SONY®

Networked Content Management Server

Service Manual

Before operating this equipment, please read this manual
thoroughly and retain it for future reference.

HDXS-C200

Edition 1

⚠警告

このマニュアルは，サービス専用です。

お客様が，このマニュアルに記載された設置や保守，点検，修理などを行うと感電や火災，人身事故につながることがあります。

危険をさけるため，サービストレーニングを受けた技術者のみご使用ください。

⚠WARNING

This manual is intended for qualified service personnel only.

To reduce the risk of electric shock, fire or injury, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified service personnel.

⚠WARNUNG

Die Anleitung ist nur für qualifiziertes Fachpersonal bestimmt.

Alle Wartungsarbeiten dürfen nur von qualifiziertem Fachpersonal ausgeführt werden. Um die Gefahr eines elektrischen Schlages, Feuergefahr und Verletzungen zu vermeiden, sind bei Wartungsarbeiten strikt die Angaben in der Anleitung zu befolgen. Andere als die angegeben Wartungsarbeiten dürfen nur von Personen ausgeführt werden, die eine spezielle Befähigung dazu besitzen.

⚠AVERTISSEMENT

Ce manual est destiné uniquement aux personnes compétentes en charge de l'entretien. Afin de réduire les risques de décharge électrique, d'incendie ou de blessure n'effectuer que les réparations indiquées dans le mode d'emploi à moins d'être qualifié pour en effectuer d'autres. Pour toute réparation faire appel à une personne compétente uniquement.

Safety notices

disconnection device

WARNING

This unit has no power switch. When installing the unit, incorporate a readily accessible disconnect device in the fixed wiring, or connect the power cord to a socket-outlet which must be provided near the unit and easily accessible, so that the user can turn off the power in case a fault should occur.

WARNUNG

Dieses Gerät hat keinen Netzschalter. Beim Einbau des Geräts ist daher im Festkabel ein leicht zugänglicher Unterbrecher einzufügen, oder das Netzkabel muß mit einer in der Nähe des Geräts befindlichen, leicht zugänglichen Wandsteckdose verbunden werden, damit sich bei einer Funktionsstörung die Stromversorgung zum Gerät jederzeit unterbrechen läßt.

Peripheral cables

For safety, do not connect to any peripheral devices that may have excessive voltage or may not be earthed.

Laser classification

This Networked Video Editing System is classified as a CLASS 1 LASER PRODUCT. The CLASS 1 LASER PRODUCT label is located on the DVD/CD drive.

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CLASS 1
LASER PRODUCT

LASER KLASSE 1
PRODUKT
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Rack mounting

When this product is installed in a rack, observe the following safety precautions:

Prevention against overloading of branch circuit

When this product is installed in a rack and is supplied power from an outlet on the rack, make sure that the rack does not overload the supply circuit.

Providing a protective earth

When this product is installed in a rack and is supplied power from an outlet on the rack, confirm that the outlet is provided with a suitable protective earth connection.

Internal air ambient temperature of the rack

When this product is installed in a rack, make sure that the internal air ambient temperature of the rack is within the specified limits for this product.

Prevention from overheating

When installing, ensure the rear of the unit is 10 cm (4 inches) or more away from walls in order to allow adequate ventilation.

Prevention of unstable mechanical loading

When this product is installed in a rack, make sure that the rack does not become unstable due to uneven mechanical loading. For example when the unit is pulled out from the rack on its slide rails.

Safe working precautions

Before carrying out servicing:
- After powering down the server, isolate the mains supply, then remove all three input cables.
- The server is heavy, approximately 47 kg. Do not attempt to remove the unit from a rack unaided. Seek assistance.
- The power supply area may be hot to the touch immediately after power down.

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Overview

Chapter **1**

Introduction

About this manual

This Service Manual provides information and procedures for servicing the HDXchange server, HDXS-C200. The information contained in this manual is intended for qualified service engineers to diagnose faults, replace parts and maintain HDXchange systems on-site.

This manual is designed to identify problems within the server hardware only; if the problem is associated with the HDXchange software or its operation, then the appropriate manual should be consulted. For faults or repairs outside of the scope of this manual, return the server to your Sony representative for repair.

Associated documents

HDXS-C200 Installation Manual

This document provides information and procedures for installing the HDXS-C200 server.

HDXC-C030 HDXC-B030 HDXC-X030 HDXC-L030 Installation Manual

This document provides information and procedures for setting up an HDXchange system. It contains details of the web-based administration tools, used to configure and manage the system.

Manual structure

This Service Manual is organised into the following chapters:

- **Chapter 1 Overview** - provides an introduction to the manual and a functional overview of the equipment.

- **Chapter 2 Description** - identifies the hardware components parts, and explains their function. It also describes any jumpers, switches and LEDs.
- **Chapter 3 Servicing** - describes the servicing tasks that are required, and the precautions to be used for the safety of the service engineer and the care of the equipment.
- **Chapter 4 Utilities** - describes the software utilities that may be used to aid the service engineer with diagnostic functions, testing and configuration of the equipment.
- **Chapter 5 Troubleshooting** - identifies fault symptoms and describes the probable cause and recommends the action to rectify the problem.
- **Chapter 6 Parts Replacement** - provides procedures for replacing hardware component parts.
- **Chapter 7 Maintenance** - describes the recommended periodic maintenance for the equipment.
- **Chapter 8 Spare Parts** - lists the replaceable parts, and their part numbers to enable ordering of spare parts.

How to use this manual

For an understanding of the server and its functions, please read *Chapters 1 and 2*.

To learn about the servicing tasks to be performed on this equipment, please read *Chapters 3*.

The information provided in *Chapter 5* will help you identify the fault symptom and determine the likely cause of the problem, and the action you should take to rectify the problem.

Chapter 6 will describe how to repair the equipment by replacing faulty parts and *Chapter 4* will describe diagnostic tests that can be done to prove that the server has been returned to health.

Functional description

The Sony HDXS-C200 server is designed specifically to support HDXchange, a client-server workgroup system for importing, exporting and editing audio visual (AV) material for use by playout devices.

The compact 3U-high chassis is designed to be used in a rack-mount system in a server room environment.

Data storage

The server's main function is to allow clients to run the HDXchange suite of applications installed on the server and to store the media content generated by them.

The server provides two Redundant Array of Independent disks (RAID) arrays comprised of Hard Disk Drives (HDDs). The larger one, available at the front panel, stores media, and the smaller one, located internally, stores the operating system (OS).

Both Media and OS RAID arrays are configured in a 'mirror' arrangement that creates an exact copy (or mirror) of the data on two identical disks. This is useful when read performance or reliability are more important than data storage capacity. This is known as a 'fault tolerant' system because if one of the mirrored drives suffers a mechanical failure (e.g. a spindle failure) or does not respond, the remaining drive will continue to function and data will not be lost.

Media RAID

The server provides a total of 8 TB of storage comprising sixteen 500 GB hard disk drives (HDDs) (see *"Media RAID" on page 20*). Only 4 TB are available to the user for storage of media as each drive is duplicated by a 'mirror' drive containing the same data, thereby ensuring that media is not lost in the event of a single disk failure.

The HDDs are accessible from the front of the unit, after removal of the front bezel, and are arranged in a specific order which must be maintained. If multiple drives are removed for any reason, they must be returned to their original positions. Failure to do this will result in unrecoverable loss of media. See *Chapter 2, Description* for an illustration showing the numbering scheme.

Control of the Media RAID comes from a RAID Controller Card which is installed in a Motherboard PCI slot. Power supplies are delivered via the System Power Board to the Backplane boards.

OS RAID

The Operating System RAID comprises two HDDs, installed within the server unit (see *"Operating system (OS) RAID" on page 26*). A 'mirror' arrangement ensures that the system can continue to operate in the event that a fault develops in one of the HDDs.

Control of the OS RAID is achieved by software. Control and data is received from the Motherboard, with power supplies delivered via the System Power Board and the Slim Power Distribution Board.
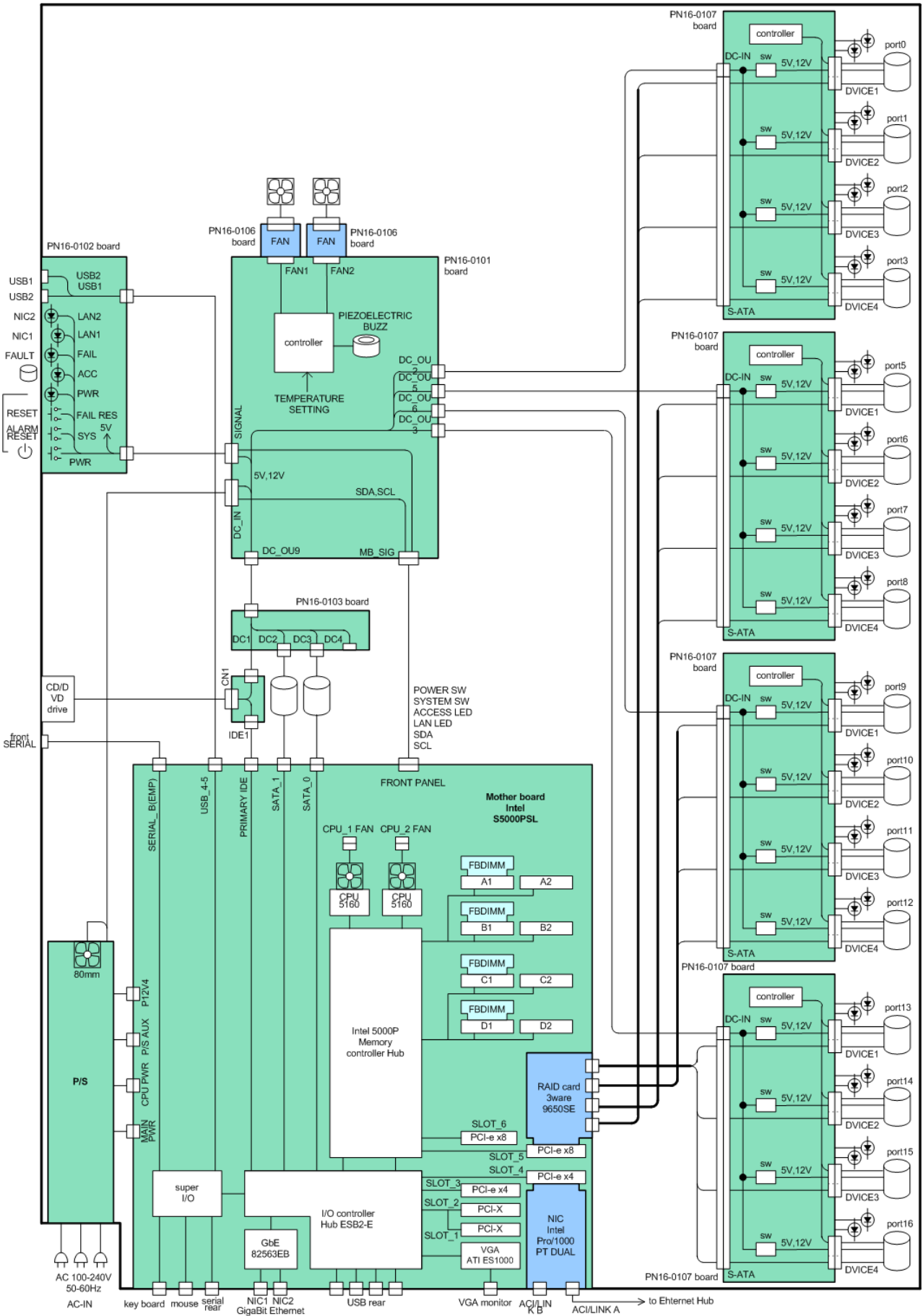
Processing

The HDXS-C200 is a high performance server containing a dual-processor Motherboard, which controls the operation of the HDDs and other server functions (see *"Motherboard" on page 27*).

Four Dual Inline Memory Modules (DIMMs) are fitted to the Motherboard to provide 4 GByte of RAM (see *"Memory Modules" on page 31*).

Two of the PCI slots provided by the Motherboard are fitted with a RAID Controller Card (see *"RAID controller card" on page 32*), which controls the Media RAID, and a NIC Card (see *"NIC card" on page 32*).

Interface

The front panel provides basic controls and status indicators (see *"Front panel controls and indicators" on page 19*). These are located behind a removable front bezel which filters the incoming air.

The general status indicators: power, HDD activity and fault are visible with the bezel in place by means of 'light pipes' fitted to the bezel, which direct the light from these indictors through the bezel so that they are visible from the front of the unit with the bezel fitted in place. Additionally each media RAID HDD provides status LEDs - the bezel must be removed to see these (see *"Media RAID" on page 20*).

The rear panel provides details status power-on self test (POST) indicators and connectors (see *"Rear panel connectors and LEDs" on page 23*).

Power distribution

The chassis contains a 2+1 redundant modular power supply arrangement, ensuring continued operation in the event of a single PSU failure (see *"Power supply modules" on page 22*).

Three independent PSU modules are supplied from separate a power sources and they equally share the load of the unit. Green status LEDs are provided on the rear panel of each module to enable identification of a faulty module.

The three modules are physically located inside a cage and the outputs are combined to deliver internal dc supplies directly to the Motherboard which are then routed to the System Power Board and other internal boards.

Description

Introduction

About this chapter

This chapter provides a detailed description of the component parts of the server. It also describes any jumpers, switches and on-board LEDs.

Server component parts

The server chassis is divided into two compartments: front and rear, which separate the main functions of the server. Each is covered by separate lids.

NIC Card   RAID Controller Card

System Fans   DIMMs

OS RAID HDDs

PS Modules

HDD Carrier

Motherboard

DVD/CD Drive   Chassis
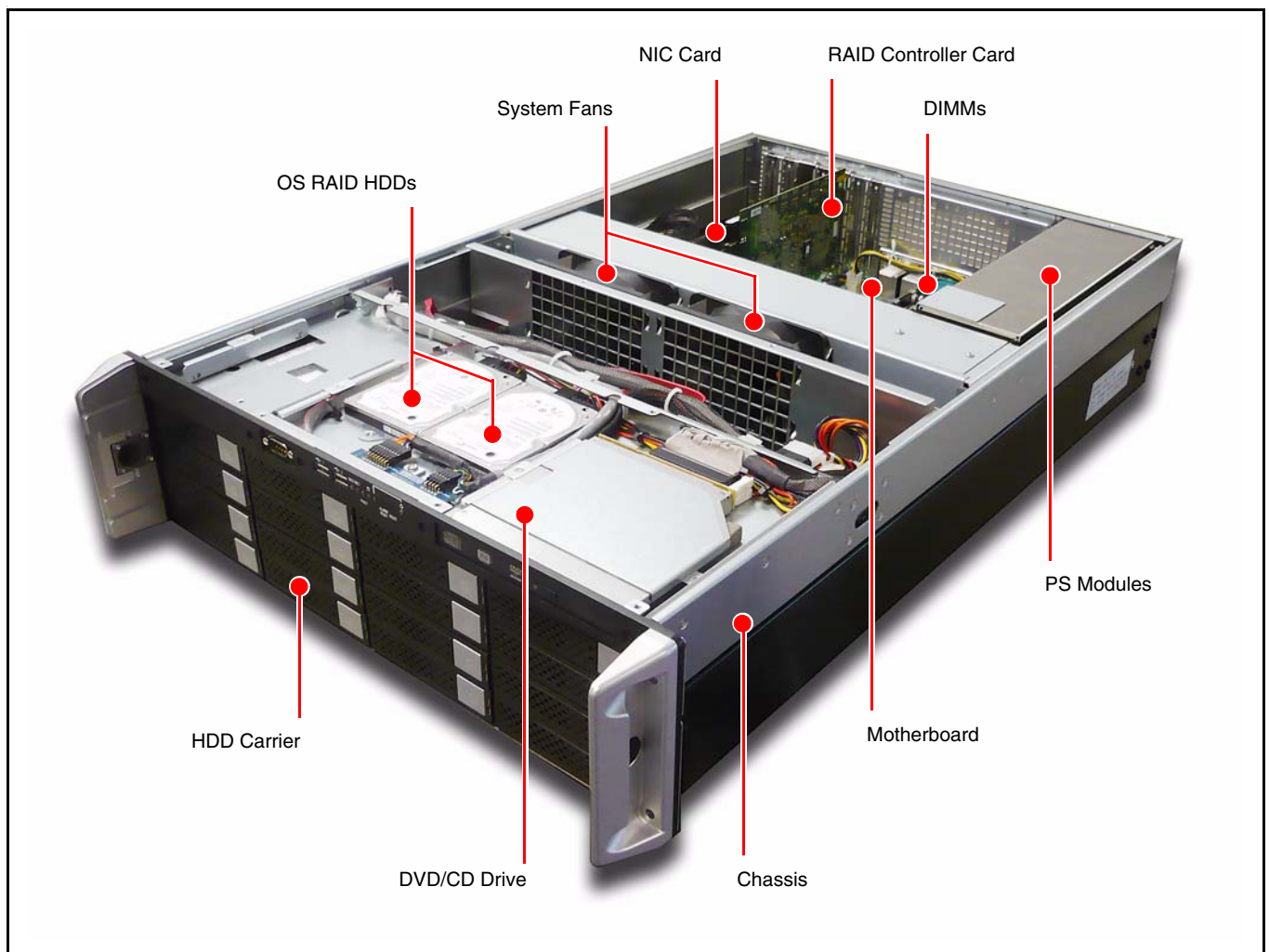
Front compartment - storage

The front compartment houses the *storage* components of the server:

- Media RAID hard disk drives (HDDs)
- OS RAID HDDs
- DVD/CD disk drive
- led switch board

These parts are accessible by removing the front lid the top cover (see *"Front lid" on page 83* for removal instructions).

Rear compartment - processing and power

The rear compartment houses the *processing and power* components of the server:

- Motherboard
- RAID controller card
- NIC card
- DIMMs
- Power supply modules
- system power board

These parts are accessible by removing the rear lid the top cover (see *"Rear lid" on page 83* for removal instructions).

Compartment separator

The front and rear compartments are separated by two system cooling fans. These ensure that cooling airflow is drawn in through the front of the server unit and expelled from the rear.

For a complete list of parts making up the server unit see *Chapter 8, Spare Parts*.

Physical description

Chassis

The server unit is a rack-mountable 3U-high chassis. The unit is 132 mm (5.2 in.) high, 482 mm (19 in.) wide, 711 mm (28 in.) deep and weighs 42 kg.

The Media RAID HDDs and Power Supply Modules can be accessed without removing the covers (see *Chapter 6, Parts Replacement*). To access all other components, the two top covers (front and rear lids) must be removed.

Internal cabling

To assist in fixing a problem associated with the cabling within the chassis, the figure below may be used in conjunction with the table to determine the location of connectors concerned with a specific hardware area.

In the event of a problem, use the table as a guide to check relevant connectors are not loose.
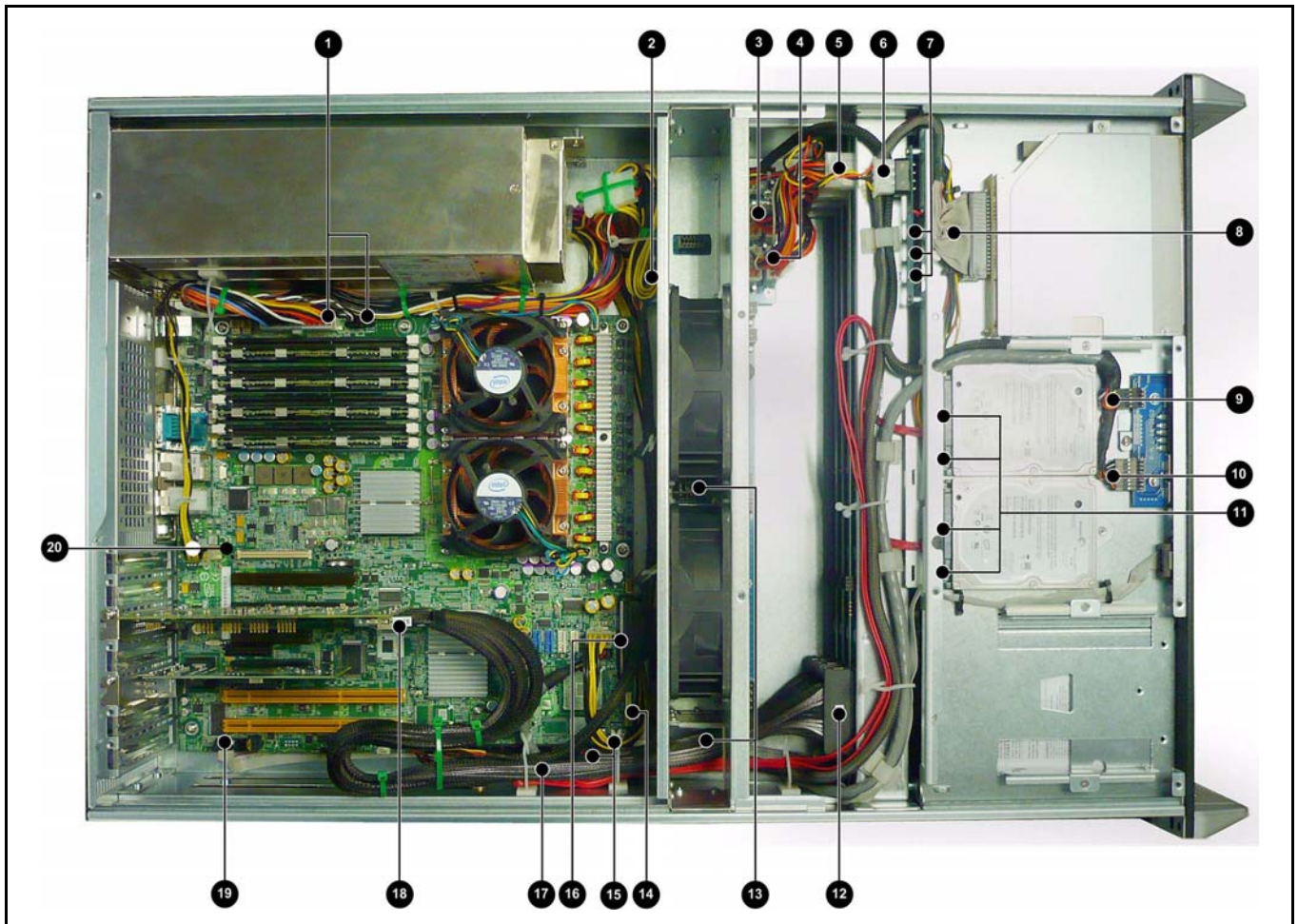
Cable Connector	Location	Description
Power	❶❹❺❻❼	Power from Power Supply Modules and supplies to drives.
Front panel controls/indicators	❷❸❾⓱	
System Fans	⓭	
Media RAID	⓬⓲	Maintain original positions when refitting.
OS RAID	⓫⓯	
DVD/CD	❽⓰	
Front panel USB	⓾⓮	

External parts

Front bezel

A push-on front bezel covers the front of the server.

Cooling air is drawn in through the holes in the front bezel. A filter, fitted to the rear of the bezel, filters the air and captures dust. Air is expelled through the rear of the unit.

'Light-pipes' are integrated into the bezel to route the status LED indications from the front panel behind the front bezel to allow the user to view the status LEDs without having to remove the bezel.

Front bezel push-button release

Front bezel push-button release

Power LED

HDD Activity LED

Fault LED

Cooling air in-take holes (Do not block)
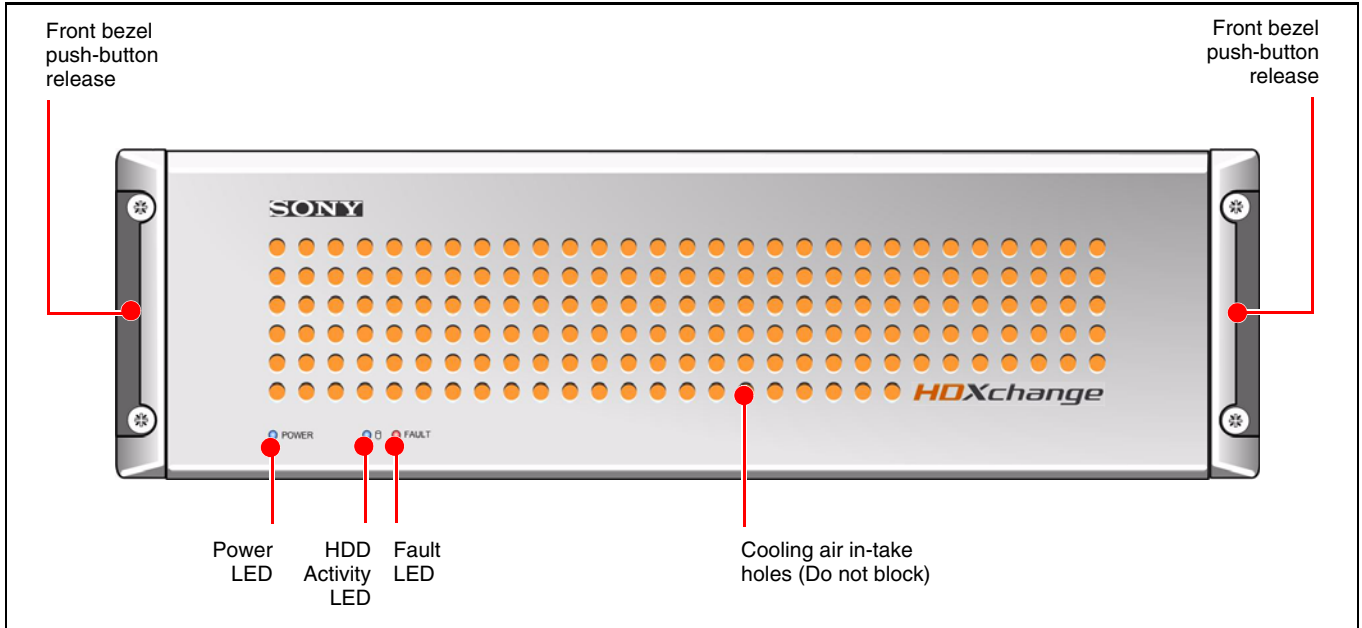
Front panel (bezel removed)

With the front bezel removed, the front panel controls, indicators, remote serial connector, CD/DVD drive and 16 hot-swappable RAID hard disk drives (HDDs) are exposed.

See the following sections for control, LED, connector descriptions.

16 RAID Hard disk Drives

Remote control connector

Front panel controls and indicators

CD/DVD drive
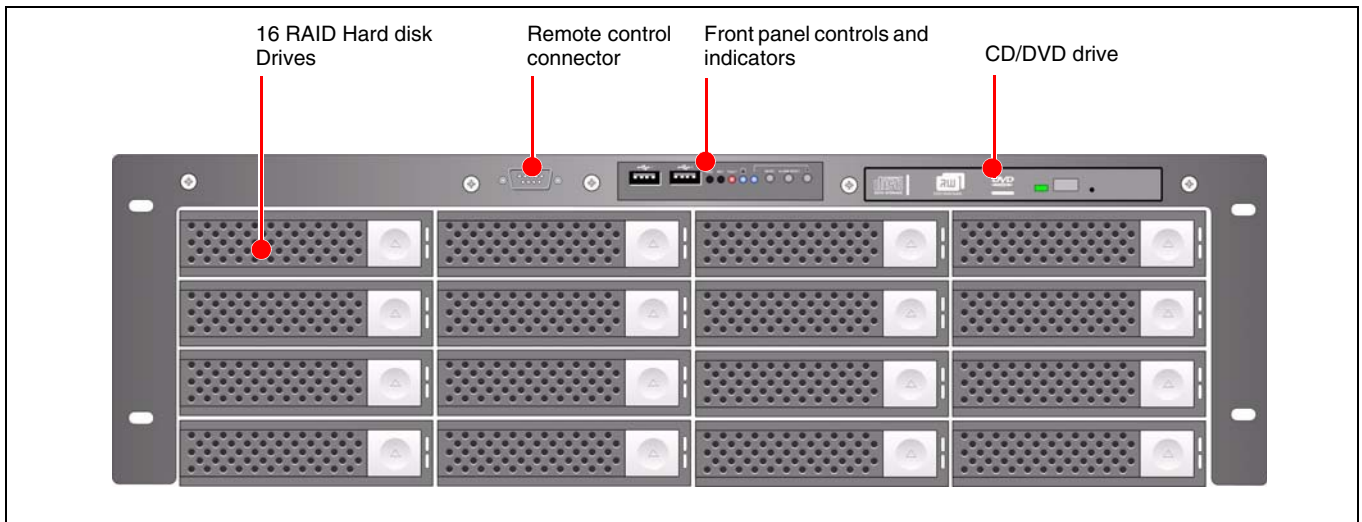
Front panel controls and indicators

The front panel provides the following status indicators and controls, behind the front bezel of the server. Their functions are described in the following table.

❶	USB connector 1		Service use only.
❷	USB connector 2		Service use only.
❸	NIC 2 LED		Not used/disabled.
❹	NIC 1 LED		Not used/disabled.
❺	FAULT LED	Red	BLINKING = fan temperature or power supply failure. Server emits a **single audible beep** (one per second) when a system fan fails. *Note: The audible alarm does not sound if a system fan failure occurs prior to boot-up.* Server emits a **double audible beep** (two per second) when the temperature inside the chassis exceeds the preset value of 38°C. Server emits a **continuous audible beep** (longer than one second) when a power supply fails. OFF = Fan temperature and power supply OK.
❻	HDD Activity LED	Blue	BLINKING = HDD activity/communication to motherboard. OFF = No HDD activity.
❼	POWER LED	Blue	ON = system power is ON. OFF = system power is OFF.
❽	Reset button		Reboots and initializes the system.
❾	Alarm Reset button		Resets the system alarm for fan/temperature failures.
❿	Power ON/OFF button		Toggles the system power ON/OFF.

Media RAID

The Media RAID array consist of two parts: the RAID array itself comprising 16 hard disk drives (HDDs) for storage, and a RAID controller card mounted on the motherboard.

The Media RAID array is arranged in four rows. Each row comprises 4 HDDs. Data is simultaneously written to two disks, this allows continued operation and full recovery of data when a single disk fails. The HDDs are hot-swappable, and therefore can be removed while the unit is still operational (see *"Media RAID HDD replacement" on page 84*).

The RAID controller stores certain configuration parameters on a reserved area of each disk drive called the Drive Configuration Block (DCB). disk configuration block. This is 3ware proprietary RAID table information that is written to disk drives that are in a RAID unit. The DCB includes information on the unit type, unit members, RAID level, and other important RAID information.

HDDs are numbered according to the illustration below. If multiple drives are removed for any reason, they must be returned to their original positions. Failure to do this will result in unrecoverable loss of media.

RAID hard disk drives (x16)
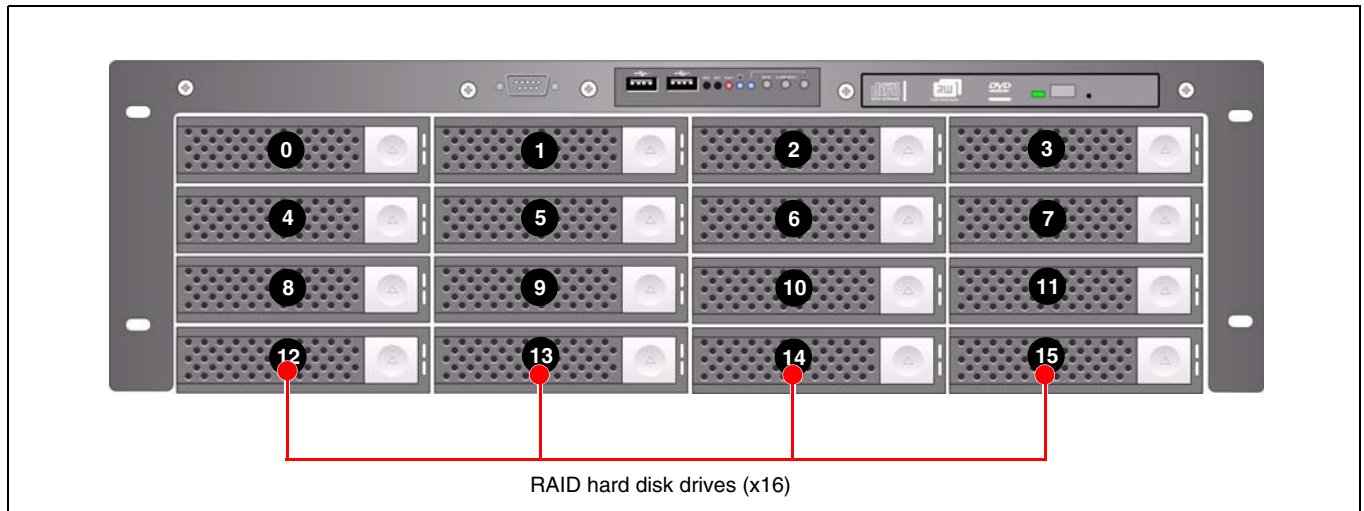
Failure or degraded operation can be alerted to an operator using Windows Messenger to a nominated client PC. See the *HDXC-C030 HDXC-B030 HDXC-X030 HDXC-L030 Installation Manual* for details of the Windows Messenger service. The manual also describes how to access the web page associated with the RAID controller cards. The web page should be used to identify faulty drives, and administration of their replacement.

When the server has booted up, all (16) of the blue ON/ACTIVITY LEDs should be ON to indicate that the RAID array is functioning correctly.
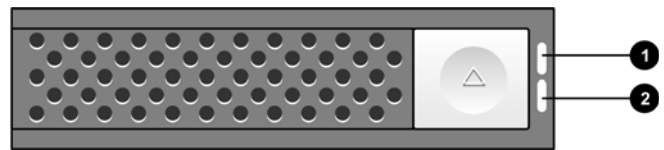
❶	ON/ACTIVITY LED	Blue	ON = Drive present. BLINKING = Drive activity. OFF = Drive not detected.
❷	FAULT LED	Red	ON = Drive fault detected. OFF = No fault detected. **Note:** During normal operation some blue light from the ON/ACTIVITY LED may be visible in this position.

DVD/CD drive

The server provides a DVD/CD disk drive, used to install software onto the server.
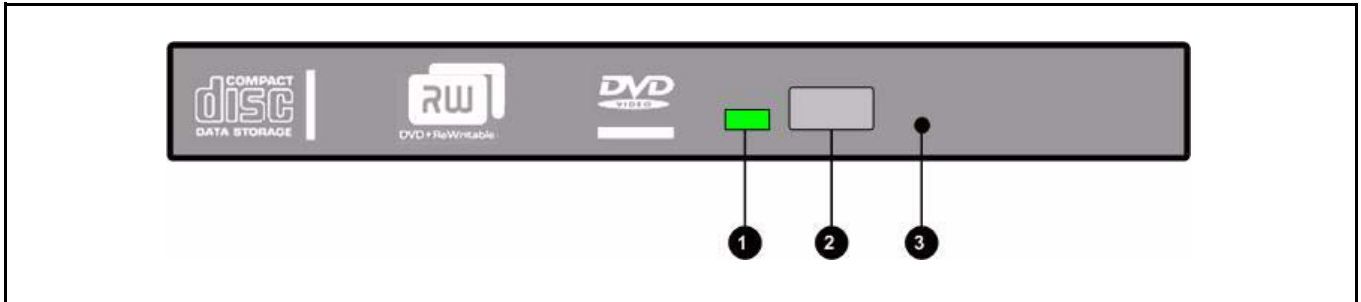
❶	Activity LED	Green	ON/BLINKING = Accessing data on the disk.
			OFF = disk is not being accessed.
❷	Tray Open/Close Button		Press to eject/load disk.
❸	Tray Eject Hole		Insert paperclip, or similar, to eject disk.

Rear panel

The following indicators and connectors are provided on the rear panel of the server.

Three hot-swappable Power Supply Units (PSUs) are fitted at the rear of the server unit. They are arranged in a 2+1 redundancy configuration, with 2 of the PSU sharing the load.
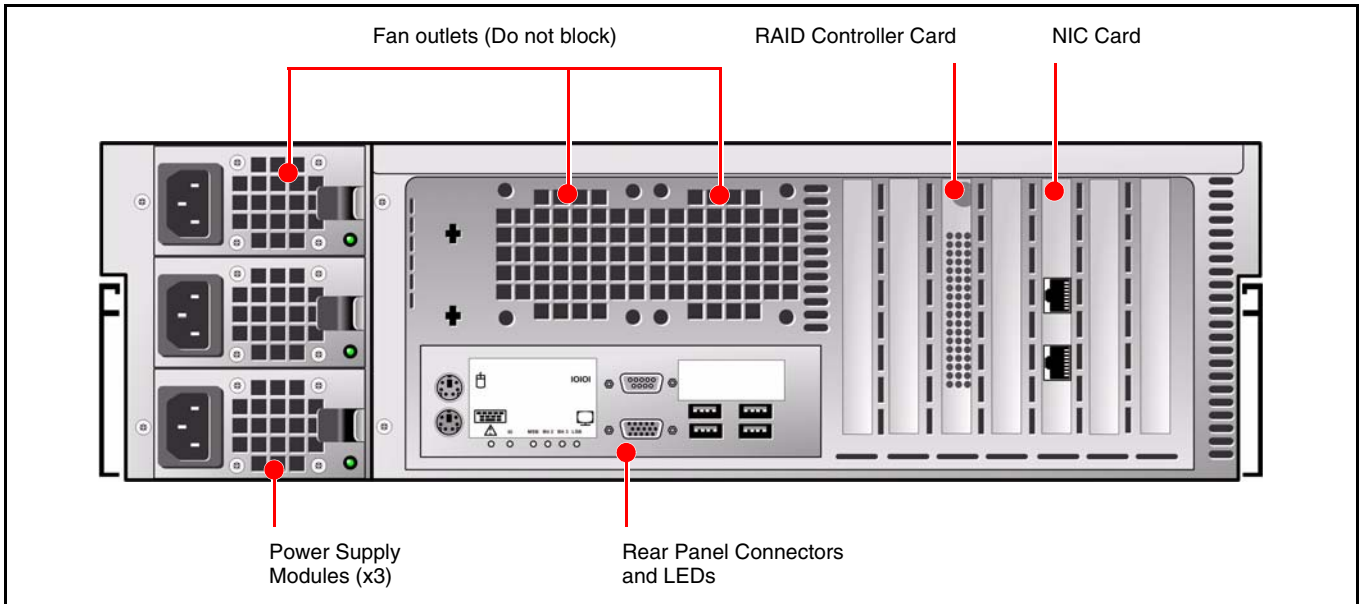
Power supply modules

Three power supply modules provide a 2 + 1 redundant power supply delivering 650 W. By having multiple modules it ensures that the server continues to operate in the event of a fault developing on any module. The modules are hot-swappable.

Each power supply module is a self-contained unit with a separate ac power input ❶ and a green status LED ❷ which is lit when the module is working correctly.
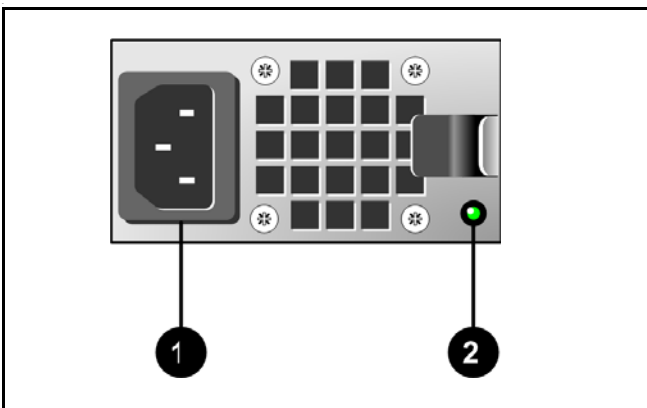
When all three modules are fitted, they share the load of the server supply and deliver dc output voltage supplies that are distributed and used throughout the server.

Power supply module DC output voltages

Output Voltage (V)	Output Current (A)	
	Min.	Max.
+5 V	3.0 A	60 A
+2 V	2.0 A	40 A
-5 V	0.05 A	1 A
-12 V	0.05 A	1 A
+3.3 V	1.1 A	40 A
+5 VSB	0.1	2.5

Note

Total current of +5 V and +3.3 V not exceed 70 A. Total +5 V and +3.3 V and +12 V power not exceed 630 W

Power supply module specification

Item	Description
Input voltage/frequency	90-264 VAC/47~63 Hz
Input current	9.0/5.0 A for 115/230 VAC
Inrush current	80A/100 A max for 115/ 230 VAC per module
Active power factor correction	IEC-1000-3-2 Class D
EMI noise filter	FCC Class B, CISR22 Class B
Safety	UL 1950, CSA 22.2 No/950 TUV IEC 950
MTBF	8 years, continuous at 40 degrees C
Operating temperature	0 to 40 degrees C
Efficiency	63% typical, at full load
Dimensions	82 mm (Height) 127 mm (Width) 300 mm (Depth)

Rear panel connectors and LEDs

The rear panel provides a connector interface and indictors from the Motherboard.

The rear panel interface is used to connect the mouse, keyboard and monitor, which is required to monitor the boot-up sequence and used to run the diagnostic and monitoring utilities (see *Chapter 4, Utilities* for details).

The indicators at the rear panel interface are status and Power On Self Test (POST) diagnostic indicators (see *"Motherboard" on page 27* for a description of LEDs and *Chapter 5, Troubleshooting* for a list of POST error codes and their meaning).

❶	Mouse PS/2 Connector		Mouse.
❷	Keyboard PS/2 Connector		Keyboard
❸	Status LED	Green/Amber	This Status LED indicates the status of the server. See *"Motherboard" on page 27* for a full description.
❹	Chassis ID LED		Not used
❺	POST Diagnostic LEDs (MSB, Bit 2, Bit 1, LSB)	Red = Bit set in upper nibble Green = Bit set in lower nibble Amber = Bit set in both nibbles	During the Power On Self Test (POST) the four tri-colour LEDs will change colour, displaying the currently active test. When the server has completed its POST successfully the LEDs are turned off. Should the server 'hang' during any test the LEDs will display the point at which failure has occurred. See *"Motherboard" on page 27* for a full description.
❻	Monitor VGA Connector		Monitor
❼	Serial Connector		Not used/disabled.
❽	USB Connectors		Service use only.

Connector pinouts

USB

Signal standard:
USB series A. USB
standard Version 2.0
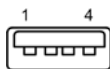
Pin No.	I/O	Signal name
1	-	Vcc (+5 V)
2	I/O	DATA (-)
3	I/O	DATA (+)
4	-	GND

Serial interface 1 & 2

Signal standard:
D-sub 9-pin, male.
Conforms to RS-232C
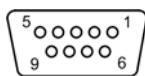
Pin No.	I/O	Signal name
1	I	DCD1
2	I	RXD1
3	O	TXD1
4	O	DTR1
5	-	GND
6	I	DSR1
7	O	RTS1
8	I	CTS1
9	I	RI1

Mouse/keyboard

Signal standard:
Mini-DIN 6-pin,
female. Conforms to
PS/2 standard

Pin No.	I/O	Signal name
1	I/O	DATA
2	-	GND
3	-	GND
4	O	POWER
5	I/O	CLOCK
6	-	GND

VGA

Signal standard:
Mini D-sub 15-pin,
female, Vesa
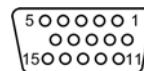
Pin No.	I/O	Signal name
1	O	RED Video
2	O	GREEN Video
3	O	BLUE Video
4	I	ID 2
5	-	GND
6	-	RED GND
7	-	GREEN GND
8	-	BLUE GND
9	-	(No pin)
10	-	Sync GND
11	I	ID 1
12	I	ID 0
13	O	HOR Sync
14	O	VERT Sync
15	I	ID 3

Network

Signal standard: RJ-45
modular jack. Conforms to:
IEEE 802.3u (10BASE-TX)
IEEE 802.3 (10BASE-T)
IEEE 802.3ab (1000BASE-T)
1000 Base-T Connections
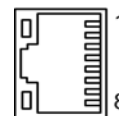
Pin No.	I/O	Signal name
1	I/O	Data A+
2	I/O	Data A-
3	I/O	Data A+
4	I/O	Data B+
5	I/O	Data C+
6	I/O	Data B-
7	I/O	Data D+
8	I/O	Data D-

The connector also contains two integral LEDs that display the status of the NIC port.

LED	State	NIC Function
Green/Amber	Off	10 Mb/s
	Green	100 Mb/s
	Amber	1000 Mb/s
Green	On	On
	Blinking	Transmit/receive activity

Internal parts

Operating system (OS) RAID

The OS RAID comprises two S-ATA 2.5 inch Hard Disk Drives (HDDs) which are mounted in the front section of the server unit, located on top of the Media RAID.

The HDDs are configured in a 'mirror' arrangement that creates an exact copy (or mirror) of a set of data on two both disks. This is useful when read performance or reliability are more important than data storage capacity. This is called 'fault tolerant' because if one of the mirrored drives suffers a mechanical failure (e.g. a spindle failure) or does not respond, the remaining drive will continue to function.
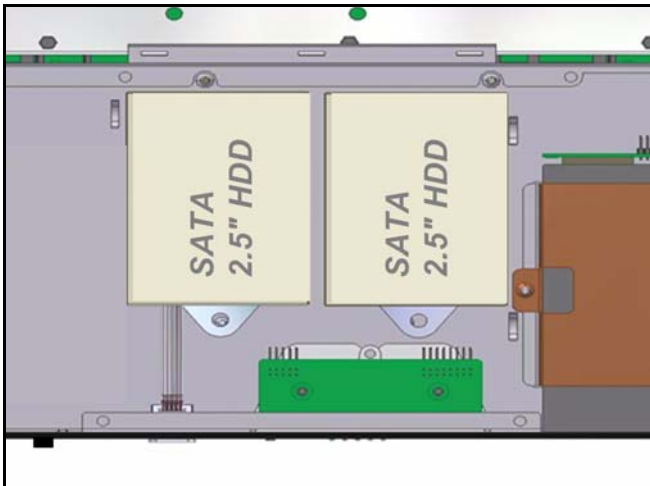
OS RAID control is implemented by software, unlike the Media RAID which is controlled by the PCI RAID Controller Card.

DC power supplies for the HDDs is routed via the Motherboard, the System Power Board and the Slim Power Distribution Board.

Motherboard

Description

The Motherboard is a dual-processor board which provides the processing functions of the server.
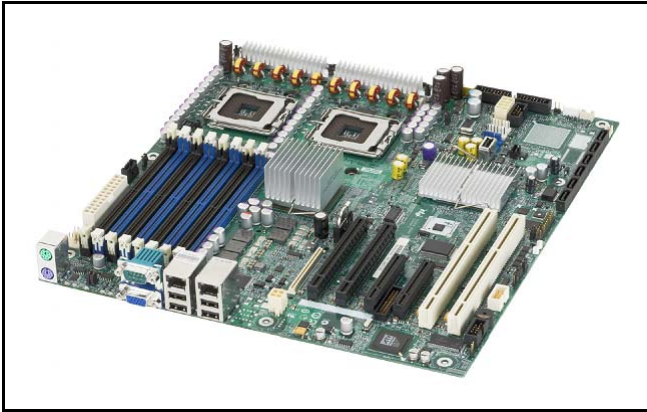
Connectors and headers

The Motherboard provides various connectors and headers for internal communications and power distribution.
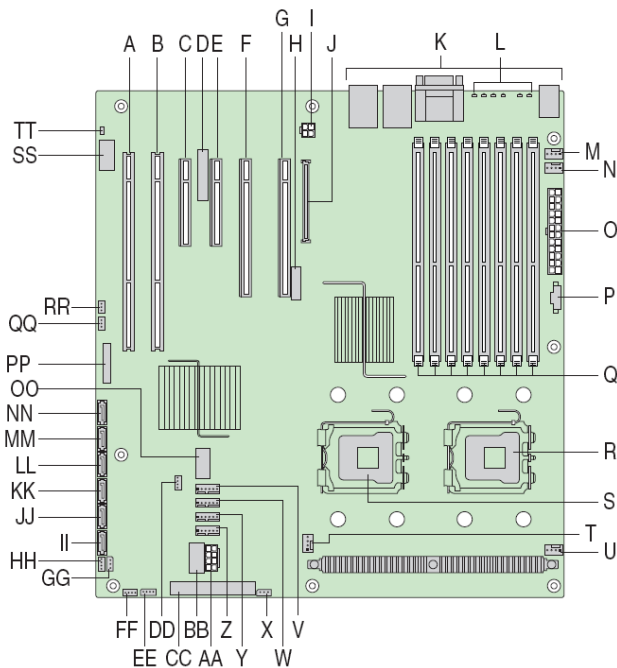
Item	Description
A	PCI-X 64-bit, 100 MHz slot 1
B	PCI-X 64-bit, 100/133 MHz slot 2
C	PCI Express x4 slot 3
D	RMM NIC connector
E	PCI Express x4 slot 4 (ROMB slot)
F	PCI Express x8 slot 5

Item	Description
G	PCI Express x8 slot 6
H	CMOS battery
I	P12V4 connector
J	RMM connector (Remote Management Module)
K	Back panel I/O ports
L	Diagnostic and Identify LEDs
M	System fan 6 header
N	System fan 5 header
O	Main power connector
P	Auxiliary power signal connector
Q	DIMM sockets
R	Processor 1 socket
S	Processor 2 socket
T	Processor 2 fan header
U	Processor 1 fan header
V	System fan 4 header
W	System fan 3 header
X	IPMB connector
Y	System fan 2 header
Z	System fan 1 header
AA	Processor power connector
BB	USB header
CC	IDE connector
DD	Enclosure management SATA SGPIO header (S5000SLSATA and S5000PSLROMB only)
EE	Intel® Local Control Panel header
FF	Hot-swap backplane B header
GG	Enclosure management SAS SES2 (S5000PSLSAS only)
HH	Hot-swap backplane A header
II	SATA 0
JJ	SATA 1
KK	SATA 2 or SAS 0 (S5000PSLSAS only)
LL	SATA 3 or SAS 1 (S5000PSLSAS only)
MM	SATA 4 or SAS 2 (S5000PSLSAS only)
NN	SATA 5 or SAS 3 (S5000PSLSAS only)
OO	USB port
PP	Front control panel header
QQ	SATA_Key: SATA RAID 5 key connector
RR	SAS_Key: SAS RAID 5 key connector (S5000PSLSAS only)
SS	Serial B / emergency management port header
TT	Chassis intrusion header

Jumpers

The Motherboard provides various jumpers for configuring and monitoring the server.
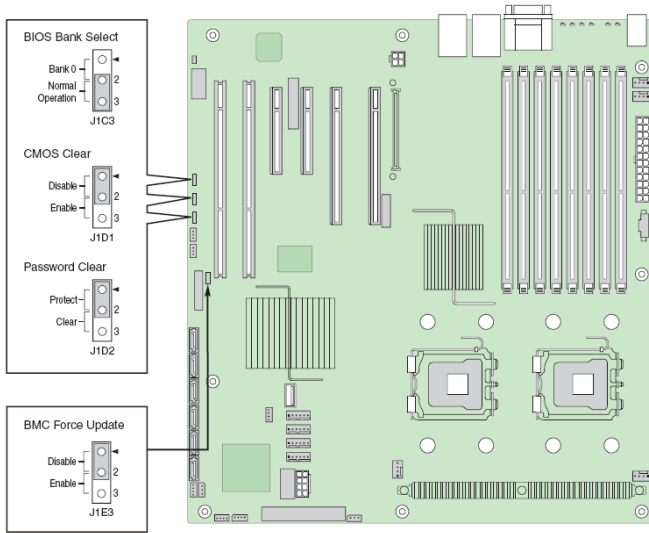
Item	Description
J1C3	**Bank Select Jumper.** The server stores two versions of the BIOS: the current BIOS, and the one previously installed. If you have a problem with your BIOS, you may revert to the previously installed BIOS. If you upgrade the BIOS version more than once, the two versions stored in your server will be identical. Force Lower Bank Normal (Default) Operation
	1 - 2 Bank 0: Boot to an alternate BIOS.
	2 - 3 Boot from the standard BIOS. These pins should be jumpered for normal operation.

Item	Description
J1D1	**CMOS Clear Jumper.** If you are not able to access the BIOS setup screens, use the CMOS Clear jumper to reset the configuration RAM. Default Clear CMOS
	1 - 2 Protect CMOS: these pins should be jumpered for normal operation.
	2 - 3 Erase CMOS: If these pins are jumpered for 5 to 10 seconds, the CMOS settings will be cleared on the next server reset. These pins should not be jumpered for normal operation. To clear the CMOS: Power down the server, leaving AC power connected. Place the jumper on pins 2 - 3 for 5 to 10 seconds. Move the jumper back to pins 1 - 2. Power on the server.
J1D2	**Password Clear Jumper.** If the user or administrator password(s) is lost or forgotten, moving the password clear jumper into the "clear" position clears both passwords. The password clear jumper must be restored to its original position before a new password(s) can be set. Default Clear Password
	1 - 2 Protect password: These pins should be jumpered for normal operation.
	2 - 3 Erase password: If these pins are jumpered, then the password will be cleared on the next server boot. These pins should not be jumpered for normal operation. To use this jumper to reset the password: Power down the server. Place the jumper on pins 2 - 3. Power on the server and wait 5 to 10 seconds. Power down the server. Move the jumper back to pins 1 - 2. Power on the server.
J1E3	**BMC Force Update.** If you are not able to access the BIOS setup screens, the CMOS Clear jumper will need to be used to reset the configuration RAM. Default Force BMC Update
	1 - 2 Disable force update: These pins should be jumpered for normal operation.
	2 - 3 Enable force update: Jumpering these pins forces a BMC update.

Power connectors

The main power supply connection are listed below.

J9B5 main power connector

A 24-pin connector is an SSI-compliant connector, providing the main power connection for the Motherboard.

Pin	Signal Name	Pin	Signal Name
1	+3.3 Vdc (orange)	2	+3.3 Vdc (orange)
3	GND (orange)	4	+5 Vdc (red)
5	GND (black)	6	+5 Vdc (red)
7	GND (black)	8	PWR_OK (grey)
9	5 VSB (purple)	10	+12 Vdc (yellow)
11	+12 Vdc (yellow)	12	+3.3 Vdc (orange)
13	+3.3 Vdc (orange)	14	-12 Vdc (blue)
15	GND (black)	16	PS_ON# (green)
17	GND (black)	18	GND (black)
19	GND (black)	20	RSVD_(-5 V) (white)
21	+5 Vdc (red)	22	+5 Vdc (red)
23	+5 Vdc (red)	24	GND (black)

J3J2 CPU voltage regulator power connector

A 8-pin connector is an SSI-compliant connector, providing power to the central processing unit voltage regulators.

Pin	Signal Name	Pin	Signal Name
1	GND (black)	2	GND (black)
3	GND (black)	4	GND (black)
5	+12 Vdc (yellow/black)	6	+12 Vdc (yellow/black)
7	+12 Vdc (yellow/black)	8	+12 Vdc (yellow/black)

J9D1 I^{2}C monitoring power connector

A 5-pin connector is an SSI-compliant connector, providing power to the I^{2}C monitoring circuitry.

Pin	Signal Name
1	SMB_CLK_ESB_FP_PWR_R (orange)
2	SMB_DAT_ESB_FP_PWR_R (black)
3	SMB_ALRT_3_ESB_R (red)
4	3.3 V SENSE- (yellow)
5	3.3 V SENSE+ (green)

J9D1 12V power connector

A 4-pin connector is an SSI-compliant connector, providing power to the server board.

Pin	Signal Name
1	GND (black)
2	GND (black)
3	+12 Vdc (yellow/black)
4	+12 Vdc (yellow/black)

Indicators

The Motherboard provides various indicators for monitoring the server functions.
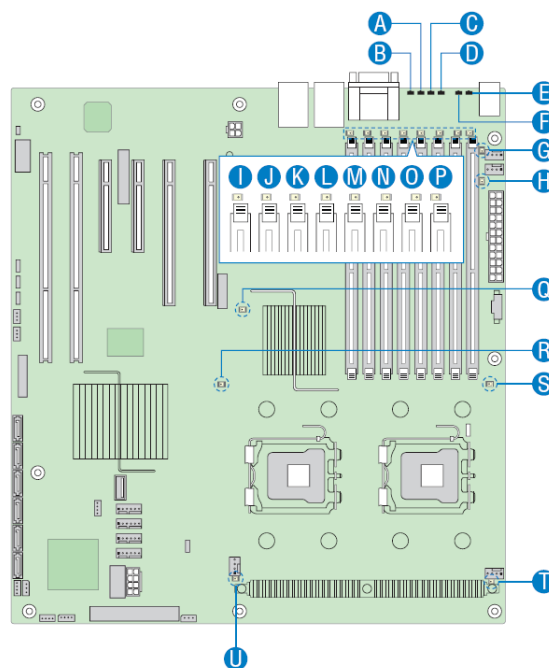
Item	Description
A	Bit 3 POST Diagnostic LED (amber/green/red). See "POST Diagnostic LEDs" on page 30.
B	LSB POST Diagnostic LED (amber/green/red). See "POST Diagnostic LEDs" on page 30.
C	Bit 2 POST Diagnostic LED (amber/green/red). See "POST Diagnostic LEDs" on page 30.
D	MSB POST Diagnostic LED (amber/green/red). See "POST Diagnostic LEDs" on page 30.
E	Status LED (green/amber). See "Status LED" on page 30.
F	ID LED. This LED is not used.
G	System fan 6 fault LED (not used)
H	System fan 5 fault LED (not used)
I	DIMM A1 fault LED (amber). Normally off.
J	DIMM A2 fault LED (amber). Normally off.
K	DIMM B1 fault LED (amber). Normally off.
L	DIMM B2 fault LED (amber). Normally off.
M	DIMM C1 fault LED (amber). Normally off.

Item	Description
M	DIMM C2 fault LED (amber). Normally off.
O	DIMM D1 fault LED (amber). Normally off.
P	DIMM D2 fault LED (amber). Normally off.
Q	+5 Volt standby LED (green). Lit when AC power is applied to the system. If there is no power or the motherboard is at fault, the LED will be off.
R	Processor 2 fault LED (amber). Normally off.
S	Processor 1 fault LED (amber). Normally off.
T	Processor 2 fault LED (amber). This LED applies only to server systems that use an active heatsink. This LED indicates a fault has occurred with fan that is installed on the heatsink for processor 2.
U	Processor 1 fault LED (amber). This LED applies only to server systems that use an active heatsink. This LED indicates a fault has occurred with fan that is installed on the heatsink for processor 1.

POST Diagnostic LEDs

During the Power On Self Test (POST) the four tri-colour LEDs will change colour, displaying the currently active test. When the server has completed its POST successfully the LEDs are turned off. Should the server 'hang' during any test the LEDs will display the point at which failure has occurred.

The four LEDs are used to display an 8-bit word utilising the colours available to the tri-colour LEDs. Each LED is comprised of an in-built red and green source. When both sources are lit, amber is displayed.

The four red LED sources represent the upper nibble of the code word, and the four green LED sources represent the lower nibble. If the LED is amber this means that the corresponding bit of both the upper and lower nibble is set.

In the example below, the code word displayed is 'AC' (in hexadecimal), or 10101100 (in binary).

	MSB	**Bit 2**	**Bit 1**	**LSB**
	🟠	🟢	🔴	⚫
U Nibble (Red)	1	0	1	0
L Nibble (Green)	1	1	0	0
	Amber	Green	Red	Off

See *Chapter 8, Troubleshooting* for a list of error codes and their meanings.

Status LED

This bi-colour LED indicates the status of the server.

Colour	Condition	Description
Green	Continuous	System ready/functioning (AC power present).
	Blinking	System ready/functioning but degraded (possible CPU/DIMM fault or temperature within 8°C).
Amber	Continuous	Critical Failure (Internal voltage or temperature out of range).
	Blinking	Non-critical failure (internal voltage or temperature).
Off		System not ready.

CMOS Battery

A lithium CMOS Battery ensures that the on-board CMOS chip stores the system configuration (e.g., hard disk type, floppy drive types, date and time, and the order in which the computer will look for bootable disks) when the server is turned off.
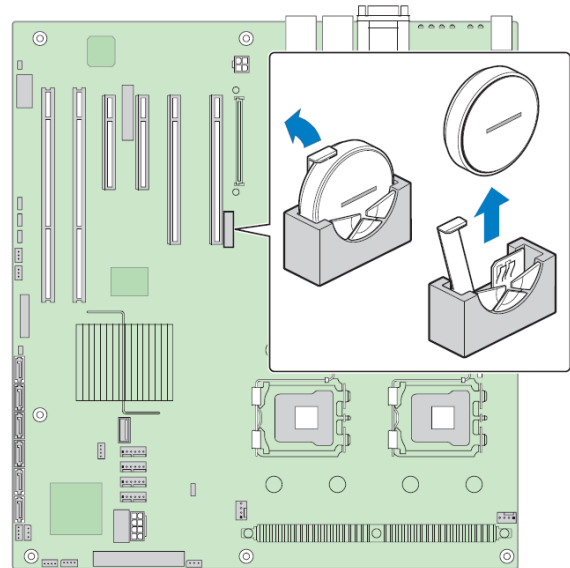
When the battery starts to degrade, the clock values will be incorrect and system configuration will be affected. Ensure that the CMOS battery is replaced before a problem occurs, see *"5-yearly maintenance" on page 97*.
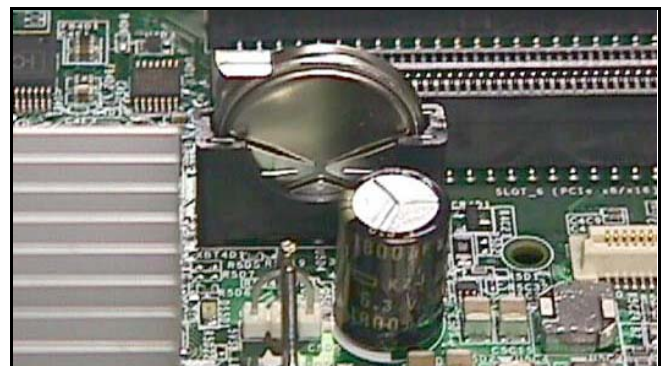
For removal/replacement instructions, see *"CMOS battery replacement" on page 91*.

CPU Fans

Each of the central processing units (CPUs) have fans mounted on their heatsinks to aid cooling and performance.

If CPU 1 Fan fails, a fan fail LED (item S in the table on *"Indicators" on page 29*) is lit on the Motherboard. Similarly, if CPU 2 Fan fails, a fan fail LED (R) is lit.
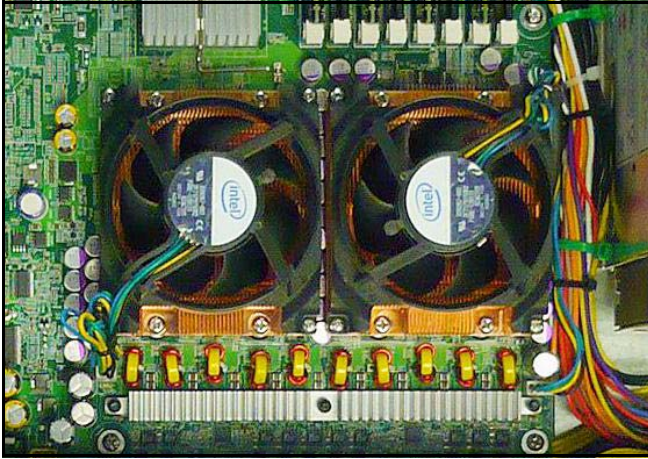
For removal/replacement instructions, see *"Memory module replacement" on page 90*.

Memory Modules

The Dual Inline Memory Modules (DIMMs) are fitted in the dedicated Motherboard slots to provide 4 GB of RAM.
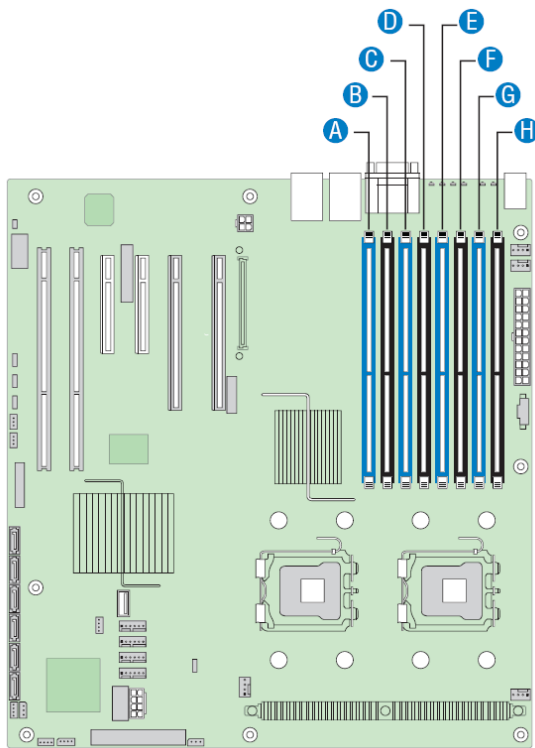
The DIMMs are fitted in two pairs: A and C, E and G.

RAID controller card

The RAID Controller Card is a 3ware 9650SE-16ML plug-in board that provides hardware control of the Media RAID.

It is physically located in PCI express slot 5 of the Motherboard.

Jumpers and indicators

Connections for this plug-in board are located along the bottom edge of the board, which directly mates with the PCI slot 5 of the Motherboard.

In addition, at the opposite end to the metal mounting panel there are connectors which mate with the eight S-ATA cables carrying signals to and from the Media RAID Backplane Boards.

Drive Activity LED Indicators

Overall LED drive status indicator is the right-most LED header pin pair on each LED connector (J7, J8, J9, J1). The anode is the lower of the two pins and the cathode is the upper.

- J7 is for drives 0, 1, 2, 3 (left-to-right).
- J8 is for drives 4, 5, 6, 7 (left-to-right).
- J9 is for drives 8, 9, 10, 11 (left-to-right).
- J1 is for drives 12, 13, 14, 15 (left-to-right).
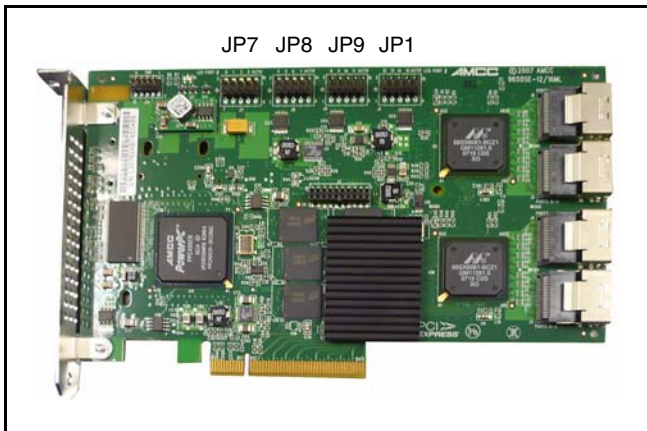
NIC card

The NIC Card is a Intel Pro/1000 PT Dual plug-in board the provides a Gigabit Ethernet interface for the server.

It is physically located in PCI slot 3 of the Motherboard.

Two Ethernet ports are provided on the metal mounting panel, but only the upper one is used. The lower one is not used. See *"Connector pinouts" on page 24* for connector details.

Jumpers and indicators

Connections for this plug-in board are located along the bottom edge of the board, which directly mates with the PCI slot 3 of the Motherboard.

S-ATA backplane board (PN16-0107)

A Serial-ATA (S-ATA) Backplane Board supports a single row of hot-swappable Serial ATA hard disk drives.

Four Backplane Boards are required to support the full complement of four rows of Media RAID HDDs (16 HDDs in total).
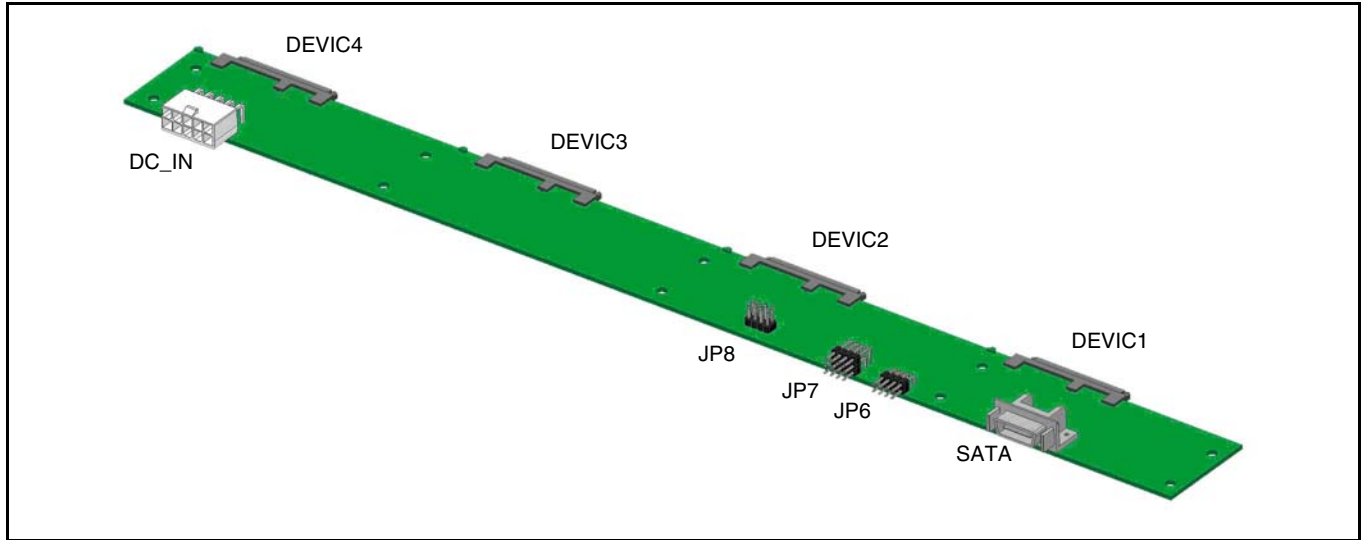
Jumpers and indicators

DEVIC1 - DEVIC4 Serial ATA Connector Header

A 22-pin connector header connects the backplane to the Serial ATA hard disk drive.
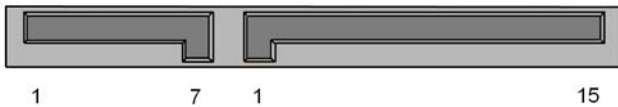
The *signal* connector is a separate 7-pin segment.

Pin	Signal Name	Pin	Signal Name
1	GND	2	DRV RX Positive
3	DRV RX Negative	4	GND
5	DRV TX Positive	6	DRV TX Negative
7	GND		

The *power* connector is a separate 7-pin segment.

Pin	Signal Name	Pin	Signal Name
1	+3.3 V	2	+3.3 V
3	+3.3 V	4	GND
5	GND	6	GND
7	+5 V	8	+5 V
9	+5 V	10	GND
11	Note	12	GND
13	+12 V	14	+12 V
15	+12 V		

Note

Pin 11 on the 22-pin connector *power* segment will receive drive activity signal directly from the hard disk drive. See *"JP7 Hard disk Status Signal Header" on page 34* to enable or disable pin 11 function. The default setting is 'disabled'. Hard drive that support Pin 11 activity signal include all Western Digital model, Maxtor DiamondMAX 10, MaXLine III and MaXLine III+.

SATA Multi-lane Serial ATA Connector Header

A 25-pin header connects the backplane to the Serial ATA controller.

Pin	Signal Name	Pin	Signal Name
1	GND	2	DRV1 RX Positive
3	DRV1 RX Negative	4	GND
5	DRV2 RX Positive	6	DRV2 RX Negative
7	GND	8	DRV3 RX Positive
9	DRV3 RX Negative	10	GND
11	DRV4 RX Positive	12	DRV4 RX Negative
13	GND	14	DRV4 TX Positive
15	DRV4 TX Negative	16	GND
17	DRV3 TX Positive	18	DRV3 TX Negative
19	GND	20	DRV2 TX Positive
21	DRV2 TX Negative	22	GND
23	DRV1 TX Positive	24	DRV1 TX Negative
25	GND		

JP6 Serial ATA Activity and Failed Signal Header

This 8-pin header carries status signals. The upper 4 pins are connected to the Serial ATA controller activity signal header and the lower 4 pins are connected to the Serial ATA controller failure signal header.
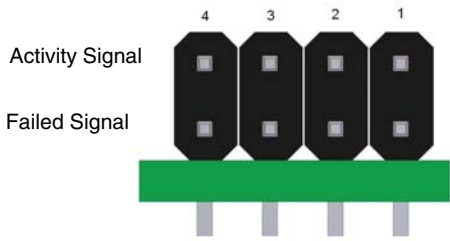
JP7 Hard disk Status Signal Header

This 8-pin header carries status signals. The jumpers set the hard disk drive status LED signal either from the Hard Disk Drive pin 11 or from the Serial ATA controller. Follow the table below for jumper setting information. The default setting has jumper on 2-3 for signal from the Serial ATA controller.
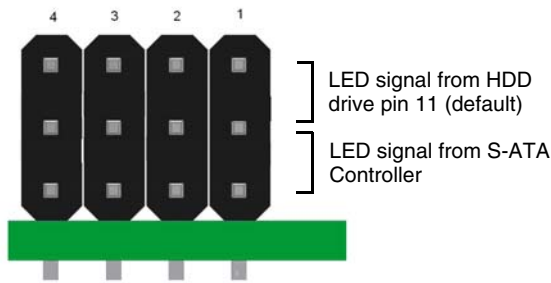
JP8 MOSFET Setup Header

Not used/connected.

DC_IN Power Connector Header

A10-pin power connector is connected to the System Power Board to provide power to the Serial ATA backplane and hard disk drives.

System cooling fans

Two System Cooling Fans are located in the centre of the server unit, separating the front and rear compartments of the chassis.

The Fans are hot-swappable, and can therefore be removed while the server is operational (see *Chapter 6, Parts Replacement* for the replacement procedure).
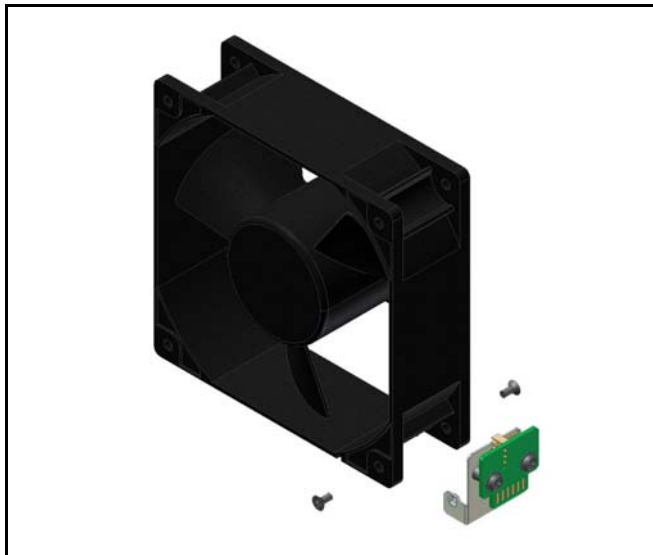
The fans are designed to direct cooling airflow from the front compartment of the chassis, into the rear compartment and over the Motherboard, to be expelled from the rear of the unit. It is therefore important to check that the orientation of these fans is correct when replacing them.

Each Fan is connected to a Fan Adapter Board which supplies power to the Fan from the System Power Board, which controls the internal temperature of the unit, and reports back the speed of the Fan.

Fan adapter board (PN16-0106)

Two hot-swappable system fans are provided by the server, and the interconnection between the fans and the System Power Board is through the Fan Adapter Board.

The fan is connected to the board through the 4-pin connector and is connected to the System Power Board via the Card edge connector, which has a total of 10 pins; 5 on each side.
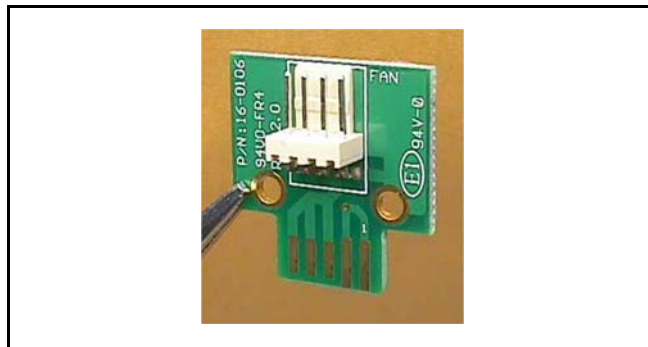
Pin	Signal Name
1	Ground
2	+12 V
3	Fan Tach out Signal
4	Fan PWM out Signal

System power board (PN16-0101)

A System Power Board consolidates all power cables to support backplane and hot-swappable system fans. It distributes dc power to the Media RAID HDDs, OS RAID HDDs and the DVD/CD drive. Power to OS RAID HDD and to DVD/CD drive is supplied through the Slim Power Distribution board (PN16-0103). The power to chassis fan is supplied through the Fan Adapter board (PN16-0106).

The System Power Board is equipped with system management sensors such as fan failure signal, power failure signal and over-temperature signal. The fan failure signal triggers n audible beeper and LED blinking on the LED switch board.

All data cables are bundled on the one side of the chassis while all power cables are located on the other side to avoid interference with the data performance.
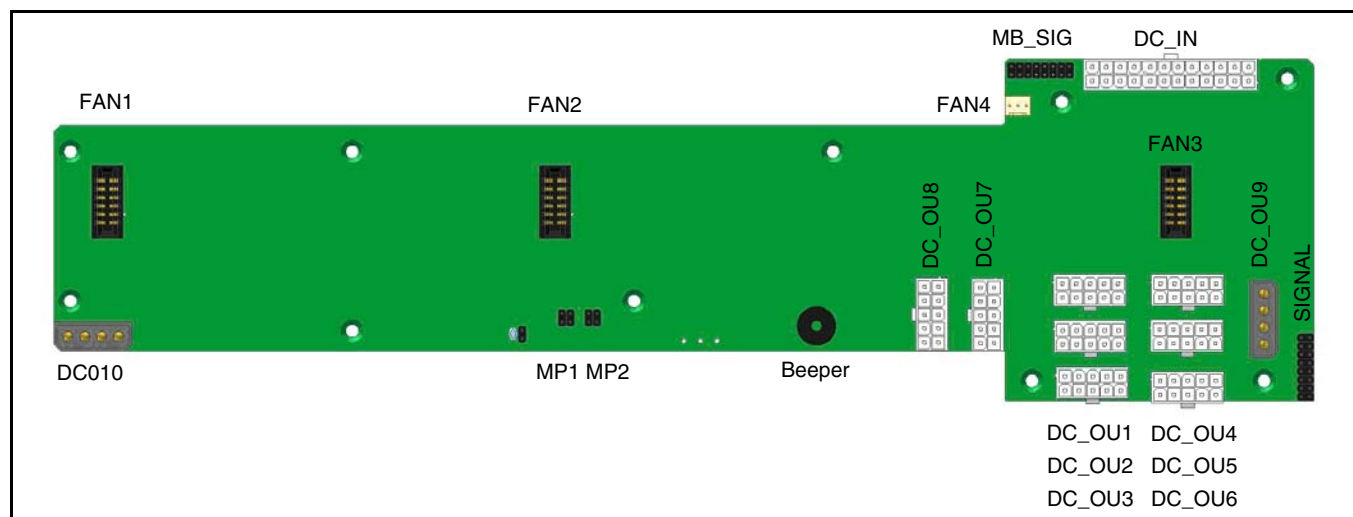
Jumpers and indicators

DC_IN Power Input from Power Supply

This 24-pin jumper connector receives power from the Power Supply.

Pin	Signal Name	Pin	Signal Name
1	+5 V	2	+5 V
3	+5 V	4	+5 V
5	GND	6	GND
7	+12 V	8	+12 V
9	+12 V	10	GND
11	SDA	12	Reset
13	+5 V	14	+5 V
15	+5 V	16	+5 V
17	GND	18	GND
19	GND	20	+12 V
21	+12 V	22	GND
23	SCL	24	TTL

MB_SIG Front Panel to Motherboard and System Fan Feedback Header

This 16-pin jumper connector supplies power to the LED switch board and
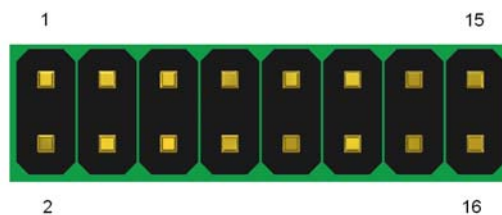
Pin	Signal Name	Pin	Signal Name
1	Fan 1 PWN-OUT	2	Fan 1 TACH-OUT
3	Fan 2 PWN-OUT	4	Fan 2 TACH-OUT
5	Power SW 1	6	Power SW 2
7	Reset SW 1	8	Reset SW 2
9	HDD LED +	10	HDD LED -
11	LAN 1 LED +	12	LAN 1 LED -
13	LAN 2 LED +	14	LAN 2 LED -
15	SDA	16	SCL

FAN4 Fan Header

This 3-pin jumper connector supplies power to the Fan Edge Adapter Board and receives the fan speed signal back.
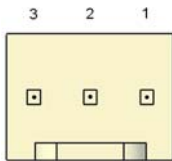
Pin	Signal Name
1	Fan TACH
2	+12 V
3	GND

FAN1- FAN3 Hot Swap Fan Headers

These 12-pin jumper connectors provide connections to the hot swappable system fans.

Pin	Signal Name	Pin	Signal Name
1		2	
3		4	
5		6	
7		8	
9		10	
11		12	

DC_OU9 and DC_O10 Power Headers

The DC_OU9 4-pin power header provides dc power supply to the Slim Power Distribution Board.

The DC_O10 4-pin power header is used for high power add-in-card (such as graphic card that requires additional power).
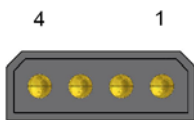
Pin	Signal Name
1	+12 V
2	GND (Common)
3	GND (Common)
4	+5 V

SIGNAL LED switch board Header

This 16-pin jumper connector provides communication between the System Power Board to the LED switch board through the Front Panel Cable. Switch control, LED driving signals and dc power supplies are routed through to the front panel controls and indicators.
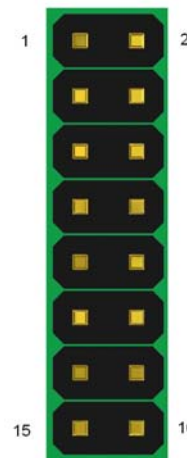
Pin	Signal Name	Pin	Signal Name
1	Power Switch 1	2	Power Switch 2
3	Sys Reset Switch 1	4	Sys Reset Switch 2
5	Alarm Reset	6	Fail LED Negative (-)
7	Access LED (+)	8	Access LED (-)
9	LAN1 LED (-)	10	LAN1 LED (+)
11	LAN2 LED (-)	12	LAN2 LED (+)
13	GND	14	GND
15	+5 V	16	+5 V

DC_OU1 - DC_OU8 Power Out Headers

These 10-pin power out headers are connected to the backplane board to provide power to hard disk drives.
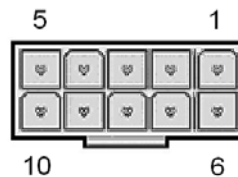
Pin	Signal Name	Pin	Signal Name
1	+5 V	2	+5 V
3	GND	4	GND
5	+12 V	6	+5 V
7	GND	8	GND
9	+12 V	10	+12 V

MP1, MP2 Thermocouple Threshold Jumper Headers

Two 4-pin jumpers define the thermocouple threshold setting of two thermocouples (1 and 2). If the temperature feedback from the thermocouple exceeds the threshold setting, the beeper will emit an audible alarm and the fan failed LED on the front panel will turn on.
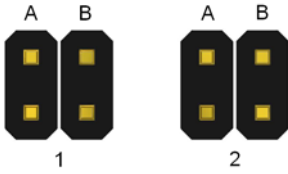
Jumper position	Threshold Setting
1	113 degrees F (45 degrees C) - default
	131 degrees F (55 degrees C)
	149 degrees F (65 degrees C)

Thermocouple 1

There is one Thermocouple embedded on the system power board (Thermocouple 1) to monitor the system temperature.
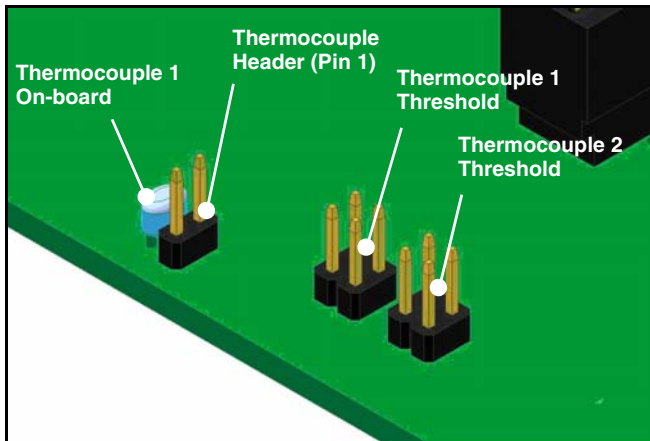
The Thermocouple 1 on-board and Thermocouple 1 Threshold are set.

The Thermocouple Header (pin 1) and Thermocouple 2 Threshold are set. The Thermocouple Header (pin 1) and Thermocouple 2 Threshold are not used.

Slim power distribution board (PN16-0103)

The Slim Power Distribution Board provides dc power supplies to the slim-line DVD/CD disk drive (via the Slim DVD board described below) and to the two OS hard disk drives.
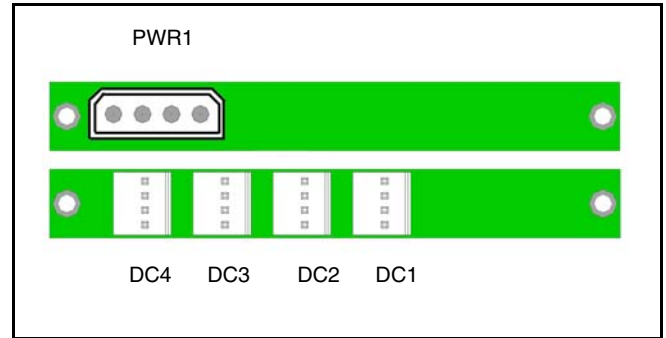
Jumpers

PWR1 System Power Board Connector Header

This 4-pin jumper connector is cabled to the System Power Board to provide power to the Slim Power Board through a DC power cable.

Pin	Signal Name
1	+12 V
2	Ground (COM)
3	Ground (COM)
4	+5 V

DC1 - DC4 Device Power Connector Header

Four jumper connectors each have 4 pins, similar to JP1, and are cabled to the Slim Power DVD Board and the OS HDDs.

Pin	Signal Name
1	+12 V
2	Ground (COM)
3	Ground (COM)
4	+5 V

Slim DVD board (PN16-0105)

The Slim DVD Board is configured for either the slim-line DVD/CD disk drive.

The following table describes the connector pin assignments on the slim CD/DVD-Rom Board.
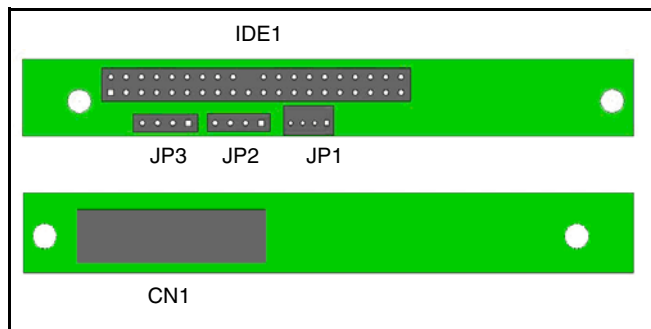
Jumpers

IDE1 IDE Header

This 40-pin jumper header is connected to the IDE cable. The PCB supports cable select only, so master/slave is determined by the IDE cable.

Pin	Signal Name	Pin	Signal Name
1	RST IDE S L	2	GND
3	IDE SDD <7>	4	IDE SDD <8>
5	IDE SDD <6>	6	IDE SDD <9>
7	IDE SDD <5>	8	IDE SDD <10>
9	IDE SDD <4>	10	IDE SDD <11>
11	IDE SDD <3>	12	IDE SDD <12>
13	IDE SDD <2>	14	IDE SDD <13>
15	IDE SDD <1>	16	IDE SDD <14>
17	IDE SDD <0>	18	IDE SDD <15>
19	GND	20	Not used
21	IDE SDDREQ	22	GND
23	IDE SDIOW L	24	GND
25	IDE SDLOR L	26	GND
27	IDE SIORDY	28	IDEP ALE H
29	SDDACK L	30	GND
31	IDE S	32	NC IDEIO16 L
33	IDE SDA<1>	34	NC CBL DET S
35	IDE SDA<0>	36	IDE SDA<2>
37	IDE SDCS0 L	38	IDE SDCS1 L
39	IDE SEC HD ACT L	40	GND

JP3 Power Header

A 4-pin header supplies power to the DVD/CD drive.

Pin	Signal Name
1	+12 V
2	Ground (COM)
3	Ground (COM)
4	+5 V

JP2 2.54 mm pitch Audio Output Header

This connector is not used.

JP1 2.0 mm pitch Audio Output Header

This connector is not used.

CN1 Direct Plug Connector

A 50-pin direct plug Slim DVD connector provides the connection between the drive, power supply and server board.

Pin	Signal Name	Pin	Signal Name
1	RSV LCM	2	RSV RCM
3	RSV GND	4	GND
5	RST IDE S L	6	IDE SDD <8>
7	IDE SDD <7>	8	IDE SDD <9>
9	IDE SDD <6>	10	IDE SDD <10>
11	IDE SDD <5>	12	IDE SDD <11>
13	IDE SDD <4>	14	IDE SDD <12>
15	IDE SDD <3>	16	IDE SDD <13>
17	IDE SDD <2>	18	IDE SDD <14>
19	IDE SDD <1>	20	IDE SDD <15>
21	IDE SDD <0>	22	IDE SDDREQ
23	GND	24	IDE SDIOR L
25	IDE SDIOW L	26	GND
27	IDE SIORDY	28	IDE SDDACK L
29	IRQ IDE S	30	NC IDEIO16 L
31	IDE SDA<1>	32	NC CBL DET S
33	IDE SDA<0>	34	IDE SDA<2>
35	IDE SDCS0 L	36	IDE SDCS1 L
37	IDE SEC HD ACT L	38	+5 V
39	+5 V	40	+5 V
41	+5 V	42	+5 V
43	GND	44	GND
45	GND	46	GND
47	IDEP ALE H	48	GND
49		50	

LED switch board (PN16-0102)

The LED switch board houses the pushbuttons, status LEDs and 2 USB ports that are accessible on the front panel of the server unit.

DC power for the various on-board components is received from the Motherboard via the System Power Board. The USB interface signals are received directly from the Motherboard.

For a description of the controls and indicators, see *"Front panel controls and indicators" on page 19*.

Jumpers

JP1 Front Panel Switch/Indicator Connector Header

The 16-pin connector header provides signal communication between the System Power Board and the LED switch board.

Pin	Signal Name	Pin	Signal Name
1	Power Switch 1	2	Power Switch 2
3	Sys Reset Switch 1	4	Sys Reset Switch 2
5	Alarm Reset	6	Fail LED Negative (-)
7	Access LED (+)	8	Access LED (-)
9	LAN1 LED (-)	10	LAN1 LED (+)
11	LAN2 LED (-)	12	LAN2 LED (+)
13	GND	14	GND
15	+5 V	16	+5 V

JP2 Front Panel USB Connector Header

The 10-pin connector header provides communication between external USB devices to the Motherboard through Front Panel USB Cable.

Pin	Signal Name	Pin	Signal Name
1	USB Port 2 Power	2	USB Port 1 Power
3	Port 2 (-)	4	Port 1 (-)
5	Port 2 (+)	6	Port 1 (+)
7	GND	8	GND
9	Key N/C	10	Overcurrent Signal N/C

Servicing

Introduction

About this manual

This chapter describes servicing tasks and provides an overview of safe working practices to be used when servicing the server unit.

Servicing policy

Generally, a 'board replacement' policy is implemented on the server unit. The service engineer WILL NOT normally be expected to change board components (ICs, LEDs, resistors, etc.). The information and instructions given in this manual reflect this policy.

A list of all the serviceable parts, and exploded views of the server unit are given in *Chapter 8, Spare Parts*.

Servicing tasks

An on-site service engineer may be asked to do the following servicing asks:

- Perform regular and essential maintenance - see *Chapter 7, Maintenance*.
- Troubleshoot apparent fault symptoms - see *Chapter 5, Troubleshooting*.
- Order replacement parts - see *Chapter 8, Spare Parts*.
- Replace any faulty parts - see *Chapter 6, Parts Replacement*.
- Use diagnostic and testing utilities to help identify problems, asses the status of the server and test the functionality of replaced parts - see *Chapter 3, Utilities*.

Notifying clients of interruptions

Servicing tasks should, in general, be performed, with consideration for the HDXchange clients and, where possible, without interruption to the normal operation of the HDXchange system.

Some servicing tasks, however, will require that clients be disconnected or shut down while internal parts are replaced or system tests carried out, thereby interrupting the day-to-day operation of HDXchange.

- **Always ensure the minimum of interruption** to clients and users of the HDXchange system. Ensure that all possible servicing or corrective actions have been attempted prior to shutting down the server or taking it off-line.
- **Always notify clients prior to shutting down** the server or interrupting the operation of the HDXchange system. Give as much advanced warning as possible and allow clients/users to back-up or save their work.
- **Always keep clients and users up-to-date** with progress and estimates of how long repairs will take. Give regular bulletins if parts have to be ordered and fitted.
- **Always notify clients when the system is back on-line**. Ensure that any other relevant administrators, office staff, etc., are also notified that the HDXchange system is working and available.

Safe working practices

Safe handling precautions

High voltage

WARNING

Danger of electric shock - high voltages exist within this equipment. Only an approved and qualified service engineer is permitted to remove the covers of this equipment. Failure to comply may result in death or serious injury.

When servicing, always isolate the mains power supply and remove all three mains input cables after powering down the server, thereby removing the danger of electric shock from the server.

High temperature

Warning

Danger of burns - the temperature on the surface of the power supply module maybe around 48°C (120°F) to 60°C (140°F) depending on the ambient temperature. Wear protective gloves as needed.

Always take care when handling the server immediately after it has been powered down, as the covers and chassis in close proximity to the power supply area may be hot to the touch.

Heavy weight

Warning

Danger of injury - this equipment weighs approximately 42 kg. Do not attempt to lift the unit unaided. Seek assistance.

Always seek assistance when lifting the server unit or removing it from a rack. The server is heavy and requires special handling.

Electrostatic discharge (ESD) precautions

Caution

This equipment contains electrostatic sensitive devices. Only qualified persons familiar with appropriate ESD handling precautions and procedures should remove the covers or the hard disk drives (HDDs). Failure to observe these procedures may result in damage to this equipment.

The server unit contains components (including printed circuit boards and hard disk drives) that are sensitive and susceptible to damage from electrostatic discharge (ESD). Static generated by your body, your clothes, or by work environment, can cause immediate or latent damage to the these components, which may subsequently fail. Avoid the possibility of static build-up by ensuring that you are earthed at all times. You can do this by using the handling methods outlined below.

Anti-static handling precautions are recommended:

- **when the covers of the server are removed** for servicing and internal components are exposed.
- **when replacing any parts** on the server, with the power on or off.
- **when inserting or removing a USB memory device** with the server power on.
- **when pushing the eject button on the DVD/CD drive** with the server power on.

Anti-static handling

The following methods are recommended to help prevent damage to the server by ESD:

- **use an anti-static wrist or foot strap.** Attach the relevant end of the strap to the server metal chassis or appropriate earthing point, and attach the other end to your wrist or ankle. Refer to the instructions provided with the strap.
- **place items on an anti-static mat (or equivalent)**. A permanent anti-static mat, or disposable mat shipped with replacement parts, must be earthed in the same way as a wrist strap.
- **use an anti-static bag** to protect replacement parts for shipping or handling.
- **hold cards by the edges** to avoid touching conducting parts and pcb tracks.
- **touch the lid/chassis of the server** every 30 seconds or so, when handling sensitive components.

Environmental considerations

When servicing, check that the server is located in a suitable environment. Server performance may be degraded or components may fail as a result of the server being operated or stored in an unsuitable environment.

Caution

Damage may be caused by condensation or dew formed inside the equipment. Always allow the equipment to acclimatise to a new operating environment before attempting to power up.

If you move the server unit from a cool environment to a warm one, for example from outside or from a storage room into an office or equipment room, allow the unit to stand for 20 minutes to acclimatise to the new environment. Ensure that the unit is completely free of condensation before powering up.

• Operating guaranteed temperature: +5°C to +35°C
• Operating humidity: 20% to 80% (relative humidity)
• Storage temperature: -20°C to +60°C

Prohibited locations

Do not install the server in the following environments:
• Areas where the unit will be exposed to direct sunlight or any other strong lights.
• Dusty areas.
• Areas subject to vibration.
• Areas with strong electric or magnetic fields.
• Areas near heat sources.
• Areas subjected to electrical noise.
• Areas subjected to static electrical noise.

Ventilation

The HDXS-C200 is cooled by internal fans drawing air through the front of the unit and exhausting through the vents at the rear of the unit. The server can be damaged if these exhaust vents (rear panel) or air intake (front panel) are blocked or the fan is stopped.

Ensure that a clear space of more than 10 cm is maintained at the front and back of the unit to enable free airflow.

Acoustic noise

Due to the nature of server type products, consideration should be given to the level of acoustic noise produced. It is advisable to locate the server in a room acoustically isolated from users.

Power supply

Ensure that a suitable power supply is provided to power the server:

Power requirements: 100 to 240 VAC +/-10% 50/60 Hz

Current consumption: Maximum 9.0/5.0 A 115/230 VAC

Inrush current at turn-on is maximum 80/100 A 115/230 VAC per module, the AC power supply must be capable of supplying this value.

If the capacity of the AC power is not adequate, the breaker of the AC power at the supply side may operate or the unit can operate unreliably.

Note

Sony recommends that this unit be located in a dedicated server room. Noise levels from the unit may cause people to feel uncomfortable. If the server is to be used in an office or other environment where people work for long periods, it is strongly recommended that the server unit be located in a well ventilated enclosure with suitable noise management properties.

Recommended power cords

This unit is not supplied with power cords. To obtain power cords, please contact your dealer or sales office.

WARNING

Use the approved Power Cord (3-core mains lead)/Appliance Connector/Plug with earthing-contacts that conforms to the safety regulations of each country if applicable.

Use the Power Cord (3-core mains lead)/Appliance Connector/Plug conforming to the proper ratings (Voltage, current).

If you have questions on the use of the above Power Cord/Appliance Connector/Plug, please contact your local dealer or sales office.

Never use a damaged power cord.

Power cord (USA)

This warning is applicable for USA only. If used in USA, use the UL LISTED power cord specified below.

DO NOT USE ANY OTHER POWER CORD.

Plug Cap: Parallel blade with ground pin

(NEMA 5-15P Configuration)

Cord: Type SJT, three 16 or 18 AWG wires

Length: Minimum 1.5 m (39 3/8 in.)

Less than 2.5 m (8 ft. 3 in.)

Rating: Minimum 10 A, 125 V

Using this unit at a voltage other than 120 V may require the use of a different line cord or attachment plug, or both. To reduce the risk of fire or electric shock, refer servicing to qualified service personnel.

Basic operations

How to power off the server

Cautions

- **Be sure to follow the correct Shutdown procedure - Do not turn off by disconnecting the AC power.**
- **Before shutdown ensure that all users are aware and are logged out.**

The server can be shutdown either remotely from a client PC or Mac, or from the server if a monitor and keyboard are connected.

Powering off from a monitor/keyboard connected to the server

1 On the server login screen, click on **Shutdown**.

2 When prompted with the message "Are you sure you want to shut down the machine?", click **Shut Down** to continue the power off process.

Powering off remotely from a client machine

The server may be shutdown or re-booted remotely from a client PC. Please refer to the *HDXS-C200 Installation Manual* for details.

Note

If the system is not responding and you cannot issue an operating system command to turn the system power off, remove the front bezel (if fitted), and press and hold the **Power** button on the front control panel for more than three seconds

How to power on the system

Notes

- Although it is not necessary to have a monitor and keyboard connected, they may be required to assist with troubleshooting if the server does not boot-up correctly.
- A P/S2 keyboard must be connected before powering on.

Cautions

- **Never move the system when system power is on, movement can cause disk drive failure. Always power off the system before moving it.**

- **Before you power on the system, make sure that the top lids are in place.**

1 Turn on power to any peripherals and external storage devices.

2 Turn on power to the monitor (if connected). A monitor is required for viewing system messages.

3 Press the front panel **Power** button.

Notes

- The system may take 30 seconds to two minutes before information is displayed on the system monitor. The delay depends on the level of power-on self-test (POST) diagnostics being performed.

- Boot-up of the operating and application software may take several minutes to complete. On completion a login screen should be displayed.

How to 'ping' a computer

'Pinging' a computer is a way to check and see if a computer is on the network. Pings send a network request to a computer asking it to respond (ICMP ECHO_REQUEST).

When you 'ping' a computer, you need to know its name or its IP address. Using the IP address is better than using the name, as it eliminates the need to look up the name.

- To ping a computer from a UNIX machine, use the command:
  ping <IP address>
- To ping a computer from a Macintosh, use the program:
  macping.
- To ping a computer from a Windows/PC machine, use the MSDOS prompt and type the command:
  ping <IP address>

Interpreting the results

A successful 'ping' consists of receiving back a copy of a short transmitted test message. The reply will display 'ping statistics' (number of packets sent and received and the time taken, in ms, to receive back those packets, as shown below.

```
Command Prompt
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\user>ping 66.246.3.197

Pinging 66.246.3.197 with 32 bytes of data:

Reply from 66.246.3.197: bytes=32 time=280ms TTL=46
Reply from 66.246.3.197: bytes=32 time=279ms TTL=46
Reply from 66.246.3.197: bytes=32 time=279ms TTL=46
Reply from 66.246.3.197: bytes=32 time=279ms TTL=46

Ping statistics for 66.246.3.197:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 279ms, Maximum = 280ms, Average = 279ms

C:\Documents and Settings\user>
```

- **Reply from <IP address>** - the host IP number that responded.
- **bytes=32** - number of bytes sent in the packet.
- **time=280ms** - time (in milliseconds) of the round trip to the host, which gives an indication of the quality of the communications link. The time taken for a packet to reach the host is also called 'latency'. Depending upon the location of the remote host, a good time would be less than 100 ms (i.e. 1 second). A variation in the times, called 'jitter', may indicate poor communication with the host.
- **TTL=46** - Time To Live. Indicates the hops along the way. Every ping packet that is sent out has a TTL value which by default is 255. For every router hop that the packet passes through, the TTL figure gets decreased by one. So in the example above the TTL of 46 means (255 - 46) 209 hops. Variations in the TTL show that the packets are traversing different routes.
- **Packets sent** - total number of packets sent during the test.
- **Packets received** - number of packets received by the host. A successful 'ping' receives back the same number of packets that were sent. Failure to receive back any packets indicates a communications path does not exist between sender and recipient.
- **Packets lost** - number of packets not received (i.e. lost on the way). Loss of some packets may indicate that the communications link requires troubleshooting.

An unsuccessful 'ping' may display:
- **Request timed out** - means there was no response in the default time period of one second. If the latency of the response is more than one second, try using the **-w** option on the ping command to increase the time-out, e.g. try **ping -w 5000 [IP address]** to allow responses within 5 seconds.
- **Unknown host** - means that the IP address does not exist.
- **Destination host unreachable** - means that the IP address is recognised but cannot be reached.

Ping options
- **-a** - resolve **A**ddress to hostname.
- **-f** - set "Don't fragment **F**lag" in packet.
- **-i** - Time To Live (TTL).
- **-j** - host-list loose source route along host-list.
- **-k** - host-list strict source route along host-list.
- **-l** - size send buffer size.
- **-n** - count **N**umber of echo requests to send.
- **-r** - count **R**ecord route for count hops
- **-s** - count timestamp for count hops.
- **-t** - pings the specified host until interrupted.
- **-v** - Type Of Service (TOS).
- **-w** - timeout (in milliseconds) to wait for each reply.

Ping Commands
- **Ctrl + Break** - to see statistics and continue.
- **Ctrl + C** - stop ping.
- **> c:\filename.txt** - send results to a text file.

Ping the loopback address - type ping 127.0.0.1

Successfully pinging the loopback address verifies that TCP/IP is both installed and configured correctly on the local client. If your loopback test fails, then it means IP stack is not answering. If any TCP drivers get corrupted, or if your network adapter is not functioning properly, or if any of the other service is interrupting IP, then lack of response might can occur. Open event viewer, and look for problems reported by setup or by the TCP/IP service.

Ping the local client - ping <IP address>

Successfully pinging the local client's IP address verifies that the client was successfully added to your network. If you cannot successfully ping the local IP address after successfully pinging the loopback address, check that the local client's IP address is a valid IP address, check the routing table, and check network adapter driver.

Ping the default gateway - ping <IP address>

Successfully pinging the default gateway of the local client verifies that you can properly communicate with the local subnet to your local host and your default gateway is also functioning properly. If you cannot successfully ping the default gateway after successfully pinging the local client, check the default gateway.

Ping the IP address of network device located on a remote network - ping <IP address>

Successfully pinging the IP address of the remote host verifies that the local client can communicate with the remote host through a router. if the remote host is located across a high delay link, try using the -w (wait) parameter to specify a longer time out period than the default time out of four seconds.

If you cannot successfully ping the remote host IP address after successfully pinging the default gateway, this indicates that there is no respond from the remote host, or if there is any network hardware problem between the source host and the destination host. To rule out the possibility of a problem in the work hardware, ping to a different remote host on the same subnet where the first remote host is located.

Ping the host name of another host on a remote network - ping <host name>

Successfully pinging the name of the remote host verifies that ping can resolve the remote host name to an IP address. If you cannot successfully ping the remote host name after successfully pinging the IP address of the remote host, the problem is with host name resolution, but not with network connectivity. When pinging the host name of the target host, ping attempts to resolve the name to an address (first through a DNS server, and next through a WINS server, if one is configured), and then attempts a local broadcast. Check TCP/IP properties to see whether the client has DNS server and WINS server addresses configured, either typed manually or assigned automatically. If DNS and WINS server addresses are configured in TCP/IP properties, and if they appear when you type ipconfig/all, then try pinging with server addresses to ascertain whether they are accessible.

On a network that uses DNS for name resolution, if the name entered is not a Fully Qualified Domain Name (FQDN), the DNS name resolver appends the computer's domain name or name to generate the FQDN. Name resolution might fail if you do not use an FQDN for a remote name. These requests fail because the DNS name resolver appends the local domain suffix to a name that resides elsewhere in the domain hierarchy.

How to upgrade the software version

The HDXchange software may be upgraded by selecting **Upgrade** on the **System > Configuration** page of the Administration web pages.

See HDXC-C030 HDXC-B030 HDXC-X030 HDXC-L030 Installation Manual for details of the Administration web pages.

The upgrade is achieved by transferring a set of RPM (Red-hat Package Manager) software packages from a supplied DVD.

The upgraded software files are normally stored at:

/Upgrade_rpms/[date]/[filename]

A list of the files that have been transferred and details of the transfer process are stored in two files labelled: **rpmlist.txt** and **rpmlist.log**

How to re-install the software

The HDXchange software is pre-loaded onto the server at the factory and cannot be re-installed as a 'clean install'.

A system of creating 'checkpoints' is provided by the **System > Checkpoints** page of the Administration web pages, however, to store a backup copy of the current operating system configuration on the server. Alternatively, it may be burned onto a DVD.

If the operating system has to be 're-installed', restore the system to a known-good checkpoint.

See HDXC-C030 HDXC-B030 HDXC-X030 HDXC-L030 Installation Manual for details of the Administration web pages.

Note

- A checkpoint stores the operating system configuration settings of the OS RAID, NOT data on the Media RAID.

A new checkpoint should be made following significant events on the server such as changes to users and groups, or after a software upgrade, or before replacing an OS hard disk drive; so that a previous system configuration can be restored in the event of a problem.

Transportation and packaging

If the server, or any component part of the server, has to be returned to your Sony representative for repair or further investigation, please ensure that it is adequately packaged. Sony cannot be held liable for goods that are inadequately packaged and damaged in transit.

If the original packaging is not available, please use a suitable replacement.

Returning parts to your Sony representative

If parts are to be returned to your local Sony representative for repair or further investigation, please ensure that they are adequately cushioned and packaged. Ensure that anti-static packaging is used for circuit boards and parts that require protection from electrostatic discharge.

Returning the server to your Sony representative

Please use the original packaging to protect the server from damage during transit.

In addition to providing external packaging for the server, ensure that the Media RAID HDDs cushioning blocks are re-inserted, and that the PCI card cushioning block is re-inserted to protect these items from possible vibration and damage (see the *HDXS-C200 Installation Manual* for details).

Introduction

About this chapter

This chapter describes the recommended utilities that may be used by the service engineer to configure the server, diagnose faults and test functionality.

Some of the utilities described here are provided, some must be obtained from an external vendor.

About the utilities

The following utilities are recommended to assist with servicing, see the following sections in this chapter for further details:

- **Motherboard BIOS manager** - used for setting up and managing the BIOS settings and firmware of the Motherboard (see *"Motherboard BIOS manager" on page 50*).
- **HDXchange administration web pages** - an application developed for HDXchange and used to configure the server and diagnose the status of the Media and OS RAIDs. Available by accessing the appropriate URL (see *"HDXchange administration web pages" on page 51*).
- **3ware disk manager** - an application that provides an interface to the controlling and monitoring functions of the 3ware RAID Controller Card (see *"3ware disk manager" on page 55*).
- **3ware RAID BIOS manager**- used for configuring Media RAID mirroring and other functions on the RAID Controller Card (see *"Checking RAID controller BIOS settings" on page 57*).
- **Pc-Check** - a utility produced by Eurosoft, used to test and diagnose hardware problems down to core component level (see *"Pc-Check" on page 60*).

- **SEL viewer** - used to obtain a system error log (SEL). Available from the SupportWEB (see *"SEL viewer" on page 63*).
- **PuTTY terminal emulator** - used to log on to the service account from a client machine (see *"PuTTY terminal emulator" on page 64*).

Motherboard BIOS manager

Introduction

The built-in BIOS manager may be used to configure and manage the BIOS settings and firmware on the Motherboard.

Accessing the utility

The Motherboard BIOS manager is accessed by pressing the function key **F2** when prompted by the on-screen display during the boot up procedure.

Manually entering server BIOS settings

The HDXchange server requires only several minor changes to be made to the default Motherboard BIOS settings. Therefore, if the settings are lost (for example, when the Motherboard CMOS battery fails) the correct BIOS settings can be quickly entered manually, as detailed in the procedure below.

To manually enter the BIOS settings:

1 Power on the server and press **F2** to go into the Motherboard BIOS.

2 Check the BIOS and FW revisions match the following:

   BIOS = 84   BMC = 62   FRU / SDR = 46

3 Press **F9** to load optimized defaults and then change ONLY the following:

   • **Main Page** - Set the date and time.
   • **Main Page** - Change Quiet Boot to Disabled.
   • **PCI Configuration** - Disable both Onboard NIC ROMS
   • **System Acoustics and Performance** - Change Throttling mode to Closed Loop
   • **Server Management Page** - Enable Clear system event log
   • **Boot Options** - Check the boot order is:
     DVD drive – SATA 0 Drive – Disabled

4 Save and Exit.

HDXchange administration web pages

Introduction

The Administration web page utility enables the setting up of user accounts and other management tasks on the HDXchange system.

It also provide a **Diagnostics** page that enables routine checking of the server data and system RAIDs, as well as enabling the creation of diagnostic logs and quota checking.

The 3ware disk Manager utility (see *"3ware disk manager" on page 55*) is automatically invoked from the Administration web page utility when **Data RAID** is selected on the **System > Diagnostics** web page.

Instructions are described in this section for:

* checking OS RAID status
* recovery from a failed OS disk drive

For further details see the *HDXC-C030 HDXC-B030 HDXC-X030 HDXC-L030 Installation Manual*.

Accessing the utility

This application is pre-installed on the server and may be viewed using a web browser.

> **Note**
>
> If using Microsoft Internet Explorer, a rescan failure may occur. In such case, please reload/refresh the page by clicking **F5**. We recommend using the Mozilla Firefox browser to avoid rescan failures when checking 3ware. Firefox may be downloaded from the internet as freeware.

Administrator login

Login to the utility as a user using:

> URL: **http://hdxchangeserver/**
>
> User: **admin**
>
> Password: **hxXXXXXX**
>
> (Where XXXXXX is the software serial number printed on a sticker at the rear of the server unit)
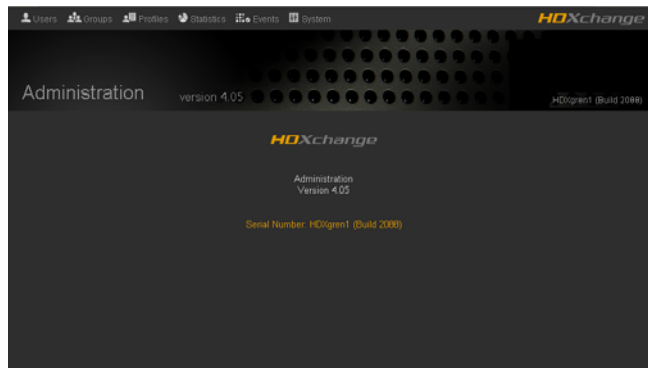
Checking OS RAID status

During operation of the server, the Administration web pages may be accessed from a remote client, or other networked machine, through a web browser application.

To check RAID status:

1 Login to the Administration web pages.

2 From the main Administration page, click the [System] icon at the top of the screen to display the system page, showing the version and serial numbers.
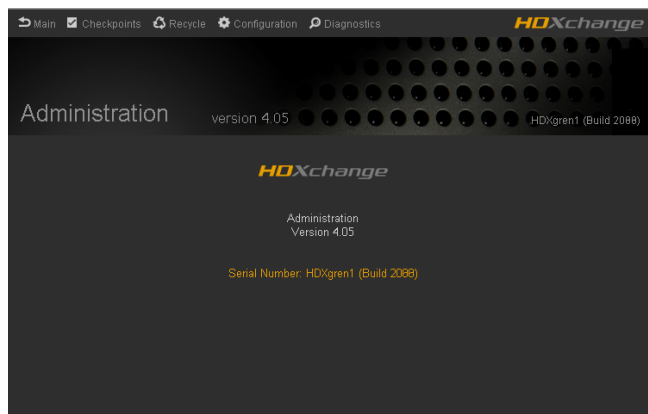
3 From the System page, click the [Diagnostics] icon to display the Diagnostics page, showing various diagnostic options.
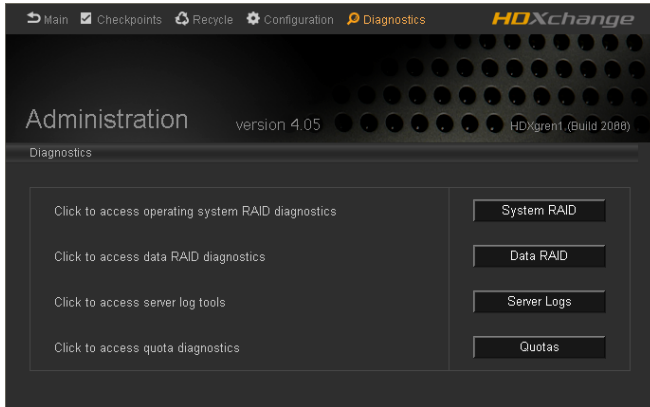
4 Click on the [System RAID] button to access operating system diagnostics.
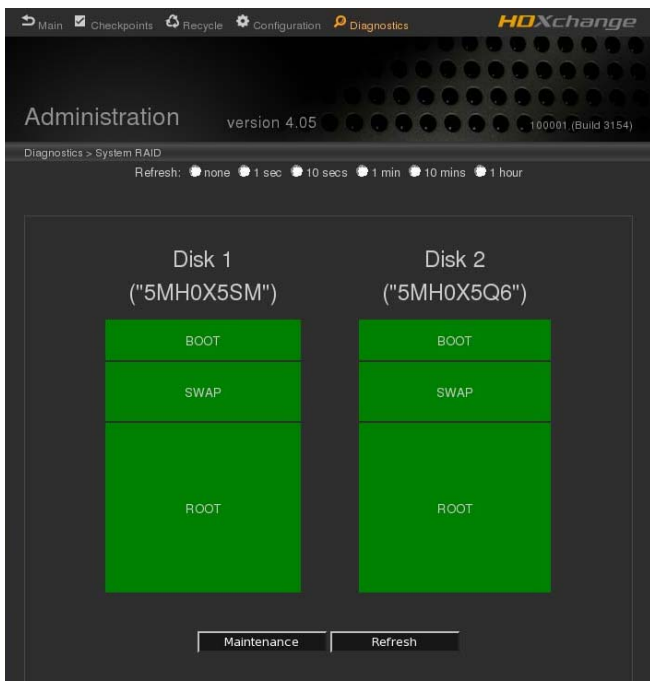
A visual display of the OS RAID HDDs is displayed, splitting up each HDD into boot, swap and root segments. The disks appear green when functioning normally, and change to red when a fault occurs.

Recovery from a failed OS disk drive

The recovery procedure for the OS RAID depends on the severity of the failure.

- **Partial failure** - a gradual degradation of the disk will be visible from the administrator web page, and notified to all logged in clients, if the windows messenger service has been enabled. In the event of partial failure, the affected OS hard drive should be changed as soon as possible.

- **Complete disk failure** - in the event of complete OS disk failure the server will stop responding, mounted drives will not be available and the administrator web pages will be unavailable.

- **Dual complete OS disk failure** - in the unlikely event of a dual OS disk failure, both disks must be replaced. The operating system will then need to be restored using the Restore CD and the latest Checkpoint file.

Recovery from partial OS drive failure

1 If the System RAID diagnostics indicate a problem, click on the [Maintenance] button to attempt to recover/rebuild the problem drive.
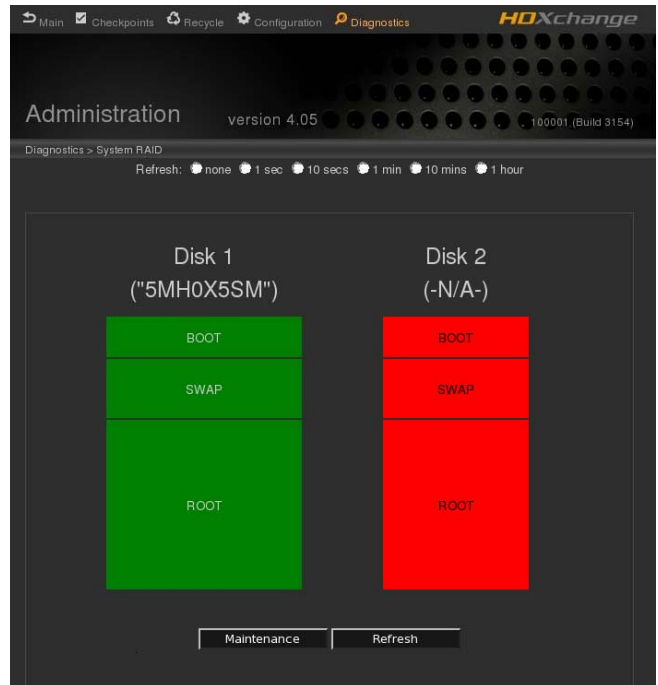
2 A text window displays information about the rebuild process. If there is no problem to fix or if the drive cannot be fixed, proceed to step 4. Otherwise the partition structure of the faulty drive is rebuilt and data is re-synchronised between the drives. This may take approximately 40 minutes. When "Rebuild Complete" is displayed, close the window.
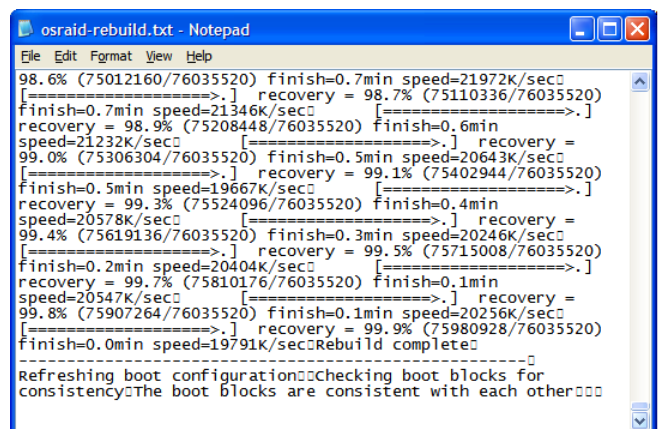
3 Click the [Refresh] button to update the System RAID page with the current drive status. If the display shows two healthy disks, then drive has been successfully recovered. If not, proceed to step 4.

4 Using the Administration web page, record the serial number of the healthy OS drive (the serial number of the faulty OS drive will not be displayed).

5 Create a checkpoint *(see HDXC-C030 HDXC-B030 HDXC X030 HDXC-L030 Installation Manual for details)* as a fall-back recovery procedure.

6 Power down the server (see *"How to power off the server" on page 45*).

7 Identify the **faulty** drive to be replaced (the serial number is printed on both the top and the front of the disks) - remember the serial number of the **healthy** drive was noted in step 4.

8 Replace the faulty OS drive (see *"OS HDD replacement" on page 87*).

> **Note**
>
> Before changing the OS drive, ensure that the drive and motherboard connectors are properly mated. If any were loose, re-power and check the operation of the server before changing the disk.

9 Power on the system and recover/rebuild the new disk by clicking the [Maintenance] button on the **System > Diagnostics > System RAID** Administration web page (as described in steps 1 - 3 above).

Recovery from complete OS drive failure

If an OS disk failure causes the server to lock-up, the recovery action is as follows:

1 Restart the server by pressing the front panel POWER button.

2 Using the Administration web page, record the serial number of the healthy OS drive (the serial number of the faulty OS drive will not be displayed).

3 Create a checkpoint *(see HDXC-C030 HDXC-B030 HDXC X030 HDXC-L030 Installation Manual for details)* as a fall-back recovery procedure.

4 Power down the server (see *"How to power off the server" on page 45*).

5 Identify the **faulty** drive to be replaced (the serial number is printed on both the top and the front of the

disks) - remember the serial number of the **healthy** drive was noted in step 2.

6 Replace the faulty OS drive (see *"OS HDD replacement" on page 87*).

> **Note**
>
> Before changing the OS drive, ensure that the drive and motherboard connectors are properly mated. If any were loose, re-power and check the operation of the server before changing the disk.

7 Power on the system and recover/rebuild the new disk by clicking the [Maintenance] button on the **System > Diagnostics > System RAID** Administration web page (as described in steps 1 - 3 above).

Recovery from a dual complete OS drive failure

In this event no control of the server will be available after a re-boot.

1 Power down the server (see *"How to power off the server" on page 45*).

2 Replace the OS disk (see *"OS HDD replacement" on page 87*).

> **Note**
>
> Before changing the OS drive, ensure that the drive and motherboard connectors are properly mated. If any were loose, re-power and check the operation of the server before changing the disk.

3 The OS will now have to be rebuilt using the Restore CD and the latest Checkpoint file, a copy of which should be found on the media RAID *(see 'Restoring a checkpoint file' in the HDXC-C030 HDXC-B030 HDXC X030 HDXC-L030 Installation Manual).*

> **Note**
>
> The server will require monitor, keyboard and mouse connected for Restoring a Checkpoint.

4 Insert the Restore boot-up CD into the DVD/CD drive of the server unit.

5 Power on, or Reboot the server using the Power Up/ Shutdown page.

6 The Gentoo boot-up screen will appear and will be displayed for approximately ten seconds. This allows the administrator time to cancel the Restore. To

continue the Restore, wait ten seconds or press the Enter key.

7 When the boot-up has completed the HDXchange Restore Desktop will be displayed.

8 Double click the 'Restore checkpoint' icon

Note

There will be a delay before the GUI appears.

9 Select desired checkpoint from the list.

10 Click the [Restore] button.

11 On the confirmation window, click [Yes] to start the restore process. (Clicking [No] will dismiss this message box).

12 When the restore is complete click the [Exit] button.

13 When the HDXchange Core server has completed shutdown, and begins its automatic reboot, press eject on the optical drive and remove the Recovery CD.

14 When a Red Hat desktop appears, click the Reboot icon and select option 'Reboot' to re-initialise the Core's network connectivity.

15 Log into the HDXchange Core Administration system as user 'admin', open the Profiles page and click [Save].

The HDXchange Core system RAID and the installation Profiles will be fully recovered and ready for use.

3ware disk manager

Introduction

The 3ware disk Manager application is used in conjunction with the RAID Controller Card to configure and monitor the Media RAID hard disk drives.

Instructions are described in this section for:

- checking RAID status
- recovery from a failed Media drive

For further details see the '*AMCC Users Guide for 3ware 9650SE, 9590SE, and 9550SX Series Controllers (PC)*' available at the 3ware home page.

Accessing the utility

The 3ware disk Manager utility is pre-installed on the server. It may be viewed using a web browser and is automatically invoked from the Administration web page utility (see *"HDXchange administration web pages" on page 51*) when **Data RAID** is selected on the **System > Diagnostics** web page.

> **Note**
>
> If using Microsoft Internet Explorer, a rescan failure may occur. In such case, please reload/refresh the page by clicking F5. We recommend using the Mozilla Firefox browser to avoid rescan failures when checking 3ware. Firefox may be downloaded from the internet as freeware.

User login

Login to the utility as a user using:

> User: **user**
>
> Password: **3ware**

Administration Login

Login to the utility as an administrator using:

> User: **admin**
>
> Password: **3ware**
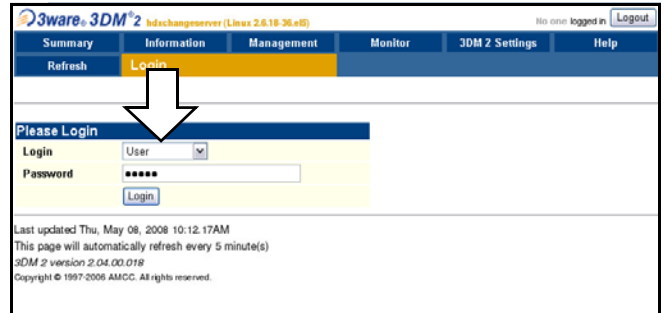
Checking media RAID status

To check Media RAID status:

1 Login to the Administration web pages using:

2 Go to the **System > Diagnostics** page and click the [Data RAID] button to display the 3ware Disk Manager (DM) web-based application.

3 Login to the 3ware web page as a user or administrator. The Summary page displays the status of the server RAID controllers.
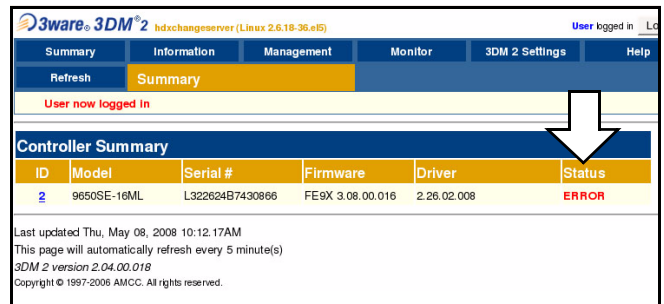
4 For information about the individual HDDs, click the ID number of the controller.
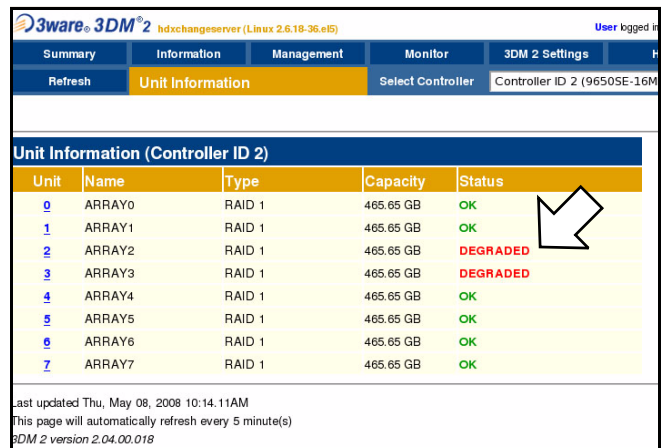
Ensures the status of each unit is 'OK' (displayed as green). Troubleshoot any RAID which has 'FAILED' or 'DEGRADED' (displayed as red).

Note

If you see 'INITIALIZING' in the Status column on 3ware web tool, please refer the following description and wait until it changes to 'OK'.

If the server is not cleanly shut down (e.g. if the power is cut), the 3ware tool will display that it is initializing when you next boot up. This is actually a drive/array verification process that takes place in the background to make sure the HDDs are fully working after the power loss.

Recovery from a failed media disk drive

Replace only one Media RAID drive from a unit at a time. After replacement the drive will need to be connected using the controller card web page (see *HDXC-C030 HDXC-B030 HDXC X030 HDXC-L030 Installation Manual*). The data will then be rebuilt from its RAID mirror drive automatically - this may take several hours. Do not replace any further drives during this period or data may be irretrievably lost.

If drives are removed make a note of their position in the chassis. Each drive is uniquely identified and should, if returned to the chassis, be placed in its original position.

Notes

- The functions performed by the **Management > Maintenance** options on the 3ware disk manager may also be performed by the using 3ware BIOS manager utility (see *"Checking RAID controller BIOS settings" on page 57*).
- Before commencing work, ensure that the operation of all clients has ceased and will not resume for the duration of the repair until the OS drive has been successfully replaced and rebuilt.

To identify, replace and recover from a faulty drive, use the following procedure:

1 Log in to the Administration web page utility.

2 On the **System > Diagnostics** page select [DATA RAID].

3 Login to the 3ware page as an administrator.

4 Select **Maintenance** from the Management drop-down menu.

5 Select the controller to display the Unit Information page which will show which unit or array is degraded.

6 Click on the 'DEGRADED' array. From this you can see which of the drives needs replacing.

7 Click on [Remove Drive] for the relevant drive to halt the disk drive. It may take up to 2 minutes for the disc to stop revolving. The drive status will appear as 'DEGRADED' or 'NOT PRESENT'.

8 Replace the faulty media disk (see *"Media RAID HDD replacement" on page 84*).

9 When the new disk is fitted, click the [Rescan Controller] button to find the new drive. The new disk should appear in the list of **Available Drives** at the bottom of the **Maintenance** page.

10 Tick the array that is 'DEGRADED' and click the [Rebuild Unit] button.

11 Select the new drive and click OK to see the status of the new drive displayed as 'REBUILDING 0%'. Refresh the screen periodically by pressing the [Rescan Controller] button, to ensure that the percentage increases, signifying that a rebuild is in progress.

Checking RAID controller BIOS settings

The RAID Controller Card BIOS settings determine the configuration of the Media RAID and should can be checked using the 3ware utility, as well as using the 3ware RAID BIOS Manager.

The 3ware utility **Management > Controller Settings** page provides **Background Task Rate** which can be adjusted to prioritise the actions of rebuild/migrate and verify.

The 3ware utility **Management > Controller Settings** page also provides **Other Controller Settings** which should be left at their default values (carve size, etc.).

3ware RAID BIOS manager

Introduction

The 3ware RAID BIOS manager may be used for configuring the 3ware RAID Controller Card.

- The functions performed by the 3ware RAID BIOS manager may also be performed by the using the **Management > Maintenance** option on the 3ware disk manager utility (see *"3ware disk manager" on page 55*).
- The background task rate and verify rate should not be changed from default. The carve size is not required as the Auto Carve should be disabled.

Accessing the utility

The BIOS manager is pre-installed on the RAID Controller Card. It may be invoked by simply pressing the **ALT-3** when prompted to do so at the normal boot-up screen.

Checking RAID controller BIOS settings

The RAID Controller Card BIOS settings determine the configuration of the Media RAID and should be checked when the card is replaced in the server.

Confirmation of the boot drive

Use the 3ware RAID BIOS manager to check the presence of the OS RAID drives and the boot order.

Typically the DVD disk drive is listed first in the boot order (the **IDE drive**).

Second, the **3ware Storage Controller** is listed next. A submenu for the controller will list the hard drives to be used. The drives are designated by their model numbers:

- **SATA 0: ST980825AS**
- **SATA 1: ST980825AS**

Setting up the RAID arrays

Caution

Take care to set up the RAID correctly and not to delete units, as this will result in loss of data.

1 Enter the 3ware RAID BIOS setup by pressing **ALT-3** when prompted to do so by the boot-up screen.

2 The following warning screen may appear when you first enter the 3ware RAID setup. Press any key to continue.
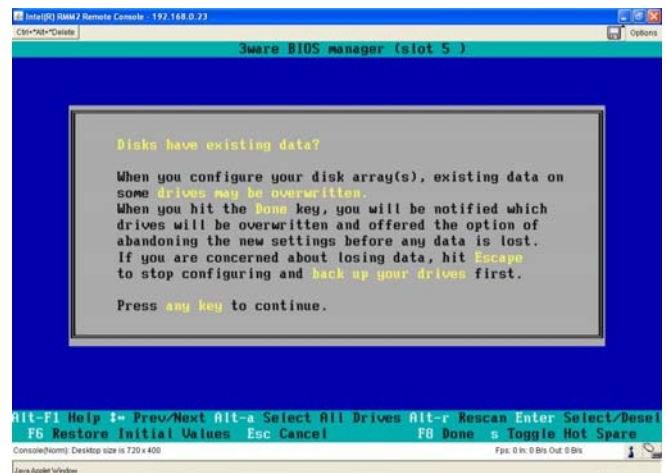
3 Check all the data HDDs are seen.

4 Open Settings and Controller Policies.
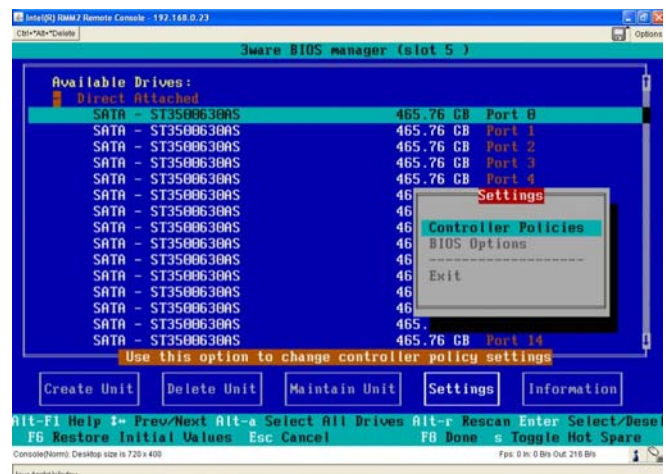
5 Disable Auto Rebuild in the controller settings and press **OK**.
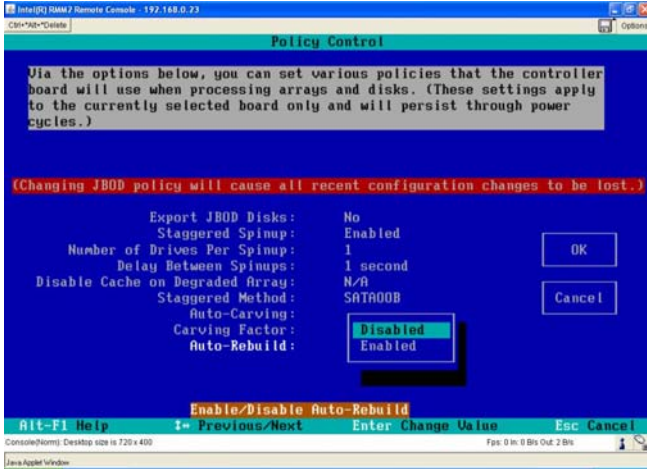
6 Select the first 2 HDDs (ports 0 and 1) by highlighting the relevant drive and press the **spacebar**.
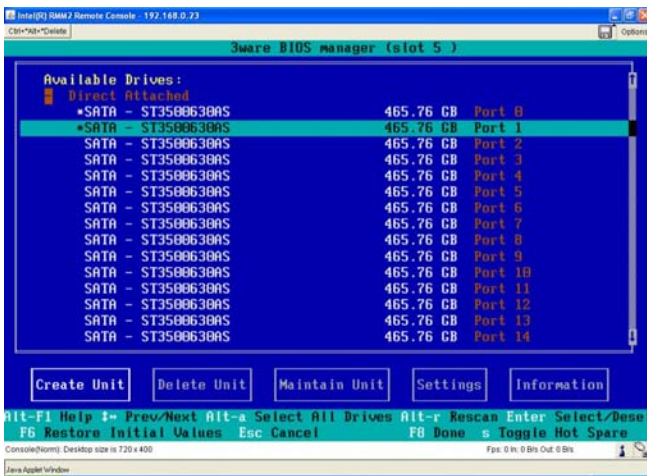
7 Select **Create Unit** at the bottom of the screen.

8 In the Create Disk Array screen, name the first array Array0.

9 Set **RAID configuration** as **Mirror (RAID 1)**.
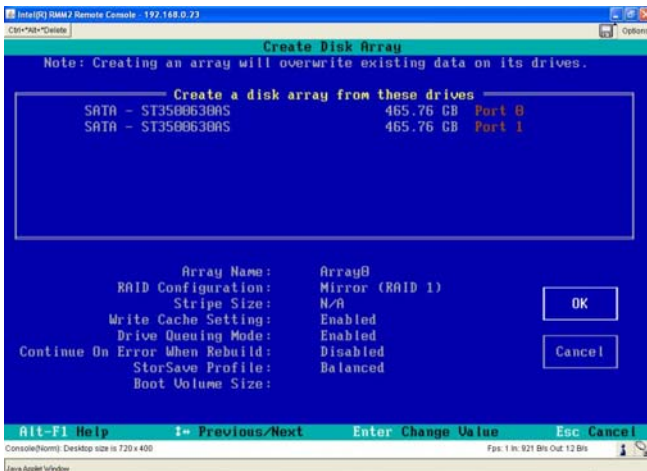
10 Change **StorSave Profile** to **Balanced** and press **OK**

11 Repeat steps 7, 8, and 9 above for the remaining drives to create eight different Mirrored (RAID 1) disk arrays called:Array0, Array1, Array2, Array3, Array4, Array5, Array6 and Array7. When complete, the screen will show all eight disk arrays.
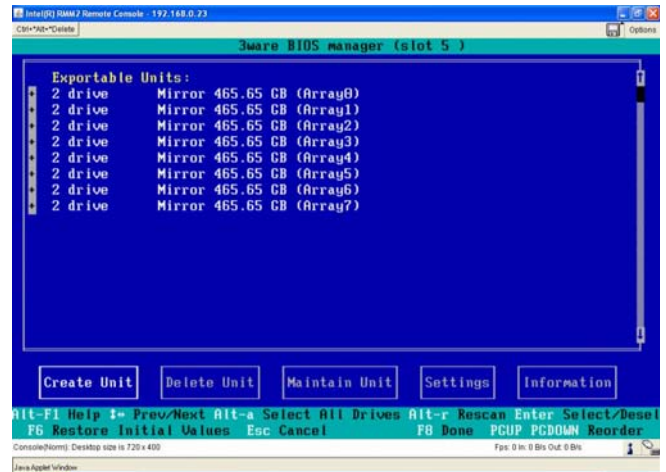
12 Press **F8** to complete the process.

13 A screen is displayed to inform you that all existing data on these disks will be overwritten. Type **Y** to Save and Exit.
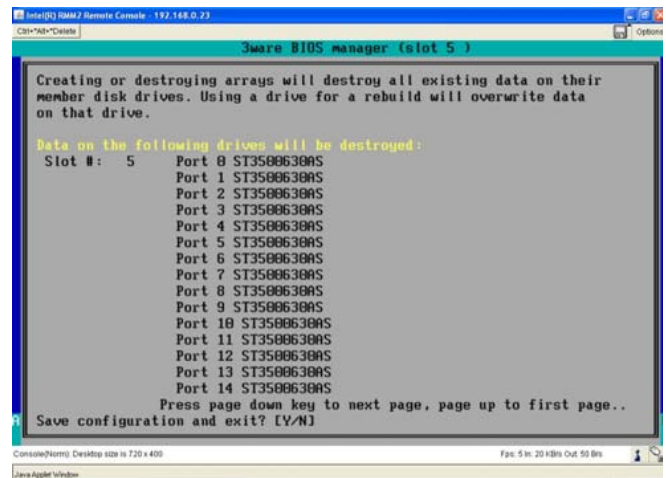
14 Insert the Pc-Check utility CD and restart the server.

15 Set-up Pc-Check to run diagnostics on the server hardware (see *"Pc-Check" on page 60*).

Pc-Check

Introduction

The Pc-Check utility is a utility produced by Eurosoft, used to monitor the status of the server hardware and monitor internal communications.
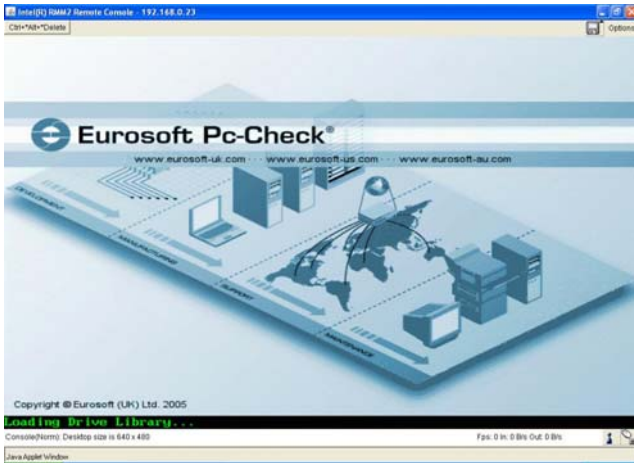
Instructions are described in this section for:

- continuous burn-in test
- advanced diagnostics tests

For further details, see the manual supplied with the utility.

Obtaining the utility

The Pc-Check utility may be obtained from Eurosoft-UK Ltd.

Continuous burn-in test

Pc-Check provides a configurable 'burn-in' test that enables you to choose the tests to perform on your server.

Note

- A complete continuous burn-in test may take up to 2 days to complete. To perform a quicker test for specific problems, perform an advanced diagnostic test (see *"Advanced diagnostic tests" on page 62*

The following continuous burn-in test procedure is recommended for checking the operation of:

- processor
- memory modules
- cache memory
- video memory

- motherboard (including controllers, timers and PCI bus)
- hard drives
- serial ports

1 Boot to the Pc-Check CD.

2 From the **MAIN MENU**, highlight the **Immediate Burn-in Testing** option using the arrow keys, then press the **<ENTER>** key to select.

3 From the **BURN IN MENU**, highlight the **Change Options** option using the arrow keys, then press the **<ENTER>** key to select.

4 From the **PASS CONTROL MENU**, highlight the **Individual Passes** option using the arrow keys, then press the **<ENTER>** key to select.

```
Pc-Check - Continuous Burn-in Testing

Pass Control: Overall Passes        Pause on Fail:     N
Duration:        1                   Screen Display:    Control Panel
Script  File: N/A                    POST Card:         N
Report  File: None                   Beep Codes:        N
Journal File: PCCHECK.JNL            Maximum Fails:     Disabled
Journal Options: Failed Tests  Test Summary


                   PASS CONTROL MENU

                   Individual Passes
                   Overall Passes
                   Overall Time



    Use +↑↓← and <ENTER> to select, press <ESC> when finished
```

5 Press the **<ESC>** key to go back to the **BURN-IN MENU** and highlight the **Select Tests** option using the arrow keys, then press the **<ENTER>** key to select.

6 Highlight all CPU and configure for 5 passes.

```
Pc-Check - Continuous Burn-in Testing

Device and Tests                              Passes

•Processor 1 (Intel(R) Xeon(R) CPU 5160 @ 3.00GHz)
  •Core                                         5
  •AMD64/Intel64 Core                           5
  •Coprocessor Core                             5
  •Known Design Faults                          5
  •MMX Extensions                               5
  •3DNow! Extensions                            5
  •SSE (SIMD) Ext.                              5
  •SSE 2 (SIMD) Ext.                            5
  •MP Symmetry                                  5
 Processor 2 (Intel(R) Xeon(R) CPU 5160 @ 3.00GHz)
 Processor 3 (Intel(R) Xeon(R) CPU 5160 @ 3.00GHz)
 Processor 4 (Intel(R) Xeon(R) CPU 5160 @ 3.00GHz)
 Memory 1 (1024 MB FB-DIMM (ONBOARD DIMM_A1))
 Memory 2 (1024 MB FB-DIMM (ONBOARD DIMM_B1))
 Memory 3 (1024 MB FB-DIMM (ONBOARD DIMM_C1))
 Memory 4 (1024 MB FB-DIMM (ONBOARD DIMM_D1))

    Use <F1> for Help, <ESC> or <F10> to Exit with changes
```

7 Highlight each Memory module and configure for only 1 pass.

```
Pc-Check - Continuous Burn-in Testing

Device and Tests                              Passes

 Processor 1 (Intel(R) Xeon(R) CPU 5160 @ 3.00GHz)
 Processor 2 (Intel(R) Xeon(R) CPU 5160 @ 3.00GHz)
 Processor 3 (Intel(R) Xeon(R) CPU 5160 @ 3.00GHz)
 Processor 4 (Intel(R) Xeon(R) CPU 5160 @ 3.00GHz)
•Memory 1 (1024 MB FB-DIMM (ONBOARD DIMM_A1))
  •Module Seating                               1
  •Inversion Tree                               1
  •Progressive Inversion                        1
  •Chaotic Addressing                           1
  •Block Rotation                               1
  •Microtopology                                1
 Memory 2 (1024 MB FB-DIMM (ONBOARD DIMM_B1))
 Memory 3 (1024 MB FB-DIMM (ONBOARD DIMM_C1))
 Memory 4 (1024 MB FB-DIMM (ONBOARD DIMM_D1))
 Cache Memory 1 (32+32 KB)
 Cache Memory 2 (4096KB)
 Video Memory (16384KB)

    Use <F1> for Help, <ESC> or <F10> to Exit with changes
```

8 Highlight the Cache Memory.

9 Highlight the Video Memory.

```
Pc-Check - Continuous Burn-in Testing

Device and Tests                              Passes

 Processor 1 (Intel(R) Xeon(R) CPU 5160 @ 3.00GHz)
 Processor 2 (Intel(R) Xeon(R) CPU 5160 @ 3.00GHz)
 Processor 3 (Intel(R) Xeon(R) CPU 5160 @ 3.00GHz)
 Processor 4 (Intel(R) Xeon(R) CPU 5160 @ 3.00GHz)
 Memory 1 (1024 MB FB-DIMM (ONBOARD DIMM_A1))
 Memory 2 (1024 MB FB-DIMM (ONBOARD DIMM_B1))
 Memory 3 (1024 MB FB-DIMM (ONBOARD DIMM_C1))
 Memory 4 (1024 MB FB-DIMM (ONBOARD DIMM_D1))
 Cache Memory 1 (32+32 KB)
 Cache Memory 2 (4096KB)
•Video Memory (16384KB)
  •Inversion Tree                               1
  •Progressive Inversion                        1
  •Chaotic Addressing                           1
  •Block Rotation                               1
  •Microtopology                                1
 Motherboard

    Use <F1> for Help, <ESC> or <F10> to Exit with changes
```

10 Highlight the Motherboard and set to 5 passes for each test.

```
Pc-Check - Continuous Burn-in Testing

Device and Tests                              Passes

 Processor 3 (Intel(R) Xeon(R) CPU 5160 @ 3.00GHz)       ▲
 Processor 4 (Intel(R) Xeon(R) CPU 5160 @ 3.00GHz)
 Memory 1 (1024 MB FB-DIMM (ONBOARD DIMM_A1))
 Memory 2 (1024 MB FB-DIMM (ONBOARD DIMM_B1))
 Memory 3 (1024 MB FB-DIMM (ONBOARD DIMM_C1))
 Memory 4 (1024 MB FB-DIMM (ONBOARD DIMM_D1))
 Cache Memory 1 (32+32 KB)
 Cache Memory 2 (4096KB)
 Video Memory (16384KB)
•Motherboard
  •DMA Controller                               5
  •System Timer                                 5
  •Interrupt Controller                         5
  •Keyboard Controller                          5
  •PCI Bus                                      5
  •Real-Time Clock Chip                         5
 Hard Drive 1 (80.02GB ST980825AS)             ▼

    Use <F1> for Help, <ESC> or <F10> to Exit with changes
```

11 Highlight all Hard Drives and select to do the **Read** and **Read Verify** test once per drive.

```
              Pc-Check - Continuous Burn-in Testing

Device and Tests                                        Passes

Memory 3 (1024 MB FB-DIMM (ONBOARD DIMM_C1))                   ▲
Memory 4 (1024 MB FB-DIMM (ONBOARD DIMM_D1))
Cache Memory 1 (32+32 KB)
Cache Memory 2 (4096KB)
Video Memory (16384KB)
Motherboard
•Hard Drive 1 (80.02GB ST980825AS)
 •Read                                                      1
 •Read Verify                                               1
  Non-Destructive Write                                     0
  Destructive Write                                         0
  Mechanics Stress                                          0
  Internal Cache                                            0
  SMART Immediate                                           0
  SMART Short                                               0
  SMART Extended                                            0
Hard Drive 2 (80.02GB ST980825AS)                             ▼

     Use <F1> for Help, <ESC> or <F10> to Exit with changes
```

12 Highlight the **Serial Port 1** and **2**.


```
              Pc-Check - Continuous Burn-in Testing

Device and Tests                                        Passes

Hard Drive 3 (499.98GB )                                      ▲
Hard Drive 4 (499.98GB )
Hard Drive 5 (499.98GB )
Hard Drive 6 (499.98GB )
Hard Drive 7 (499.98GB )
Hard Drive 8 (499.98GB )
Hard Drive 9 (499.98GB )
Hard Drive 10 (499.98GB )
CD/DVD Drive 1 (Optiarc DVD RW AD-5540A)
•Serial Port 1 (3F8H)
 •Line Control                                              1
 •Handshaking                                               1
 •Loopback                                                  1
 •Internal FIFO                                             1
 •Internal Loopback                                         1
Serial Port 2 (2F8H)
Modem                                                        ▼

     Use <F1> for Help, <ESC> or <F10> to Exit with changes
```

13 Press the **<ESC>** key to go back and select **Perform Burn-in Tests** (you will need serial port loop-backs inserted, if required).


```
              Pc-Check - Continuous Burn-in Testing

Pass Control: Individual Passes       Pause on Fail:   N
Duration:    N/A                      Screen Display: Running Tests
Script File: N/A                      POST Card:       N
Report File: None                     Beep Codes:      N
Journal File: PCCHECK.JNL             Maximum Fails:  Disabled
Journal Options: Failed Tests  Test Summary


                    ┌─── BURN-IN MENU ───┐
                    │                    │
                    │ Load Burn-in Script│
                    │ Save Burn-in Script│
                    │ Change Options     │
                    │ Select Tests       │
                    │ Perform Burn-in Tests│
                    └────────────────────┘

     Use ↑↓ to Move Bar, <ENTER> to Select, <ESC> to Exit
```

14 When the test configuration is complete, press the **<ESC>** key to go back to the **BURN-IN MENU** and select **Perform Burn-in Tests**. View the Test Results page and check that all components pass the tests.


```
              Pc-Check - Memory Diagnostics

Current Test: Inversion Tree Test              Status: Testing
Current Step: 00000000:00100000 - 00000000:9E200FFF (1 of 28)

0%  ████████████████████████████████████████████ 100%

Last Failure: No failure


4 x 1024 MB FB-DIMM        Testing      16384 KB Video Memory    Not Run
32 KB L1 Cache Memory      Not Run
4096 KB L2 Cache Memory    Not Run
─ Currently tested modules ─
1024 MB FB-DIMM (socket ONBOARD DIMM_A1, Channel A, MotherboardTesting
1024 MB FB-DIMM (socket ONBOARD DIMM_B1, Channel B, MotherboardTesting
1024 MB FB-DIMM (socket ONBOARD DIMM_C1, Channel C, MotherboardTesting
1024 MB FB-DIMM (socket ONBOARD DIMM_D1, Channel D, MotherboardTesting
─ Last failed modules ─
No failure

                Testing, please wait...
```

Advanced diagnostic tests

The Pc-Check utility enables advanced diagnostic tests to be performed on the server, in the event of a particular problem being discovered by the continuous burn-in test described above. These enable relatively quick tests to be performed on specific areas of server.

To access these tests, from the **MAIN MENU** highlight the **Advanced Diagnostics Tests** option using the arrow keys, then press the **<ENTER>** key to select.

The tests that may be performed include:

- Memory module tests
- Cache memory tests
- Video memory tests
- Motherboard tests
- DMA Controller tests
- PCI bus tests

SEL viewer

Introduction

The System Event Log (SEL) viewer utility is used to view the log produced by the Motherboard, which can be used for diagnosing problems.

Instructions are described in this section for:
- Saving a Motherboard log file
- Sending a log file to your Sony representative

For further details, a manual is provided with the utility.

Obtaining the utility

The SEL viewer utility may be obtained from Intel corporation and downloaded to a bootable USB memory device, bootable CD or DVD.

When you need details of how to make a bootable USB, contact your local Sony sales office or service center.

Saving a motherboard log file

The following procedure describes how to save a SEL file to a USB Memory device:

1 Run the downloaded SEL viewer utility (.exe file) on the server from USB memory device, CD or DVD. The SEL viewer will open automatically and start reading SEL entries.
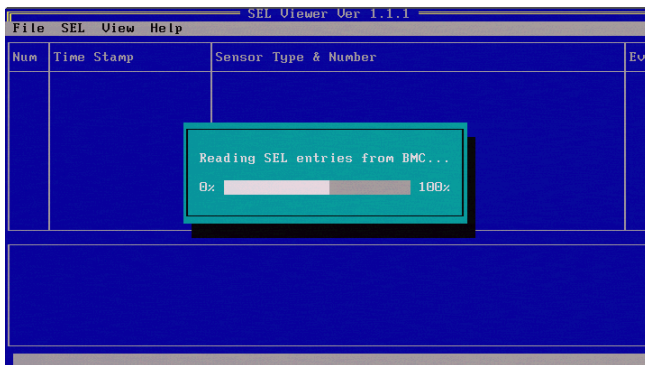

Notes

- When the SEL viewer is open the mouse cannot be used to select menu options. To move the cursor, use the arrow and Tab keys. Use the keyboard Enter key for [OK].
- If the event log is full, the log may not contain information on the latest events. In this case clear the contents then exit the viewer, re-boot the server

using [Ctrl]+[Alt]+[Del], then repeat the above procedure.

2 Insert a USB memory device into a rear panel USB connector.

3 Move the purple cursor to the drop-down menu **'File'** press Enter on the keyboard.
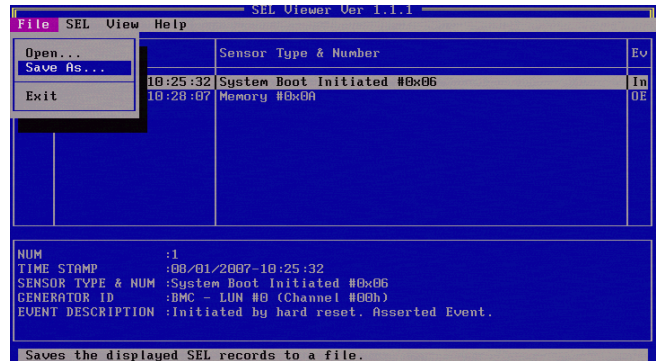
4 Select **'Save as'** and press Enter.

5 Type in a file name and press Enter to save the SEL to the relevant drive.
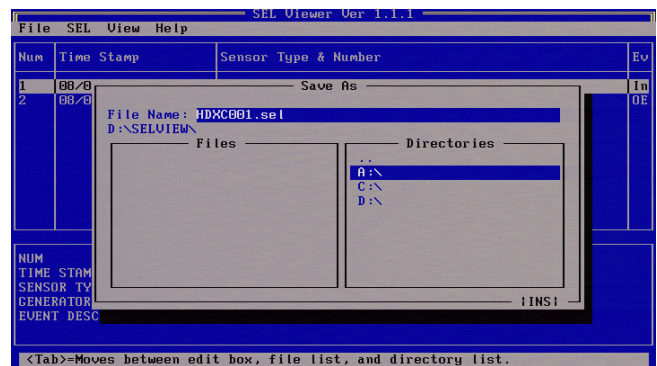
Sending a log file to your Sony representative

Your local Sony representative may ask for logs to be emailed to them for examination in order to investigate a problem.

1 Save the log file to a USB memory device (see above).

2 On another computer with internet access, email the file to your Sony representative for examination.

PuTTY terminal emulator

Introduction

HDXchange allows service engineers to log on using a service account. Using this account, service engineers can run commands which allows them to investigate problems at operating system level.

PuTTY commands are divided into three groups.

- Clip commands
- Mac client (ldap) commands
- Miscellaneous commands

To use the commands, navigate from the root directory to the directory where the command is located, then enter the command. To avoid the need to enter long command strings, use the 'tab' key to auto complete the required directory name or command.

Command options

Where a command has options, they should be used with the syntax as shown in the example below.

  ...~]$ **sudo /etc/init.d/smb start**

This command will force the Samba service to start.

Obtaining the utility

The PuTTY utility may be obtained from Intel corporation and downloaded to a USB memory device, CD or DVD.

Logging on to PuTTY from the server

Logging on to the PuTTY service account can be done directly from the server login prompt:

1 Connect a monitor, keyboard and mouse to the server (see *"Rear panel" on page 21*) and boot-up the server, if necessary. When booted up, the login screen is displayed.

2 Enter your user name and password to login to redhat.

3 When successfully logged in, select **Open Terminal** from the right-click menu to open a terminal window in which to enter the PuTTY commands.

4 A terminal window is then displayed in which to login using your user name and password.

   User Name: **user**

   Password: **usrxxxxxx-8579**

   (Where xxxxxx is the 6-digit software serial number of the server)

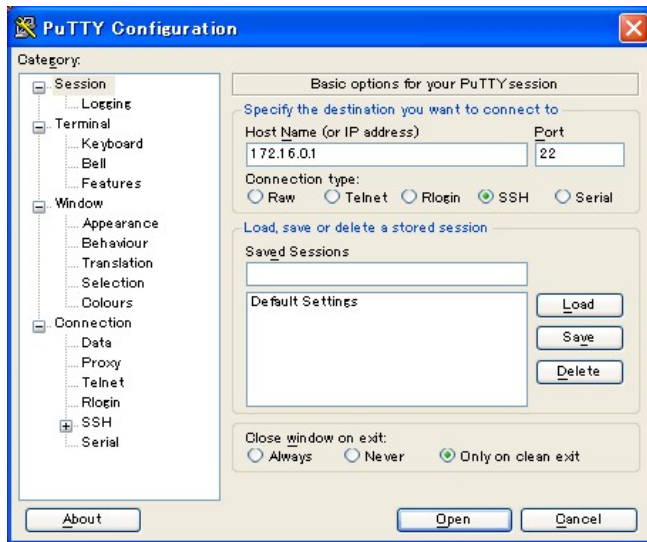**5** When successfully logged in, enter the PuTTY commands at the '$' prompt.

Service account logging off

To log out from the service account: at the '$' prompt, type: **logout**

Logging on to PuTTY from a Windows client

Logging on to the PuTTY service account can be done from a Windows client:

1 Run the PuTTY utility to display the PuTTY configuration screen. Enter the IP address of the HDXchange server in order to open a login session, and press the **Open** button.

2 A security alert dialog will be displayed. To confirm that the computer you are trying to connect to is trusted, press the **Yes** button.
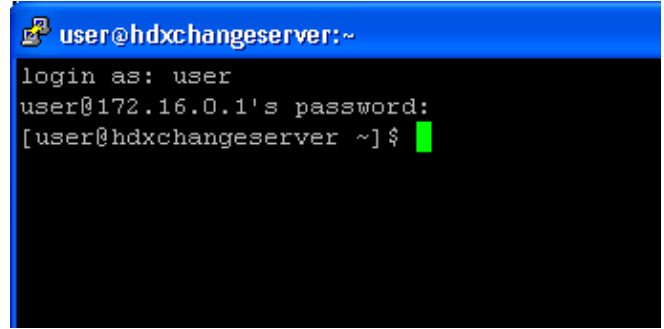

3 A terminal window is then displayed in which to login using your user name and password.

User Name: **user**

Password: **usrxxxxxx-8579**

(Where xxxxxx is the 6-digit software serial number of the server)

4 When successfully logged in, enter the PuTTY commands at the '$' prompt.

Service account logging off

To log out from the service account: at the '$' prompt, type: **logout**

Clip commands

Viewing generation of proxy images

Command: **sudo /opt/dvstation/backend/scan/cron-proxy.sh**

Options: None.

Description: This command is used to manually start the generation of proxies on the system. This can be used for identifying clips where proxies are failing to be generated. When run, the proxy generation process is visible in the terminal window.

Viewing promotion of clips to the library

Command: **sudo /opt/dvstation/backend/scan/cron-promote.sh**

Options: None.

Description: This command is used to manually start the promotion of clips to the library from *'my bins'*. This can be used for identifying clips on the fly which are not being promoted to the library. When run, the promotion of clips is visible in the terminal window.

Manually starting the promotion of clips to the archive

Command: **sudo /opt/dvstation/backend/scan/cron-archivingPush.sh**

Options: None.

Description: This command is used to manually start the promotion of high resolution video clips to archive using ftp. This can be used to identify clips which are not being

promoted to the archive. When run, the process is visible in the terminal window.

Mac client (ldap) commands

Note

The commands in this section relate to the ldap database. The ldap database is used for logging onto a Mac client connected to the HDXchange domain.

To view the ldap entries, type the command:
ldapsearch -x -b 'dc=hdxchange, dc=com' | less

Manually adding Mac users to ldap database

Command: **sudo /opt/dvstation/www/html/webadmin/ users/addldapuser.sh**

Options: None

Description: This command is used to manually add an HDXchange user to the ldap database. This command can be used when a user that has been added to HDXchange via webadmin, has failed to update the ldap database.

Manually deleting Mac users from ldap database

Command: **sudo /opt/dvstation/www/html/webadmin/ users/deleteldapuser.sh**

Options: None

Description: This command is used to manually delete a HDXchange user from the ldap database. This command can be used when a user that has been deleted from HDXchange via webadmin, has failed to update the ldap database.

Manually adding groups to ldap database

Command: **sudo /opt/dvstation/www/html/webadmin/ groups/addldapgroup.sh**

Options: None

Description: This command is used to manually add an HDXchange group to the ldap database. This command can be used when a group that has been added to HDXchange via webadmin, has failed to update the ldap database.

Manually deleting groups from ldap database

Command: **sudo /opt/dvstation/www/html/webadmin/ groups/deleteldapgroup.sh**

Options: None

Description: This command is used to manually delete an HDXchange group from the ldap database. This command can be used when a user that has been deleted from HDXchange via webadmin, has failed to update the ldap database.

Miscellaneous commands

Rebuilding the OS RAID

Command: **sudo /opt/dvstation/www/html/webadmin/ cgi-bin/webadmin/rebuildsoftraid.pl**

Options: None

Description: This command is used to start the rebuild of the OS software RAID.

Listing Bins and directories

Command: **sudo /bin/ls**

Options: None

Description: This command is used to list the contents of a specified directory.

Deleting files

Command: **sudo /bin/rm**

Options: None

Description: This command allows the deletion of files from HDXchange. Please use with great care.

Network settings

Command: **sudo /sbin/ifconfig**

Options: None

Description: This command displays the network settings of the NIC card such as IP address, subnet mask etc.

Samba service

Command: **sudo /etc/init.d/smb**

Options: start, stop, restart, status

Description: This command may be used with the above listed options. The samba service is used to allow a client PC access the HDXchange server.

DNS service

Command: **sudo /etc/init.d/named**

Options: start, stop, status, restart

Description: This command may be used with the above listed options. The DNS service is used to translate computer hostnames to IP addresses on the HDXchange domain.

DHCP service

Command: **sudo /etc/init.d/dhcpd**

Options: **start, stop, restart, status**

Description: This command may be used with the above listed options. The DHCP is used to dynamically assign IP addresses to computers on the HDXchange domain.

Network interface

Command: **sudo /etc/init.d/network**

Options: **start, stop, restart, status**

Description: This command may be used with the above listed options. This command can be used to restart network interfaces, without having to restart the server.

MYSQL Service

Command: **sudo /etc/init.d/mysql**

Options: **start, stop, restart**

Description: This command may be used with the above listed options. This command can be used to start, stop and view the status of mysql service, used for the hdxchange database.

AVI service

Command: **sudo /etc/init.d/aviserver**

Options: **start, stop, restart, status**

Description: This command may be used with the above listed options. The AVI server is used by HDXchange to take a stream of dv frames and write them to an avi file.

Troubleshooting

Introduction

About this manual

This chapter provides troubleshooting information and procedures for service engineers. Possible problems and fault symptoms are listed here along with suggested corrective action that may be taken to rectify the problem.

This chapter is organised into the following topics:

- Error messages
- Power supply problems
- Audible alarms
- Communication problems
- RAID problems
- Miscellaneous problems

Servicing policy

Warning

High voltage is present within this equipment. Only trained and approved service engineers may remove the cover of this equipment. Failure to comply may result in death or injury.

Caution

Electronic circuits within this equipment may be damaged by ElectroStatic discharge (ESD). Always ensure correct ESD techniques and procedure are used when handling electronic circuits.

Generally, a 'board replacement' policy is implemented on the server unit. The service engineer will not normally be expected to change board components. The information and instructions given in this manual reflect this policy.

Initial checks

Confirm the fault symptom

Before using this chapter to troubleshoot a reported fault symptom, it is advisable to confirm the existence of the reported fault and to use the troubleshoot information in the *HDXS-C200 Installation Manual* to verify that the fault is not due to operator error and cannot be easily rectified. When this user-level troubleshooting has been exhausted, proceed to the relevant service-level troubleshooting section contained in this chapter.

Check for recent changes to the system

Depending on the nature of the fault, it may helpful when troubleshooting to find out if there have been any recent changes or alterations to the system which may have been made. For example, the addition of a workstation which has not been configured correctly for the network, or a change to a setting which was not considered to have an impact at the time, but may now be the cause of a new problem.

Troubleshooting overview

The service engineer's function is to:

1 Identify faults as server hardware, external hardware, or software.

2 Isolate faults within the HDXchange server and decide if a part needs replacement.

3 Provide guidance on 'next steps' should local repair not be possible.

Error Messages

POST errors

The Power On Self Test (POST) diagnostics are controlled by the server's BIOS settings, which should not be altered.

Errors encountered while performing the POST are displayed in one of three ways:

- POST on-screen messages
- POST audible 'beep' codes
- POST diagnostic LEDs

POST on-screen messages

During power-on of the server, POST diagnostics are performed and on-screen messages are displayed showing the progress of this process and any errors encountered. A monitor, keyboard and mouse must be connected to the unit before power-up in order to view, and respond to, the boot-up messages.

The error messages or codes are of three types:

- **Warning** – a message is displayed on the screen and an error is logged to a System Error Log (SEL). The system will continue booting with a degraded state. The user may replace the part causing the error.
- **Pause** – a message is displayed on the screen and user input is required to continue. The user may take immediate corrective action or can choose to continue booting.
- **Halt** – the system cannot boot unless the error is resolved. The user must replace the faulty part and restart the system.

All codes are reported to the SEL and are available for examination at a later time (see *"SEL viewer" on page 63*).

Code	Error Message	Response
004C	Keyboard/interface error	Pause
0012	CMOS date/time not set	Pause
5220	Configuration cleared by jumper	Pause
5221	Passwords cleared by jumper	Pause
5223	Configuration default loaded	Pause
0048	Password check failed	Halt
0141	PCI resource conflict	Pause
0146	Insufficient memory to shadow PCI ROM	Pause
8110	Processor 01 internal error (IERR) on last boot	Pause
8111	Processor 02 internal error (IERR) on last boot	Pause

Code	Error Message	Response
8120	Processor 01 thermal trip error on last boot	Pause
8121	Processor 02 thermal trip error on last boot	Pause
8130	Processor 01 disabled	Pause
8131	Processor 02 disabled	Pause
8160	Processor 01 unable to apply BIOS update	Pause
8161	Processor 02 unable to apply BIOS update	Pause
8190	Watchdog timer failed last boot	Pause
8198	Operating system boot watchdog timer expired on last boot	Pause
0192	L3 cache size mismatch	Halt
0194	CPUID, processor family are different	Halt
0195	Front side bus mismatched	Pause
0197	Processor speeds mismatched	Pause
8300	Baseboard management controller failed self-test	Pause
8306	Front panel controller locked	Pause
8305	Hot swap controller failed	Pause
84F2	Baseboard management controller failed to respond	Pause
84F3	Baseboard management controller in update mode	Pause
84FF	Sensor data record empty	Pause
8500	Memory component could not be configured in the selected RAS mode	Pause
8520	DIMM_A1 failed Sell Test (BIST)	Pause
8521	DIMM_A2 failed Sell Test (BIST)	Pause
8522	DIMM_A3 failed Sell Test (BIST)	Pause
8523	DIMM_A4 failed Sell Test (BIST)	Pause
8524	DIMM_B1 failed Sell Test (BIST)	Pause
8525	DIMM_B2 failed Sell Test (BIST)	Pause
8526	DIMM_B3 failed Sell Test (BIST)	Pause
8527	DIMM_B4 failed Sell Test (BIST)	Pause
8528	DIMM_C1 failed Sell Test (BIST)	Pause
8529	DIMM_C2 failed Sell Test (BIST)	Pause
852A	DIMM_C3 failed Sell Test (BIST)	Pause
852B	DIMM_C4 failed Sell Test (BIST)	Pause
852C	DIMM_D1 failed Sell Test (BIST)	Pause
852D	DIMM_D2 failed Sell Test (BIST)	Pause
852E	DIMM_D3 failed Sell Test (BIST)	Pause

Code	Error Message	Response
852F	DIMM_D4 failed Sell Test (BIST)	Pause
8540	Memory component lost redundancy during last boot	Pause
8580	DIMM_A1 correctable ECC error encountered	Pause
8581	DIMM_A2 correctable ECC error encountered	Pause
8582	DIMM_A3 correctable ECC error encountered	Pause
8583	DIMM_A4 correctable ECC error encountered	Pause
8584	DIMM_B1 correctable ECC error encountered	Pause
8585	DIMM_B2 correctable ECC error encountered	Pause
8586	DIMM_B3 correctable ECC error encountered	Pause
8587	DIMM_B4 correctable ECC error encountered	Pause
8588	DIMM_C1 correctable ECC error encountered	Pause
8588	DIMM_C2 correctable ECC error encountered	Pause
858A	DIMM_C3 correctable ECC error encountered	Pause
858B	DIMM_C4 correctable ECC error encountered	Pause
858C	DIMM_D1 correctable ECC error encountered	Pause
858D	DIMM_D2 correctable ECC error encountered	Pause
858E	DIMM_D3 correctable ECC error encountered	Pause
858F	DIMM_D4 correctable ECC error encountered	Pause
8600	Primary and secondary BIOS IDs do not match	Pause
8601	Override jumper is set to force boot from lower alternate BIOS bank of flash ROM	Pause
8602	Watchdog timer expired (secondary BIOS may be bad!)	Pause
8603	Secondary BIOS checksum fail	Pause

POST audible 'beep' codes

Audible 'beeps' are used to communicate error conditions during the POST, prior to system video initialization.

Number of Beeps	Description	Recommended Action
1-3	Memory problem	Re-seat Memory modules or replace with known-good modules.
4-7, 9-11	Motherboard problem	Fatal error indicating a serious problem with the system. Before declaring the Motherboard faulty, eliminate the possibility of interference by a faulty add-in card. Remove all expansion cards. If the beep codes are generated even when all other expansion cards are absent, the Motherboard has a serious problem. Return to your Sony representative for repair. If the beep codes are not generated when all expansion cards are absent, one of the cards is probably causing the malfunction. Insert the cards back into the system one at a time until the problem occurs again. This will reveal the faulty card.
8	Video hardware problem	This function is integrated into the Motherboard. Return to your Sony representative for repair.

POST diagnostic LEDs

The rear panel POST diagnostic LEDs indicate the status of the unit at boot-up (see *"Motherboard" on page 27* for a description of the LEDs and how to read the codes).

During the system boot process, the BIOS executes a number of platform configuration processes, each of which is assigned a specific hexadecimal POST code number. As each configuration routine is started, the BIOS displays the POST code via the rear panel diagnostic LEDs.

In the event that the system stops/hangs during the POST process, the diagnostic LEDs will identify the last process to be executed. This information may be used to identify and repair the fault. If the nature of the fault cannot be identified or repaired, report the relevant error code back to your Sony representative.

A list of POST error codes is given in the table below (O = off, A = Amber, R = Red, G = Green).

Code	MSB	Bit 2	Bit 1	LSB	Description
Host Processor					
0x10h	O	O	O	R	Power-on initialization of the host processor (bootstrap processor)
0x11h	O	O	O	A	Host processor cache initialization (including AP)
0x12h	O	O	G	R	Starting application processor initialization
0x13h	O	O	G	A	Starting application processor initialization
Chipset					
0x21h	O	O	R	G	Initializing a chipset component
Memory					
0x22h	O	O	A	O	Reading configuration data from memory (SPD on DIMM)
0x23h	O	O	A	G	Detecting presence of memory
0x24h	O	G	R	O	Programming timing parameters in the memory controller
0x25h	O	G	R	G	Configuring memory parameters in the memory section
0x26h	O	G	A	O	Optimizing memory controller settings
0x27h	O	G	A	G	Initializing memory, such as ECC init
0x28h	G	O	R	O	Testing memory
PCI Bus					
0x50h	O	R	O	R	Enumerating PCI busses
0x51h	O	R	O	A	Allocating resources to PCI busses
0x52h	O	R	G	R	Hot plug PCI controller initialization
0x53h	O	R	G	A	Reserved for PCI bus
0x54h	O	A	O	R	Reserved for PCI bus
0x55h	O	A	O	A	Reserved for PCI bus
0x56h	O	A	G	R	Reserved for PCI bus
0x57h	O	A	G	A	Reserved for PCI bus
USB					
0x58h	G	R	O	R	Resetting USB bus
0x59h	G	R	O	A	Reserved for USB devices
ATA/ATAPI/SATA					
0x5Ah	G	R	G	R	Resetting PATA/SATA bus and all devices
0x5Bh	G	R	G	A	Reserved for ATA
SMBUS					
0x5Ch	G	A	O	R	Resetting SMBUS
0x5Dh	G	A	O	A	Reserved for SMBUS
Local Console					
0x70h	O	R	R	R	Resetting the video controller (VGA)
0x71h	O	R	R	A	Disabling the video controller (VGA)
0x72h	O	R	A	R	Enabling the video controller (VGA)
Remote Console					
0x78h	G	R	R	R	Resetting the console controller (VGA)
0x79h	G	R	R	A	Disabling the console controller (VGA)
0x7A2h	G	R	A	R	Enabling the console controller (VGA)
Keyboard (PS2 or USB)					
0x90h	R	O	O	R	Resetting the keyboard
0x91h	R	O	O	A	Disabling the keyboard
0x92h	R	O	G	R	Detecting the presence of the keyboard
0x93h	R	O	G	A	Enabling the keyboard
0x94h	R	G	O	R	Clearing keyboard input buffer
0x95h	R	G	O	A	Instructing keyboard controller to run Self Test (PS2 only)
Mouse (PS2 or USB)					
0x98h	A	O	O	R	Resetting the mouse
0x99h	A	O	O	A	Disabling the mouse
0x9Ah	A	O	G	R	Detecting the presence of the mouse
0x9Bh	A	O	G	A	Enabling the mouse
Fixed Media					
0xB0h	R	O	R	R	Resetting fixed media device
0xB1h	R	O	R	A	Disabling fixed media device
0xB2h	R	O	A	R	Detecting the presence of the fixed media device (IDE hard drive detection, etc.)
0xB3h	R	O	A	A	Enabling/configuring a fixed media device
Removable Media					
0xB8h	A	O	R	R	Resetting removable media device
0xB9h	A	O	R	A	Disabling removable media device
0xBAh	A	O	A	R	Detecting the presence of the removable media device (IDE DVD/CD detection, etc.)
0xBCh	A	G	R	R	Enabling/configuring a removable media device
Boot device selection					
0xD0h	R	R	O	R	Trying boot device selection
0xD1h	R	R	O	A	Trying boot device selection
0xD2h	R	R	G	R	Trying boot device selection
0xD3h	R	R	G	A	Trying boot device selection
0xD4h	R	A	O	R	Trying boot device selection
0xD5h	R	A	O	A	Trying boot device selection

Code	MSB	Bit 2	Bit 1	LSB	Description
0xD6h	R	A	G	R	Trying boot device selection
0xD7h	R	A	G	A	Trying boot device selection
0xD8h	A	R	O	R	Trying boot device selection
0xD9h	A	R	O	A	Trying boot device selection
0xDAh	A	R	G	R	Trying boot device selection
0xDBh	A	R	G	A	Trying boot device selection
0xDCh	A	A	O	R	Trying boot device selection
0xDEh	A	A	G	R	Trying boot device selection
0xDFh	A	A	G	A	Trying boot device selection
Pre-EFI Initialization (PEI0 Core					
0xE0h	R	R	R	O	Started dispatching early initialization modules (PEIM)
0xE1h	R	R	A	O	Initial memory found, configured and installed correctly
0xE2h	R	R	R	G	Reserved for initialization module use (PEIM)
0xE3h	R	R	A	G	Reserved for initialization module use (PEIM)
Driver Execution Environment (DXE) Core					
0xE4h	R	A	R	O	Entered EFI driver execution phase
0xE5h	R	A	R	G	Started dispatching drivers
0xE6h	R	A	A	O	Started connecting drivers
DXE Drivers					
0xE7h	R	A	A	G	Waiting for user input
0xE8h	A	R	R	O	Checking password
0xE9h	A	R	R	G	Entering BIOS setup
0xEAh	A	R	A	O	Flash update
0xEEh	A	A	A	O	Calling Int 19. One beep unless silent boot is enabled.
0xEFh	A	A	A	G	Unrecoverable boot failure/S3 resume failure
Runtime Phase/EFI Operating System Boot					
0xF4h	R	A	R	R	Entering sleep state
0xF5h	R	A	R	A	Exiting sleep state
0xF8h	A	R	R	R	Operating system has requested EFI to close boot services (ExitBootServices ( ) has been called)
0xF9h	A	R	R	A	Operating system has switched to virtual address mode (SetVirtualAddressMap ( ) has been called)
0xFAh	A	R	A	R	Operating system has requested the system to reset (ResetSystem ( ) has been called)
Pre-EFI Initialization Module (PEIM)/Recovery					
0x30h	O	O	R	R	Crisis recovery has been initiated because of a user request

Code	MSB	Bit 2	Bit 1	LSB	Description
0x31h	O	O	R	A	Crisis recovery has been initiated by software (corrupt flash)
0x34h	O	G	R	R	Loading crisis recovery capsule
0x34h	O	O	R	A	Handing off control to the crisis recovery capsule
0x3F0h	G	G	A	A	Unable to complete crisis recovery

Windows messenger error messages

Failure or degraded operation of the Media RAID or OS RAID arrays can be alerted to an operator using Windows Messenger to a nominated client PC. See the *HDXC-C030 HDXC-B030 HDXC-X030 HDXC-L030 Installation Manual* for details of the Windows Messenger service.

A typical message is displayed below.
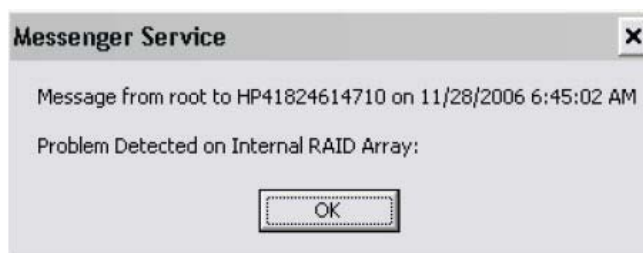
The service engineer should confirm the message at the client screen and investigate further using the 3ware utility (see *"3ware disk manager" on page 55*).

Power supply problems

In the event of failure of one of the PSUs, an alarm will sound. The server will continue to function normally with two working PSUs.

Server will not power up

Symptom	Possible Problem	Recommended Action
Power Supply Module green status LEDs are lit, but unit does not power up when POWER button is pressed. Server completes the boot-up process.	Loose/faulty connector between POWER button and LED switch board. Faulty LED switch board. Loose/faulty connector between the LED switch board and the Motherboard +5 V or +12 V line on Motherboard short-circuit. PS-ON/PS-OK signal path broken (Motherboard power connector). Motherboard fault (memory, volt regulator, controller).	Check voltages on LED switch board connectors, using a multimeter (see *"LED switch board (PN16-0102)" on page 40*). Check the power and signal voltages (+12 V, +5 V, +3.3 V, PS-ON, PS-OK) on Motherboard power connectors (24-pin, 8-pin, 4-pin) using a multimeter (see *"Power connectors" on page 29*). Check LEDs (CPU fault, DIMM fault, etc.) on the Motherboard (see *"Motherboard" on page 27*). Replace chassis if fault found on motherboard, LED switch board or associated cabling (see *"Chassis replacement (containing motherboard and CPUs)" on page 92*).
Server stops/hangs during boot/initialise.	Motherboard fault (memory, voltage regulator, controller chip, etc.). PCI board is not installed correctly. PCI board, memory, HDD fault.	Check LEDs (CPU fault, DIMM fault, etc.) on the Motherboard (see *"Power connectors" on page 29*). Check the POST LEDs and the POST beep codes (see *"POST errors" on page 70*), if any. Confirm of the POST code 'POST Error Pause' is enabled by setting up BIOS (see *"Motherboard BIOS manager" on page 50*). Check the PCI bus is working by using the PC-Check utility (see *"Pc-Check" on page 60*). Temporarily remove PCI boards and memory, HDD, and USB cable, to see if they are causing the problem (see *"Powered-off replacement parts" on page 87*). Replace chassis if motherboard fault found (see *"Chassis replacement (containing motherboard and CPUs)" on page 92*). Replace PCI board if necessary (see *"RAID controller card replacement" on page 89* or *"NIC card replacement" on page 90*).
Server stops/hangs during boot/initialise before Linux is running.	OS-HDD not set up as boot-device by BIOS setting. Boot-sector in the OS-HDD is broken. S-ATA cable disconnected/ loose/faulty.	Confirm that OS-HDD is detected by BIOS on the Motherboard (see *"Motherboard BIOS manager" on page 50*). Confirm that OS-HDD is boot-device set up by BIOS on the Motherboard (see *"Motherboard BIOS manager" on page 50*). Check S-ATA cable by swapping with known-good cable. Replace OS-HDD if necessary (see *"OS HDD replacement" on page 87*).

Server shuts down automatically

Symptom	Possible Problem	Recommended Action
Server shuts down automatically.	Temperature detection circuit fault on System Power Board. Over-voltage detection circuit or over-current detection circuit fault. Voltage gradually drops.	Check the voltage (+12 V, +5 V, +3.3 V, PS-ON, PS-OK) on Motherboard power connectors (24-pin, 8-pin, 4-pin) using a multimeter (see *"Power connectors" on page 29*). Replace faulty System Power Board, if necessary (see *"Chassis replacement (containing motherboard and CPUs)" on page 92*).

Audible alarms

The HDXS-C200 server provides three types of audible alarms to indicate fan, temperature and power problems within the server. Troubleshoot in accordance with the tables given below.

Caution

Faulty Fans must be replaced as soon as possible to avoid overheating of the server. Prolonged overheating of the server will result in the server being automatically shutdown.
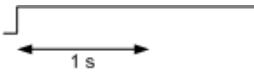
Single beep

Symptom	Possible Problem	Recommended Action
Server emits a single audible beep (one per second), which indicates a system fan failure. *Note: The audible alarm does not sound if a system fan failure occurs prior to boot-up.*	The number of revolutions of the fan is falling or the fan has stopped. Temperature detection circuit fault on the System Power Board.	Check the voltage on Motherboard power connectors (24-pin, 8-pin, 4-pin) using a multimeter (see *"Power connectors" on page 29*). Trace the voltage from the Power Supply to the Fan. Replace faulty fan (see *"System cooling fan replacement" on page 86*). Replace faulty System Power Board (see *"Chassis replacement (containing motherboard and CPUs)" on page 92*).

Double beep

Symptom	Possible Problem	Recommended Action
Server emits a double audible beep (two per second), which indicates that the temperature inside the chassis has exceeded the preset value 38°C. 	The number of revolutions of the fan is falling or the fan has stopped. Temperature detection circuit fault on the System Power Board.	Check the voltage on Motherboard power connectors (24-pin, 8-pin, 4-pin) using a multimeter (see *"Power connectors" on page 29*). Trace the voltage from the Power Supply to the Fan.Replace faulty fan (see *"System cooling fan replacement" on page 86*). Replace faulty System Power Board (see *"Chassis replacement (containing motherboard and CPUs)" on page 92*).

Continuous beep

Symptom	Possible Problem	Recommended Action
Server emits a continuous audible beep, which indicates a power supply failure. 	Power Supply fault.	Check the voltage on Motherboard power connectors (24-pin, 8-pin, 4-pin) using a multimeter (see *"Power connectors" on page 29*). Trace the voltage from the Power Supply to the Fan. Replace faulty Power Supply module (see *"Power supply module replacement" on page 85*).

Communication problems

Communications to client workstations is accomplished via the network interface card (NIC) connector in slot 3. The NIC provides an Ethernet (RJ-45) 1000BaseT connection that is connected to clients via an Ethernet Gigabit Switch.

No communications between server and client

Symptom	Possible Problem	Recommended Action
No communications between server and client. Both LEDs on the NIC ethernet connector are off.	NIC Card Fault. Motherboard does not recognise PCI bus or NIC Card.	Check communication using the 'ping' command (see *"How to 'ping' a computer" on page 45*). Perform a 'ping' to the local host (127.0.0.0) and then attempt to 'ping' connected clients on the network. Confirm the PCI bus is working by using the PC-Check utility (see *"Pc-Check" on page 60*). Replace faulty NIC Card (see *"NIC card replacement" on page 90*).

Slow communications between server and client

Symptom	Possible Problem	Recommended Action
Slow operation experienced by client machines. The (bi-colour LED at the rear panel NIC ethernet connector LED is off when operating at 10 Mb/s, green when operating at 100 Mb/s and amber when at 1 Gb/s. The second (green) activity LED blinks to indicate transmit/receive activity at the connector.	NIC Card Fault.	Confirm the PCI bus is working by using the PC-Check utility (see *"Pc-Check" on page 60*). Replace faulty NIC Card (see *"NIC card replacement" on page 90*).

RAID problems

- **Faulty HDDs should be replaced as soon as possible as a further HDD failure may result in loss of data.**
- **The Media RAID HDD is a hot-swappable item. When the unit is use, do not remove more than one HDD at a time as removal of a second HDD may result in loss of data.**

Failure or degraded operation of the Media RAID or the OS RAID may be alerted to an operator in various ways:

- Errors reported on the Diagnostics page of the Administration web page utility.
- Red LED present on the affected Media RAID drive (to be visible, the Front Bezel must be removed).
- Performance degradation (frame dropping or slow server response).
- Failure or degraded operation alert is broadcast to a nominated client machine using Windows Messenger (see *HDXC-C030 HDXC-B030 HDXC-X030 HDXC-L030 Installation Manual* for instructions on setting up this facility).

Media RAID HDD not present

Symptom	Possible Problem	Recommended Action
HDD reported as 'NOT PRESENT' or 'NOT RECOGNISED' by the Administration Web Pages or 3ware utility (see *"3ware disk manager" on page 55*) **during installation**. Both status LEDs on the front panel of the HDD should be off. If this symptom is reported **during normal operation**, troubleshoot as for *"Media RAID HDD error" on page 78*.	Poor HDD connector contact	Ensure HDD is pushed firmly into its slot. Check HDD status.
	Poor S-ATA cable connector contact	Check S-ATA cable and connections (see *"RAID controller card" on page 32*). Check HDD status.
	S-ATA cable fault	Swap S-ATA cables to check whether fault remains. Check HDD status. If fault symptom remains with the cable, replace S-ATA cable.
	RAID Controller Card fault	If fault persists, confirm symptom by powering off the unit and then powering the unit checking HDD status using the 3ware BIOS manager utility (see *"Checking RAID controller BIOS settings" on page 57*). If RAID setting up problems are present, replace RAID Controller Card (see *"RAID controller card replacement" on page 89*).
	Poor Backplane Board connector contact	Check the relevant Backplane Board connections (see *"S-ATA backplane board (PN16-0107)" on page 33*). Check HDD status.
	Backplane board fault	Swap over HDDs by inserting HDD in another slot position. Check HDD status. If the fault symptom remains in the same slot position, replace Backplane Board (see *"S-ATA backplane replacement" on page 94*).
	HDD fault.	If the fault symptom remains with the HDD, replace the faulty HDD (see *"Media RAID HDD replacement" on page 84*).

Media RAID HDD degraded

Symptom	Possible Problem	Recommended Action
HDD reported as 'DEGRADED' by the Administration Web Pages or 3ware disk manager utility (see *"3ware disk manager" on page 55*) **during normal operation**. The upper blue activity LED on the front panel of the HDD should be on or blinking. The lower red fault LED should be off.	RAID configuration settings are incorrect or wrongly adjusted.	Check 'DRIVE information' using the 3ware disk manager utility. Reconfigure HDD, if necessary.
	HDD fault.	Replace the faulty HDD (see *"Media RAID HDD replacement" on page 84*).
If the fault persists, normal operation of the unit will have to be interrupted to enable further checks to be done.		
	RAID Controller Board fault.	Confirm symptom by powering off the unit and then powering the unit checking HDD status using the 3ware BIOS manager utility (see *"Checking RAID controller BIOS settings" on page 57*). If RAID setting up problems are present, replace RAID Controller Card (see *"RAID controller card replacement" on page 89*).

Media RAID HDD error

Symptom	Possible Problem	Recommended Action
HDD reported as 'ERROR' or @DCB checksum error' by the Administration Web Pages or 3ware utility **during normal operation** The upper blue activity LED on the front panel of the HDD may be on or blinking. The lower red fault LED should be on.	Poor HDD connector contact	Ensure HDD is pushed firmly into its slot. Check HDD status.
	Poor S-ATA cable connector contact	Check S-ATA cable and connections (see *"RAID controller card" on page 32*). Check HDD status.
	Poor Backplane Board connector contact	Check the relevant Backplane Board connections (see *"S-ATA backplane board (PN16-0107)" on page 33*). Check HDD status.
	HDD fault.	Replace the faulty HDD (see *"Media RAID HDD replacement" on page 84*). Check HDD status.
If the fault persists, normal operation of the unit will have to be interrupted to enable further checks to be done.		
	S-ATA cable fault.	Swap S-ATA cables to check whether fault remains. Check HDD status. If fault symptom remains with the cable, replace S-ATA cable.
	Backplane board fault.	Swap over HDDs by inserting HDD in another slot position. Check HDD status. If the fault symptom remains in the same slot position, replace Backplane Board (see *"S-ATA backplane replacement" on page 94*).
	RAID Controller Board fault.	If fault persists, confirm symptom by powering off the unit and then powering the unit checking HDD status using the 3ware BIOS manager utility (see *"Checking RAID controller BIOS settings" on page 57*). If RAID setting up problems are present, replace RAID Controller Card (see *"RAID controller card replacement" on page 89*).

OS RAID HDD not present

Symptom	Possible Problem	Recommended Action
HDD reported as 'NOT PRESENT' or 'NOT RECOGNISED' by the Administration web pages) **during installation**. It assumes that the server is not yet being used for data storage. If this symptom is reported **during normal operation**, troubleshoot as for *"OS RAID HDD error" on page 79*.	Poor HDD connector contact.	Check HDD cable and connections (see *"Operating system (OS) RAID" on page 26*). Check HDD status.
	HDD cable fault.	Swap HDD cables to check whether fault remains. Check HDD status. If fault symptom remains with the cable, replace S-ATA cable.
	HDD fault.	If the fault symptom remains with the HDD, replace the faulty HDD (see *"OS HDD replacement" on page 87*).
	Motherboard fault.	If the fault persists after the HDD has been replaced, replace the Motherboard/chassis (see *"Chassis replacement (containing motherboard and CPUs)" on page 92*).

OS RAID HDD degraded performance

Symptom	Possible Problem	Recommended Action
HDD reported as 'DEGRADED' by the Administration web pages (see *"HDXchange administration web pages" on page 51*) **during normal operation**.	RAID configuration settings are incorrect or wrongly adjusted.	Check settings using the Administration web pages. Reconfigure HDD, if necessary.
	HDD fault.	Recover/rebuild the OS HDD using the Administration Web Pages (see *"Recovery from partial OS drive failure" on page 52*) for details of recovery from failed OS disk drive.
If the fault persists, normal operation of the unit will have to be interrupted to enable further checks to be done.		
	Motherboard fault.	Confirm symptom by powering off the unit and then powering the unit checking HDD status using the BIOS manager utility (see *"Motherboard BIOS manager" on page 50*). If the fault persists after the HDD has been replaced, replace the Motherboard/chassis (see *"Chassis replacement (containing motherboard and CPUs)" on page 92*).

OS RAID HDD error

Symptom	Possible Problem	Recommended Action
HDD reported as 'ERROR' by the Administration web pages (see *"HDXchange administration web pages" on page 51*) **during normal operation**.	Poor HDD connector contact	Check HDD cable and connections (see *"Operating system (OS) RAID" on page 26*). Check HDD status.
	HDD fault.	If the unit is still operational, recover/rebuild the OS HDD using the Administration Web Pages (see *"Recovery from partial OS drive failure" on page 52*) for details of recovery from failed OS disk drive. If the unit is locked-up attempt to recover/rebuild using the Administration Web Pages (see *"Recovery from complete OS drive failure" on page 53*) for details of recovery from failed OS disk drive.
If the fault persists, normal operation of the unit will have to be interrupted to enable further checks to be done.		
	HDD cable fault.	Swap HDD cables. Re-check HDD status. If fault symptom remains with the cable, replace HDD cable.
	Motherboard fault	Confirm symptom by powering off the unit and then powering the unit checking HDD status using the BIOS manager utility (see *"Motherboard BIOS manager" on page 50*). If the fault persists after the HDD has been replaced, replace the Motherboard/chassis (see *"Chassis replacement (containing motherboard and CPUs)" on page 92*).

Miscellaneous problems

If the following problems or fault symptoms occur, troubleshoot according to the recommended action given in the following tables.

Time and date reset

Symptom	Possible Problem	Recommended Action
Time and date are reset on monitor and cannot be permanently updated. Error message of the following type displayed: CMOS CHECKSUM FAILURE, CMOS BATTERY STATE LOW, CMOS SYSTEM OPTIONS NOT SET or CMOS TIME AND DATE NOT SET.	Internal battery or Motherboard	Replace internal battery on Motherboard (see *"CMOS battery replacement" on page 91*). Replace faulty Motherboard (see *"Chassis replacement (containing motherboard and CPUs)" on page 92*).

CD/DVD cannot be read

Symptom	Possible Problem	Recommended Action
CD/DVD drive not recognised.	IDE cable or power cable disconnected/ loose/faulty. Drive fault.	Check CD/DVD drive cable and connectors. Replace faulty CD/DVD drive (see *"DVD/CD drive replacement" on page 88*).
CD/DVD media not recognised	Lens is dirty. Drive fault.	Clean CD/DVD drive lens. Replace faulty CD/DVD drive (see *"DVD/CD drive replacement" on page 88*).

CD/DVD will not eject

Symptom	Possible Problem	Recommended Action
CD/DVD drive not recognised. CD/DVD is recognised but cannot eject	Power cable disconnected/ loose/faulty.	Check CD/DVD drive cable and connectors.
	Drive fault.	Replace faulty CD/DVD drive (see *"DVD/CD drive replacement" on page 88*).

Parts Replacement

Chapter **6**

Introduction

About this chapter

This chapter provides removal and replacement instructions for component parts of the server unit.

Parts replacement policy

Generally, a 'board replacement' policy is implemented on the server unit. The service engineer will not normally be expected to change board components. The information and instructions given in this manual reflect this policy.

For replacement tasks outside of the scope of this manual, return the server to your Sony representative for repair.

What are hot-swappable parts?

Key parts of the server are 'hot-swappable' and designed to be replaced while ac power is applied to the server unit:

- Power Supply Modules
- Media RAID HDDs
- System Fans.

In order to be 'hot-swappable', redundant parts are built-in to ensure that the server continues to function normally when a fault occurs on any single module, HDD or fan. This also enables replacement of the faulty part without interrupting the operation of the server.

See *"Hot-swappable parts" on page 84* for instructions.

What is powered-off replacement?

Parts of the server that are not hot-swappable require the power to be turned off in order to be replaced.

See *"Powered-off replacement parts" on page 87* for instructions.

Safety precautions

`WARNING`

Danger of electric shock - high voltages exist within this equipment. Only an approved and qualified service engineer is permitted to remove the covers of this equipment. Failure to comply may result in death or serious injury.

Only qualified service engineers are permitted to remove the covers of this equipment. Always use safe working practices and observe all safety precautions when replacing parts *"Safe working practices" on page 42*.

Tools required

The following tools are required to replace parts the server:

- Screwdriver, Phillips #1.
- Screwdriver, Phillips #2.
- Screwdriver, long flat-blade #2.
- Screwdriver, long precision flat-blade 2 mm.
- Electrostatic discharge mat.
- Grounding wrist or foot strap.

The last two items help protect the server against damage due to electrostatic discharge. For more information, see *"Electrostatic discharge (ESD) precautions" on page 42*.

Returning parts to Sony

Please use adequate packaging when returning parts to your local Sony representative. Sony cannot be held liable for goods damaged in transit, see *"Transportation and packaging" on page 48*.

Removing the covers

Front bezel

The front bezel protects the controls, indicators and RAID HDDs on the front panel of the server unit. To gain access to these items the bezel must be removed using the procedure below.

Note

It is recommended that the bezel is fitted to the unit during normal operation in order to protect the HDDs and other internal circuitry from dust and dirt. This will prolong the life of your equipment and protect the unit from overheating.

Front bezel removal

1 With a finger, press the release buttons located at either end of the bezel, integral to the grab handles.

2 Pull the bezel forward by the grab handles to remove it from the front of the server unit.

Front bezel replacement

1 Place the bezel in position on the front panel of the server unit.

2 Push the bezel backward onto the unit a click is heard as the release buttons re-engage with the chassis.

3 Check the bezel is securely attached by attempting to pull forward by the grab handles without pressing the release buttons.

Checks after replacement

After replacement, ensure that the front panel LEDs are displayed through the light pipes and are visible from with the bezel in place.

Rear lid

Removing the rear lid provides access to the rear compartment of the chassis, houses the Motherboard, processing ancillary boards.

Rear lid removal

Caution

This equipment contains electrostatic sensitive devices. Only qualified persons familiar with appropriate ESD handling precautions and procedures should remove the covers or the hard disk drives (HDDs). Failure to observe these procedures may result in damage to this equipment.

Take car not to touch, or to let objects fall into, the rotating CPU fans located on the Motherboard.

1 With a flat blade screwdriver, remove the two flat-head #6-32x5 mm screws that secure the lid to the chassis.
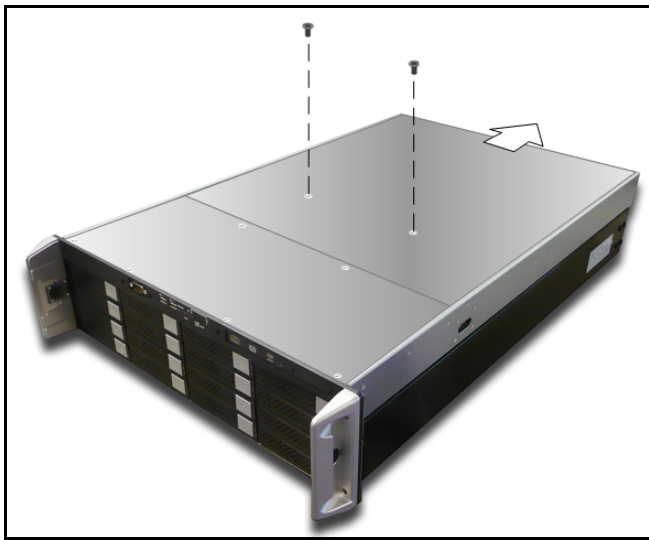
2 Slide the lid backward and grasp the cover at both ends.

3 Remove the rear lid and put it aside and away from the immediate working area.

Rear lid replacement

1 Ensure that no tools or parts are left inside the unit and that all cables are routed so that they will not be trapped or damaged by the lids.

2 Replace the rear lid, sliding it forward into position and secure with the two screws previously removed, using a torque of 10-11 kgf-cm.

Front lid

Removing the front lid provides access to the front compartment of the chassis, housing Media RAID, OS RAID and DVD drive.

Front lid removal

Caution

This equipment contains electrostatic sensitive devices. Only qualified persons familiar with appropriate ESD handling precautions and procedures should remove the covers or the hard disk drives (HDDs). Failure to observe these procedures may result in damage to this equipment.

1 It is advisable to remove the rear lid (see *"Rear lid removal" on page 83*) first in order to be able to lift the front lid.

2 With a flat blade screwdriver, remove the six flat-head #6-32x5 mm screws that secure the lid to the chassis.
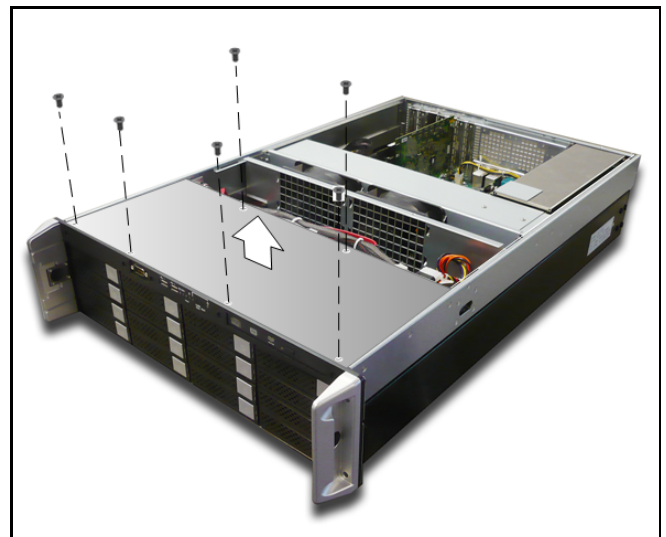
3 Lift the lid upward and grasp the cover at both ends.

4 Remove the front lid and put it aside and away from the immediate working area.

Front lid replacement

1 Ensure that no tools or parts are left inside the unit and that all cables are routed so that they will not be trapped or damaged by the lids.

2 Replace the front lid and secure with the six screws previously removed, using a torque of 10-11 kgf-cm.

Hot-swappable parts

For convenience it may be possible to carry out replacement of parts without removing the server from the rack. In this case, ensure that there is no danger of the rack tipping as the chassis is drawn forward on its slide rails.

Warning

Before starting work on a powered unit, consider the following hazards:

1 Parts may be hot to the touch.

2 Take care of rotating fan blades within the chassis (including within the caged partition).

3 Take care not to drop tools, parts or other items inside the chassis.

4 Normally there are no exposed mains voltage within the chassis, however be aware of the possibility of faulty or damaged parts.

Media RAID HDD replacement

16 Media RAID Hard disk Drives (HDDs) are provided by the server. The hard disks are contained within a protective carrier which slots into the front panel of the server chassis.

Care must be taken when replacing HDDs - only replace one HDD at a time.

Carrier removal

1 If fitted, remove the front bezel to access the Media RAID drives (see *"Front bezel removal" on page 82*).

2 Identify the faulty drive from the RAID diagnostics page accessible using the 3ware disk manager utility (see *"Recovery from a failed media disk drive" on page 56* for details).

3 Ensure the faulty drive is disabled by pressing the [Remove Drive] button has on the 3ware disk manager **Management > Maintenance** page. The disk may take up to 2 minutes to stop revolving.

4 Push the release button in the front of the hard-drive carrier to unlock the handle.
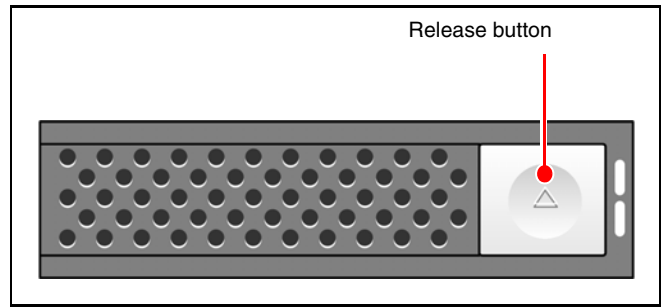
Release button

Note

Occasionally, when the release button is pushed, the carrier handle may not pop up. If this occurs, unlock the hook mechanism inside of the caddy by using flat-head 2 mm precision screwdriver.
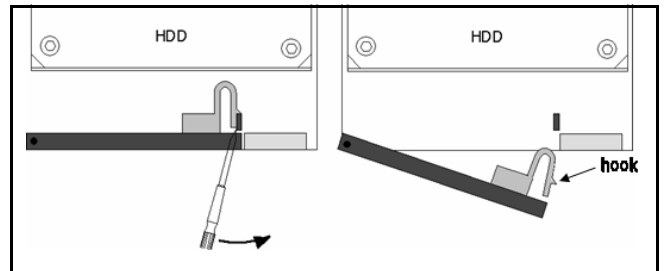
5 Open the hard-drive carrier handle.

6 Withdraw the hard-drive carrier from its slot.

Note

Occasionally, the hard-drive carrier may catch on the carrier of the drive above it, preventing withdrawal from the unit. If this happens, carefully lift the above carrier with your thumb or finger while still in its slot, to disengage the two parts and enable faulty carrier to be removed.

HDD removal from carrier

1 Remove the hard disk drive from the carrier by removing the four Pan Head, Thin Head Type, #6-32x5 mm screws.

Hard disk Drive
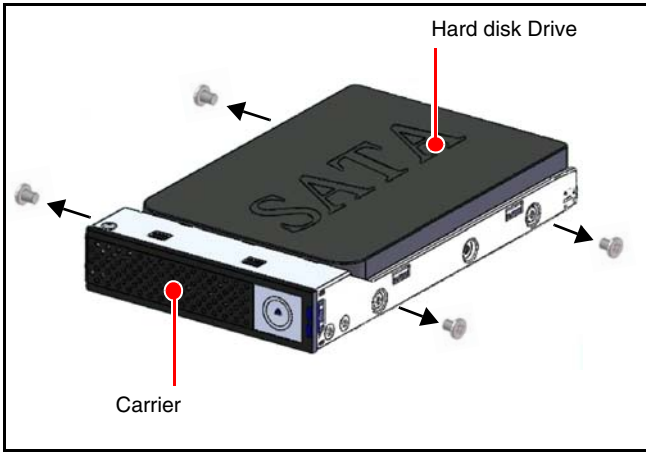
Carrier

2 Lift the HDD from the carrier and set it down.

HDD installation in carrier

1 Insert the replacement hard disk drive into the carrier, ensuring that the connector faces the rear of the tray.

2 Insert the four Pan Head, Thin Head Type, #6-32x5 mm screws, previously removed, to secure the hard disk drive to the carrier.

Carrier installation

1 Insert the HDD carrier into its drive slot.

2 Push the tray in by pushing the release button. Do not use the aluminium handle to push-in the drive tray. Make sure the front of the tray is flush with the front of the chassis.

3 Close the aluminium handle to lock it in place.

Checks after replacement

After replacement, the HDD must be connected using the RAID Controller Card 3ware utility (see *"3ware disk manager" on page 55*) to rebuild the data from the 'mirror' drive - this may take several hours. Do not replace any further HDDs during this time or data may be irretrievably lost.

Power supply module replacement

Three power supply modules are used to supply power to the server unit.

Locate the faulty power supply module by checking the green LEDs on the rear of the power supply module. The module with the unlit LED is defective and should be replaced.

Power supply module removal

1 Isolate and unplug the AC power cord from the defective power supply module.

2 Remove the #6-32x6 mm hexagonal fixing screw on the retaining bar that secures the power supply modules.

Retaining bar

Fixing screw
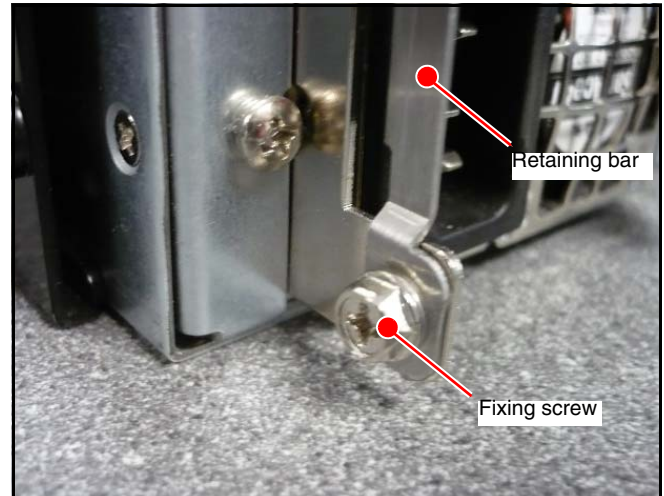
3 Remove the retaining bar.

4 Squeeze the latch at the right side of the power supply handle to release the latch locking mechanism.
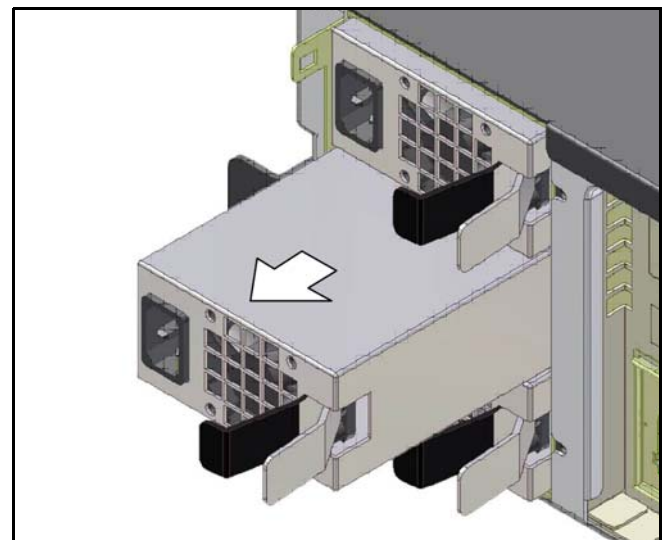
Warning

Danger of burns - the temperature on the surface of the power supply module maybe around 48°C (120°F) to 60°C (140°F) depending on the ambient temperature. Wear protective gloves as needed.

5 Pull the power supply module straight out clear of the chassis and set it down on the workbench.

Power supply module installation

1 Carefully slide the replacement module into the chassis until it clicks into place.

2 Put the retaining bar back in position and secure with the #6-32x6 mm hexagonal fixing screw.

3 Attach the power cord to the replacement module and connect to the power source.

Checks after replacement

After replacement, allow several seconds for the unit to recognize the module and determine whether it is working properly. Confirm that the rear panel green PSU LED is lit, indicating that the module is working and supplying power.

System cooling fan replacement

System fan removal

1 Remove rear lid (see *"Rear lid removal" on page 83*).

2 Identify the defective fan and pull it upward.
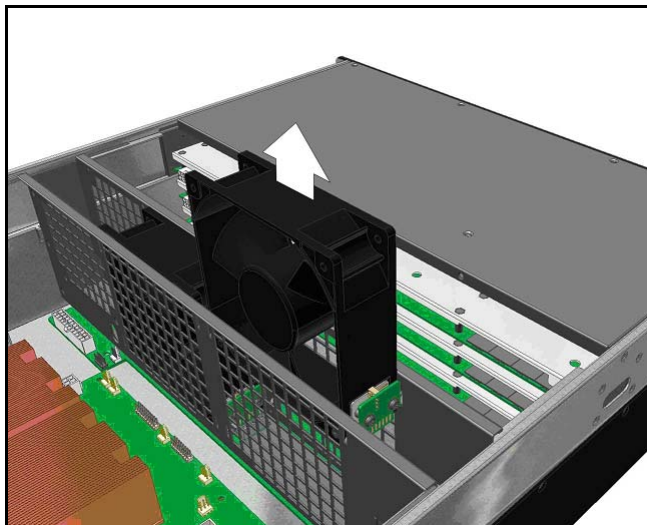
3 disconnect the 3-pin fan connector (4-pin for PWM fan) attached to the fan edge board.

4 Remove the assembly from the unit and place it on the workbench.

Fan edge board removal

1 Unscrew the two Flat Head, #6-32x8 mm screws securing the fan edge board assembly to the fan.
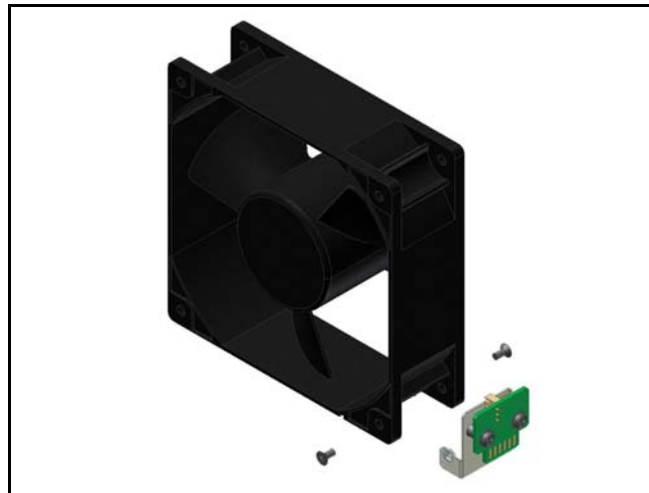
2 Remove the board and set it aside for connection to the replacement fan.

Fan edge board installation

1 Attach the fan edge board assembly to the new fan using the two Flat Head, #6-32x8 mm screws, previously removed,

2 Plug in the fan connector to the fan edge board.

System fan installation

1 Ensure the system fan is correctly orientated so that airflow will be directed rearward.

2 Install the fan assembly by sliding it into position into the unit, ensuring it mates correctly with the connector beneath.

Checks after replacement

After installing a new fan, it may take several seconds for the system to recognize the fan and determine whether it is working properly.

The fan failure indicator and alarm will turn off automatically to signify that the fan is functioning correctly (see *"Front panel controls and indicators" on page 19* for details).

Visually check that the fan is revolving in the correct direction, before replacing the rear lid (see *"Rear lid replacement" on page 83*).

Powered-off replacement parts

The following parts require that the server unit is powered off before attempting to replace parts (see *"How to power off the server" on page 45* for details).

OS HDD replacement

Two Operating System (OS) hard disk drives (HDDs) are located in the front compartment of the server chassis.

OS HDD Removal

1 Before powering off to replace a faulty drive, identify the faulty drive from the RAID diagnostics page accessible using the Administration web pages (see *"Recovery from a failed OS disk drive" on page 52* for details).

2 Unpack the 2.5" slim-line hard disk drive in preparation for installation.

3 Power off the unit (see *"How to power off the server" on page 45*) and then remove the rear and front lids (see *"Front lid removal" on page 83*) to access the part.

4 Identify which drive is faulty by comparing the serial number of the disks with the number shown by the System RAID web page.

5 disconnect the 4-pin S-ATA cable and 2-pin power cable.
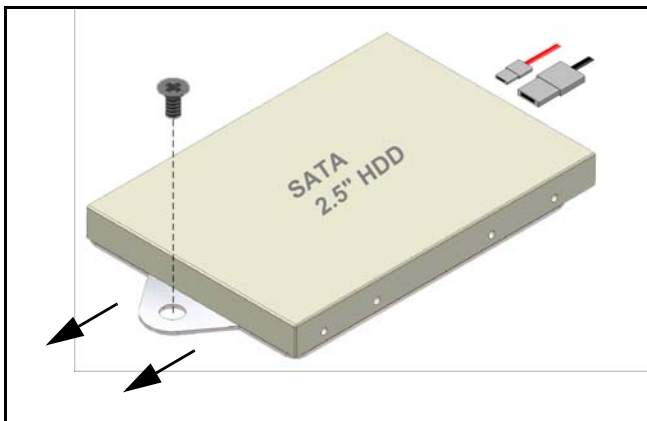
6 Remove the single Flat Head #6-32x5 mm screw and slide the slim-line hard drive assembly towards the front of the unit and lift clear.

7 Remove the faulty drive from the tray by removing the four Flat Head, M3x5 mm screws.
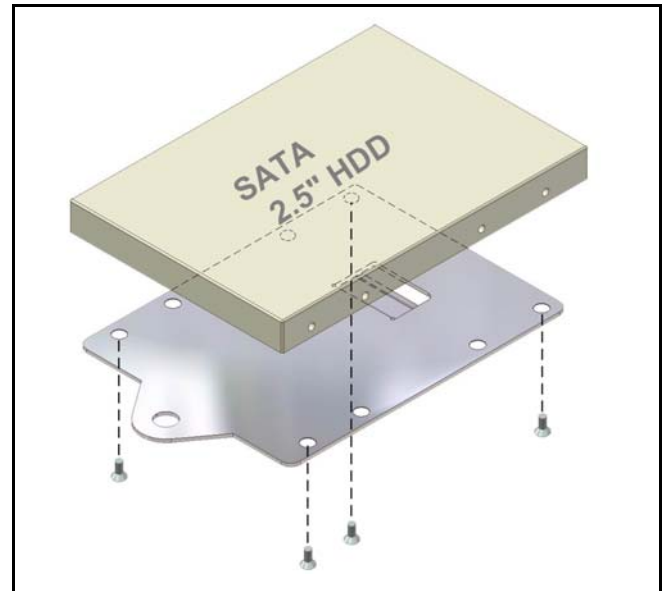
OS HDD installation

1 Place and align the replacement HDD on the tray securing it with the four Flat Head, M3x5 mm screws previously removed.

2 Position the HDD and tray, replace the single retaining screw previously removed.

3 Reconnect the 4-pin S-ATA cable and 2-pin power cable.

4 Replace the front and rear lids (see *"Front lid replacement" on page 83*) and power on the server (see *"How to power on the system" on page 45*).

Checks after replacement

After replacement, use the Administration web pages (see *"HDXchange administration web pages" on page 51*) for details of recovery from failed OS disk drive.

DVD/CD drive replacement

Disk drive removal

1 Power off the unit (see *"How to power off the server" on page 45*) and then remove the rear and front lids (see *"Front lid removal" on page 83*) to access the part.

2 disconnect the 40-pin IDE cable and the mini 4-pin power connector from the rear of the DVD/CD drive.

3 Remove the two Flat Head, #6-32x5 mm screws on the DVD/CD mounting bracket and lift the drive clear of the chassis.
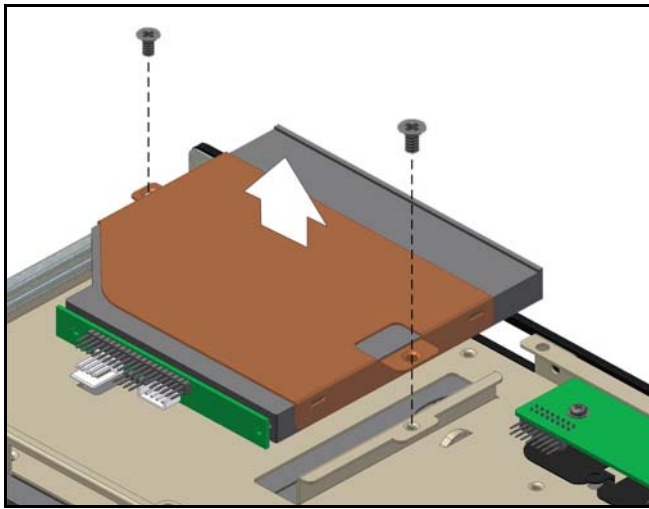
4 Remove the mounting bracket from the DVD/CD drive.

5 Remove the DVD/CD adapter board from the back of the drive by removing the two Pan Head, M2x8mm screws.
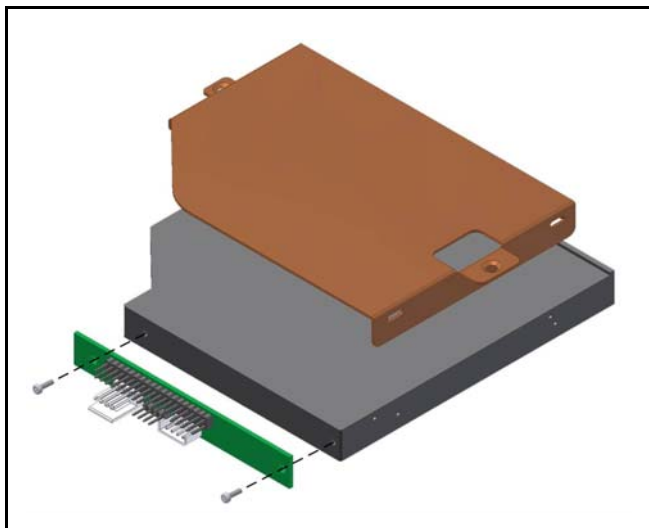
Disk drive installation

1 Secure the DVD/CD adapter board to the new DVD/CD using the two Pan Head, M2x8 mm screws previously removed.

2 Insert the new DVD/CD drive into the mounting bracket and snap the fingers into the slim DVD/CD Drive mounting holes.

3 Replace the DVD/CD drive into the chassis and secure the mounting plate using the two Flat Head, #6-32x5 mm screws previously removed, taking care not to trap any cables.

4 Connect the 40-pin IDE cable to the adapter board and connect the mini 4-pin connector to the adaptor board.

5 Replace the front and rear lids (see *"Front lid replacement" on page 83*) and power on the server (see *"How to power on the system" on page 45*).

Checks after replacement

After replacement, check the DVD/CD drive is functioning by inserting a known-good disk and reading the data from it.

RAID controller card replacement

If the S-ATA connector cables are not returned to their original positions on the RAID Controller Card, media data will not be recoverable.

RAID controller card removal

1 Power off the unit (see *"How to power off the server" on page 45*) and remove the rear lid (see *"Rear lid removal" on page 83*) to access the part.

2 Make a note of the position of the eight S-ATA cables connected to the card before disconnecting them and moving them clear of the card.

3 Remove the Pan Head Screw, #6-32x4 mm retaining screw which secures the card metal mounting panel to the chassis.

Note

The figure above shows the removal of a typical PCI card and may not show the correct position. See *"Motherboard" on page 27* for the correct position of the RAID controller card.

4 Withdraw the card upwards out of the chassis.
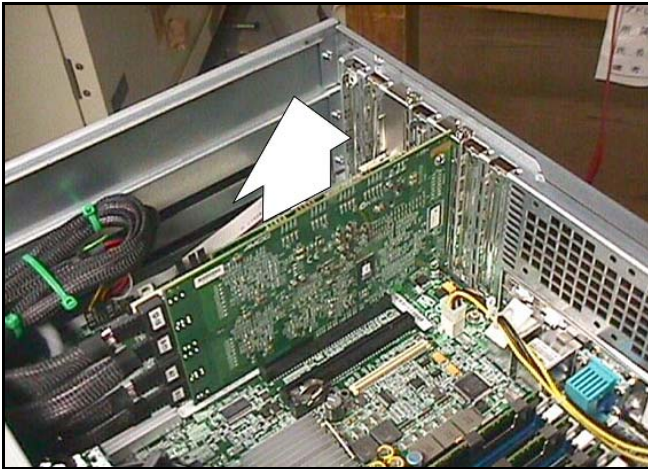
RAID controller card installation

1 Remove the replacement card from its packaging and prepare for installation. Refer to your card manual for details.

2 Position the new card so that the card-edge connector from the system board aligns with the card connector.

3 Insert the card edge connector firmly into the expansion card connector until the card is fully seated.

4 Replace and secure the expansion-card with the Pan Head Screw, #6-32x4 mm screw previously removed.

5 Re-connect the controller card S-ATA cables in their original connector locations.

Caution

If the S-ATA cables are not returned to their original positions then media data will not be recoverable.

6 Replace the rear lid (see *"Rear lid replacement" on page 83*) and power on the server (see *"How to power on the system" on page 45*).

Checks after replacement

After replacement, use the 3ware BIOS manager to set up the Media RAID and the operation of the RAID controller card (see *"Checking RAID controller BIOS settings" on page 57*).
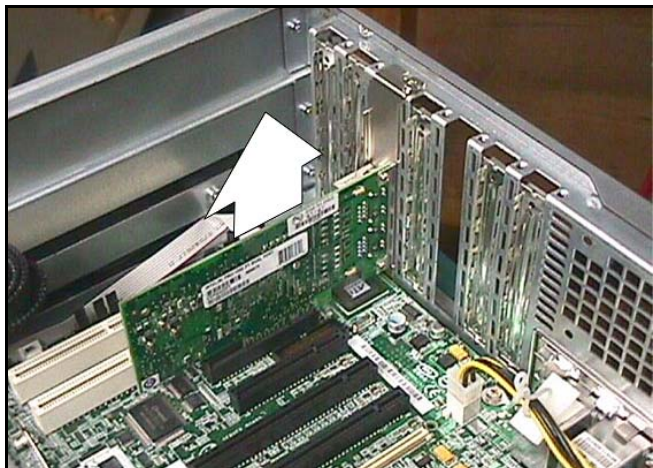
NIC card replacement

NIC card removal

1 Power off the unit (see *"How to power off the server" on page 45*) and remove the rear lid (see *"Rear lid removal" on page 83*) to access the part.

2 Remove the Pan Head Screw, #6-32x4 mm retaining screw which secures the card metal mounting panel to the chassis.

> **Note**
>
> The figure above shows the removal of a typical PCI card and may not show the correct position. See *"Motherboard" on page 27* for the correct position of the RAID controller card.

3 Withdraw the card upwards out of the chassis.

NIC card installation

1 Remove the replacement card from its packaging and prepare for installation. Refer to your card manual for details.

2 Position the card so that the card-edge connector from the system board aligns with the card connector.

3 Insert the card edge connector firmly into the expansion card connector until the card is fully seated.

4 Replace and secure the expansion-card with the Pan Head Screw, #6-32x4 mm screw previously removed.

5 Replace the rear lid (see *"Rear lid replacement" on page 83*) and power on the server (see *"How to power on the system" on page 45*).

Checks after replacement

After replacement, check that the Gigabit Ethernet connection is functioning as required by performing a ping command (see *"How to 'ping' a computer" on page 45*) and that the connector integral LEDs indicate a healthy connection can be established (see *"Rear panel connectors and LEDs" on page 23*).

Memory module replacement

Memory modules (DIMMs) contain devices which are extremely sensitive to static electricity. Note the following precautions:

If there is a faulty memory module then both of the pair must be replaced to make sure that revisions are correct. The pairs are A and C or E and G (see *"Memory Modules" on page 31*).

> **Caution**
>
> • **Do not remove a module from its packaging until you are ready to install it.**
> • **Always wear a grounding strap when handling modules.**
> • **Handle modules only by their edges taking care not to touch the edge connector contacts.**

Memory module removal

1 Power off the unit (see *"How to power off the server" on page 45*) and remove the rear lid (see *"Rear lid removal" on page 83*) to access the parts.

2 Locate the memory module(s) to be removed.

3 Push the ejection levers at either end of the module away from the memory module and eject it from the socket.
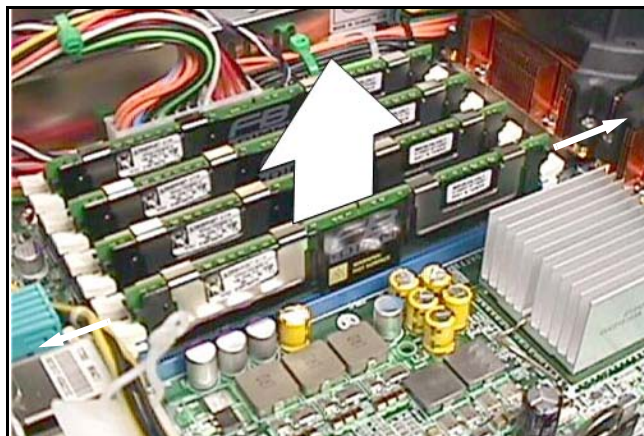
4 Hold the top corners of the memory module and lift it clear from its socket.

5 Place the module in an anti-static bag.

6 Repeat for each memory module being removed.

Memory module replacement

1 Position the module so that the small notch on the bottom corner of the module is at the same end as the socket's ejection lever.

2 Align the module with its socket until it contacts the socket evenly along the socket's length.

3 Press firmly down on both corners of the module until the bottom edge is firmly seated in the socket.

4 You will hear a clicking sound when the module is fully seated. Do not use excessive force. If the module does not click into place check that the module is of the correct type, and is inserted the right way around.

5 Repeat the steps for each module to be installed.

6 Replace the rear lid (see *"Rear lid replacement" on page 83*) and power on the server (see *"How to power on the system" on page 45*).

Checks after replacement

After replacement, use the Pc-Check utility to check the amount of RAM installed on the server (see *"Pc-Check" on page 60*).

CMOS battery replacement

• **Damage may result to the equipment if battery is connected incorrectly. Always connect the (+) and (-) terminals of the battery as instructed.**

• **Battery may explode if short-circuited. When handling the battery take care not to short-circuit the sides of the battery with jewellery or a similar conductor.**

Replace only with type **CR2032** 3.0 Volt Lithium battery.

Note

Remove and replace the battery within 20 seconds to avoid loss of BIOS settings.

Battery removal

1 Power off the unit (see *"How to power off the server" on page 45*) and remove the rear lid (see *"Rear lid removal" on page 83*) to access the part.

2 Remove the new battery from its packaging.

3 Locate the old battery on the Motherboard.
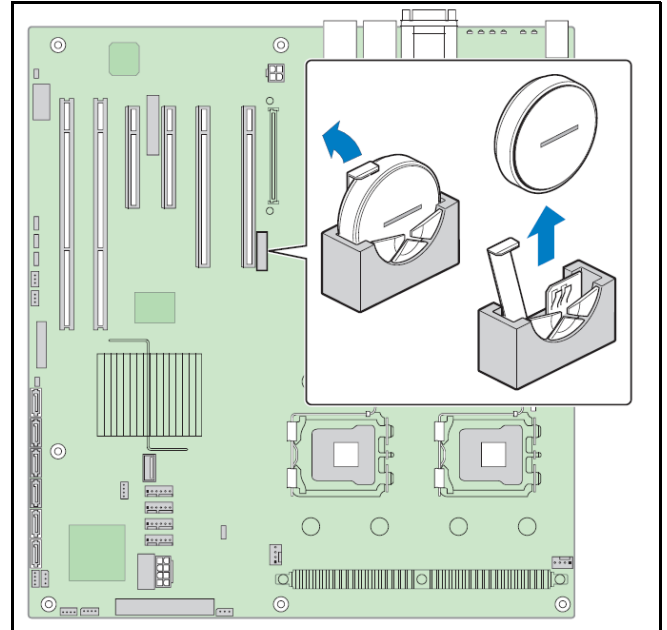
4 Remove the old battery, noting its orientation, by pulling back the retaining clip with a finger (taking care not to bend the clip) and withdrawing the battery upward. Immediately replace with the new battery in the same orientation to avoid loss of settings.

Battery installation

1 Insert the new battery, taking care to observer the correct polarity with the + symbol positioned facing the clip and PCI card connector.

2 Replace the rear lid (see *"Rear lid replacement" on page 83*) and power on the server (see *"How to power on the system" on page 45*).

Checks after replacement

After replacement, confirm that the CMOS BIOS settings have not been lost, using the BIOS setup utility (see *"Motherboard BIOS manager" on page 50*). If the settings are not required restore them to their correct values.

Disposal

Warnings

• **Batteries may explode if mistreated. Do not attempt to re-charge, disassemble or dispose of in a fire.**

• **Batteries may explode if short-circuited. When disposing of a battery, wrap all metal surfaces in insulating tape.**

Always dispose of Lithium batteries responsibly. Wrap the battery in insulating tape to completely cover the metal surfaces and dispose of it according to local ordinance.

Chassis replacement (containing motherboard and CPUs)

For situations where the server chassis must be returned for repair, it is possible to transfer parts from the faulty chassis to a good chassis to minimise downtime and allow continued use.

Caution

The RAID board cable connections, and Media drive positions MUST be exactly as they were in the original chassis or media data will be lost!

1 Power off the unit (see *"How to power off the server" on page 45*), disconnect and remove the faulty chassis from the rack and place alongside the chassis

2 If fitted, remove the front bezel (see *"Front bezel removal" on page 82*).

3 Remove the rear lid (see *"Rear lid removal" on page 83*).

4 Remove the front lid (see *"Front lid removal" on page 83*).

5 Transfer the following parts across to the new chassis:

• DVD/CD (see *"DVD/CD drive replacement" on page 88*)

• Both OS hard drives (see *"DVD/CD drive replacement" on page 88*)

• Both system cooling fans (see *"System cooling fan replacement" on page 86*)

• RAID controller card (see *"RAID controller card replacement" on page 89*)

• NIC card (see *"NIC card replacement" on page 90*)

• All 16 Media RAID disks (see *"Media RAID HDD replacement" on page 84*). When the complete Media RAID is transferred to a different chassis, it is essential that the original order of the disk drives is maintained. Failure to achieve this may result in loss of data.

• All four memory modules (see *"Memory module replacement" on page 90*)

• All three PSU modules (see *"Power supply module replacement" on page 85*)

6 When complete, check that the S-ATA connections have been correctly replaced and that the Media RAID HDDs have been placed in their correct positions. Loss of media will result if the server is powered on with incorrect connections or positions.

7 Replace the front and rear lids (see *"Front lid replacement" on page 83*).

8 Install the rebuilt unit in its rack.

9 Power on the server (see *"How to power on the system" on page 45*).

Checks after replacement

After replacement, test the unit on the bench. Use the BIOS setup utility to check the BIOS settings (see *"Motherboard BIOS manager" on page 50*).

Use the Pc-Check utility to confirm the correct operation and installation of the new hardware (see *"Pc-Check" on page 60*).

When the hardware is proved to work, use the Administration web pages to set the configuration the server (see *"HDXchange administration web pages" on page 51*).

Power supply cage replacement

Cage removal

1 Power off the unit (see *"How to power off the server" on page 45*) and remove the front and rear lids (see *"Front lid removal" on page 83*) to access the parts.

2 Remove Flat Head M4 10 mm screws from sides of chassis.

3 Remove crossbar sections (PSU holder).

4 Remove PSU retaining arm.

5 Remove 3 x power modules from the PSU cage.

6 Unplug all relevant power cables coming from the PSU cage to the motherboard.

7 Remove the 2 round head screws from the Power Supply holder metal strip, which runs across the top of the chassis.
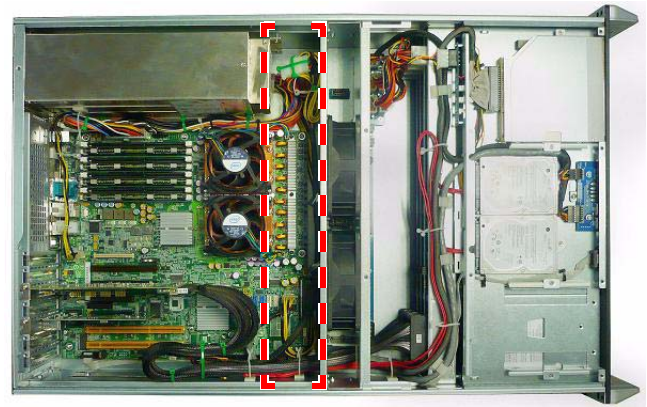
8 Remove single round head screw from inside the chassis securing the cage to the chassis.

9 Remove 4 round head screws from the rear of the chassis. The PSU will then slide toward the front of the chassis and can be removed.
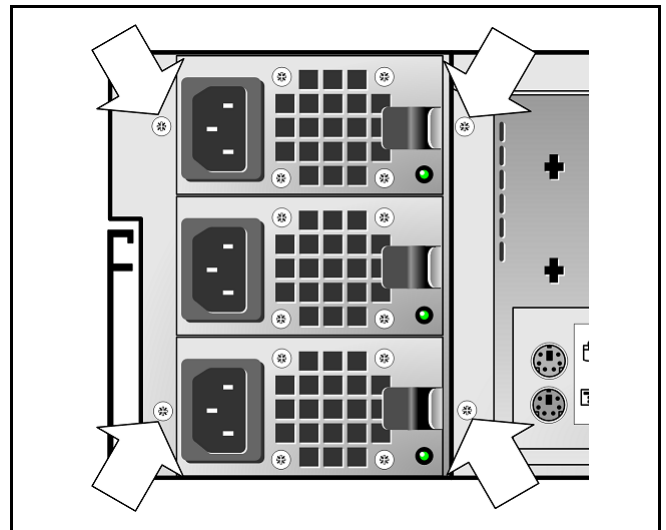
Cage installation

Installation is, generally, the reverse of removal. However, the power supply wires provided with the replacement PSU cage should be secured to the cage to avoid obscuring and interfering with Motherboard components.

1 When the cage has been slotted into position and the all the connectors are re-attached, carefully wind any excess wire into a loop and secure in position with cable-ties.

2 Attach the wire loop to the side of the cage using the stick-on clip provided to hold the top of the loop, ensuring the wires are clear of the Motherboard and taking care not to obscure the air vents in the power supply or rear panel.
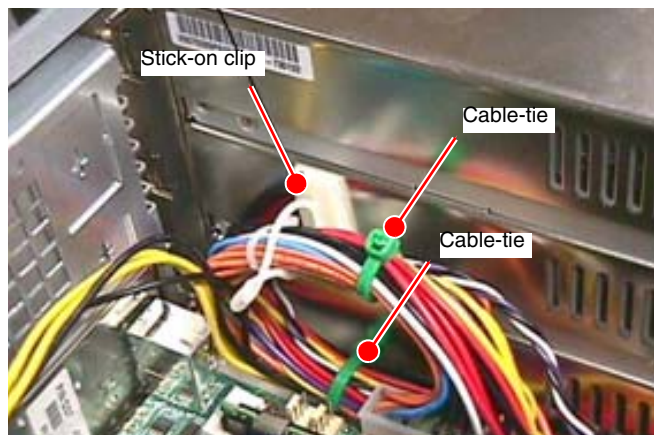
Checks after replacement

After replacement, allow several seconds for the unit to recognize the module and determine whether it is working properly. Confirm that the rear panel green PSU LEDs are lit, indicating that the modules are working and supplying power.

S-ATA backplane replacement

Caution

• **Extra care must be taken when handling and storing the backplane boards. The backplane board components can be damaged by rough handling. When removing the backplane boards from the storage system, place them on a padded surface. Never drop the backplane boards.**

• **Always wear a wrist grounding strap when handling equipment with static-sensitive components**
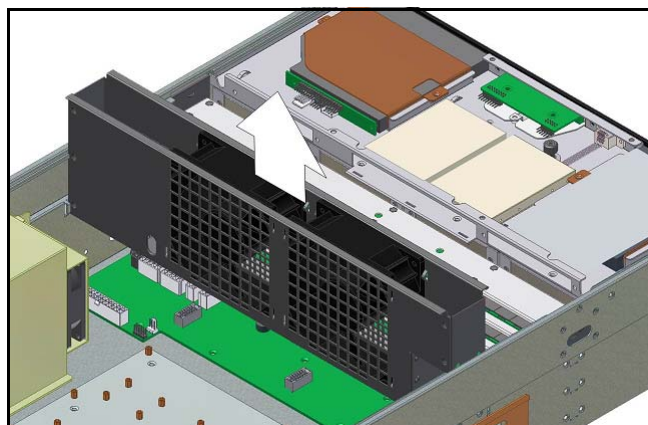
Backplane removal

1 Power off the unit (see *"How to power off the server" on page 45*) and remove the front and rear lids (see *"Front lid removal" on page 83*) to access the parts.

**2** Remove the Flat Head, M4x10 mm screws from both sides of the chassis.
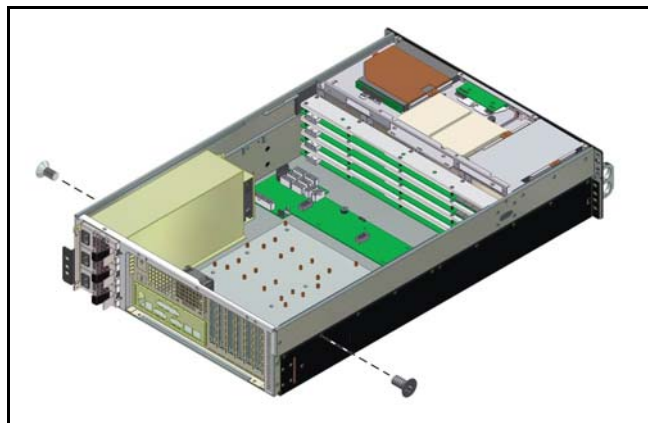
3 Fully extend the slide rail set, as shown below, to reveal the mounting screws on two sides of the chassis that support the backplane.
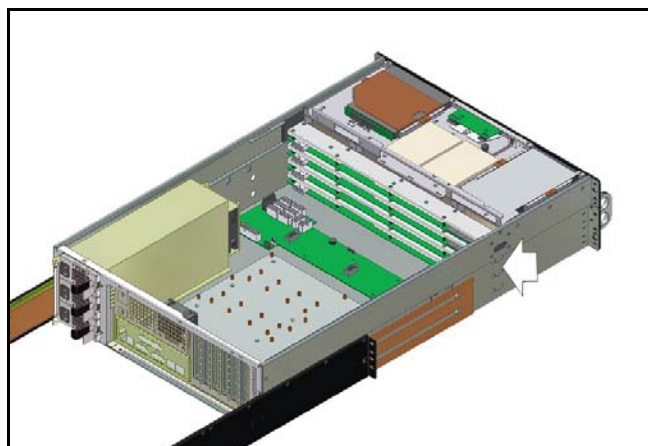
4 Unplug all the cables attached to the backplane boards.

5 Remove the system fan mounting bracket by unscrewing the two Flat Head, #6-32x5 mm screws on both sides of the chassis as shown. Carefully lift up the system fan mounting bracket.
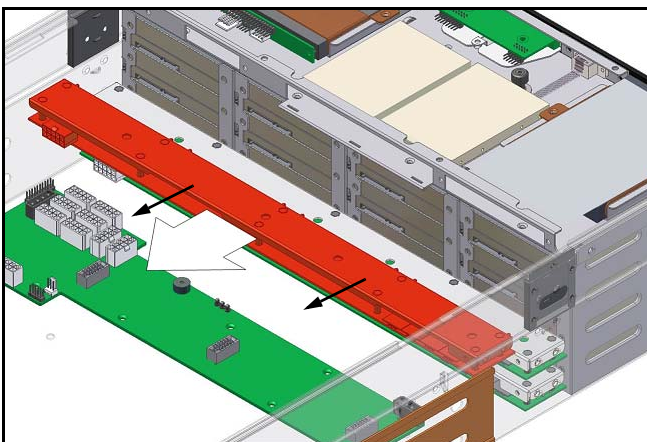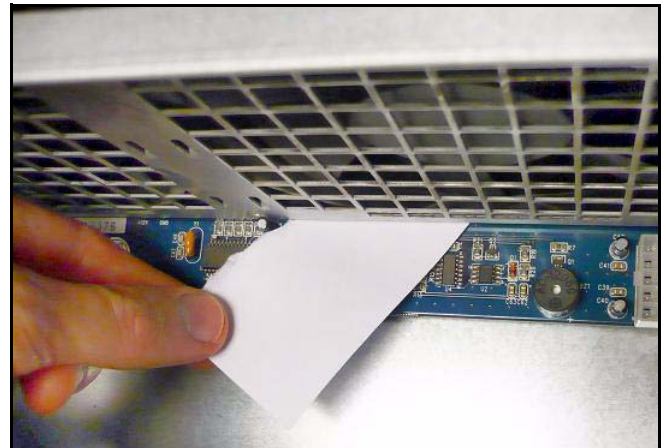

6 Remove the two Flat Head, #6-32x5 mm screws on both sides of the chassis on the backplane mounting brackets.
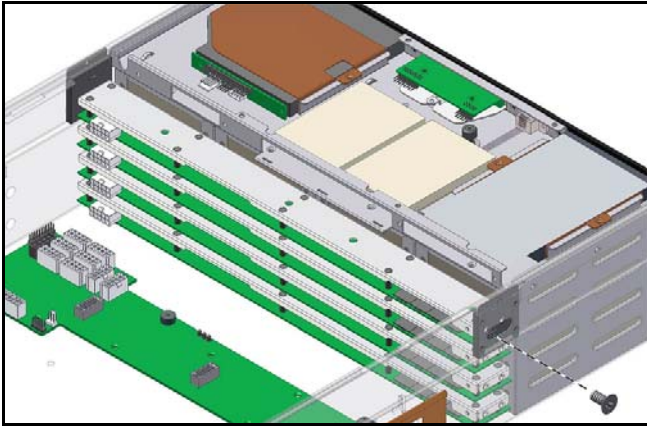
7 After the mounting screws removed, carefully slide out the backplane mounting bracket.
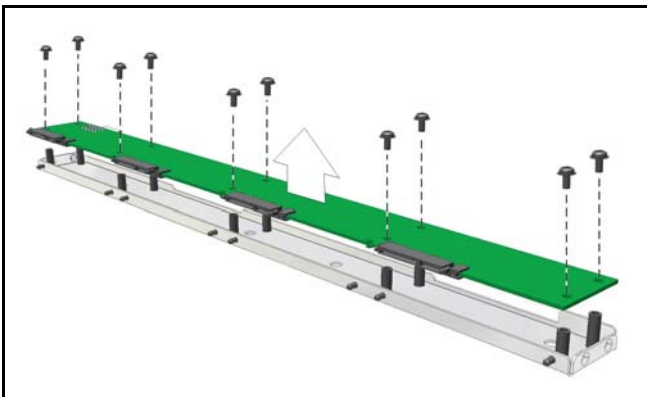

8 Remove the 10 Pan Head, #6-32x6 mm screws on the backplane board and remove the backplane board away from the backplane mounting bracket.

9 Replace the front and rear lids (see *"Front lid replacement" on page 83*) and power on the server (see *"How to power on the system" on page 45*).

Backplane installation

Installation of the backplane is the reverse of removal.

Check that the Power Distribution Board does not touch the Fan bracket when re-assembled, by sliding a piece of paper underneath. Re-adjust/re-fit as necessary.

Checks after replacement

After replacement, use the 3ware utility to check the configuration of the Media RAID and the operation of the RAID controller card (see *"3ware disk manager" on page 55*).

Maintenance

Introduction

About this chapter

This chapter provides information about regular maintenance to be carried out on the server unit.

Maintenance policy

Generally, the server is designed to be maintenance-free. However, minor periodic maintenance tasks are listed in the following section.

Periodic maintenance

Daily maintenance

• Check for alarms, if the server is located in an isolated room.

• Visually inspect the server for build-up of dirt or dust, particularly around the air intake at the front bezel and the air outflow from the unit rear panel and power supply modules. and clean if required (see *"Cleaning the front bezel filter" on page 98*).

5-yearly maintenance

• Replace the CMOS battery (see *"CMOS battery replacement" on page 91*) to avoid loss of settings and interruption to server operation. The expected life of the battery is 7-10 years.

Maintenance tasks

Cleaning the front bezel filter

The removable front panel bezel contains a filter for cooling air to be drawn into the unit.

How often the filter must be cleaned depends on the environment in which the server operates. As the filter collects dust, the air in-take of the unit will become restricted, causing the server's internal fans to spin faster and work harder to maintain the internal temperature within normal operating parameters.

If the filter becomes severely blocked, this may result in more fan noise or in overheating, causing an automatic shutdown of the server.

Follow the procedure below to remove and clean the front bezel air filter:

1 If fitted, remove the front bezel to access the filter (see *"Front bezel" on page 82*).

2 Use a vacuum cleaner to remove the dust from the exposed parts of the foam filter at the front and rear of the bezel.

3 Re-fit the bezel to the front of the server by pushing the bezel into place. The release buttons will snap into place when positioned correctly.

Note

It is recommended that the bezel is fitted to the unit during normal operation in order to protect the HDDs and other internal circuitry from dust and dirt. This will prolong the life of your equipment and protect the unit from overheating.

Spare Parts

Introduction

About this chapter

This chapter lists the spare parts that are available for the server unit and provides exploded views of the unit to permit identification of the component parts.

Notes on spare parts

Ordering spare parts

Spare parts for server unit can be ordered through your local Sony representative, quoting the order code shown in the table (see *"Parts list" on page 100*).

Use officially sourced parts

- The parts used in this server have been specifically selected for their performance. The use of parts not obtained from an approved source may compromise the operation and performance of this equipment and will invalidate any warranty.

- Parts must only be replaced by qualified personnel. No liability can be accepted for damage resulting from parts replaced by non-qualified or approved personnel.

- Users should ensure at all times that their material is backed up. No liability can be accepted for the loss of users' data through whatever cause.

Safety related parts warning

Warning

Parts marked with ⚠ are critical to the safe operation of this equipment. These parts must always be replaced with Sony-approved parts.

Substitution of parts

Parts supplied by Sony may differ from those listed in the table (see *"Parts list" on page 100*). Such parts, where supplied, will be appropriately tested and approved for your server as direct replacements, and will deliver an equivalent or improved specification for your server.

Harnesses

Harnesses without part numbers are not registered as spare parts.
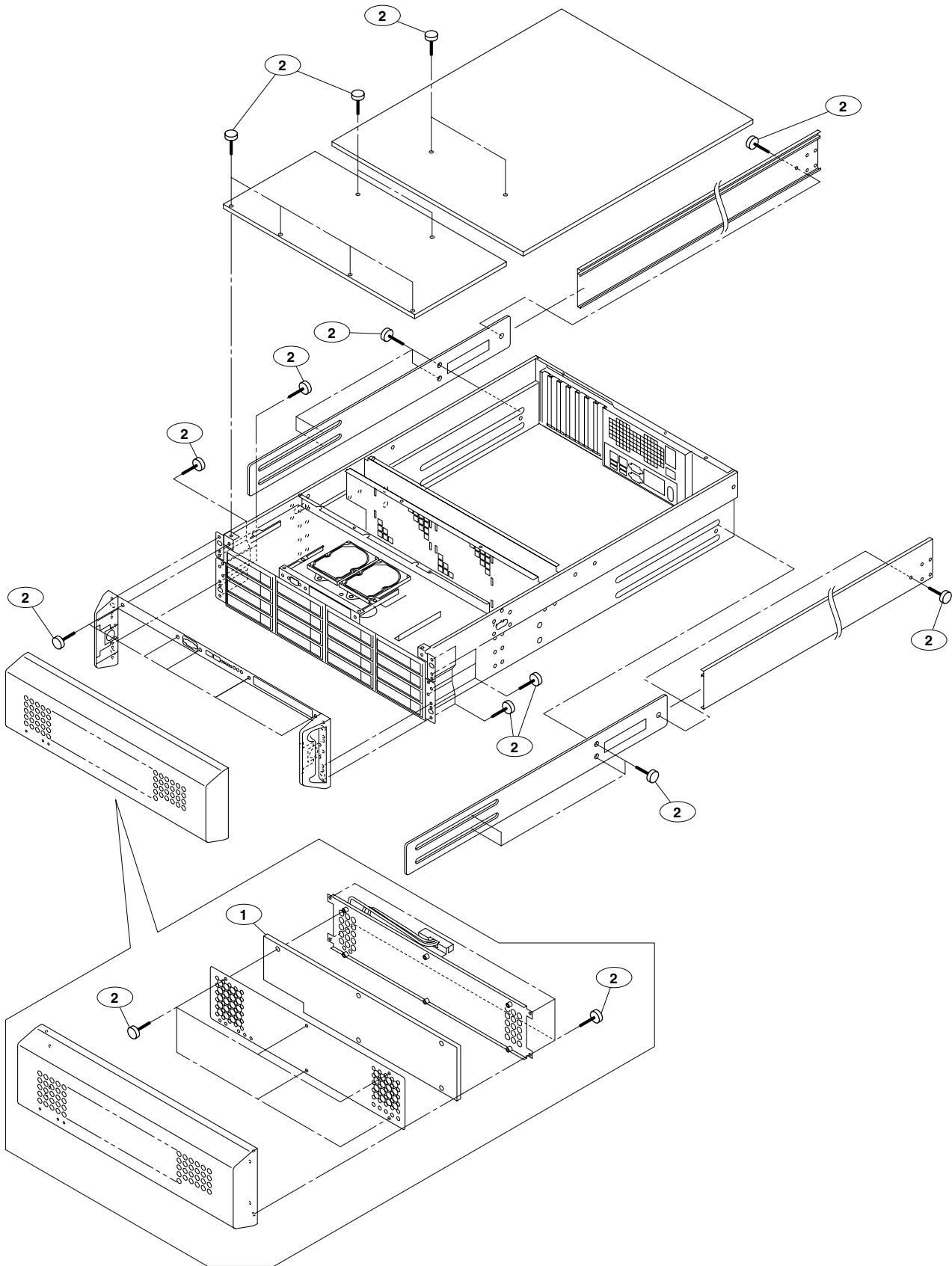
Parts list

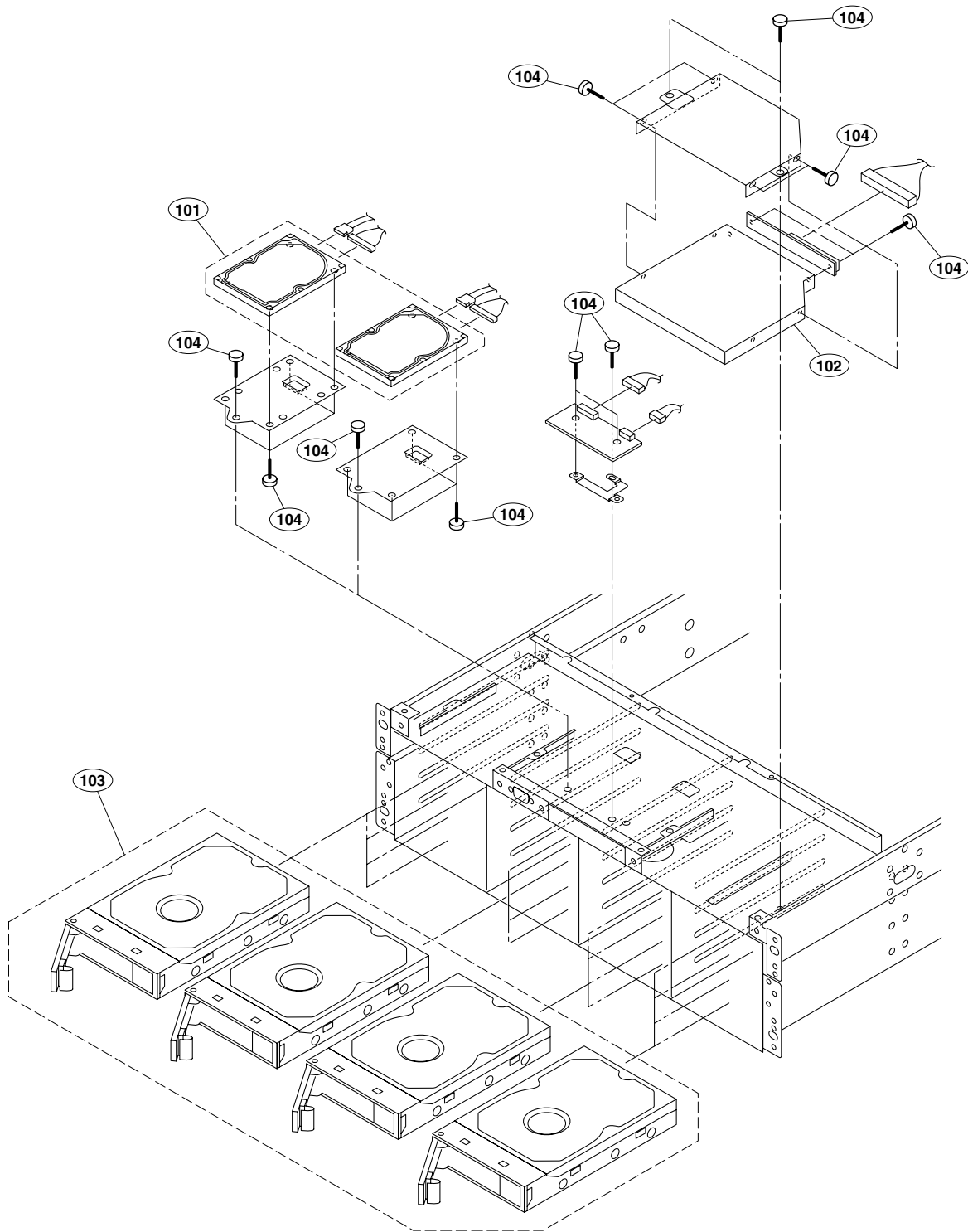The table below lists the parts which are available as standard replacement parts.

Should other parts be required that are not listed below, contact your dealer or sales office with details for advice on availability.
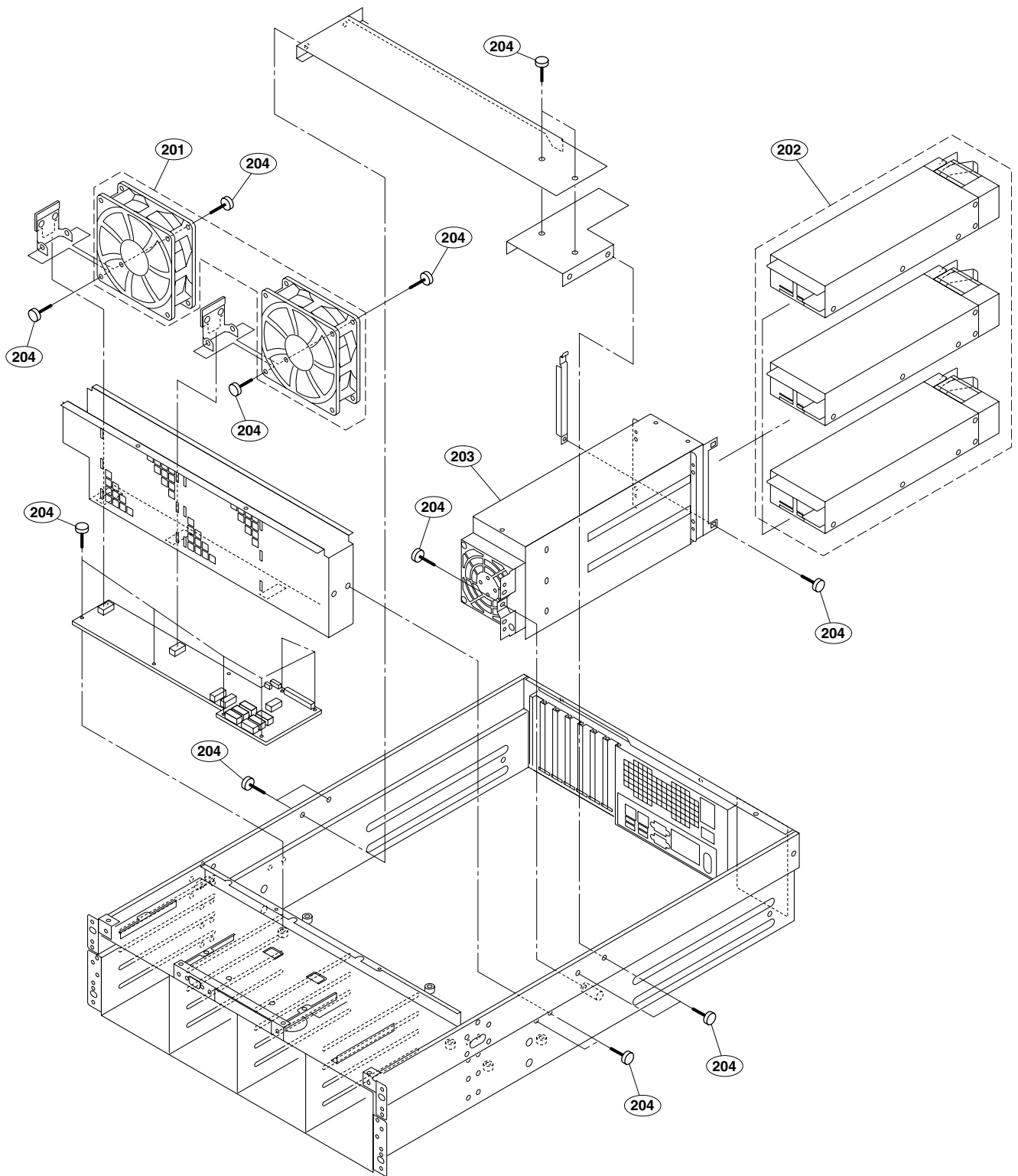
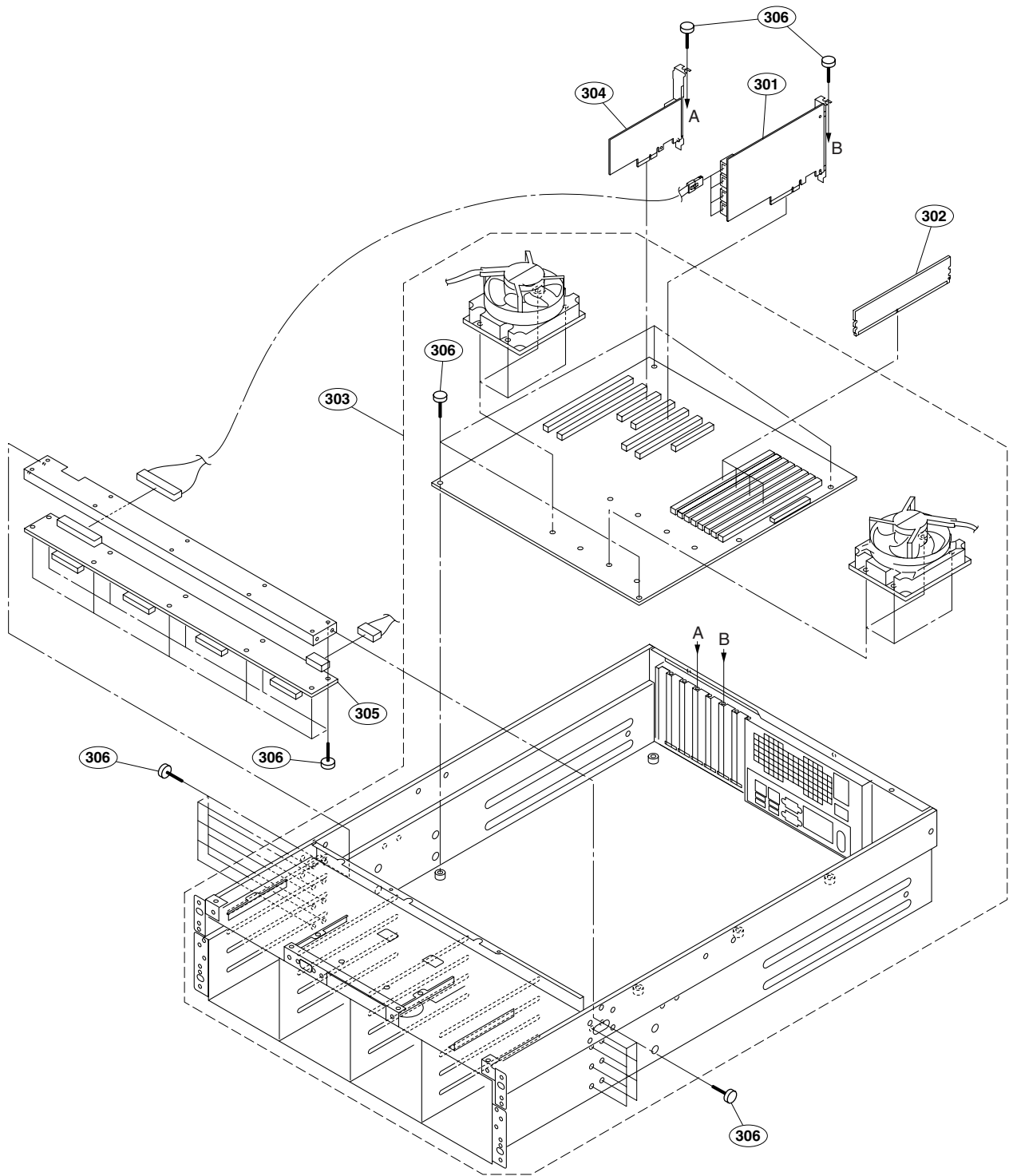The spare parts listed in the table below are detailed on the accompanying exploded views in the following section.

Item number	Sony part number	Description
1	9-885-120-89	BLACK FILTER
2	9-885-120-90	SCREW PACKAGE
101	9-885-120-78	2.5 INCH OS DISK
102	9-885-120-82	DVD/CD-RW
103	9-885-120-83	3.5 INCH DATA DISK (500 GB)
104	9-885-120-90	SCREW PACKAGE
201	9-885-120-79	SYSTEM COOLING FAN
202	9-885-120-84	PSU
203	9-885-120-86	POWER CAGE
204	9-885-120-90	SCREW PACKAGE
301	9-885-120-80	3WARE RAID CONTROLLER
302	9-885-120-81	1 GB MEMORY MODULE
303	9-885-120-85	CHASSIS
304	9-885-120-87	NIC BOARD
305	9-885-120-88	SATA BACKPLANE BOARD

Parts location

104

104

104

104

104

104

104

104

104

104

101

104

104

102

103

306

304   301

302

306

303

305

306   306

A B

A B

306

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer :

Check the metal trim, "metallized" knobs, screws, and all other exposed metal parts for AC leakage. Check leakage as described below.

LEAKAGE TEST

The AC leakage from any exposed metal part to earth ground and from all exposed metal parts to any exposed metal part having a return to chassis, must not exceed 3.5 mA. Leakage current can be measured by any one of three methods.

1. A commercial leakage tester, such as the Simpson 229 or RCA WT-540A. Follow the manufacturers' instructions to use these instruments.
2. A battery-operated AC milliammeter. The Data Precision 245 digital multimeter is suitable for this job.
3. Measuring the voltage drop across a resistor by means of a VOM or battery-operated AC voltmeter. The "limit" indication is 5.25 V, so analog meters must have an accurate low-voltage scale. The Simpson 250 and Sanwa SH-63Trd are examples of a passive VOM that is suitable. Nearly all battery operated digital multimeters that have a 20 V AC range are suitable. (See Fig. A)
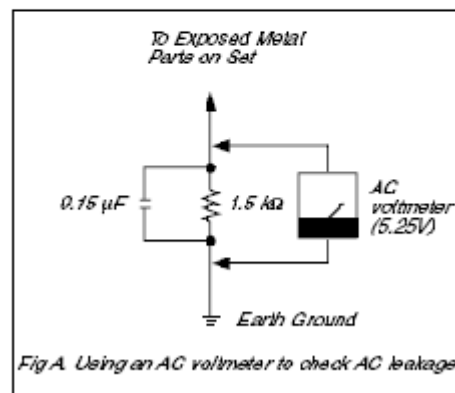

To Exposed Metal Parts on Set

0.15 µF   1.5 kΩ   AC voltmeter (5.25V)

Earth Ground

Fig A. Using an AC voltmeter to check AC leakage.

http://www.sony.net/

Sony Corporation