager	to view logs and manage archives.
Servicing Tools	to install, maintain, and update the server.
Configuration Tasks	to customize server features.

Table 2.   PAM Tree nodes

PAM Tree Toolbar

The PAM Tree toolbar, located at the top of the PAM Tree, is used to refresh, expand, or collapse the tree display.

Toolbar Buttons	Meaning
	Refresh /rebuild the PAM Tree to view changes.
	Expand the complete tree.
	Collapse the complete tree.
	Expand selected node.
	Collapse selected node
	View the related **Help** topic.

Figure 49.   PAM Tree toolbar

Note:
The **PAM Tree** pane is refreshed at your request.

Control Pane

When an item is selected in the **PAM Tree** pane, details and related commands are displayed in the **Control** pane.

Note:
The **Control** pane is automatically refreshed every minute.

Simultaneous Connection

⚠ **Important:**

Before connecting to PAM from a remote computer, you are advised to disconnect from your local Windows session on the PAP unit by clicking Start → Log Off.

As Customer Administrator, you can view the list of PAM users currently logged onto the PAM Web site by clicking **Hardware Monitor → PAM Web Site**.

The Web site version and a list of connected users and session details are displayed in the **Control** pane.
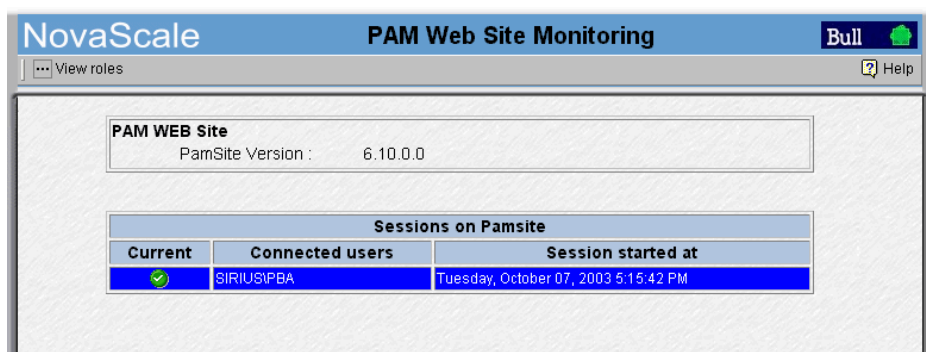
Figure 50.   PAM Web site session details

☞ **Note:**

The ✅ icon indicates the current session.

Toggling the Local / Integrated Console Display

The KVM Switch allows the integrated keyboard, monitor and mouse to be used as the local server and local PAP unit console. KVM ports are configured as shown in Table 3.

AV 400 KVM Port	Console Display
Port A	PAP Unit
Port B (PS2)	Microsoft Windows domain
Port C (USB)	Linux domain

Table 3.   KVM port configuration

You can easily toggle from the server display to the PAP unit display:

1. From the keyboard, press the **Control** key twice to display the KVM Switch Comand Menu.

2. Select the required port with the ↑↓ keys and press **Enter**.

3. The selected display appears on the Console monitor.

Powering Up / Down the Server Domain

The Bull NovaScale 5000 Series server is designed to operate as a single SMP system and is delivered with one pre–configured domain.

When server status has been checked – functional status icon and CSS availability status bar green in the Status pane – the server domain can be powered up.

Powering Up the Domain

1. From the PAM Tree, click **Domain Manager** to open the **Control** pane. If the server domain is in the stand–by mode, **INACTIVE** is displayed in the **Domain Status** panel and the **Power ON** button is accessible.

2. Click **Power ON** to power up the server domain and associated hardware components.

Domain Status panel

Functional status icon &
CSS availability status indicator
GREEN

Power ON step and state indicators
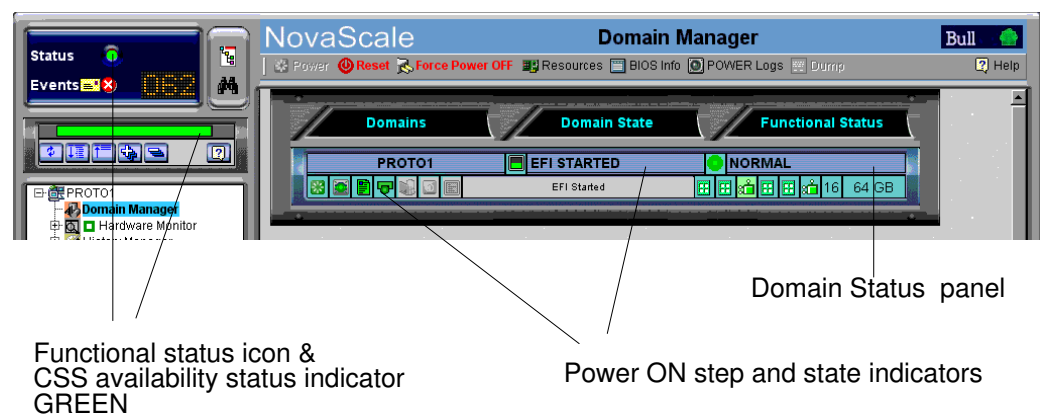
Figure 51.   Domain Manager Control pane

3. Toggle the local / integrated console from the PAP unit display to the server display. See *Toggling the Local / Integrated Console Display*, on page 2-18.

☞ Note:

For further details about the **Power ON** sequence, see *Powering ON a Domain* in the *User's Guide*, 86 A1 89EF.

☞ Note:

If the functional status icon and/or presence status bar is/are not green or if the domain cannot be powered up, see Chapter 3. *Troubleshooting*.

Powering Down the Domain

1. Shut down the server domain from the Operating System.

2. Toggle the local / integrated console from the server display to the PAP unit display. See *Toggling the Local / Integrated Console Display*, on page 2-18.

☞ **Note:**
If required, the server domain can also be powered OFF from the PAM **Domain Manager**. If the Operating System is configured to accept a PAM **Power OFF** command, it will automatically save data, close open applications, and shut down the server domain:

1. Toggle the local / integrated console from the server display to the PAP unit display. See *Toggling the Local / Integrated Console Display*, on page 2-18.

2. From the PAM Tree, click **Domain Manager** to open the **Control** pane. If the server domain is powered up, **RUNNING** is displayed in the **Domain Status** panel and the **Power OFF** button is accessible.

3. Click **Power OFF**. The server domain and associated hardware components will be powered down to the stand–by mode.

☞ **Note:**
For further details about the **Power OFF** sequence, see *Powering OFF a Domain* in the *User's Guide*, 86 A1 89EF.

☞ **Note:**
If the domain cannot be powered down, see Chapter 3. *Troubleshooting*.

⚠ **Important:**
The Force Power OFF button should only be used if the Operating System is not running or is not able to respond to a standard Power OFF request.
Do NOT use the Force Power OFF button if a BIOS recovery process is underway.

Shutting Down the PAP Unit

1. From the PAM home page, click **File** → **Close** to return to the Microsoft Windows 2000 Server desktop.

2. Shut down the PAP unit by selecting the **Shut Down** command in the Start Menu.

Shutting Down the Server

Turn the site power supply circuit breakers OFF.

Customizing the Server

Once the operational check has been successfully completed, the authorized Customer Service Engineer will customize the server by replacing factory default data with Customer data.

A list of the Customer data required for re–configuration by the authorized Customer Service Engineer is given in the *Read Me First*, 86 A1 53EG booklet delivered with the system 24 hours before the scheduled installation date.

![i] **Important:**
Before proceeding to complete PAP Unit configuration, check Regional, Date/Time, and Time Zone settings.
The server is delivered with a QWERTY keyboard. Advise the Customer to take care when entering User Names and Passwords.

Setting the BIOS Setup Utility Password

Access to the BIOS Setup Utility is reserved for Customer Service Engineers only and must be protected by a password. To set the password:

1. Turn the site power supply circuit breakers ON in the following order:

   a. PDU breaker.
   b. CSS module breaker.

   The Platform Administration Processor (PAP) unit automatically powers up and boots the Microsoft Windows 2000 Server software, and the Bull NovaScale Server initializes.

2. Toggle the console display to the server port to visualize the POST. See *Toggling the Local / Integrated Console Display*, on page 2-18.

3. When prompted, press **<DEL>** to enter Setup. After a few seconds, the BIOS Setup Utility **Main Screen** appears.

4. Use the ←→ keys to scroll throught the main menu screen to the **Security** menu.

5. Select **Change Supervisor Password** and press **<ENTER>**.

6. Enter the pre–defined password.

7. Exit the BIOS Setup Utility by selecting **Exit saving changes**.

☞ **Note:**
Reserved for Customer Service Engineers only.
If the password has been lost or forgotten, it can be cleared by checking the **Clear Password** box accessible from the PAM software utility:
Domain Manager → **Advanced** → **BIOS Features** → **Clear Password** and then rebooting the domain.

Completing PAP Unit Configuration

PAP unit configuration is reserved for Customer Service Engineers. To complete PAP unit configuration:

1. Open a new Microsoft Windows 2000 Server session with the predefined User Name and Password.

2. From the Microsoft Windows 2000 Server desktop, click:
   Start → Program Files → Platform Administration and Maintenance → PAP Configuration
   to launch the PAP configuration setup wizard which guides you through the PAP unit configuration procedure (approximately 10 minutes).
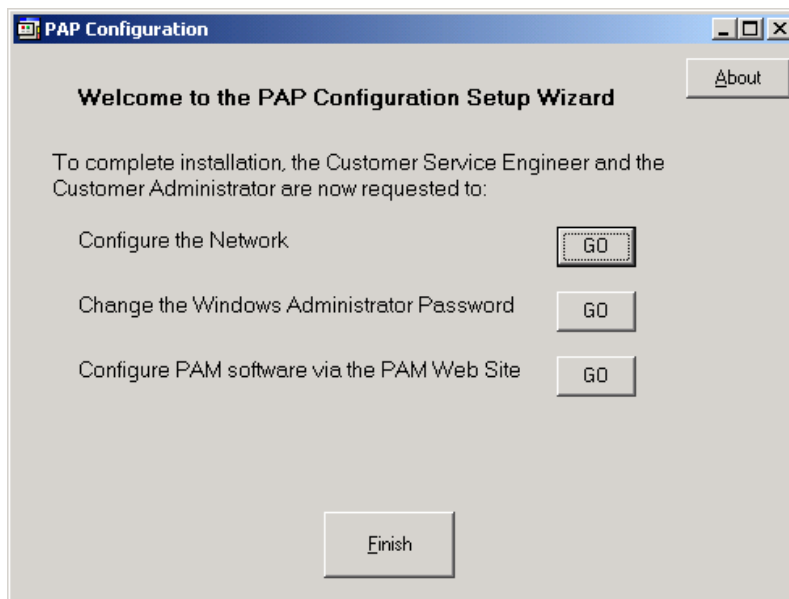
Figure 52.   PAP configuration wizard

3. Follow the instructions displayed on the screen to customize the server with the *Installation Setup Data* supplied by the Customer.

☞ **Note:**
During the setup process, the Customer Service Engineer and Customer Administrator are requested:

– to configure Customer Enterprise LAN settings,

– to change the default factory PAP unit network setting,

– to change the Customer Administrator password,

– to configure PAM software via the PAM Web Site.

The *Installation Setup Data* tables are part of the *Read Me First*, 86 A1 53EG booklet enclosed in the *Open Me First* kit.

Changing the iStorage Manager User Name and Password

Storeway FDA 1300 and Storeway FDA 2300 subsystems are delivered with iStorage Manager (iSM) for integrated monitoring and centralized management.

The iSM Server / Client utility is installed on the PAP Unit desktop. The Customer can install iSM Client on any standard PC running under Microsoft Windows 2000 Server (2000 or later).

Before using iSM, the Customer is advised to replace the factory default User Name and Password.

To change the iStorage Manager User Name and Password:

1. From the PAP Unit Microsoft Windows 2000 Server desktop, click:
   Start → Programs → NEC Storage Manager Server → Setting Utility.

2. Select the **Users** tab. The default User Name and User Level is displayed in the User List.

Default User Name	**Administrator**
Default User Level	**L3**
Default Password	**administrator**

3. Select **Administrator** from the User List and click **Edit** to open the **User – Edit** dialog box.

4. Change the User Name and Password and check that the **L3** radio button is highlighted.

5. Click **OK**.

6. A dialog box requests you to restart iSM to apply changes. Click **Yes**.

7. From the PAP Unit Microsoft Windows 2000 Server desktop, click:
   Start → Programs → Administrative Tools → Services.

8. Select **NEC Storage Manager → Action → Stop** to stop iSM.

9. Click **Action → Start** to restart iSM. Changes are applied.

Connecting the PAP Unit to the Customer's Enterprise LAN

⚠ **CAUTION:**
Remote access is a security hazard. Customers are strongly advised to protect their systems with up–to–date protection devices such as virus–prevention programs and firewalls, and to maintain a detailed record of authorized users.

Once the PAP unit has been configured for remote use, it can be connected to the Customer's Enterprise LAN.

The PAP unit provides two RJ45 Ethernet ports. The first is used for the internal server network and the second for connection to the Customer's Enterprise LAN for remote platform administration and maintenance.

1. Open the rear door and remove the left side cover.
   See *Removing Side Covers*, on page 1-19.

2. Guide the Enterprise network cable supplied by the Customer through the cable cut–out at the base of the cabinet and up through the free space on the left side of the cabinet.

3. Access the PAP unit RJ45 Ethernet ports from the rear of the cabinet.

Free Ethernet port

Figure 53.   PAP unit free Ethernet port

4. Secure the Enterprise network cable to the left flange of the cabinet with the velcro fasteners supplied in the *Open Me First* kit.

5. Close the rear door and refit the left side cover. See *Refitting Side Covers*, on page 1-20.

ℹ **Important:**
If the PAP unit is not connected to the Customer's Enterprise LAN, the remote maintenance autocall and event messaging systems will not be enabled.

Enabling Remote Access to PAM on the Client Computer

The PAM software utility can be accessed from any standard PC running under Microsoft Windows with the Microsoft Internet Explorer 6 (or later) browser installed.

To enable remote access to PAM:

1. Check that Microsoft Internet Explorer 6 (or later) and Java VM are installed on the Client computer.

☞ **Note:**
If Microsoft Internet Explorer 6 (or later) and/or Java VM is/are not installed on the Client computer, they can be downloaded from the Microsoft   Web site.

2. Select **Tools** → **Internet Options** → **Home page**.

3. In the home page address field, type:
   http://<papname>/pam
   (where <**papname**> is the name given to the PAP unit during configuration) so that when the Customer launches the Microsoft Internet Explorer 6 browser, he connects directly to the PAM Web site. See *Completing PAP Unit Configuration*, on page 2-22.

4. Click **Go** to connect to the PAM Web site.

Enabling Remote Access to iSM on the Client Computer

The iSM Client utility can be installed on the PAP unit and on any standard PC running under Microsoft Windows 2000 Server.

To enable remote access to iSM:

1. Insert the iSM Client setup CD–Rom in the client computer.

2. Run the **CLIENT\2000\ISMCE211.EXE** program to launch the setup wizard which guides you through the iSM Client configuration procedure.

3. When you are requested to select **Setup Type**, click **basic + extended function** → **Next**.

4. Once setup is complete, launch iSM Client to connect to iSM Server. A dialog box appears requesting you to set the environment for iSM Client.

5. From the iSM Client menu, click **File** → **Environment Settings** to open the **Server Settings** page.

6. In the **IP Address** field, enter the PAP unit IP address allocated during the PAP unit setup process. See *Completing PAP Unit Configuration*, on page 2-22.

7. Click **OK** to establish the connection.

8. When requested enter the User Name and Password and click **OK**. See *Changing the iStorage Manager User Name and Password*, on page 2-23.

Configuring FTP Parameters for Autocalls

If the Customer's maintenance contract includes the Autocall feature, configure FTP parameters as follows:

1. Navigate to the PAM Web site (**http://*<papname>/pam***).
   See *Launching PAM Software*, on page 2-14.

2. Click **Configuration** → **Autocalls**.

3. Check the **Enable Autocalls** box.

4. Complete the fields with the following information:

Field	Explanation	Value
Server name	Remote Maintenance Center server IP address	123.145.167.189
Server port	Default server port	21
Target directory	Default server directory	/autocall
Login	Declared authorized user name	X
Password	Declared authorized user password	X

☞ **Note:**
The **Network id** and **IP address** boxes are only to be checked if authorized by the Customer.

Important:
For enhanced confidentiality, the Customer Administrator is advised to supply a temporary password for setup purposes and to change this password once setup is complete.

Completing Microsoft Windows Setup

Before proceeding to complete setup:

- Check Regional, Date/Time, and Time Zone settings.

- Check that the Customer has supplied the System and Networking data required to complete setup and customize the system. See the *Installation Setup Data* tables in the *Read Me First* document supplied on delivery.

☞ **Note:**
SCSI Disk Racks
Unlock all DATA disks not used by the current Microsoft Windows instance. See *Preparing SCSI Disk Racks*, on page 2-30.

- Check that the Microsoft Windows CD–ROM labeled *"TO BE COMPLETED"* is ready for use.

- Check that the yellow sticker with the 25–character Microsoft Windows Product Key required to complete setup is clearly visible inside the cabinet.

Power up the required system domain by repeating the actions described in *Powering Up / Down the Server Domain* on page 2-19. The Microsoft Windows setup wizard is launched automatically and guides the Customer and the Customer Service Engineer through the setup completion procedure (approximately 30 minutes).

⚠ **Warning:**
Most of the options selected and validated during the setup sequence can be modified.
However, special attention is to be paid when selecting and validating the Licensing Mode (Per Seat / Per Server).
If selected and validated the "Per Server" Licensing Mode option CAN be modified.
If selected and validated, the "Per Seat" Licensing Mode CANNOT be modified.

Once setup is complete, Microsoft Windows shuts down, the system domain is rebooted and the server configuration wizard is launched automatically. Server configuration is a Customer–specific task and is not performed by the Customer Service Engineer during installation.

Close the server configuration wizard. Once the system has been fully installed, the Customer Administrator may launch this wizard to configure and manage Server Roles. See the *User's Guide*, 86 A1 89EF for recommended configuration tasks.

☞ **Note:**
Repeat this procedure for each pre–installed Microsoft Windows instance.

Hot plug the data disks removed before launching the setup completion procedure.

Completing Linux Setup

Before proceeding to complete setup:

- Check Regional, Date/Time, and Time Zone settings.

- Check that the Customer has supplied the System and Networking data required to complete setup and customize the system. See the *Installation Setup Data* tables in the *Read Me First* document supplied on delivery.

☞ **Note:**
SCSI Disk Racks
Unlock all DATA disks not used by the current Operating System instance. See *Preparing SCSI Disk Racks*, on page 2-30.

Power up the required system domain by repeating the actions described in *Powering Up / Down the Server Domain* on page 2-19. The Customer and the Customer Service Engineer can now proceed to configure the Customer Enterprise Network (approximately 30 minutes).

Linux RedHat

Setup is completed via the Webmin administration tool:

1. From the PAP unit Microsoft Internet Explorer 6 or Linux Mozilla browser, enter the Webmin URL:
   http://<system name>:10000. The **Login to Webmin** dialog box opens.

2. Enter the factory default User Name and Password:

User Name	**root**
Password	**root**

   followed by **Enter**. The Webmin home page opens.

3. Click the **Networking** icon to open the Networking main page.

4. Click **Network Configuration** → **Network Interfaces**. In the **Interfaces Activated at Boot Time** field, click **Add a new interface** to open the **Create Bootup Interface** configuration page. Complete the required fields with the data supplied by the Customer and click **Create**.

5. From the **Interfaces Activated at Boot Time** field, select the new interface. The **Edit Bootup Interface** page opens. Check settings and click **Save and Apply** → **Return to network configuration**.

6. Click **Routing and Gateways** to open the **Routing and Gateways** configuration page. Complete the required fields with the data supplied by the Customer and click **Save** → **Return to network configuration**.

7. Click **DNS Client** to open the **DNS Client Options** configuration page. Complete the required fields with the data supplied by the Customer and click **Save** → **Return to network configuration**.

8. Click **Host Addresses** → **Add a new host address** to open the **Host and Addresses** configuration box. Complete the required fields with the data supplied by the Customer and click **Create** → **Return to host addresses list** → **Return to network configuration** → **Return to index** → **System** → **Bootup and Shutdown** to create a new bootup and shutdown action.

9. From the action list, select **Network** to display the **Edit Action** page and click → **Restart Now** → **Return to action** → **Return to bootup and shutdown actions** → **Return to index** → **Log Out** to exit Webmin.

10. Hot plug the data disks removed before launching the setup completion procedure. Once setup is complete, the network is activated.

Note:
Repeat this procedure for each pre–installed Linux Redhat instance.

Linux SuSe SLES–8

Setup is completed via the Yast Control Center administration tool:

1. From the PAP unit enter the factory default User Name and Password:

User Name	**root**
Password	**root**

followed by **Enter**.

2. Enter **yast2** (graphical mode) or **yast** (non–graphical mode) to open the Yast Control Center main page.

Note:
Use the **<Tab>** and **<Arrow>** keys to navigate through the menus.

3. Click **Network/Basic** → **Network Card Configuration**.

4. Select the required network card and click **Configure**.

5. From the **Network Address Setup** page, select the setup method and complete the required fields with the data supplied by the Customer.

6. From the **Details settings** area, click **Host name and name server**. Complete the required fields and click **Next**.

7. From the **Details settings** area, click **Routing**. Complete the required fields and click **Next** to return to the **Network Card Configuration** page. Your network card is displayed in the **Already configured devices** area.

8. Click **Close** to exit Yast Control Center.

9. Hot plug the data disks removed before launching the setup completion procedure. Once setup is complete, the network is activated.

Note:
Repeat this procedure for each pre–installed Linux SuSE SLES–8 instance.

Preparing SCSI Disk Racks

ⓘ **Important:**
Only the system / spare disks used by the current Operating System instance must be accessible. Optional data disk drives must be unlocked, as shown in the following figures.

SR–0812 SCSI Disk Rack
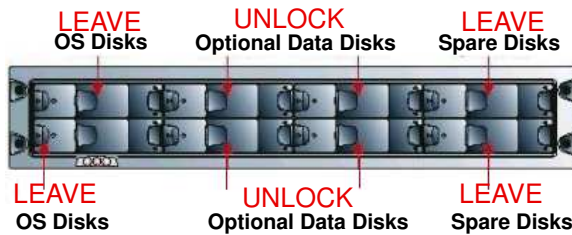
Figure 54.   SR–0812 SCSI disk location (system and data)

SR–1422 SCSI Disk Rack

Figure 55.   SR–1422 SCSI disk location (system and data)

SJ–0812 SCSI Extension Disk Rack
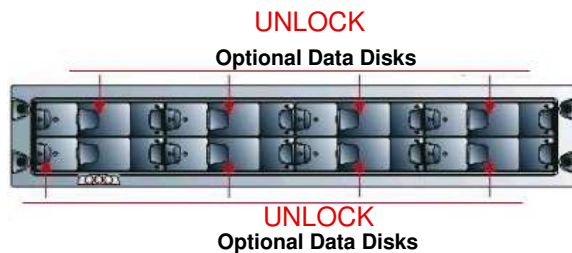
Figure 56.   SJ–0812 extension disk location (data)

Unlocking Disk Drives

1. Before proceeding to complete Operating System setup, use a Torx T10 screwdriver to open the optional disk drive anti–tamper lock, the indicator becomes black.

2. Press the carrier latch to release the handle.

3. Wait 30 seconds.

Locking Disk Drives

1. Once Operating System setup is complete, use a Torx T10 screwdriver to close the optional disk drive anti–tamper lock, the indicator becomes red.

2. Check drive LED status. If the lock is correctly closed, both LEDs should be lit.

Connecting the Server to the Enterprise LAN

At the Customer's request, the system can be connected to the Enterprise LAN for remote operation of the Bull NovaScale Server.

According to the Customer's network requirements, the server offers two LAN connection options:

- – via the IOR (IOB #0) for a **10/100 Mb/s** network,
- – via an optional Gigabit Ethernet PCI adapter (IOB #0) for a **1 Gb/s** network.

1. Access IOB #0 from the front of the cabinet.

2. Carefully connect the network cable equipped with an RJ45 connector to the LAN port on the IOR or Gigabit Ethernet PCI adapter.

3. Take care to correctly route the network cable through the cable inlet at the base of the cabinet.

4. The network will be detected automatically.

Important:
An extra cable length of 1.5 meters is required for maintenance. This extra cable length must be absorbed in the plenum space under the cabinet.
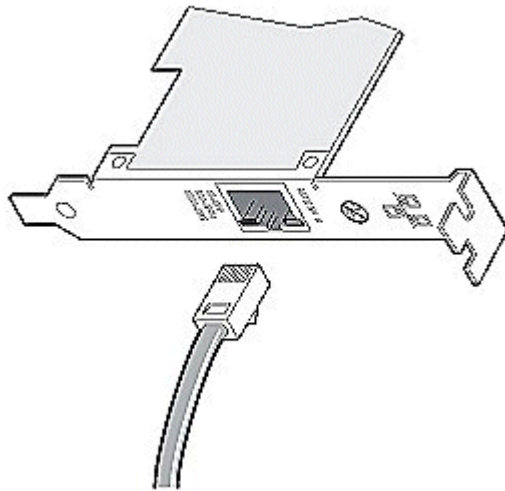
Figure 57.   1Gb/s network connection

Figure 58.   10/100 Mb/s network connection

Testing Network Connections

Network connections to the PAP unit and to the Bull NovaScale Server can be tested from a remote workstation connected to the same network by launching a PING command.

Windows Workstation

1. Click **Start** → **Run** and enter **cmd**.

2. Enter **ping <IP_address>**, (where <IP_address> is the IP address of the PAP unit or NovaScale 5080/5160 Server).

Linux Workstation

1. Open a Shell command window.

2. Enter **ping <IP_address>**, (where <IP_address> is the IP address of the PAP unit or Bull NovaScale Server).

☞ **Note:**

If the PAP unit or Bull NovaScale Server does not reply to the PING command, check network connections and configuration:

- – IP address,
- – DHCP,
- – Network mask,
- – Network card driver.

Testing Autocalls

If the Customer's maintenance contract includes the Autocall feature, check the network connection between the PAP unit and the Remote Maintenance Center as follows:

1. From the PAP unit, click **Start** → **Run**.

2. Enter **ping 123.145.167.189** (where 123.145.167.189 is the IP address of the Remote Maintenance Center).

Check the connection between the PAP unit and the Remote Maintenance Center FTP Server as follows:

1. From the PAP unit, click **Start** → **Run**.

2. Enter **ftp 123.145.167.189**.

3. When requested, enter your User Name and Password.

4. Enter **cd /** → **dir**.

5. **Accepted** or **Rejected** is displayed.

Completing the PAM Installation Intervention Report

Once system operation has been checked, an **Installation Intervention Report** must be completed. If the Customer's maintenance contract includes the Autocall feature, this report will be transferred to the Remote Maintenance Center.

1. From the PAM home page, click **Servicing Tools** → **Intervention Report**.

2. Complete the Intervention Report.

3. Click **Send** to transfer the Intervention Report to the Remote Maintenance Center.

☞ **Note:**

If the Customer's maintenance contract does not include the Autocall feature, manually complete the **Installation Work Order**.

Chapter 3. Troubleshooting

This chapter describes what to do if a problem occurs during installation. It includes the following topics:

- Server power, on page 3-2
- Mouse, on page 3-3
- Keyboard, on page 3-4
- Monitor, on page 3-5
- KVM Switch, on page 3-6
- PAP Unit, on page 3-7
- Disk Rack, on page 3-8
- CD/DVD Drive, on page 3-9
- LS240 Drive, on page 3-10
- Operating System, on page 3-11
- PAM Software, on page 3-12

Server Power

Problem	Possible Cause	Solution
The server does not power up to standby.	The CSS module power cable is not connected or is incorrectly connected to the AC outlet.	*Check the CSS module power cable connection. Connect or reconnect the power cable to the AC outlet.*
	The AC outlet is faulty.	*Try another AC outlet.*
	The AC source is missing.	*Call the site electrician to check the AC source.*
	The AC power cable is faulty.	*Check the AC power cable for faults. Replace the faulty cable.*
The operating system does not boot.	The disk rack power button is not set to ON.	*Check the power button on the rear of the disk rack. Set to ON (I).*
	System disks are incorrectly inserted in the disk rack.	*Check system disk status LEDs. If the status LEDs are not green, reinsert system disks.*
	The disk rack power cable is not connected or is incorrectly connected to the PDU.	*Check the disk rack power cable connection. Connect or reconnect the power cable to the PDU.*
	The PDU power cable is not connected or is incorrectly connected to the AC outlet.	*Check the PDU power cable connection. Connect or reconnect the power cable to the AC outlet.*
	The PDU circuit breaker is not ON.	*Check the PDU circuit breaker and turn ON if required.*
	The AC outlet is faulty.	*Try another AC outlet.*
	The AC source is missing.	*Call the site electrician to check the AC source.*
	Internal cables are not connected or are incorrectly connected to their dedicated ports.	*Check data cable connections. Connect or reconnect cables to their dedicated ports.*
	An internal cable is faulty.	*Check internal cables for faults. Replace the faulty cable.*
The server does not power down (an activated domain cannot be powered down).	Domain Operating System power management settings do not allow PAM software to power down the domain.	*Check domain Operating System power management settings and change if required. See User's Guide, 86 A1 89EF.*
	The domain Operating System is not responding.	*Click Force Power OFF to shut down the domain Operating System.*
The PAM functional status icon is not green.		*See User's Guide, 86 A1 89EF.*
The PAM presence status bar is not green.		*See User's Guide, 86 A1 89EF.*

Mouse

Problem	Possible Cause	Solution
The mouse does not move the cursor or there is no cursor on the screen.	The mouse signal has not been reset.	*Press the **Control** key twice to access the Command Menu.* *Enter the KVM Command Mode.:* *Press and hold down the **Num Lock** key.* *Press and release the (–) key.* *Type **MR** (mouse reset).* *Press the **Enter** key to accept and exit the KVM Command Mode.*
	Internal cables are not connected or are incorrectly connected to their dedicated ports.	*Check internal cable connections:* *– Mouse to KVM,* *– KVM to PAP,* *– IOR to KVM.* *Connect or reconnect cables to their dedicated ports.*
	The KVM switch power button is not set to ON.	*Check the power button on the rear of the KVM switch. Set to ON (I).*
	The KVM switch power cable is not connected or is incorrectly connected to the PDU.	*Check the KVM switch power cable connection. Connect or reconnect the power cable to the PDU.*
	The PDU power cable is not connected or is incorrectly connected to the AC outlet.	*Check the PDU power cable connection. Connect or reconnect the power cable to the AC outlet.*
	The PDU circuit breaker is not ON.	*Check the PDU circuit breaker and turn ON if required.*
	The AC outlet is faulty.	*Try another AC outlet.*
	The AC source is missing.	*Call the site electrician to check the AC source.*
	An internal cable is faulty.	*Check internal cables for faults. Replace the faulty cable.*

Keyboard

Problem	Possible Cause	Solution
The keyboard does not function.	The KVM switch power button is not set to ON.	*Check the power button on the rear of the KVM switch. Set to ON (I).*
	Internal cables are not connected or are incorrectly connected to their dedicated ports.	*Check internal cable connections:* *– Keyboard to KVM,* *– KVM to PAP,* *– IOR to KVM* *Connect or reconnect cables to their dedicated ports.*
	The KVM switch power cable is not connected or is incorrectly connected to the PDU.	*Check the KVM switch power cable connection. Connect or reconnect the power cable to the PDU.*
	The PDU power cable is not connected or is incorrectly connected to the AC outlet.	*Check the PDU power cable connection. Connect or reconnect the power cable to the AC outlet.*
	The PDU circuit breaker is not ON.	*Check the PDU circuit breaker and turn ON if required.*
	The AC outlet is faulty.	*Try another AC outlet.*
	The AC source is missing.	*Call the site electrician to check the AC source.*
	An internal cable is faulty.	*Check internal cables for faults. Replace the faulty cable.*

Monitor

Problem	Possible Cause	Solution
The monitor does not power up (the status LED on the monitor is not alight).	The monitor power button is not set to ON.	*Check that the power button on the front of the monitor is ON.* *Check that the vacation switch on the right–hand side of the monitor is ON.* *Turn the power button / vaction switch ON.*
	The monitor power cable is not connected or is incorrectly connected to the PDU.	*Check the monitor power cable connection. Connect or reconnect the power cable to the PDU.*
	The PDU power cable is not connected or is incorrectly connected to the AC outlet.	*Check the PDU power cable connection. Connect or reconnect the power cable to the AC outlet.*
	The PDU circuit breaker is not ON.	*Check the PDU circuit breaker and turn ON if required.*
	The server is not powered up.	*Power up the server.*
	The AC outlet is faulty.	*Try another AC outlet.*
	The AC source is missing.	*Call the site electrician to check the AC source.*
	The AC power cable is faulty.	*Check the AC power cable for faults. Replace the faulty cable.*
The status LED on the monitor is alight but there is no display on the screen.	The monitor contrast and / or brightness settings are too low.	*Use the buttons on the front of the monitor to adjust contrast and / or brightness settings.*
	The KVM switch power cable is not conected or is incorrectly connected to the PDU.	*Check the KVM switch power cable connection. Connect or reconnect the power cable to the PDU.*
	The KVM switch power button is not set to ON.	*Check the power button on the rear of the KVM switch. Set to ON (I).*
	The KVM is not set to the correct port (Port A – PAP, Port B – Microsoft Windows, Port C – Linux).	*Press the **Control** key twice to access the Command Menu.* *Select the required channel with the keys.* *Press **Enter** to activate the selected channel and exit the Command Mode.* *If the KVM cannot be accessed or switched, see KVM Switch on page 3-6.*
	Internal video cables are not connected or are incorrectly connected to their dedicated ports.	*Check internal video cable connections:* *– Monitor to KVM,* *– KVM to PAP,* *– IOR to KVM* *Connect or reconnect video cables to their dedicated ports.*
	An internal cable is faulty.	*Check internal cables for faults. Replace the faulty cable.*

KVM Switch

Problem	Possible Cause	Solution
The green status / channel LEDs on the front of the KVM unit are not alight.	The KVM unit is not powered up.	*Check the power button on the rear of the KVM unit. Turn to ON (I).*
	The KVM unit power cable is not connected or is incorrectly connected to the PDU.	*Check the KVM unit power cable connection. Connect or reconnect the power cable to the PDU.*
	The PDU power cable is not connected or is incorrectly connected to the AC outlet.	*Check the PDU power cable connection. Connect or reconnect the power cable to the AC outlet.*
	The PDU circuit breaker is not ON.	*Check the PDU circuit breaker and turn ON if required.*
	The AC outlet is faulty.	*Try another AC outlet.*
	The AC source is missing.	*Call the site electrician to check the AC source.*
	The AC power cable is faulty.	*Check the AC power cable for faults. Replace the faulty cable.*
The status LED on the front of the KVM unit is RED.	Internal unit failure.	*Replace the KVM.*
The KVM cannot be accessed or switched.	The KVM unit is in secure mode (lock symbol on OSD screen).	*If the KVM has been configured to the secure mode, enter the password at the prompt. Refer to the manufacturer's documentation for further information.*
	An internal cable is faulty.	*Check internal cables for faults. Replace the faulty cable.*

PAP Unit

Problem	Possible Cause	Solution
The PAP unit does not power up (the status LED on the PAP unit is not alight).	The PAP unit power switch is not set to ON.	*Press the power button on the front of the PAP unit .*
	BIOS settings are incorrect.	*Press F2 during the power–on sequence to enter BIOS Setup.* *1. Set the "After Power Failure" parameter to "Power ON".* *2. Save Settings and Exit.*
	The PAP unit power cable is not connected or is incorrectly connected to the PDU.	*Check the PAP unit power cable connection. Connect or reconnect the power cable to the PDU.*
	The PDU power cable is not connected or is incorrectly connected to the AC outlet.	*Check the PDU power cable connection. Connect or reconnect the power cable to the AC outlet.*
	The PDU circuit breaker is not ON.	*Check the PDU circuit breaker and turn ON if required.*
	The AC outlet is faulty.	*Try another AC outlet.*
	The AC source is missing.	*Call the site electrician to check the AC source.*
	The AC power cable is faulty.	*Check the AC power cable for faults. Replace the faulty cable.*
	POST is in progress.	*Wait a while. The status LED will turn green once the POST is completed.*
The status LED on the PAP unit is alight but the PAP unit does not boot.	Incorrect boot sequence.	*Press the reset button on the front of the PAP unit.*
The PAP unit does not boot.	PAP unit disks are incorrectly inserted.	*Check disk status LEDs. If the status LEDs are not green, reinsert the disks.*
The PAP unit cannot be accessed via the internal network.	The LAN cable is not connected or is incorrectly connected to the IOR in the CSS module.	*Check the PAP unit LAN cable connection. Connect or reconnect the LAN cable to the IOR in the CSS module.*
PAM software cannot be launched.	The KVM switch is not set to the correct port (Port A – PAP). The green channel 1 (PAP) LED on the front of the KVM switch is not alight (another channel LED is alight).	*Press the **Control** key twice to access the Command Menu.* *Select the PAP unit channel (Channel A) with the ↑↓ keys.* *Press **Enter** to activate the PAP unit channel and exit the Command Mode.*
	An internal cable is faulty.	*Check internal cables for faults. Replace the faulty cable.*

Disk Rack

Problem	Possible Cause	Solution
The disk rack does not power up (the power on and power status LEDs on the disk rack are not alight).	The disk rack power switch is not set to ON.	*Press the power button on the front of the disk rack.*
	The disk rack power cable is not connected or is incorrectly connected to the PDU.	*Check the disk rack power cable connection. Connect or reconnect the power cable to the PDU.*
	The PDU power cable is not connected or is incorrectly connected to the AC outlet.	*Check the PDU power cable connection. Connect or reconnect the power cable to the AC outlet.*
	The PDU circuit breaker is not ON.	*Check the PDU circuit breaker and turn ON if required.*
	The AC outlet is faulty.	*Try another AC outlet.*
	The AC source is missing.	*Call the site electrician to check the AC source.*
The disk rack is not recognized by the server.	The interface cable(s) is (are) not connected or is (are) incorrectly connected to the HBA(s) in the CSS module.	*Check the disk rack interface cable connection. Connect or reconnect the interface cable(s) to the HBA(s) in the CSS module.*
	An internal cable is faulty.	*Check internal cables for faults. Replace the faulty cable.*
The disk rack is not recognized by the server.	Disk drives have not finished spinning up.	*Wait a while. The drive status LEDs will turn green once they have finished spinning up.*
	Disk drives have not been correctly installed.	*Check that all disk drive cariers are correctly installed.*
The disk rack cannot be accessed from the PAP unit.	The interface cable is not connected or is incorrectly connected to the COM port on the PAP unit.	*Check the interface cable connection. Connect or reconnect the interface cable to the COM port on the PAP unit. Refer to the manufacturer's documentation for further information.*
	An internal cable is faulty.	*Check internal cables for faults. Replace the faulty cable.*

CD/DVD Drive

Problem	Possible Cause	Solution
The inserted CD/DVD cannot be read.	The CD/DVD is faulty.	*Eject the CD/DVD. Check for visible faults. Reinsert and try to read it again. If the CD/DVD still cannot be read, try again with another CD/DVD. If the problem persists, see Maintenance and Service Guide*, 86 A7 90EF*.*

LS 240 Drive

Problem	Possible Cause	Solution
Data cannot be written on the inserted diskette.	The diskette is write–protected.	*Remove the diskette. Check the write protection tab and change if necessary. Reinsert and try to write data again. If data still cannot be written, try again with another diskette. If the problem persists, see Maintenance and Service Guide, 86 A7 90EF.*

Operating System

Problem	Possible Cause	Solution
Microsoft Windows / Linux does not start.	Incorrect EFI boot option.	*See Maintenance and Service Guide, 86 A7 90EF.*
Microsoft Windows / Linux does not respond.	Program run error.	*Reboot the server.*
The server does not boot.	System disks are incorrectly inserted in the disk rack.	*Check system disk status LEDs. If the status LEDs are not green, reinsert system disks.*
The server does not power down (an activated domain cannot be powered down).	Domain Operating System power management settings do not allow PAM software to power down the domain.	*Check domain Operating System power management settings and change if required. See User's Guide, 86 A1 89EF.*
	The domain Operating System is not responding.	*Click Force Power OFF to shut down the domain Operating System.*

PAM Software

Problem	Possible Cause	Solution
Microsoft Internet Explorer 6 does not connect to the PAM Web site.	The Maintenance LAN connection is incorrectly configured.	*Check maintenance LAN settings. Configure or reconfigure if necessary: IP address: 10.10.240.240 Subnet mask: 255.255.0.0 No DNS No WINS* *Refer to the Microsoft Windows documentation for further information.*
The server presence status bar is RED, indicating that the CSS Module has not been detected.	The PMB is not connected or is incorrectly connected to the PAP unit.	1. *Check the PMB to PAP unit internal network cable connection. Connect or reconnect the PMB to the PAP unit.* 2. *Check PAP unit network connection configuration. From the PAP Windows desktop, click* **Start** → **Settings** → **Network and Dial–up Connection**. 3. *Click the* **Command Prompt** *icon in the Windows Task Bar.* 4. *Enter* **IPCONFIG** *to check IP address configuration.* 5. *If the local PAP address:* **10.10.240.240** *does NOT appear in the the table, check that the PAP is not configured as a DNS server.* 6. *Check that PMB code wheel position has not been changed. Default position : 0/0.* 7. *Check PMB LED status. See Maintenance and Service Guide, 86 A7 90EF.* 8. *Reset the PMB by pressing the* **Reset** *button on the front of the PMB. See Maintenance and Service Guide, 86 A7 90EF.*

Appendix A. Specifications

The following web site may be consulted for general site preparation information:
http://www.cs.bull.net/aise

NovaScale 5080/5160 Server Specifications

Dimensions / Weight	
Unpacked	**Packed**
Height: 177.5 cm (70 in)	Height: 202 cm (79.5 in)
Width: 65.0 cm (25.6 in)	Width: 80.0 cm (31.5 in)
Depth: 113 cm (44.5 in)	Depth: 127.5 cm (50.2 in)
Weight: 510 kg (1122 lb)	Weight: 550 kg (1210 lb)
Service Clearance	
Front	150 cm
Rear	100 cm
Side (left and right)	100 cm
Operating Limits	
Dry bulb temperature range	+15°C to +30°C (+59°F to +86°F) Gradient 5°C/h (41°F/h)
Relative humidity (non–condensing)	35 to 60% (Gradient 5%/h)
Max. wet bulb temperature	+24°C (+75.2°F)
Moisture content	0.019 kg water/kg dry air
Pressure / Elevation	Sea level $\leq$ 2500 m
Optimum Operational Reliability	
Temperature	+ 22°C ($\pm$ 3°C) (+ 72°F ($\pm$ 5°F)
Hygrometry	50% ($\pm$ 5%)
Non–Operating Limits	
Dry bulb temperature range	+5°C to +50°C (+41°F to +122°F) Gradient 25°C/h (77°F/h)
Relative humidity (non–condensing)	5 to 95% (Gradient 30%)
Max. wet bulb temperature	+28°C (+75°F)
Moisture content	0.024 kg water/kg dry air
Shipping Limits	
Dry bulb temperature range	–35°C to +65°C (–31°F to +149°F) Gradient 25°C/h (77°F/h)
Relative humidity (non–condensing)	5 to 95% Gradient 30%/h
Acoustic Power at Room Temperature +20° C (+68° F)	
System Running	**System Idle**
Lw(A) 6.3 Bels	Lw(A) 6.1 Bels

Power Cables	
AC (20A)	2 per cabinet
Cable type	3 x 4mm^2 / AWG # 12 (US)
Connector type	C22 Appliance Coupler
It is mandatory for power lines and terminal boxes to be located within the immediate vicinity of the system and to be easily accessible. Each power line must be connected to a separate, independent electrical panel and bipolar circuit breaker. The PDU requires an extra cable length of 1.5 meters for connection inside the cabinet.	
Electrical Specifications (power supplies are auto–sensing and auto–ranging)	
Current draw	29.5 A max. at 200 VAC input
Power consumption	3000 VA per full CSS module) 1500 VA (per PDU)
Thermal dissipation	2700 W / 9250 BTU (per full CSS module) 1300 W / 4610 BTU (per PDU
Europe	
Nominal voltage	230 VAC (Phase / Neutral)
Voltage range	207 – 244 VAC
Frequency	50 Hz $\pm$ 1%
United States of America	
Nominal voltage	208 VAC (Phase / Neutral)
Voltage range	182 – 229 VAC
Frequency	60 Hz $\pm$ 0.3%
Japan	
Nominal voltage	200 VAC (Phase / Neutral)
Voltage range	188 – 212 VAC
Frequency	60 Hz $\pm$ 0.2%
Brazil	
Nominal voltage	220 VAC (Phase / Neutral)
Voltage range	212 – 231 VAC
Frequency	60 Hz $\pm$ 2%
Breaker Protection	
Mains power CSS module Maximum inrush current	20A Curve C 210A / per quarter period
Mains power PDU Maximum inrush current	20A Curve C 210A / per quarter period

Table 4. NovaScale 5080/5160 Server specifications

Appendix B. Conversion Tables

Imperial to Metric

1 inch (")	2.54 cm (centimeters)
1 foot (') (12 inches)	30.48 cm
1 yards (yd) (3 feet)	0.91 m (meters)
1 mile (mi) (1760 yards)	1.6093 km (kilometers)
1 pound (avdp) (lb)	0.5 kg (kilograms)
1 ounce (avdp) (oz)	28.4 g (grams)
1 square foot (ft^2)	0.093 m^2 (square meters)
1 square inch (in^2)	6.5 cm^2 (square centimeters)
1 square yard (yd^2)	0.8 m^2 (square meters)
1 acre	0.4 ha (hectares)
1 cubic foot (ft^3)	0.03 m^3 (cubic meters)
1 horsepower (hp)	0.7 kw (kilowatts)
1 lb/ft^2	4.88 kg/m^2
1 Btu	0.2929 w hour

Table 5.   Imperial to metric conversion table

Metric to Imperial

1 meter (meter)	3.3' (feet) / 1.09 yd (yards)
1 centimeter (cm)	0.3937" (inches)
1 kilometer (km)	0.62 mi (miles)
1 gram (g)	0.04 oz (ounces (avdp))
1 kilogram (kg)	2.2 lbs (pounds (avdp))
1 sq. centimeter (cm^2)	0.15 in^2 (square inches)
1 square meter (m^2)	10.76 ft^2 (square feet)
1 square meter (m^2)	1.2 yd^2 (square yards)
1 hectare (ha)	2.5 acres
1 cubic meters (m^3)	35.3 ft^3 (cubic feet)
1 kilowatts (kW)	1.3 hp (horsepower)
1 kg/m^2	0.205 lb/ft^2
1 kW hour	3412 Btu (British thermal unit)

Table 6.   Metric to imperial conversion table

Celsius to Fahrenheit Conversion

Multiply the temperature in Celsius by 9, divide by 5 and add 32:

$(C° \times 9/5) + 32 = F°$

Fahrenheit to Celsius Conversion

Subtract 32 degrees from the temperature in Fahrenheit, multiply by 5 and divide by 9:

$(F° - 32) \times 5/9 = C°$

AZERTY/QWERTY Keyboard Lookup Table

Warning:
The EFI shell can only manage QWERTY keyboards. If you have an AZERTY keyboard, please refer to the following table.

Figure 59.   AZERTY keyboard

Figure 60.   QWERTY keyboard

PAM Writing Rules

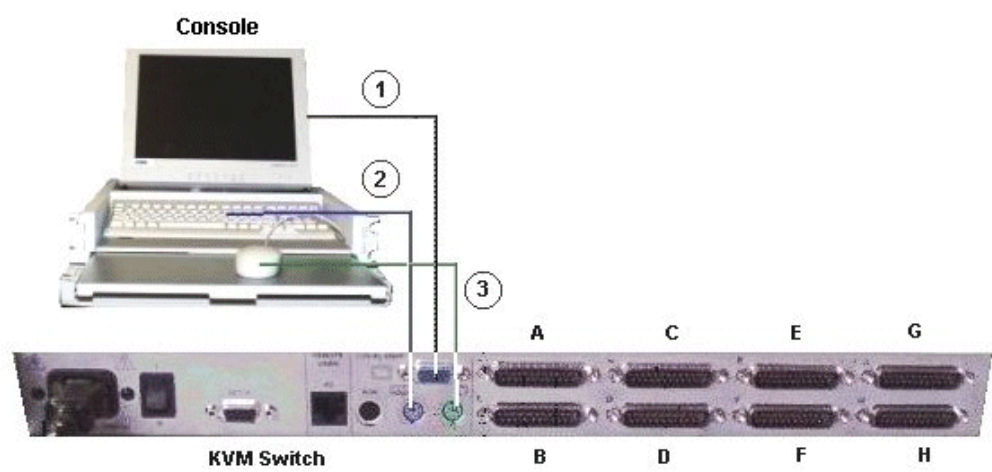The following table lists the characters that must not be used in PAM identifiers.

Forbidden Characters	
à, é, è, ù, ^, ¨	Accentuated letters
/	Slash
\	Backslash
"	Double quote
'	Simple quote
'	Inverted comma
&	Ampersand
+	Plus
*	Asterisk
%	Percent
=	Equal sign
<	Less–than sign
>	Greater–than sign
:	Colon
!	Exclamation mark
?	Question mark
;	Semi–colon
,	Comma
~	Tilde
I	Pipe operator
	Space (Use _ Underscore)

Table 7.   PAM forbidden characters

Appendix C. NovaScale 5080/5160 Server Cabling

Console Data Cables

Mark	Cable Type	From	To
1	HD15 video cable	Monitor (blue)	KVM switch (blue)
2	PS2 mini–DIN6 cable + PS2/PS2 extension cable	Keyboard (mauve)	KVM switch (mauve)
3	PS2 mini–DIN6 cable + PS2/PS2 extension cable	Mouse (green)	KVM switch (green)

Figure 61.   Console data cabling diagram

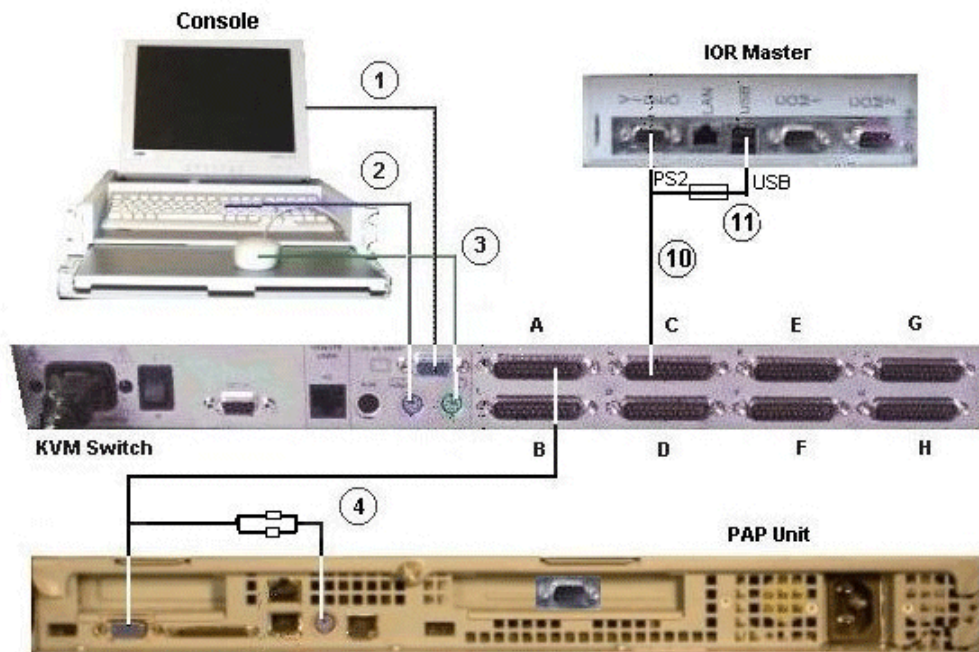# KVM Switch Data Cables (Windows)
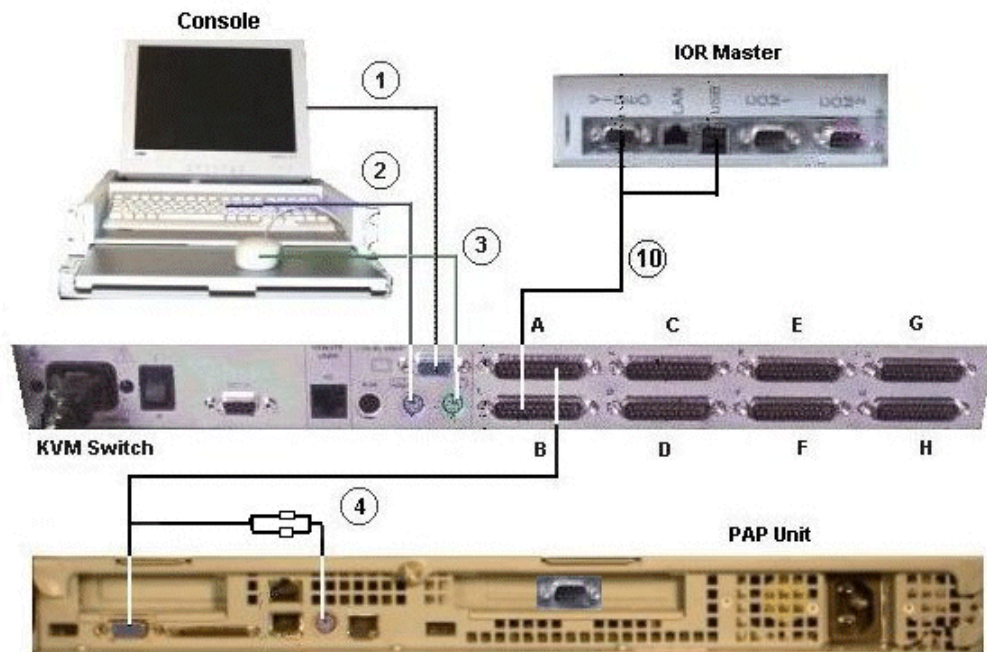
Mark	Cable Type	From	To
1	HD15 video cable	Monitor (blue)	KVM (blue)
2	PS2 mini–DIN6 cable + PS2/PS2 extension cable	Keyboard (mauve)	KVM (mauve)
3	PS2 mini–DIN6 cable + PS2/PS2 extension cable	Mouse (green)	KVM (green)
4	Combined PS2/VGA cable	KVM Port A	PAP VGA/PS2
10	Combined USB/VGA cable (Windows)	KVM Port B	IOR Video/USB

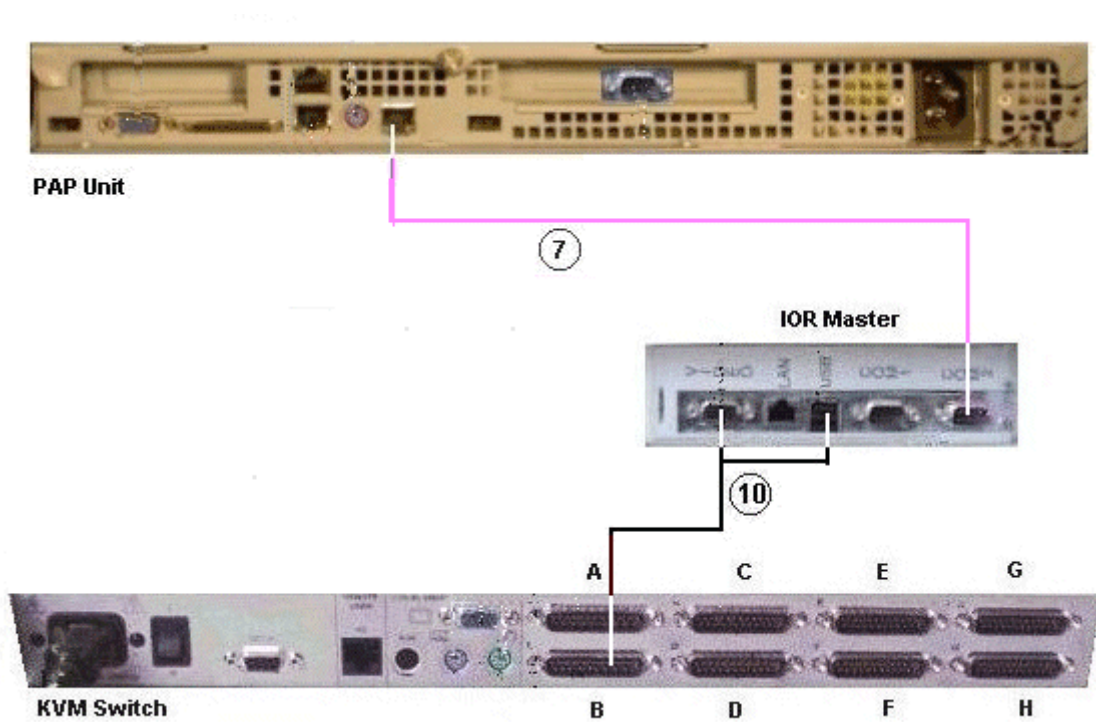Figure 62.   KVM switch data cabling diagram (Windows)

KVM Switch Data Cables (Linux)

Mark	Cable Type	From	To
1	HD15 video cable	Monitor (blue)	KVM (blue)
2	PS2 mini–DIN6 cable + PS2/PS2 extension cable	Keyboard (mauve)	KVM (mauve)
3	PS2 mini–DIN6 cable + PS2/PS2 extension cable	Mouse (green)	KVM (green)
4	Combined PS2/VGA cable	KVM Port A	PAP VGA/PS2
10	Combined PS2/VGA cable (Linux)	KVM Port C	IOR Video/ PS2/USB
11	USB/PS2 converter (Linux)	PS2 cable (mark 10)	IOR USB

Figure 63.   KVM data cabling diagram (Linux)

IOR Data Cables (Windows)

Mark	Cable Type	From	To
7	RJ45/DB9 to DB9 cross cable	PAP COM 2	IOR COM 2
10	Combined USB/VGA cable (Windows)	KVM Port B	IOR Video/USB

Figure 64.   IOR master data cabling diagram (Windows)

IOR Data Cables (Linux)
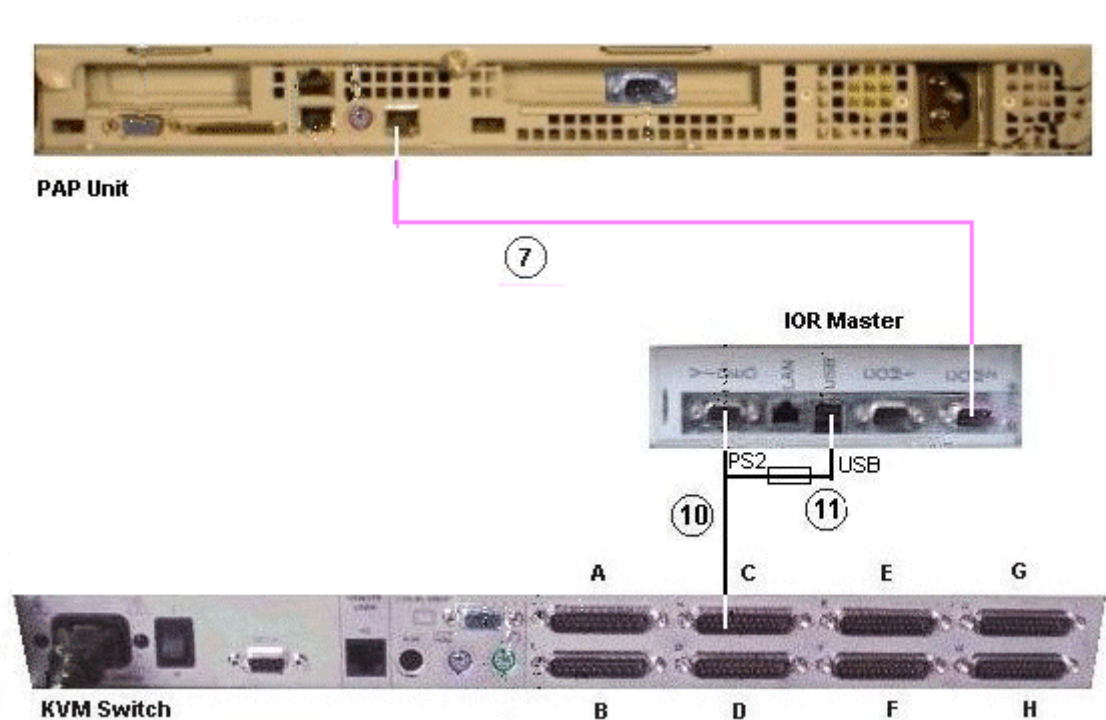
Mark	Cable Type	From	To
7	RJ45/DB9 to DB9 cross cable	PAP COM 2	IOR COM 2
10	Combined PS2/VGA cable (Linux)	KVM Port C	IOR Video/ PS2/USB
11	USB/PS2 converter (Linux)	PS2 cable (mark 10)	IOR USB

Figure 65.   IOR master data cabling diagram (Linux)

PAP Unit Data Cables (SR–0812 Disk Rack)
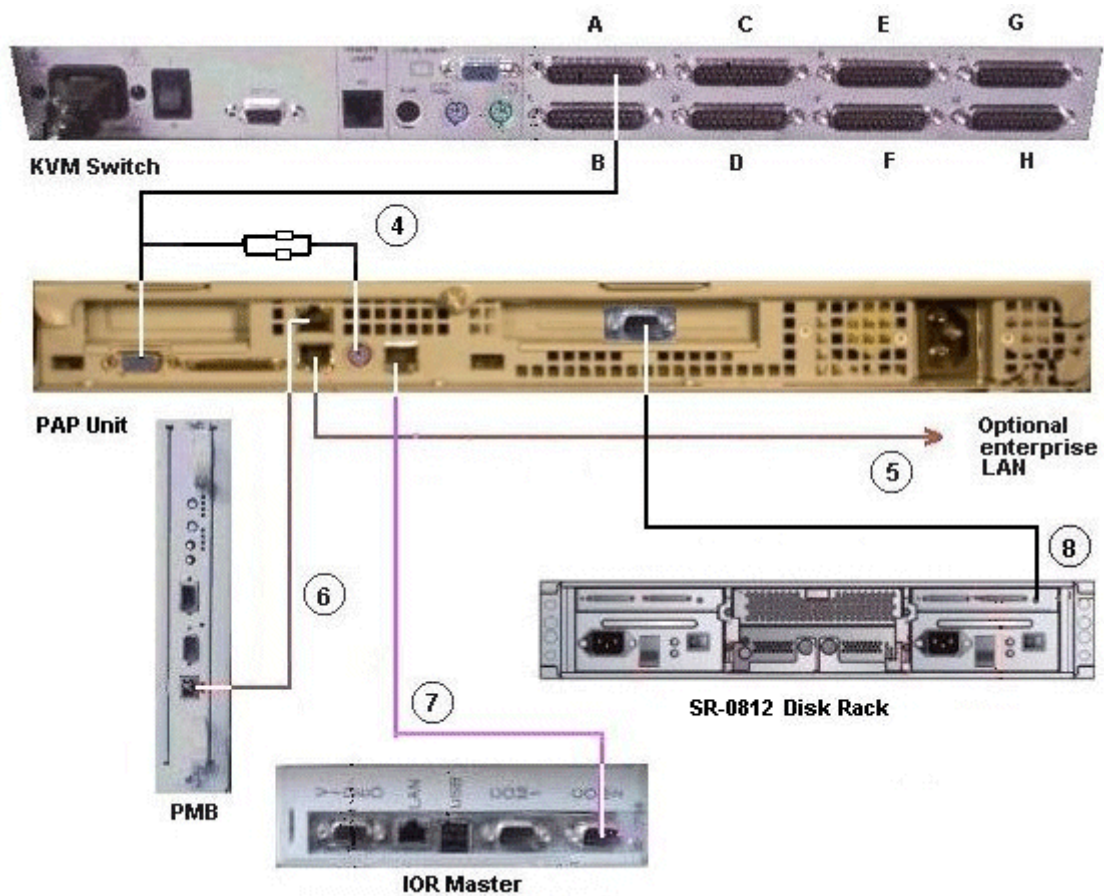
Mark	Cable Type	From	To
4	Combined PS2/VGA cable	KVM Port A	PAP VGA/PS2
5	RJ45 to RJ45 Ethernet cable	PAP LAN Enter	Enterprise LAN
6	RJ45 – RJ45 Ethernet cross cable	PAP LAN Maint	PMB Ethernet
7	RJ45/DB9 to DB9 cross cable	PAP COM 2	IOR COM 2
8	DB9 to Jack cable	PAP COM 1	S/S Disk RS232

Figure 66.   PAP unit data cabling diagram (SR–0812 SCSI disk rack)

PAP Unit Data Cables (SR–1422 Disk Rack)
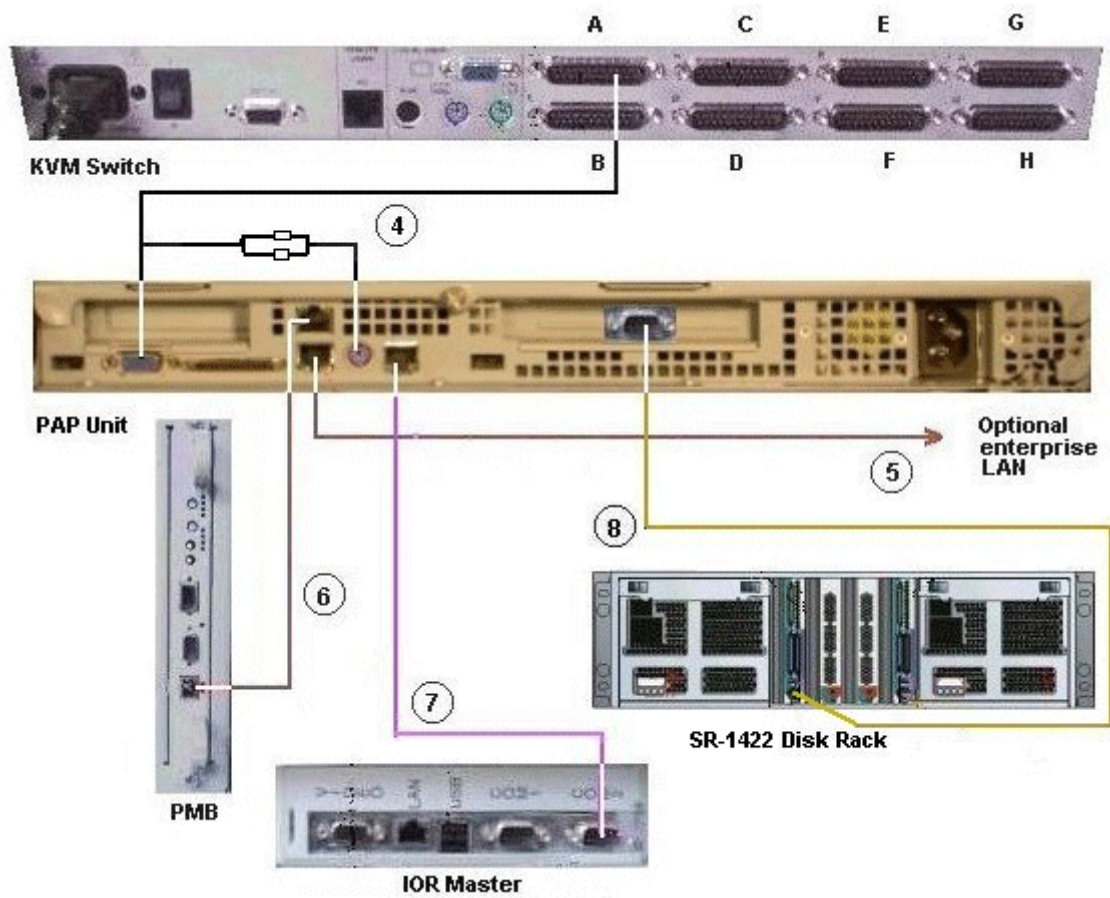
Mark	Cable Type	From	To
4	Combined PS2/VGA cable	KVM Port A	PAP VGA/PS2
5	RJ45 to RJ45 Ethernet cable	PAP LAN Enter	Enterprise LAN
6	RJ45 – RJ45 Ethernet cross cable	PAP LAN Maint	PMB Ethernet
7	RJ45/DB9 to DB9 cross cable	PAP COM 2	IOR COM2
8	DB9 to mini–din 6 cable	PAP COM 1	S/S Disk RS232

Figure 67. PAP unit data cabling diagram (SR–1422 disk rack)
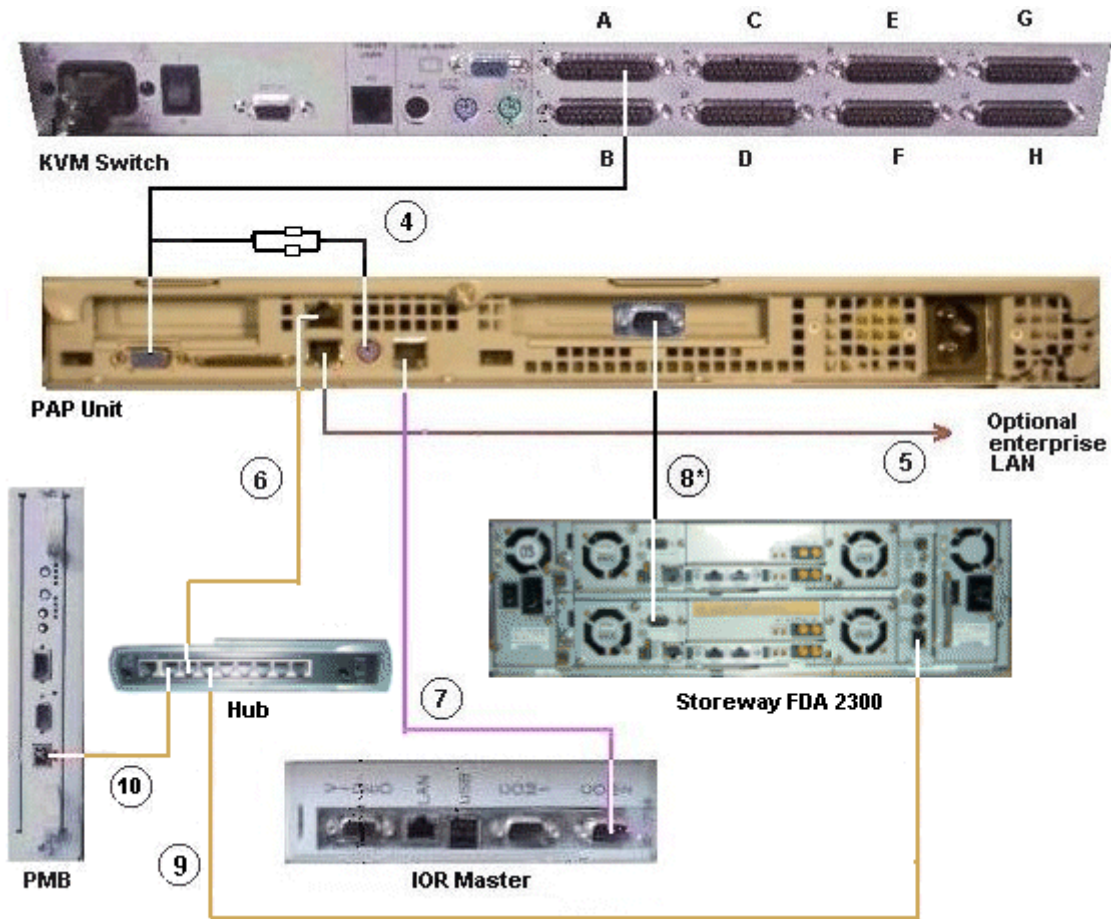
PAP Unit Data Cables (Storeway FDA 1300 Disk Rack)
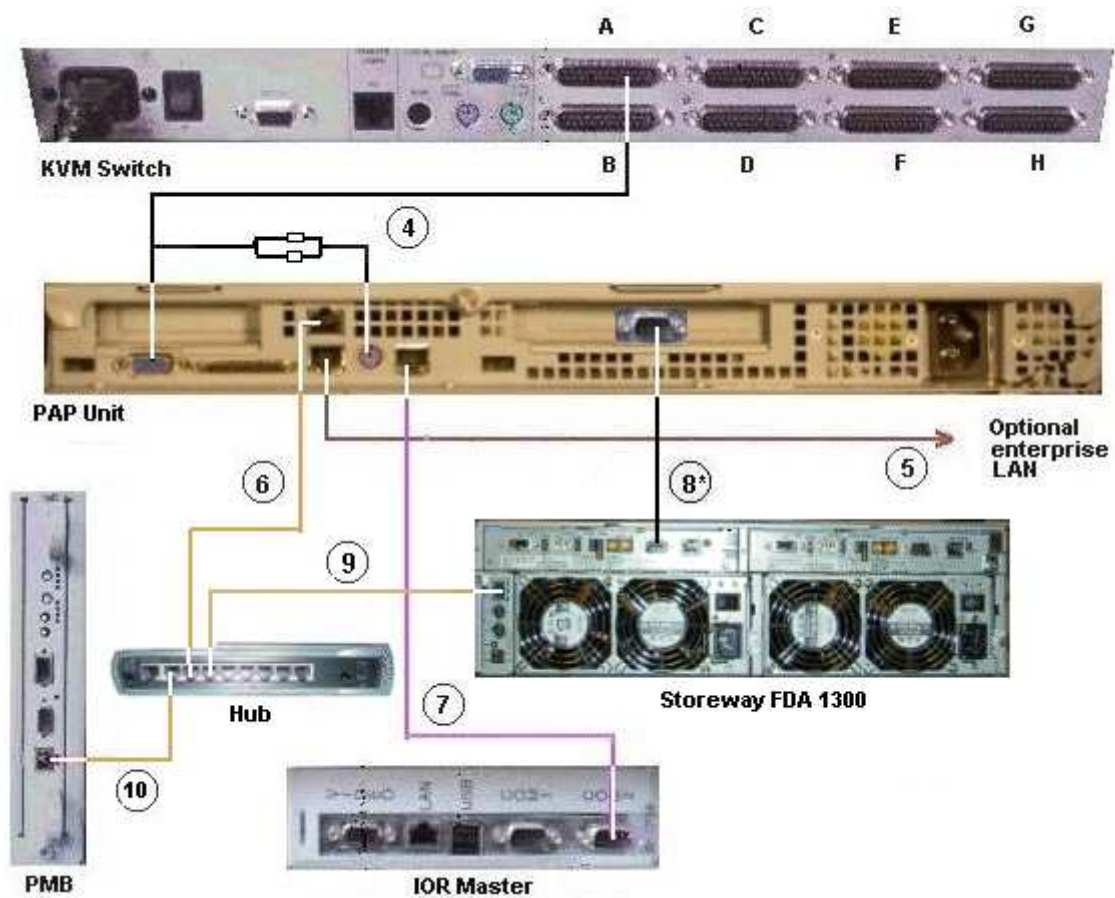
Mark	Cable Type	From	To
4	Combined PS2/VGA cable	KVM Port A	PAP VGA/PS2
5	RJ45 – RJ45 Ethernet cable	PAP LAN Enter	Enterprise LAN
6	RJ45 – RJ45 Ethernet cable	PAP LAN Maint	Hub Ethernet port 7
7	RJ45/DB9 to DB9 cross cable	PAP COM 2	IOR COM 2
8	DB9 to DB9 serial cable *	PAP COM 1	S/S Disk RS232
9	RJ45 – RJ45 Ethernet cable	FDA 1300 Ethernet	Hub Ethernet port 6
10	RJ45 – RJ45 Ethernet cable	PMB Ethernet	Hub Ethernet port 8

* optional cable used to configure the disk S/S IP address.

Figure 68.   PAP unit data cabling diagram (Storeway FDA 1300 disk rack)

# PAP Unit Data Cables (Storeway FDA 2300 Disk Rack)

Mark	Cable Type	From	To
4	Combined PS2/VGA cable	KVM Port A	PAP VGA/PS2
5	RJ45 – RJ45 Ethernet cable	PAP LAN Enter	Enterprise LAN
6	RJ45 – RJ45 Ethernet cable	PAP LAN Maint	Hub Ethernet port 7
7	RJ45/DB9 to DB9 cross cable	PAP COM 2	IOR COM 2
8	DB9 to DB9 serial cable *	PAP COM 1	S/S Disk RS232
9	RJ45 – RJ45 Ethernet cable	FDA 2300 Ethernet	Hub Ethernet port 6
10	RJ45 – RJ45 Ethernet cable	PMB Ethernet	Hub Ethernet port 8

* optional cable used to configure the disk S/S IP address.

Figure 69.   PAP unit data cabling diagram (Storeway FDA 2300 disk rack)

SR–0812 Disk Rack Data Cables
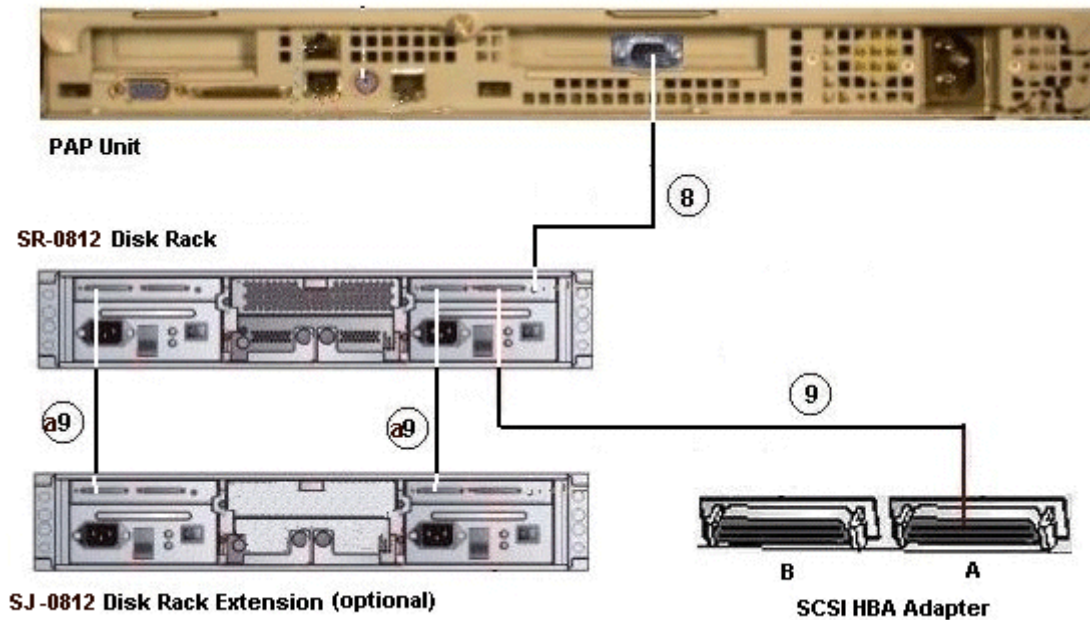
Mark	Cable Type	From	To
8	DB9 to Jack cable	PAP COM 1	S/S Disk RS232
9	SCSI–3 68–pin VHD to VHD cable	HBA SCSI	S/S Disk Host
a9	SCSI–3 68–pin VHD to VHD cable	S/S Disk Extension	S/S Disk Extension

Figure 70.   SR–0812 disk rack data cabling diagram

SR–1422 Disk Rack Data Cables
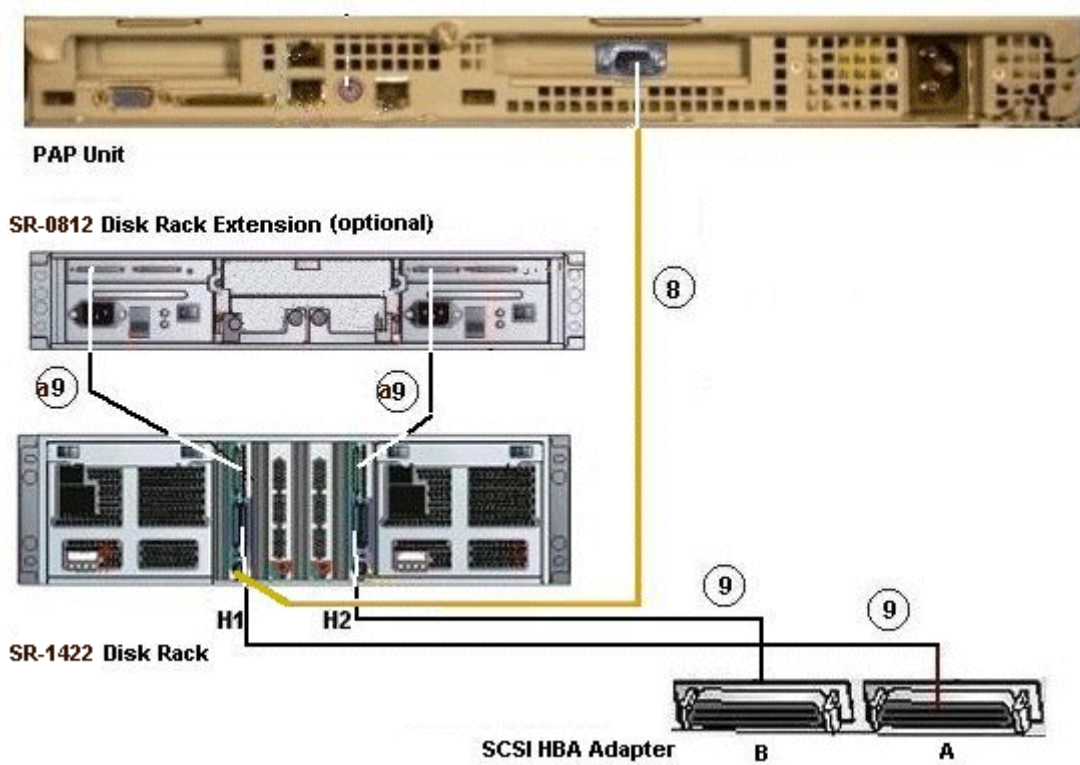
Mark	Cable Type	From	To
8	DB9 to Jack cable	PAP COM 1	S/S Disk RS232
9	SCSI–3 68–pin VHD to VHD cable	HBA SCSI	S/S Disk Host
a9	SCSI–3 68–pin VHD to VHD cable	S/S Disk Extension	S/S Disk Extension

Figure 71.   SR–1422 disk rack data cabling diagram
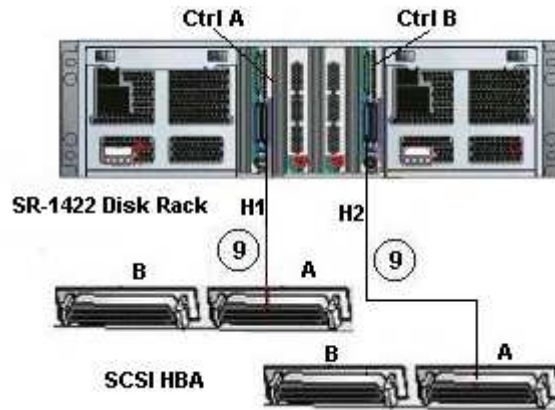
SR–1422 SCSI Disk Rack Dual HBA Data Cables
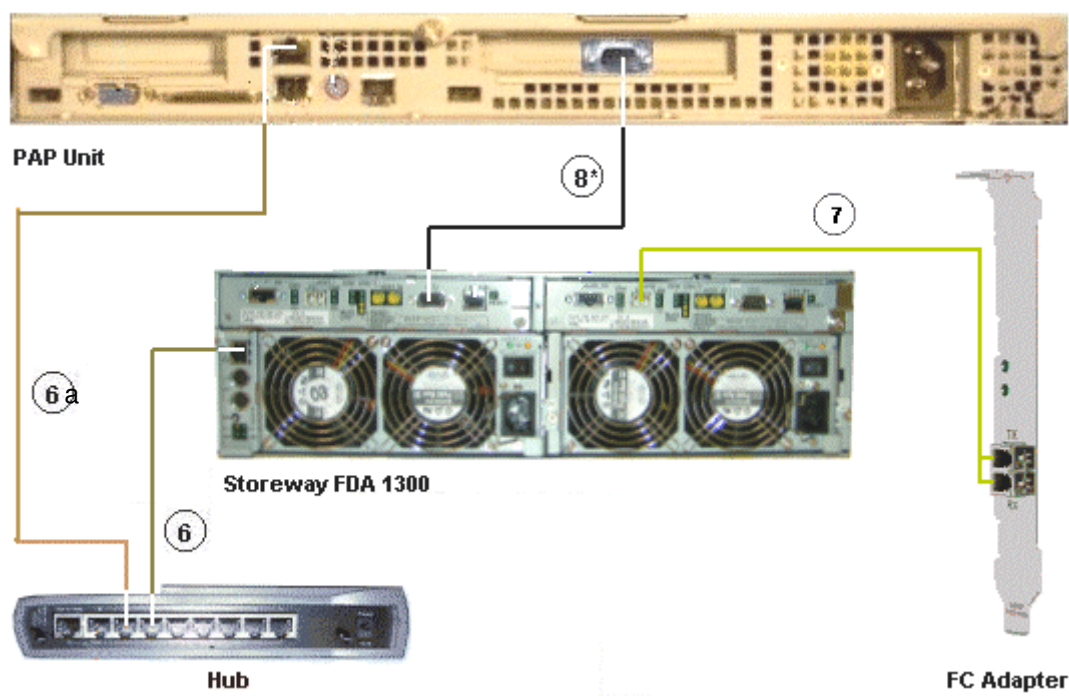
Optionally, the SR–1422 SCSI disk rack can be equipped with two SCSI HBAs, cabled as shown below:

Mark	Cable Type	From	To
9	SCSI–3 68–pin VHD to VHD cable	HBA SCSI	S/S Disk Host
9	SCSI–3 68–pin VHD to VHD cable	HBA SCSI	S/S Disk Host

Figure 72.   SR–1422 SCSI disk rack dual HBA data cabling diagram

Storeway FDA 1300 Disk Rack Data Cables

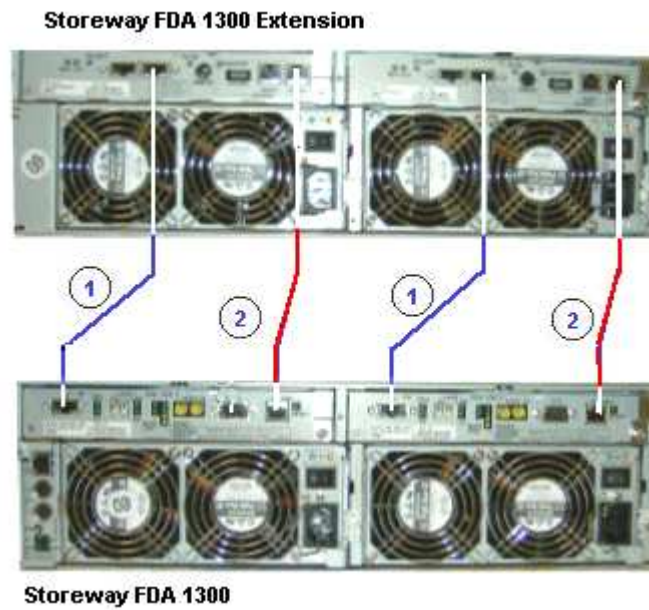| Mark	Cable Type	From	To
6	RJ45 – RJ45 Ethernet cable	S/S Disk	Ethernet Hub port 6
6a	RJ45 – RJ45 Ethernet cable	PAP LAN Maint	Ethernet Hub port 7
7	LC–LC cable	S/S Disk	FC Adapter
8	DB9 to DB9 serial cable *	PAP COM 1	S/S Disk RS232

* optional cable used to configure the S/S disk IP address.

Figure 73.   Storeway FDA 1300 disk rack data cabling diagram

Storeway FDA 1300 Extension Disk Rack Data Cables

Mark	Cable Type	From	To
1	HSSDC–HSSDC cable	S/S Disk	S/S Disk Extension
2	DE diagnosis cable	S/S Disk	S/S Disk Extension

Figure 74.   Storeway FDA 1300 extension disk rack data cabling diagram

Storeway FDA 1300 Disk Rack Dual HBA Data Cables

Mark	Cable Type	From	To
1	LC–LC cable	S/S Disk controller 0	FC Adapter 1
2	LC–LC cable	S/S Disk controller 1	FC Adapter 2

Figure 75.   Storeway FDA 1300 disk rack dual HBA data cabling diagram

Storeway FDA 2300 Disk Rack Data Cables
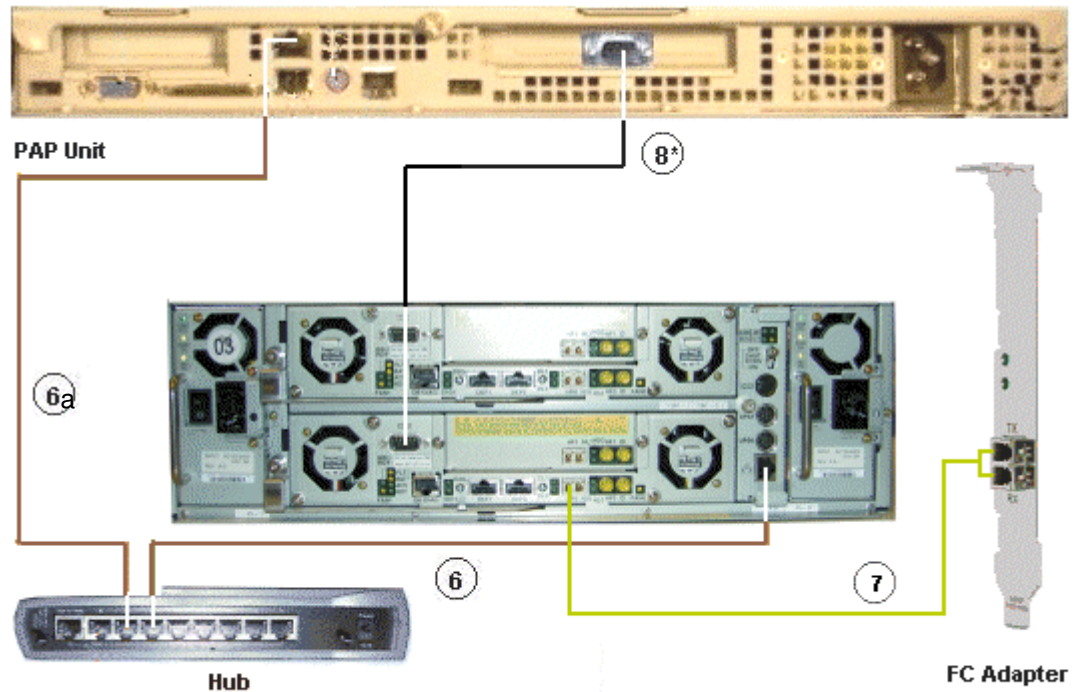
Mark	Cable Type	From	To
6	RJ45 – RJ45 Ethernet cable	S/S Disk	Ethernet Hub port 6
6a	RJ45 – RJ45 Ethernet cable	PAP LAN Maint	Ethernet Hub port 7
7	LC–LC cable	S/S Disk	FC Adapter
8	DB9 to DB9 serial cable *	PAP COM 1	S/S Disk RS232

* optional cable used to configure the S/S disk IP address.

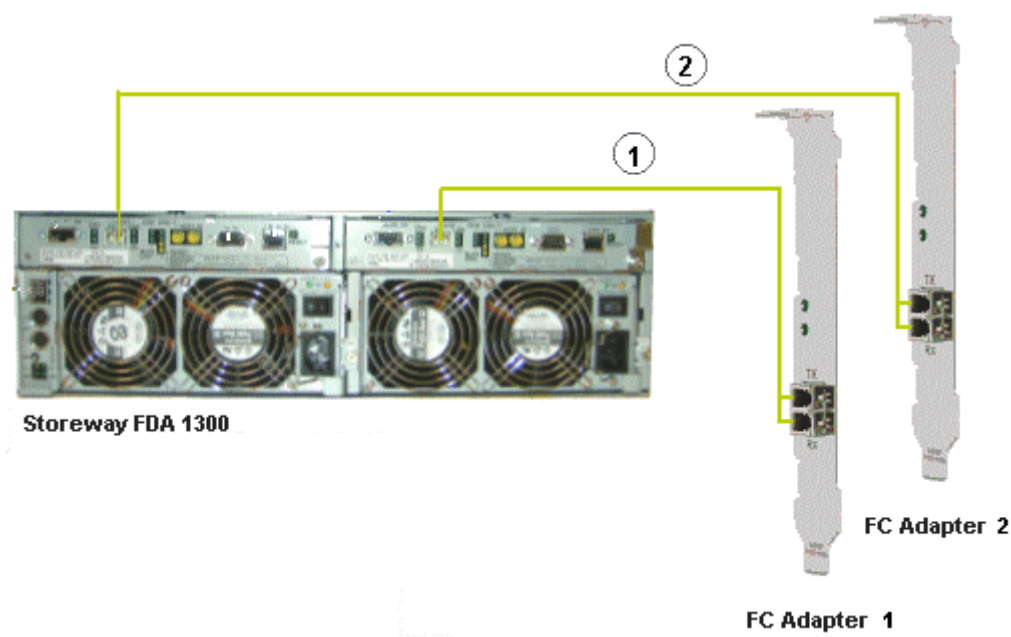Figure 76.   Storeway FDA 2300 disk rack data cabling diagram

Storeway FDA 2300 Disk Rack Dual HBA Data Cables

Mark	Cable Type	From	To
1	LC–LC cable	S/S Disk controller 0	FC Adapter 1
2	LC–LC cable	S/S Disk controller 1	FC Adapter 2

Figure 77.   Storeway FDA 2300 disk rack dual HBA data cabling diagram

Storeway FDA 2300 Extension Disk Rack Data Cables
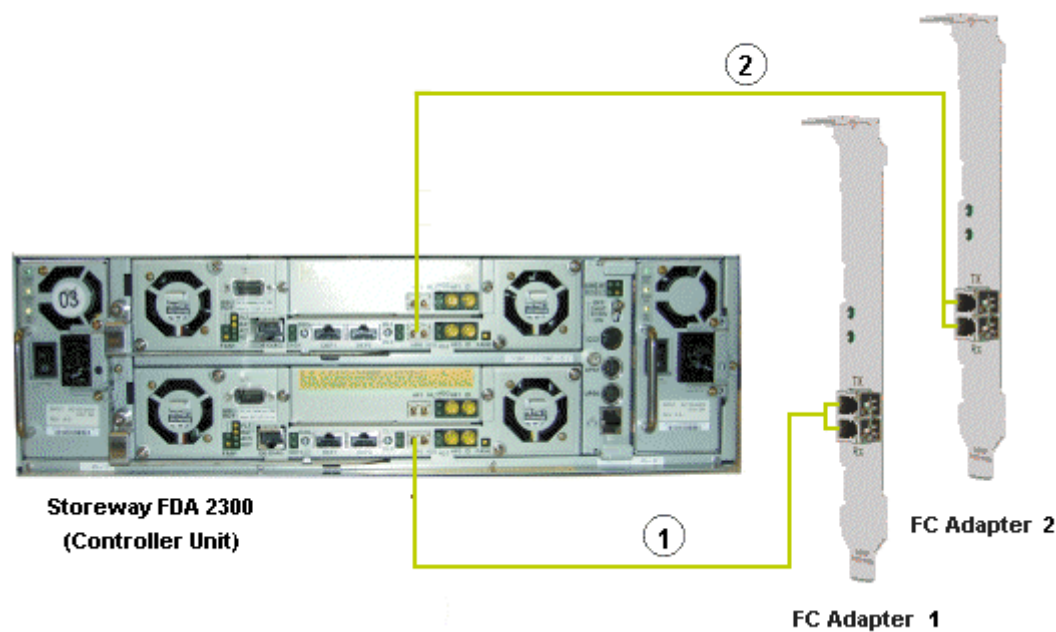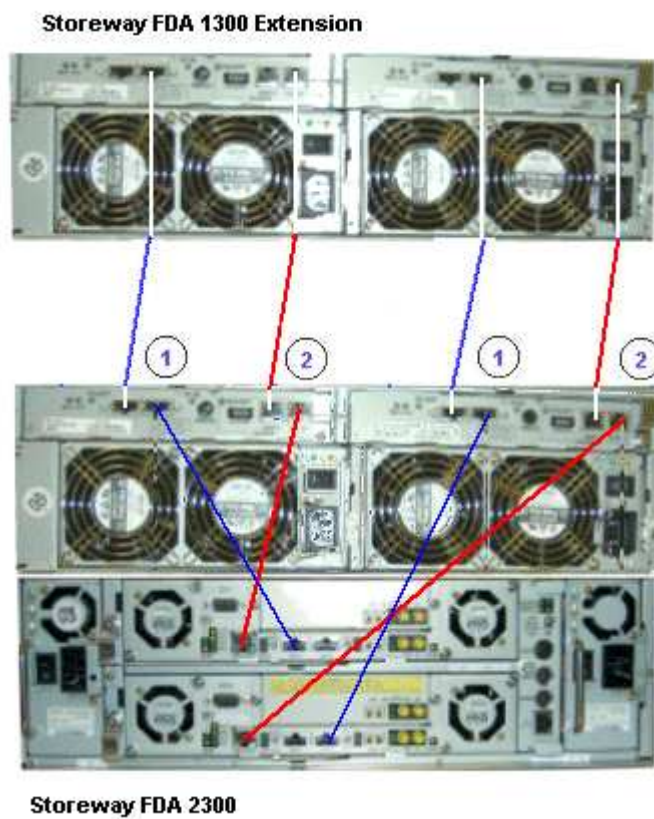

Mark	Cable Type	From	To
1	HSSDC–HSSDC cable	S/S Disk	S/S Disk Extension
2	DE diagnosis cable	S/S Disk	S/S Disk Extension

Figure 78.   Storeway FDA 2300 – Storeway FDA 1300 extension data cabling diagram

PMB – PAP Data Cables (SCSI Storage Subsystem)
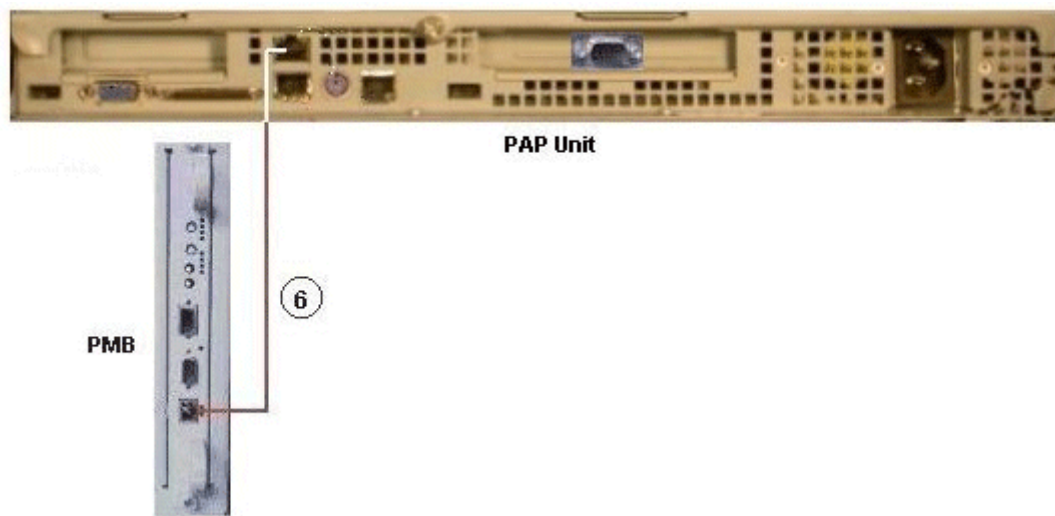
Mark	Cable Type	From	To
6	RJ45 – RJ45 Ethernet cross cable	PAP LAN Maint	PMB Ethernet

Figure 79.   PMB – PAP (SCSI Storage) data cabling diagram

PMB – PAP Data Cables (FC Storage Subsystem)
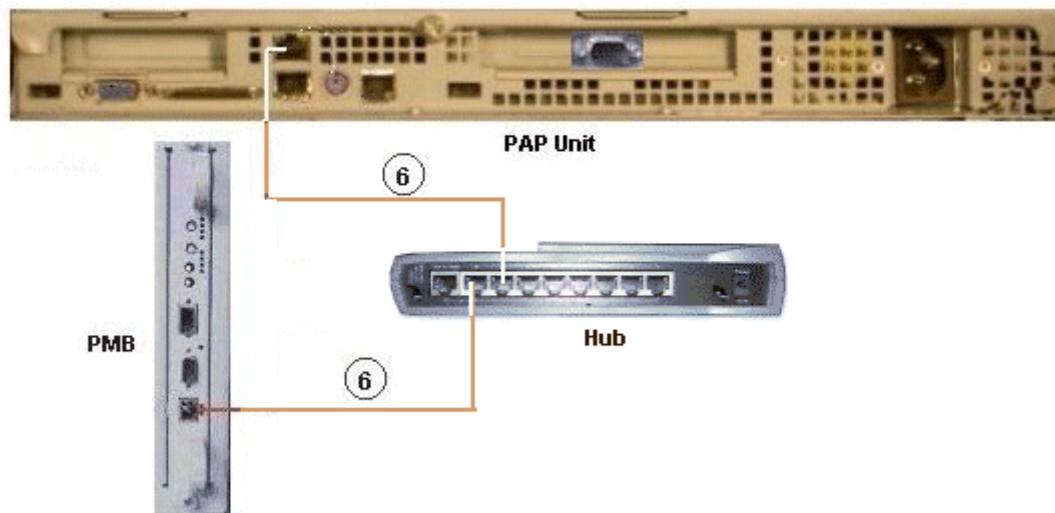
Mark	Cable Type	From	To
6	RJ45 – RJ45 Ethernet cable	PAP LAN Maint	Ethernet Hub port 7
6	RJ45 – RJ45 Ethernet cable	Ethernet Hub port 8	PMB Ethernet

Figure 80.   PMB – PAP (FC Storage) data cabling diagram

Ethernet Hub Data Cables (Storeway FDA 1300 Disk Rack)
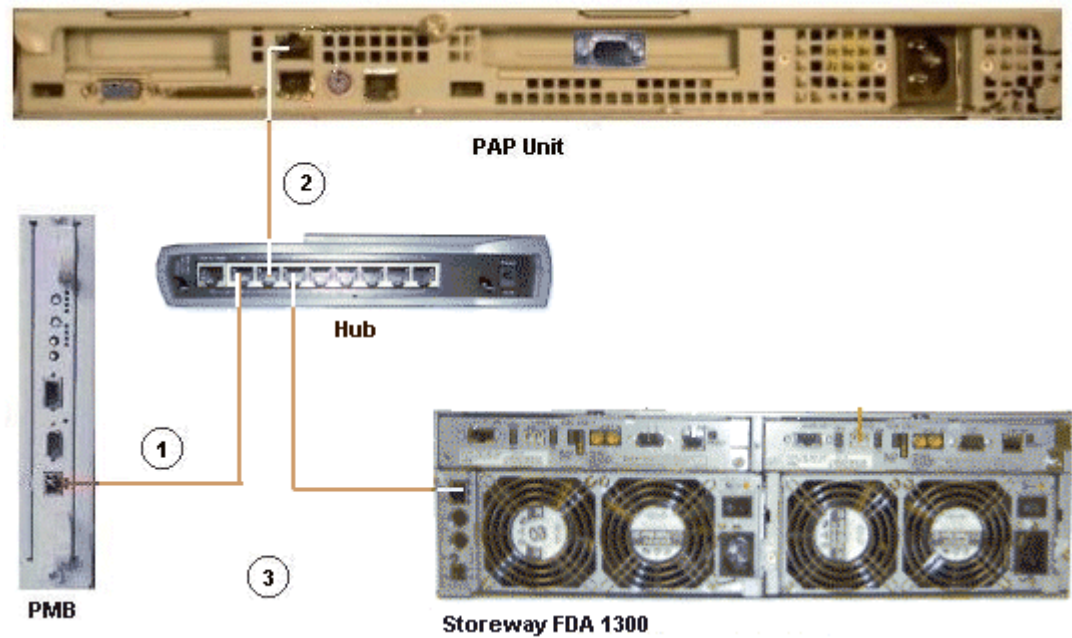
Mark	Cable Type	From	To
1	RJ45 – RJ45 Ethernet cable	Hub Ethernet port 8	PMB Ethernet
2	RJ45 – RJ45 Ethernet cable	Hub Ethernet port 7	PAP LAN Maint
3	RJ45 – RJ45 Ethernet cable	Hub Ethernet port 6	FDA 1300

Figure 81.   Ethernet hub data cabling diagram (Storeway FDA 1300 Disk Rack)

Ethernet Hub Data Cables (Storeway FDA 2300 Disk Rack)
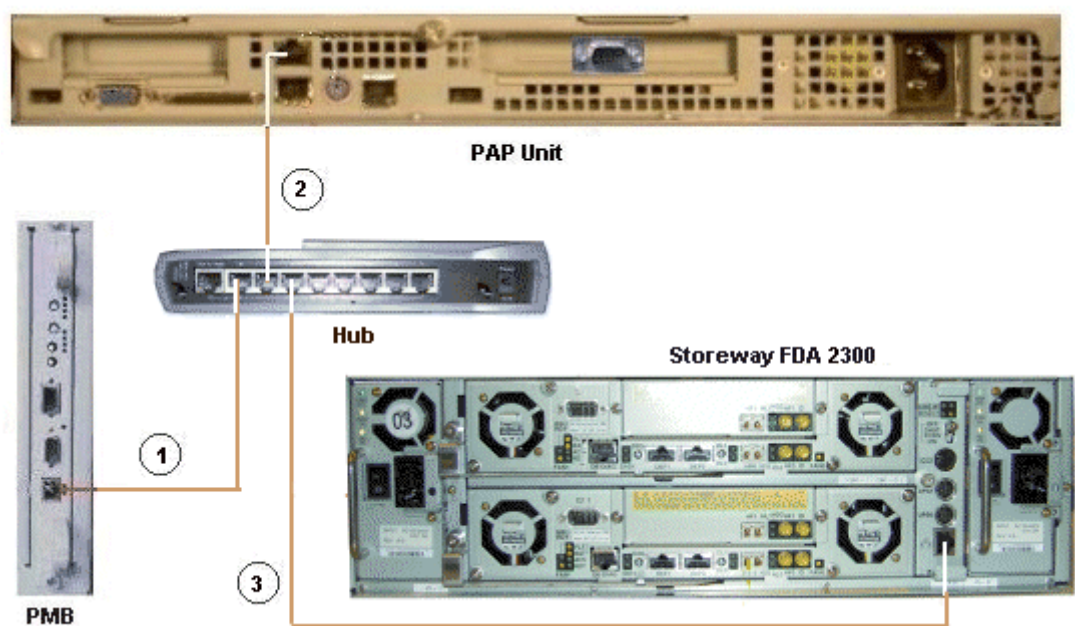
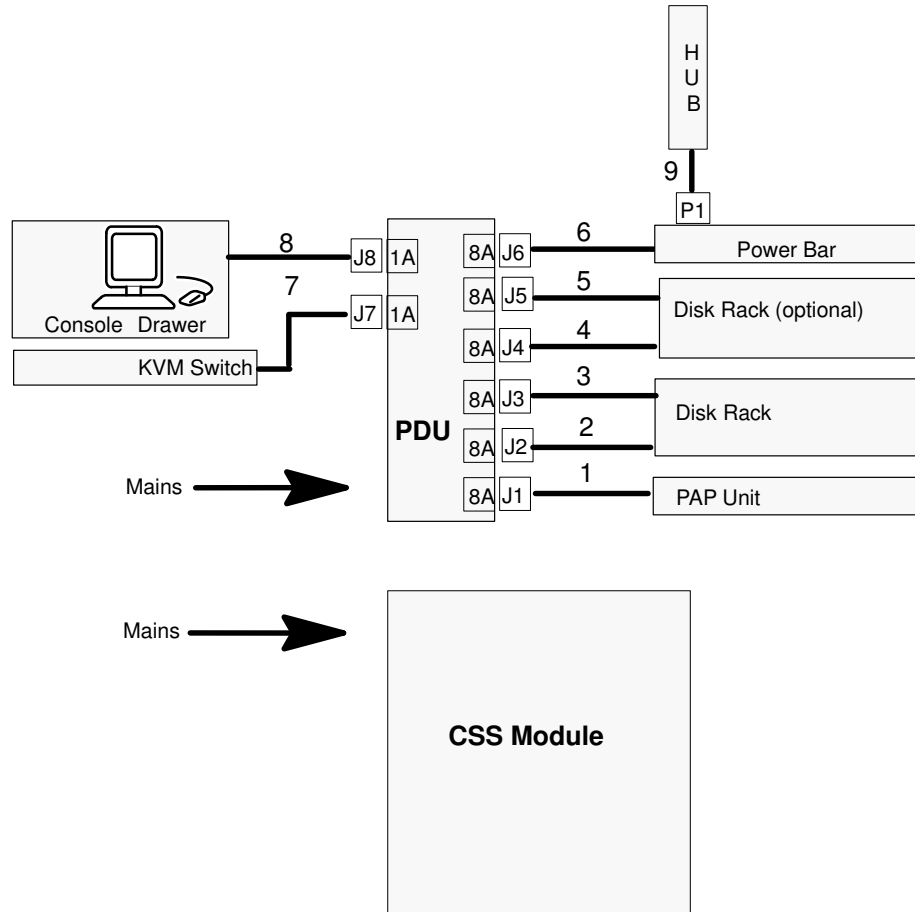| Mark	Cable Type	From	To
1	RJ45 – RJ45 Ethernet cable	Hub Ethernet port 1	PMB Ethernet
2	RJ45 – RJ45 Ethernet cable	Hub Ethernet port 2	PAP LAN Maint
3	RJ45 – RJ45 Ethernet cable	Hub Ethernet port 3	FDA 2300

Figure 82.   Ethernet hub data cabling diagram (Storeway FDA 2300 Disk Rack)

Power Cables

The CSS Module is equipped with a dedicated power supply cable. All other server component power supply cables are connected to the internal PDU, as shown below:

Mark	Cable Type	From	To
1	Power cable	PAP PWR	PDU J1
2	Power cable	S/S Disk PWR	PDU J2
3	Power cable	S/S Disk PWR	PDU J3
4	Power cable	Optional S/S Disk PWR	PDU J4
5	Power cable	Optional S/S Disk PWR	PDU J5
6	Power cable	Power Bar	PDU J6
7	Power cable	KVM PWR	PDU J7
8	Power cable	Monitor PWR	PDU J8

Mark	Cable Type	From	To
9	Power cable	Hub PWR	Power Bar P1

Figure 83.   Power cabling diagram

Glossary

A

AC: Alternating **C**urrent generated by the power supply. See DC.

ACPI: Advanced **C**onfiguration and **P**ower **I**nterface. 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.

Address: A label, name or number that identifies a location in a computer memory.

AMI: American **M**egatrends **I**ncorporated.

ANSI: American **N**ational **S**tandards **I**nstitute.

API: Application **P**rogram **I**nterface. The specific method prescribed by a computer operating system or by an application program by which a programmer writing an application program can make requests of the operating system or another application.

Archive: (Archive file). A file that is a copy of a history file. When a history file is archived, all messages are removed from the history file.

ASCII: American **N**ational **S**tandard **C**ode for **I**nformation **I**nterchange. A standard number assigned to each of the alphanumeric characters and keyboard control code keys to enable the transfer of information between different types of computers and peripherals.

B

Backup: A copy of data for safe–keeping. The data is copied form computer memory or disk to a floppy disk, magnetic tape or other media.

Backup battery: The battery in a computer that maintains real–time clock and configuration data when power is removed.

Baud rate: The speed at which data is transmitted during serial communication.

BIOS: Basic **I**nput / **O**utput **S**ystem. A program stored in flash EPROM or ROM that controls the system startup process.

BIST: Built–**I**n **S**elf–**T**est. See POST.

Bit: Derived from **BI**nary digi**T**. A bit is the smallest unit of information a computer handles.

BSP: Board **S**upport **P**ackage. Part of the PMB embedded software, in charge of PMB hardware initialization and providing hardware related functions to the VxWorks operating system and to the Maestro application.

BSP: Boot**S**trap **P**rocessor. A master processor elected among the processors of a QBB to drive QBB initialization.

BTU: British Thermal Unit.

C

Cache Memory: A very fast, limited portion of RAM set aside for temporary storage of data for direct access by the microprocessor.

CD-ROM: Compact **D**is**K** **R**ead-**O**nly **M**emory. High-capacity read-only memory in the form of an optically readable compact disk.

Cell: The smallest set of hardware components allocated to a single OS. A cell is functionally defined by:
– the number of available processors
– memory capacity
– I/O channel capacity.

CellBlock: A group of interconnected cells within a single domain. See Central Subsystem.

Central Subsystem: A group of interconnected cells gathered within a single domain. See CellBlock.

Chip: Synonym for integrated circuit. See IC.

Clipping: A PAM 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.

CMC: **C**orrected **M**emory **C**heck.

CMOS: **C**omplementary **M**etal **O**xide **S**emiconductor. A type of low–power integrated circuits. System startup parameters are stored in CMOS memory. They can be changed via the system setup utility.

COM: **C**omponent **O**bject **M**odel. Microsoft technology for component based application development under Windows.

COM +: **C**omponent **O**bject **M**odel +. Microsoft technology for component based application development under Windows. The external part of the PAM software package is a COM+ application.

COM1 or COM2: The name assigned to a serial port to set or change its address. See Serial Port.

Command: An instruction that directs the computer to perform a specific operation.

Configuration: The way in which a computer is set up to operate. Configurable options include CPU speed, serial port designation, memory allocation, ...

Configuration Tasks: A PAM feature used to configure and customize the server.

Control Pane: One of the three areas of the PAM web page. When an item is selected in the **PAM Tree** pane, details and related commands are displayed in the **Control** pane. See also PAM Tree pane and Status pane.

COS: **C**luster **O**perating **S**ystem.

CPE: **C**orrected **P**CI **E**rror.

CPU: **C**entral **P**rocessing **U**nit. See Microprocessor.

CSE: **C**ustomer **S**ervice **E**ngineer.

CSS: **C**entral **S**ub–**S**ystem. See CellBlock.

CSS Module: A MidPlane with all its connected components (QBBs, IOBs, PMB) and utility devices. See Module.

D

D2D: **D**C **to D**C converter.

DC: **D**irect **C**urrent generated by the power supply. See AC.

Default Setting: The factory setting your server uses unless instructed otherwise.

Density: The capacity of information (bytes) that can be packed into a storage device.

Device Driver: A software program used by a computer to recognize and operate hardware.

DIG64: **D**eveloper **I**nterface **G**uide for IA64.

DIM Code: **D**evice **I**nitialization **M**anager. Initializes different BUSes during the BIOS POST.

DIMM: **D**ual **I**n-line **M**emory **M**odule – the smallest system memory component.

Disk Drive: A device that stores data on a hard or floppy disk. A floppy disk drive requires a floppy disk to be inserted. A hard disk drive has a permanently encased hard disk.

DMA: **D**irect **M**emory **A**ccess. 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.

DMI: **D**esktop **M**anagement **I**nterface. An industry framework for managing and keeping track of hardware and software components in a system of personal computers from a central location.

DNS: **D**omain **N**ame **S**erver. A server that retains the addresses and routing information for TCP/IP LAN users.

Domain: is the coherent set of resources allocated to run a customer activity, i.e. the association –at boot time– of a Partition, an OS instance (including applications) and associated LUNs and an execution context including execution modes and persistent information (e.g. time, date of the OS instance). Domain definitions and initializations are performed via PAM. A Domain can be modified to run the same OS instance on a different Partition. When a Domain is running, its resources are neither visible nor accessible to other running Domains.

Domain Identity: See Indentity.

Domain Manager: A PAM feature used to power on / off and manage server domains. See Domain.

DPS: **D**istributed **P**ower **S**upply.

DRAM: Dynamic Random Access Memory is the most common type of random access memory (RAM).

E

EEPROM: Electrically **E**rasable **P**rogrammable **R**ead-**O**nly **M**emory. A type of memory device that stores password and configuration data. See also EPROM.

EFI: Extensible **F**irmware **I**nterface.

EFIMTA: EFI Modular **T**est **A**rchitecture.

EFI Shell: The EFI (Extensible Firmware Interface) Shell is a 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.

EMI: Electro–**M**agnetic **I**nterference.

EPROM: Erasable **P**rogrammable **R**ead-**O**nly **M**emory. 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.

ERC: Error **R**ecovery **C**heck.

ERP: Error **R**ecovery **P**rocedure.

ESD: Electro**S**tatic **D**ischarge. An undesirable discharge of static electricity that can damage equipment and degrade electrical circuitry.

Event: The generation of a message (event message) by a software component and that is directed to the Event Manager.

Event address: Defines the destination for a message sent over a specified event channel. An address is one of: the name of a history file (for the HISTORY channel), an e–mail address (for the EMAIL channel), the name of a user group (for the WEB channel), the SNMP Manager IP address (for the SNMP channel).

Event channel: Defines how the Event Manager sends an event message. An event channel is one of: HISTORY (the message is logged in a history file), EMAIL (the message is sent to an e–mail address), WEB (the message is stored for analysis from the PAM web user interface), SNMP (the message is sent as an SNMP trap to the selected SNMP application).

Event filter: A list of selected messages among all possible event messages. If an event message is not included in the filter, the Event Manager discards the message.

Event Manager: A PAM feature used to forward event messages over a configured event channel. See Event.

Event message: A message sent by a software component to the Event Manager for routing to a destination that is configured by an administrator.

Event subscription: An object that defines the event channel, address, and filter for sending an event message. If no such object is defined, the event message is discarded.

F

Fail–over: Failover is a backup operational mode in which the functions of a system component (such as a processor, server, network, or database, for example) are assumed by secondary system components when the primary component becomes unavailable through either failure or scheduled down time.

FAME: Flexible **A**rchitecture for **M**ultiple **E**nvironments.

FAST WIDE: A standard 16–bit SCSI interface providing synchronous data transfers of up to 10 MHz, with a transfer speed of 20M bytes per second.

FC: Fibre **C**hannel.

FCAL: Fibre **C**hannel **A**rbitrated **L**oop.

FCBQ: Fan **C**ontrol **B**oard for **Q**BB.

FCBS: Fan **C**ontrol **B**oard for **S**PS.

FDA: Fibre **D**isk **A**rray.

FDD: Floppy **D**isk **D**rive.

Flash EPROM: Flash Erasable Programmable Read-Only Memory. A type of memory device that is used to store the 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. An EPROM containing the system firmware.

Firewall: A set of related programs, located at a network gateway server, that protects the resources of a private network from users from other networks.

Firmware: an ordered set of instructions and data stored to be functionally independent of main storage.

Format: The process used to organize a hard or floppy disk into sectors so that it can accept data. Formatting destroys all previous data on the disk.

FPB: FAME **P**ower **B**oard (FAME: Flexible Architecture for Multiple Environments).

FRB: **F**ault **R**esilient **B**oot. A server management feature. FRB attempts to boot a system using the alternate processor or DIMM.

FRU: **F**ield **R**eplaceable **U**nit. A component that is replaced or added by Customer Service Engineers as a single entity.

FSS: **F**AME **S**calability **S**witch. Each CSS Module is equipped with 2 Scalability Port Switches providing high speed bi–directional links between server components. See SPS.

FTP: **F**ile **T**ransfer **P**rotocol. A standard Internet protocol: the simplest way of exchanging files between computers on the Internet. FTP is an application protocol that uses Internet TCP/IP protocols. FTP is commonly used to transfer Web page files from their creator to the computer that acts as their server for everyone on the Internet. It is also commonly used to download programs and other files from other servers.

FWH: **F**irm**W**are **H**ub.

G

GB: **G**iga**B**yte: 1,073,741,824 bytes. See Byte.

GUI: **G**raphical **U**ser **I**nterface.

H

HA: **H**igh **A**vailability. Refers to a system or component that is continuously operational for a desirably long length of time.

HA CMP: **H**igh **A**vailability **C**lustered **M**ulti**P**rocessing.

Hard Disk Drive: HDD. See Disk Drive.

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

Hardware Monitor: A PAM feature used to supervise server operation.

Hot Plug: A method used to insert or remove system components during system operation.

Hot Swap: A method used to insert or remove system components during system operation.

HBA: **H**ost **B**us **A**dapter.

HDD: **H**ard **D**isk **D**rive. See Disk Drive.

History File: A file in which the History Manager logs informative messages or error messages relating to system activity. Messages are sent from source components to target components.

History Manager: The component running on the PAP Windows operating system that logs messages to history files.

HPC: **H**igh **P**erformance **C**omputing.

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.

HTTP: **H**yper**T**ext **T**ransfer **P**rotocol. In the World Wide Web, a protocol that facilitates the transfer of hypertext–based files between local and remote systems.

HW Identifier: Number (0 – F) used to identify Cellblock components. This number is identical to PMB code–wheel position.

I

I2C: **I**ntra **I**ntegrated **C**ircuit. 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.

IA64: is a **64**–bit **I**ntel processor **A**rchitecture based on Explicitly Parallel Instruction Computing (EPIC). The Itanium processor is the first in the Intel line of IA–64 processors.

IB: **I**nfini **B**and.

IC: **I**ntegrated **C**ircuit. An electronic device that contains miniaturized circuitry. See Chip.

ICH4: **I**/O **C**ontrol **H**ub.

ICMB: **I**ntelligent **C**hassis **M**anagement **B**us.

ID: A number which uniquely identifies a device on a bus.

IDE: **I**ntegrated **D**rive **E**lectronics. A type of hard disk drive with the control circuitry located inside the disk drive rather than on a drive controller card.

Identity: a PAM Domain management logical resource. This resource contains context information related to the Customer activity running in a domain. The most visible attribute of this resource is the name that the Customer gives to the activity. For each domain created, the Domain management feature allows the operator to define a new activity or choose an activity from the list of existing activities. See Domain.

IIS: Internet **I**nformation **S**erver. A group of Internet servers (including a Web or HTTP server and a FTP server) with additional capabilities for Microsoft Windows NT and Microsoft Windows 2000 Server (and later) operating systems.

I/O: Input /**O**utput. Describes any operation, program, or device that transfers data to or from a computer.

Interface: A connection between a computer and a peripheral device enabling the exchange of data. See Parallel Port and Serial Port.

IOB: Input / **O**utput **B**oard. The IOB supports a simultaneous 3.2 GB/s throughput each way and can connect up to 11 PCI–X boards.

IOR: I/O Riser. The IO Riser provides:
– I/O controller Hub
– USB ports
– 10/100/1000 Ethernet controller
– Video controller
– Serial / debug port

IP: Internet **P**rotocol. The protocol by which data is sent from one computer to another via the Internet. Each computer (known as a host) on the Internet has at least one IP address that uniquely identifies it from all other computers on the Internet.

IPF: Itanium **P**rocessor **F**amily.

IPL: Initial **P**rogram **L**oad. It defines the firmware functional phases during the system initialization.

IPMB: Intelligent **P**latform **M**anagement **B**us.

IPMI: Intelligent **P**latform **M**anagement **I**nterface.

ISA: Industry **S**tandard **A**rchitecture. An industry standard for computers and circuit cards that transfer 16 bits of data at a time.

J

Jumper: A small electrical connector used for configuration on computer hardware.

K

KVM: Keyboard **V**ideo **M**onitor.

KVM switch: the **K**eyboard **V**ideo **M**onitor switch allows the use of a single keyboard, monitor and mouse for more than one module.

L

LAN: Local **A**rea **N**etwork. A group of computers linked together within a limited area to exchange data.

LED: Light **E**mitting **D**iode. A small electronic device that glows when current flows through it.

Legacy Application: An application in which a company or organization has already invested considerable time and money. Typically, legacy applications are database management systems (DBMSs) running on mainframes or minicomputers.

LD: Logical **D**isk. A Storeway FDA 1300/2300 logical disk (or LUN) is visible to the OS as a Disk. See LUN and PD (Physical Disk).

LPT1 or LPT2: The name assigned to a parallel port to specify its address. See Parallel Port.

LS240: Laser **S**ervo super diskette holding up to 240 Mb.

LUN: Logical **U**nit **N**umber. Term used to designate Logical Storage Units (logical disks) defined through the configuration of physical disks stored in a mass storage cabinet.

LVDS: Low **V**oltage **D**ifferential **S**CSI.

M

MAESTRO: Machine Administration Embedded Software Real Time Oriented.
Part of the PAM software package embedded on the PMB board.

MCA: Machine **C**heck **A**bort.

MIMD: Multiple Instruction **M**ultiple **D**ata

Memory: Computer circuitry that stores data and programs. See RAM and ROM.

Microprocessor: An integrated circuit that processes data and controls basic computer functions.

Mirrored volumes: A mirrored volume is a fault–tolerant volume that duplicates your data on two physical disks. If one of the physical disks fails, the data on the failed disk becomes unavailable, but the system continues to operate using the unaffected disk.

Module: a Midplane Board with all its connected components and utility devices. See CSS Module and MP.

MP, MPI, MPB: **M**id–**P**lane. All system hardware components are connected to the MP, which also houses the FAME Scalability Switch (FSS) and the internal clock.

MTBF: **M**ean **T**ime **B**etween **F**ailure. An indicator of expected system reliability calculated on a statistical basis from the known failure rates of various components of the system. Note: MTBF is usually expressed in hours.

Memory bank: The minimum quantity of memory used by the system. It physically consists of four memory DIMMs.

Multimedia: Information presented through more than one type of media. On computer systems, this media includes sound, graphics, animation and text.

Multitasking: The ability to perform several tasks simultaneously. Multitasking allows you to run multiple applications at the same time and exchange information among them.

N

NFS: **N**etwork **F**ile **S**ystem. A proprietary distributed file system that is widely used by TCP/IP vendors. Note: NFS allows different computer systems to share files, and uses user datagram protocol (UDP) for data transfer.

NMI: **N**on–**M**askable **I**nterrupt.

NUMA: **N**on **U**niform **M**emory **A**ccess. A method of configuring a cluster of microprocessors in a multiprocessing system so that they can share memory locally, improving performance and the ability of the system to be expanded.

nsh: nsh stands for **n**ew **sh**ell. See Shell and EFI Shell.

NVRAM: **N**on **V**olatile **R**andom **A**ccess **M**emory. A type of RAM that retains its contents even when the computer is powered off. See RAM and SRAM.

O

OF: **O**pen **F**irmware. Firmware controlling a computer prior to the Operating System.

Operating System: See OS.

OS: Operating System. The software which manages computer resources and provides the operating environment for application programs.

P

PAL: **P**rocessor **A**bstraction **L**ayer. See SAL.

PAM: **P**latform **A**dministration & **M**aintenance.

PAM software: **P**latform **A**dministration & **M**aintenance software. One part (PAP application and the PamSite WEB site) runs on the PAP unit. The other part (MAESTRO) is embedded on the PMB board.

PAM Tree pane: One of the three areas of the PAM web page. Server hardware presence and functional status are displayed in the PAM Tree pane. See Status pane and Control pane.

PARM request: the PARM application is designed to handle Requests issued by the CSE (Customer Service Engineer)

PAP unit: **P**latform **A**dministration **P**rocessor unit. The PC hosting all server administration software.

PAP application: **P**latform **A**dministration **P**rocessor application. Part of PAM software, PAP application is a Windows COM+ application running on PAP unit.

Parallel Port: Connector allowing the transfer of data between the computer and a parallel device.

Partition: Division of storage space on a hard disk into separate areas so that the operating system treats them as separate disk drives.

Password: A security feature that prevents an unauthorized user from operating the system.

PCI: **P**eripheral **C**omponent **I**nterconnect. Bus architecture supporting high-performance peripherals.

PD: **P**hysical **D**isk. A Storeway FDA 1300/2300 physical disk is not visible to the OS. See LD.

PDU: **P**ower **D**istribution **U**nit. Power bus used for the connection of peripheral system components.

Permanence: Property of a history file that determines whether or not the history file can be modified or deleted from the PAM user interface. Permanence is either *Static* (cannot be modified) or *Dynamic* (can be modified).

PHPB: **P**CI **H**ot **P**lug **B**oard. This board provides an interlock switch on each IO Box PCI slot which allow to hot swap PCI boards.

PIC: **P**latform **I**nstrumentation **C**ontrol.

ping: A basic Internet program that lets you verify that a particular IP address exists and can accept requests. The verb "to ping" means the act of using the ping utility or command.

PIROM: **P**rocessor **I**nformation **ROM**. Processor Information ROM (PIROM) 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.

PMB: **P**latform **M**anagement **B**oard. Links the server to the PAP unit.

PNP: **P**lug a**N**d **P**lay. The ability to plug a device into a computer and have the computer recognize that the device is there.

POST: **P**ower **O**n **S**elf **T**est. When power is turned on, POST (Power–On Self–Test) is the diagnostic testing sequence (or "starting program") that a computer runs to determine if hardware is working correctly.

PROM: **P**rogrammable **R**ead-**O**nly **M**emory.

PUID: **P**AM **U**niversal/Unique **ID**entifier. PAM software allocates a PUID (PAM Universal / Unique Identifier) to each hardware / software object to guarantee unambiguous identification. The PUID for each hardware element can be obtained by hovering the mouse over the corresponding element in the PAM tree, e.g.: PAM:/CELLSBLOCK_<NAME>/MODULE_x/QBB_y/CPU_y.

Q

QBB: **Q**uad **B**rick **B**oard. The QBB is the heart of the Bull NovaScale Server, housing 4 Itanium ® 2 processors and 16 DIMMs. Each QBB communicates with other CSS Module components via 2 high–speed bidirectional Scalability Port Switches. See SPS or FSS.

R

RAID: **R**edundant **A**rray of **I**ndependent **D**isks. A method of combining hard disk drives into one logical storage unit for disk-fault tolerance.

RAM: **R**andom **A**ccess **M**emory. A temporary storage area for data and programs. This type of memory must be periodically refreshed to maintain valid data and is lost when the computer is powered off. See NVRAM and SRAM.

RAS: **R**eliability, **A**vailability, **S**erviceability.

Real–time clock: The Integrated Circuit in a computer that maintains the time and date.

RFI: **R**adio **F**requency **I**nterference.

RJ45: 8–contact regular jack.

RMC: **R**emote **M**aintenance **C**onsole.

ROM: **R**ead-**O**nly **M**emory. A type of memory device that is used to store the system BIOS code. This code cannot be altered and is not lost when the computer is powered off. See BIOS, EPROM and Flash EPROM.

RS-232 Port: An industry standard serial port. See Serial Port.

RSF: **R**emote **S**ervice **F**acilities.

RTC: **R**eal **T**ime **C**lock.

RTL: **R**egister **T**ransfer **L**evel.

S

S@N.IT: SAN Administration Tool.

SAL: **S**ystem **A**bstraction **L**ayer. See PAL.

SAN: **S**torage **A**rea **N**etwork. A high–speed special–purpose network that interconnects different kinds of data storage devices with associated data servers on behalf of a larger network of users.

SAPIC: **S**treamlined **A**dvanced **P**rogrammable **I**nterrupt **C**ontroller message.

SBE: **S**ingle **B**it **E**rror.

SBSP: **S**ystem **B**oot**S**trap **P**rocessor. See BSP.

Scheme: Defines a set of domains.

SCI: **S**calable **C**oherent **I**nterface.

SCSI: **S**mall **C**omputer **S**ystem **I**nterface. An input and output bus that provides a standard interface used to connect peripherals such as disks or tape drives in a daisy chain.

SDR: **S**ensor **D**ata **R**ecord.

SDRAM: **S**ynchronous **D**ynamic **R**andom **A**ccess **M**emory. A type of DRAM that runs at faster clock speeds than conventional memory. See DRAM.

SEL: **S**ystem **E**vent **L**og. 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.

Serial Communication: Data sent sequentially, one bit at a time.

Serial Port: Connector that allows the transfer of data between the computer and a serial device. See COM1 or COM 2.Shell is a Unix term for the interactive user interface with an operating system.

SIO: **S**erver **I/O** / **S**uper **I/O**.

Shell: The Shell is the layer of programming that understands and executes the commands a user enters. As the outer layer of an operating system, the Shell can be contrasted with the kernel, the inmost layer or core of services of an operating system. See EFI Shell.

SIOH: **S**erver **I/O H**ub.

SMBIOS: **S**ystem **M**anagement **BIOS**.

SM–BUS: **S**ystem **M**anagement **Bus**.

SMIC: **S**erver **M**anagement **I**nterface **C**hip.

SMP: **S**ymmetrical **M**ulti **P**rocessor. The processing of programs by multiple processors that share a common operating system and memory.

SNC: **S**calable **N**ode **C**ontroller.

SNM: **S**ystem **N**etwork **M**odule.

SNMP: **S**imple **N**etwork **M**anagement **P**rotocol. The protocol governing network management and the monitoring of network devices and their functions.

Source: Each message refers to a source (the resource that generated the message) and a target (the component referred to in the message). This feature can be allows messages to be filtered according to one or more **Source** string(s) and is particularly useful for debugging and troubleshooting. See Target.

SPCR: **S**erial **P**ort **C**onsole **R**edirection **T**able. This table provides information about the configuration and use of the serial port or non–legacy UART interface.

SPS: **S**calability **P**ort **S**witch. Each CSS Module is equipped with 2 Scalability Port Switches providing high speed bi–directional links between system components. See FSS.

SRAM: **S**tatic **RAM**. A temporary storage area for data and programs. This type of memory does not need to be refreshed, but is lost when the system is powered off. See NVRAM and RAM.

SSI: **S**erver **S**ystem **I**nfrastructure.

Status Pane: One of the three areas of the PAM web page. Provides quick access to CSS Module availability status, server functional status, and pending event message information. See also Control pane and PAM Tree pane.

SVGA: **S**uper **V**ideo **G**raphics **A**rray.

T

Target: Each message refers to a target (the component referred to in the message), identified by its PUID, and a source (the component that generated the message).This feature allows messages to be filtered according to one or more **Target** string(s) and is particularly useful for debugging and troubleshooting. See Source and PUID.

T&D: **T**ests and **D**iagnostics.

TCP: **T**ransmission **C**ontrol **P**rotocol. A set of rules (protocol) used along with the Internet Protocol (IP) to send data in the form of message units between computers over the Internet.

TCP/IP: **T**ransmission **C**ontrol **P**rotocol / **I**nternet **P**rotocol. The basic communication language or protocol of the Internet.

Thresholding: A PAM 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.

U

UART: a **U**niversal **A**synchronous **R**eceiver **T**ransmitter. The microchip with programming that controls a computer interface to its attached serial devices.

ULTRA SCSI: An enhanced standard 16–bit SCSI interface providing synchronous data transfers of up to 20 MHz, with a transfer speed of 40M bytes per second. It is also called Fast-20 SCSI.

UML: **U**nified **M**odeling **L**anguage. A standard notation for the modeling of real–world objects as a first step in developing an object–oriented design methodology.

UPS: **U**ninterruptible **P**ower **S**upply. A device that allows uninterrupted operation if the primary power source is lost. It also provides protection from power surges.

URL: **U**niform / **U**niversal **R**esource **L**ocator. The address of a file (resource) accessible on the Internet.

USB: **U**niversal **S**erial **B**us. A plug–and–play interface between a computer and add–on devices. The USB interface allows a new device to be added to your computer without having to add an adapter card or even having to turn the computer off.

V

VCC: **V**oltage **C**ontinuous **C**urrent.

VGA: **V**ideo **G**raphics **A**rray.

VI: **V**irtual **I**nterface.

Visibility: A property of a history file. Visibility is either *System* (the history file is predefined by the PAM software and is visible only to an administrator) or *User* (the history file is created by an administrator and is visible to both an administrator and an operator).

VLAN: **V**irtual **L**ocal **A**rea **N**etwork. A local area network with a definition that maps workstations on some other basis than geographic location (for example, by department, type of user, or primary application).

VxWORKS: Platform Management Board Operating System.

W

WAN: **W**ide **A**rea **N**etwork. Geographically dispersed telecommunications network. The term distinguishes a broader telecommunication structure from a local area network (LAN).

WBEM: **W**eb **B**ased **E**nterprise **M**anagement.

WMI: **W**indows **M**anagement **I**nterface.

WOL: A feature that provides the ability to remotely power on a system through a network connection.

X

XML: e**X**tended **M**arkUp **L**anguage. A flexible way to create common information formats and share both the format and the data on the World Wide Web, intranets, and elsewhere.

XSP: e**X**tended **S**calable **P**ort.

Y

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Z

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