SGI® InfiniteStorage NAS System Hardware Reference

COPYRIGHT

LIMITED RIGHTS LEGEND

TRADEMARKS AND ATTRIBUTIONS

Record of Revision

Version	Description
001	October 2009. Original publication.
002	January 2010. Updated publication, replaces 007-5596-001.

Table of Contents

About This Manual

This manual provides an overview of the SGI InfiniteStorage NAS Server (IS-NAS Server) hardware and explains how to replace faulty components.

For assistance with storage arrays connected to the InfiniteStorage NAS Server refer to the *Storage Subsystem Guide*.

Audience

This guide is written for owners and field service personnel who may have to repair BlueArc Mercury Server system hardware. It is written with the assumption that the reader has a good working knowledge of computer systems and the replacement of computer parts.

Chapter Descriptions

The following topics are covered in this document:

- "About This Manual"

  Provides an introduction to this guide, lists other documentation resources available for this product, and explains the conventions used in this document.

- "Safety Information"

  Provides information relating to the safe usage and handling of the NAS storage server system, and discusses data security and important regulatory standards.

- "System Cabinet and Components"

  Provides information about the various parts of the NAS server system.

- "SGI IS-NAS Server Components"

  Provides information about the components of the BlueArc Mercury Server.

- "Replacing System Components"

  Provides information and instructions relating to the replacement of BlueArc Mercury Server parts.

- "Rebooting, Shutting Down, and Powering Off the SGI InfiniteStorage NAS Server"

  Provides information about rebooting, shutting down, and powering off the BlueArc Mercury Server or a cluster. This chapter also includes information about shutting the NAS server down for long term storage or transport.

- "Powering On an SGI IS-NAS Server/Cluster"

  Provides information about powering on the BlueArc Mercury Server or a cluster.

- "Recovering from Power Standby"

  Provides information and instructions about how to recover from a power standby state, and powering on the BlueArc Mercury Server after being in a power standby state.

Conventions

The following conventions are used throughout this document:

Convention	Meaning
Command	This fixed-space font denotes literal items such as commands, files, routines, path names, signals, messages, and programming language structures.
variable	The italic typeface denotes variable entries and words or concepts being defined. Italic typeface is also used for book titles.
user input	This bold fixed-space font denotes literal items that the user enters in interactive sessions. Output is shown in nonbold, fixed-space font.
[and]	Brackets enclose optional portions of a command or directive line.
…	Ellipses indicate that a preceding element can be repeated.
GUI element	This font denotes the names of graphical user interface (GUI) elements such as windows, screens, dialog boxes, menus, toolbars, icons, buttons, boxes, fields, and lists.

The following types of messages are used throughout this manual. SGI recommends that these icons and messages are read and clearly understood before proceeding:

Tip: A tip contains supplementary information that is useful in completing a task.

Note: A note contains information that helps to install or operate the system effectively.

Caution: A caution indicates the possibility of damage to data or equipment. Do not proceed beyond a caution message until the requirements are fully understood.

Warning: A warning contains instructions that you must follow to avoid personal injury.

Før du starter (DANSK)

Følgende ikoner anvendes i hele guiden til at anføre sikkerhedsrisici. Det anbefales, at du læser og sætter dig ind i, og har forstået alle procedurer, der er markeret med disse ikoner, inden du fortsætter.

Bemærk: "Bemærk" indikerer informationer, som skal bemærkes.

FORSIGTIG: "Forsigtig" angiver en mulig risiko for beskadigelse af data eller udstyr. Det anbefales, at du ikke fortsætter længere end det afsnit, der er mærket med dette ord, før du helt har sat dig ind i og forstået proceduren.

ADVARSEL: "Advarsel" angiver en mulig risiko for den personlige sikkerhed.

Vorbereitung (DEUTSCH)

Die folgenden Symbole werden in diesem Handbuch zur Anzeige von Sicherheitshinweisen verwendet. Lesen Sie die so gekennzeichneten Informationen durch, um die erforderlichen Maßnahmen zu ergreifen.

Anmerkung: Mit einer Anmerkung wird auf Informationen verwiesen, die Sie beachten sollten.

VORSICHT: Das Wort "Vorsicht" weist auf mögliche Schäden für Daten oder Ihre Ausrüstung hin. Sie sollten erst dann fortfahren, wenn Sie die durch dieses Wort gekennzeichneten Informationen gelesen und verstanden haben.

WARNUNG: Mit einer Warnung wird auf mögliche Gefahren für Ihre persönliche Sicherheit verwiesen.

Antes de comenzar (ESPAÑOL)

Los siguientes iconos se utilizan a lo largo de la guía con fines de seguridad. Se le aconseja leer, y entender en su totalidad, cualquier procedimiento marcado con estos iconos antes de proceder.

Sugerencia: Una sugerencia indica información adicional que puede serle de utilidad en la finalización de una tarea.

PRECAUCIÓN: Una precaución indica la posibilidad de daños a los datos o equipo. Se le aconseja no continuar más allá de una sección marcada con este mensaje, a menos que entienda el procedimiento por completo.

ADVERTENCIA: Una advertencia indica la posibilidad de un riesgo a la seguridad personal.

Avant de commencer (FRANÇAIS)

Les icônes ci-dessous sont utilisées dans le manuel pour mettre en évidence des procédures de sécurité. Nous vous invitons à les lire et à bien comprendre toutes les procédures signalées par ces icônes avant de poursuivre.

Conseil : "Conseil" signale les informations complémentaires que vous pouvez trouver utiles pour mener à bien une tâche.

ATTENTION : "Attention" signale qu'il existe une possibilité d'endommager des données ou de l'équipement. Nous vous recommandons de ne pas poursuivre après une section comportant ce message avant que vous ayez pleinement assimilé la procédure.

AVERTISSEMENT : "Avertissement" signale une menace potentielle pour la sécurité personnelle.

Operazioni preliminari (ITALIANO)

Le seguenti icone vengono utilizzate nella guida a scopo cautelativo. Prima di procedere Vi viene richiesta un'attenta lettura di tutte le procedure, contrassegnate dalle suddette icone, affinché vengano applicate correttamente.

Suggerimento: "Suggerimento" fornisce indicazioni supplementari, comunque utili allo scopo.

ATTENZIONE: "Attenzione" indica il potenziale danneggiamento dei dati o delle attrezzature in dotazione. Vi raccomandiamo di non procedere con le operazioni, prima di

aver ben letto e compreso la sezione contrassegnata da questo messaggio, onde evitare di compromettere il corretto svolgimento dell'operazione stessa.

PERICOLO: "Pericolo" indica l'eventuale pericolo di danno provocato alle persone, mettendo a rischio la vostra incolumità personale.

Vóór u aan de slag gaat (NEDERLANDS)

De volgende pictogrammen worden in de hele handleiding gebruikt in het belang van de veiligheid. We raden u aan alle procedure-informatie die door deze pictogrammen wordt gemarkeerd, aandachtig te lezen en ervoor te zorgen dat u de betreffende procedure goed begrijpt vóór u verder gaat.

VOORZICHTIG: "Voorzichtig" geeft aan dat er risico op schade aan data of apparatuur bestaat. We raden u aan even halt te houden bij de sectie die door dit woord wordt gemarkeerd, tot u de procedure volledig begrijpt.

WAARSCHUWING: Een waarschuwing wijst op een mogelijk gevaar voor de persoonlijke veiligheid.

Antes de começar (PORTUGUÊS)

Os ícones mostrados abaixo são utilizados ao longo do manual para assinalar assuntos relacionados como a segurança. Deverá ler e entender claramente todos os procedimentos marcados com estes ícones ande de prosseguir.

Sugestão: Uma sugestão assinala informações adicionais que lhe poderão ser úteis para executar uma tarefa.

CUIDADO: "Cuidado" indica que existe a possibilidade de serem causados danos aos dados ou ao equipamento. Não deverá avançar para lá de uma secção marcada por esta mensagem sem ter primeiro entendido totalmente o procedimento.

AVISO: Um aviso indica que existe um possível risco para a segurança pessoal.

Ennen kuin aloitat (SUOMI)

Seuraavilla kuvakkeilla kiinnitetään tässä oppaassa huomiota turvallisuusseikkoihin. Näillä kuvakkeilla merkityt menettelytavat tulee lukea ja ymmärtää ennen jatkamista.

Huomautus: Huomautus sisältää tietoja, jotka tulee ottaa huomioon.

VAROITUS: Varoitus varoittaa tietojen tai laitteiden vahingoittumisen mahdollisuudesta. Tällä merkillä merkitystä kohdasta ei tule jatkaa eteenpäin ennen kuin täysin ymmärtää kuvatun menettelyn.

VAARA: Vaara varoittaa henkilövahingon mahdollisuudesta.

Innan du startar (SVENSKA)

Följande ikoner används i hela handboken för att markera säkerhetsaspekter. Läs igenom handboken ordentligt så att du förstår steg som har markerats med dessa ikoner innan du fortsätter.

Obs: "Obs" anger vad du ska observera.

FÖRSIKT: "Försikt" anger vad som kan leda till data eller utrustningsskador. Fortsätt inte till nästa avsnitt innan du förstår det steg som har markerats med detta meddelande.

VARNING: "Varning" anger vad som kan leda till personskador.

Related Publications

Other publications available on the System Management Unit (SMU) are:

- *SGI* InfiniteStorage NAS Server *System Administration Guide*: In PDF and HTML format, this guide provides a full specification of the system and instructions on how to administer the IS-NAS Server using Web Manager.

- *SGI* InfiniteStorage NAS Server *Command Line Reference:* This guide (in HTML format) describes how to administer the system by typing commands at a command prompt.

- *SGI Storage Subsystem Guide:* This guide (in PDF format) describes how to configure and administer the storage enclosures attached to the IS-NAS Server.

Other publications available from SGI include:

- *SGI* InfiniteStorage NAS Server *Software Installation Guide*: In PDF format, this guide provides information about installing software and firmware, including instructions on how to upgrade and downgrade the InfiniteStorage NAS Server and the SMU.

- *SGI* InfiniteStorage NAS Server *Hardware Installation Guide*: In PDF format, this guide provides information about installing the InfiniteStorage NAS Server and connecting it to your network.

Browser Support

Any of the following browsers can be used to run Web Manager, the IS-NAS Server System Management Unit (SMU) web-based graphical user interface.

- Microsoft Internet Explorer: version 6.0 or later.

- Mozilla Firefox: version 1.5 or later.

The following Java Runtime Environment is required to enable some advanced Web Manager functionality: Sun Microsystems Java Runtime Environment: version 5.0, update 6, or later.

A copy of all product documentation is included for download or viewing through Web Manager. The following software is required to view this documentation: Adobe Acrobat: version 7.0.5 or later.

Product Support

SGI provides a comprehensive product support and maintenance program for its products. SGI also offers services to implement and integrate Linux applications in your environment.

- Refer to http://www.sgi.com/support/.

- If you are in North America, contact the Technical Assistance Center at +1 800 800 4SGI or contact your authorized service provider.

- If you are outside North America, contact the SGI subsidiary or authorized distributor in your country.

Reader Comments

If you have comments about the technical accuracy, content, or organization of this document, contact SGI. Be sure to include the title and document number of the manual with your comments. (Online, the document number is located in the front matter of the manual. In printed manuals, the document number is located at the bottom of each page.)

You can contact SGI in any of the following ways:

Send e-mail to the following address: techpubs@sgi.com.

- Contact your customer service representative and ask that an incident be filed in the SGI incident tracking system.

- Send mail to the following address:

- SGI
  Technical Publications
  46600 Landing Parkway
  Fremont, CA 94538

SGI values your comments and will respond to them promptly.

Safety Information

Electrostatic Discharge Precautions

To ensure proper handling of system components and to prevent hardware faults caused by electrostatic discharge, follow all safety precautions:

- Wear an anti-static wrist or ankle strap.
- Observe all standard electrostatic discharge precautions when handling plug-in modules or components that have been removed from any anti-static packaging.
- **Avoid** contact with backplane components and module connectors.

Safety and Handling Precautions

To ensure safe handling and correct operation of the equipment, follow all the safety precautions and instructions:

- Observe safe lifting practices. Each SGI InfiniteStorage NAS Server (IS-NAS Server) or each storage array can weigh 56 lb. (25 kg) or more. It is important to note that at least two people are **required** to handle and position them.
- A storage cabinet must be loaded correctly to prevent any serious injuries.

  1. Place the Fibre Channel switches in the center of the storage cabinet. The recommended rack unit positions are 23 and 24. The positions can be adjusted according to a specific storage cabinet configuration.

  2. Load and position the IS-NAS Server(s) directly above the Fibre Channel switches, if used in your configuration.

  3. The System Management Unit (SMU), if used in your configuration, should be placed directly below the Fibre Channel switches.

  4. The first storage enclosure should be positioned at the bottom of the storage cabinet. Additional enclosures are then placed above existing enclosures, going towards the top of the system cabinet.

  5. Once the bottom half of the storage cabinet has been filled, the top half of the storage cabinet can be filled. Begin by placing a storage component directly above the IS-NAS Server and fill upwards.

Note: All expansion cabinets including all storage enclosures, must be filled from the bottom to the top.

Warning: There is a risk that the cabinet could fall over suddenly. To prevent this from occurring:

- Do not remove more than one unit at a time.
- SGI recommends that the stabilizer plate be secured to the front of the system cabinet. For more information, see "Attaching the Stabilizer Plate to the System Cabinet," on page 15.

Electrical Precautions

- Provide a suitable power source with electrical overload protection to meet the power requirements of the entire system (the server/cluster, and all storage subsystems and switches). The power requirements per cord are - North America: 2 phase, 208Vac, 24A max; 1 phase 110Vac, 16A max. Europe: 230Vac, 16A max.

- Provide a power cord suitable for the country of installation if a power cord is not supplied.

- Power cords supplied with this server or system may be less than 1.5m in length. These are for use with a power distribution unit (PDU) which is mounted inside the 19 inch rack. If you require longer cables, please contact your local sales representative.

- Provide a safe electrical ground connection to the power cord (check the grounding of an enclosure before applying power).

- Only operate the IS-NAS Server from nominal mains input voltages in the range 100 - 240Vac, 6A max, 50/60Hz.

Caution: Turn off all power supplies or remove all power cords before undertaking servicing of the system.

- Unplug a system component if it needs to be moved or if it is damaged.

Note: For additional data protection, it is recommended to use an external UPS to power the IS-NAS Server. Also, each of the redundant power supplies in the IS-NAS Server and in the storage subsystems should be operated from a different mains power circuit in order to provide a degree of protection from mains power supply failures. In the event that one circuit fails, the other will continue to power the IS-NAS Server and the storage subsystem.

Data Security

- Each storage enclosure contains multiple removable hard disk drive (HDD) modules. These units are **fragile**. *Handle them with care and keep them away from strong magnetic fields.*

- All supplied plug-in modules and blanking plates must be in place to complete the internal circuitry and enable air to flow correctly around an enclosure.

- Using the system for more than a few minutes with modules or blanking plates missing can cause an enclosure to overheat, leading to power failure and data loss. Such use may invalidate the warranty.

- A loss of data can occur if a hard drive module is removed. Immediately replace any modules that are removed. If a module is faulty, replace it with one of the same type, of at least the same capacity and speed.

- Always shut down a IS-NAS Server before it is moved, switched OFF, or reset.

- All storage enclosures are fitted with optical SFP transceivers. The SFPs approved for use with supported storage enclosures vary depending on the original manufacturer of the unit. SFPs qualified for older systems might not be approved for use with the most current storage systems. To ensure proper operation of the IS-NAS Server and the storage subsystems, use only the approved replacement parts for each system, which can be purchased by contacting your sales representative.

- Maintain backup routines. Do not abandon backup routines. No system is completely foolproof.

Mandatory Regulations

The sections that follow outline the mandatory regulations governing the installation and operation of the system. Adhere to these instructions to ensure that regulatory compliance requirements are met.

International Standards

The equipment described in this manual complies with the requirements of the following agencies and standards:

- CSA 60950-1/UL 60950-1; EN 60950-1
- FCC Part 15, Class A; EN 55022 Class A; EN 55024

Federal Communications Commission (FCC)

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if it is not installed and used in accordance with the instruction manual, might cause harmful interference to radio communications.

Operation of this equipment in a residential area is likely to cause harmful interference, in which case the users will be required to correct the interference at their own expense.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Neither the provider nor the manufacturer is responsible for any radio or television interference caused by using non-recommended cables and connectors, or by unauthorized changes or modifications to this equipment.

Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. The device can not cause harmful interference.

2. The device must accept any interference received, including interference that might cause undesired operation.

European Union (EU) Statement

This product conforms to the protection requirements of the following EU Council Directives:

- 89/336/EEC Electromagnetic Compatibility Directive
- 73/23/EEC Low Voltage Directive
- 93/68/EEC CE Marking Directive
- 2002/95/EC Restriction in the use of Certain Hazardous Substances in Electrical and Electronic Equipment (RoHS) - This product is 6/6(fully) compliant.

The manufacturer cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product.

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

Caution: This is a Class A product and as such, in a domestic environment, might cause radio interference.

Canadian Department of Communication Compliance Statement

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

Avis de conformité aux normes du ministère des Communications du Canada

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Radio Protection for Germany

Dieses Gerät erfüllt die Bedingungen der EN 55022 Klasse A.

Food and Drug Administration (FDA)

The product complies with FDA 21 CFR 1040.10 and 1040.11 regulations, which govern the safe use of lasers.

Chinese RoHS Compliance Statement for the IS-NAS Server

有 毒 有 害 物 质 名 称 标 识
Toxic and Hazardous Substances Table

部 件 名 称 Part Name	有 毒 有 害 物 质 或 元 素 Toxic and Hazardous Substances and Elements					
	鉛 (Pb)	汞 (Hg)	鎘 (Cd)	六价鉻 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
机箱 Chassis	O	O	O	O	O	O
电源 Power Supply Module	O	O	O	O	O	O
电池包 Battery Pack	O	O	O	O	O	O
风扇模块 Fan Module	O	O	O	O	O	O
硬盘 Hard Disk Drive	O	O	O	O	O	O

O：表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T 11363-2006 规定的限量要求以下
O：Indicates that the toxic or hazardous substances contained in all of the homogeneous materials for this part is below this limit requirement in SJ/T 11363-2006.

X：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 规定的限量要求
X：Indicates that the toxic or hazardous substances contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T 11363-2006.

System Cabinet and Components

The Components in the System

The system is housed in a cabinet or rack. A *U* is a unit of measurement equivalent to 1.75 inches or 44.45 millimeters. The main components are:

- SGI InfiniteStorage NAS Server (IS-NAS Server)

  The system can contain a single IS-NAS Server, or several IS-NAS Servers operating as a cluster. Clusters using more than two IS-NAS Servers typically include 2 x 10Gbps Ethernet switches (one is required, but two are recommended for redundancy). For instructions on how to implement a cluster configuration, refer to the *System Administration Guide*.

IS-NAS Server Front View

IS-NAS Server Rear View
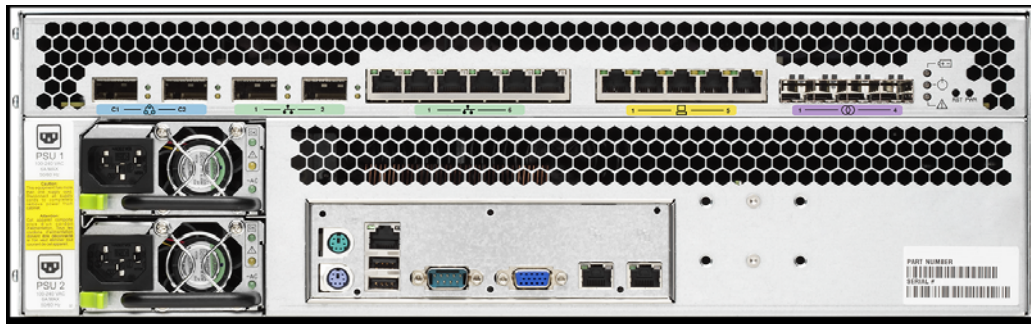
> **Note:** For additional data protection, it is recommended to use an external UPS to power the IS-NAS Server. Also, each of the redundant power supplies in the IS-NAS Server and in the storage subsystems should be operated from a different mains power circuit in order to provide a degree of protection from mains power supply failures. In the event that one circuit fails, the other will continue to power the IS-NAS Server and the storage subsystem.

- System Management Unit (SMU)

  A standalone IS-NAS Server can operate without an external SMU, but all cluster configurations require an external SMU.

- Storage Subsystem(s)

  A storage cabinet containing the IS-NAS Server can also hold several storage enclosures. The maximum number of storage enclosures in an expansion cabinet depends on the model of storage enclosures being installed. Refer to the *Storage Subsystem Guide* for more information on supported storage subsystems.

- Fibre Channel (FC) Switches

  The IS-NAS Server supports Fibre Channel switches that connect multiple servers and storage subsystems. FC switches are required in some configurations, and are optional in other configurations.

  An external FC Switch is required when connecting more than two storage subsystems to a standalone server or a cluster. An external FC Switch is optional when connecting less than three storage subsystems to a stand alone server or a cluster.

  Currently, the following Fibre Channel switches have been qualified, and are available through SGI:

  - Brocade 5100 SAN Switch
  - Brocade 300 SAN Switch

- Fast Ethernet (10/100) or GigE Switches

  A standalone IS-NAS Server can operate without an external Ethernet switch, as can some cluster configurations. Any cluster configuration requiring that five or more devices be configured on the private management network will require an external Ethernet switch.

- 10 GbE (10 Gigabit Ethernet) switches (used in cluster configurations only)

  The IS-NAS Server supports 10 GbE switches that connect multiple storage servers configured as a cluster.

  Contact BlueArc Global Services for information about the 10 GbE switches that have been qualified for use with the BlueArc Mercury Server, and to find out about the availability of those switches.

  SGI requires dual 10 GbE switches for redundancy. In a dual-switch configuration, if one switch fails, the cluster nodes remain connected through the second switch.

Server Specifications

The following specifications are for the SGI SGI InfiniteStorage NAS Server. Note that these specifications do not reflect differences among models; they are the maximum for all IS-NAS Server models. For the detailed specifications of a particular model or configuration, contact your BlueArc Global Services representative.

- Physical:
  - Weight: 25 kg (55 lb.)
  - Height: 130 mm. (5.1 in.)
  - Depth: 686 mm. (27 in.)
  - Length: 437 mm. (17.2 in.)
  - Rack space required: 3 U

- Power:
    - Watts: 224-310
    - VA: 249-344
    - Rating: 100-240 VAC, 6A maximum, at 50/60 Hz
- Thermal:
    - BTU/hr. (normal operation): 1055
    - Temp. range (operational): 10° to 35° C (50° to 95° F)
    - Temp. range (storage): -10° to 45° C (14° to 113° F)
    - Temp. range (transit): -20° to 60° C (-4° to 140° F)
- Humidity:
    - Operational: 20-80%
    - Storage: 10-90%
    - Transit: 5-95%
- Approvals:
    - Europe: CE, RoHS (6) & WEEE compliant
    - EMC: EN55022, FCC & VCCI, all class A. EN55024
    - Safety: CSA/UL 60950-1, EN60950

Attaching the Stabilizer Plate to the System Cabinet

A rack stabilizer plate and mounting hardware are supplied with some system configurations.

Note: To ensure the stability of the cabinet once it has been loaded, SGI recommends attaching the stabilizer plate to the rack **before** loading the cabinet.

To attach the stabilizer plate to the front of the system cabinet:

1. Place the stabilizer plate up against the cabinet.

2. Align the holes from the stabilizer plate to the holes on the bottom of the cabinet.

3. Place the screws in the hole and secure them into the cabinet.

4. The stabilizer contains two holes for securing it to the ground. Suitable screws must be used to secure the stabilizer.

SGI IS-NAS Server Components

Introducing the IS-NAS Server

The SGI InfiniteStorage NAS Server (IS-NAS Server) chassis is 3U (5.25 inches) high, 480 millimeters (19 inches) wide, rack mountable, and a maximum of 686 millimeters (27 inches) deep excluding the fascia. The IS-NAS Server chassis consists of:

• An MMB (Main Motherboard)

• An MFB (Main FPGA Board)

• Three hot-swappable fan assemblies

• Dual power supplies

• NVRAM Backup Battery Pack

• Dual 2.5 inch disk drives

The pre-installed boards perform functions essential to the integrity of the IS-NAS Server. If there is an issue with a board, the server must be returned to SGI for repair (boards are not field replaceable). Field replaceable units (FRUs) include power supplies, an NVRAM backup battery pack, fan assemblies, and disk drives. (For more information, see "Replacing System Components," on page 32.

Ventilation

On a IS-NAS Server, there are vents and fan openings on the front and the rear. These openings are designed to prevent the IS-NAS Server from overheating.

Therefore, at least four inches of clearance must be present at the rear of the IS-NAS Server rack so that airflow is unrestricted.

Caution: Do not place the IS-NAS Server in a built-in installation unless proper ventilation is provided.

Do not operate the IS-NAS Server in a cabinet whose internal ambient temperature exceeds 35° C (95° F).

Front View

IS-NAS Server Front

On the front panel there are two LED indicators (Power and Status), which indicate the system status as follows:

Table 1: Power Status LED (Green)

State	Meaning
Green	Normal operation with a single IS-NAS Server or an active cluster node in operation.
Slow Flash	The system has been shut down. Flashes once every three seconds.
Medium Flash	The IS-NAS Server is available to host file services but is not currently doing so. Flashes once every .8 seconds.
Fast Flash	The IS-NAS Server is rebooting. Flashes 5 times per second.
Off	The IS-NAS Server is not powered up.

Table 2: Server Status LED (Amber)

State	Meaning
Amber	Critical failure and the IS-NAS Server is not operational.
Slow Flash	System shutdown has failed. Flashes once every three seconds.
Medium Flash	The IS-NAS Server needs attention, and a non-critical failure has been detected. (Flashes once every .8 seconds.) For example, a fan or power supply has failed.
Off	Normal operation.

NVRAM Backup Battery Pack

Each server contains a battery pack used to maintain the NVRAM contents when the server is not receiving power (due to a power failure or a short-term shut down). This battery pack is located in a compartment behind the front fascia of the server, on the right-hand side. The battery pack can only be accessed by removing the front fascia.

Battery-related events are recorded in the server's event log. Other battery-related information is also saved in a battery status log, and these logs, along with the server's event log, are useful in monitoring the state of the battery.

IS-NAS Server NVRAM Battery Backup Pack

NVRAM Battery Backup Pack
(behind front fascia)

Battery pack characteristics:

- Each server contains one non-redundant battery pack.

- The battery pack uses NiMH technology.

- A battery pack has a two year operational life. A timer starts when a server is booted for the first time, and the timer is restarted when a replacement battery pack is installed. After two years of operation, a log warning event is issued to warn the user that the battery pack should be replaced.

- The battery pack is periodically tested to ensure it is operational, but the test is not for actual capacity.

- A fully charged battery pack will maintain the NVRAM contents for approximately 72 hours.

- When a new server is installed and powered on, the battery pack will not be fully charged (it will not be at 100% capacity). After being powered on, the server performs tests and starts a conditioning cycle, which may take up to 24 hours. During the conditioning cycle, the full NVRAM content backup protection time of 72 hours cannot be guaranteed.

- A replacement battery pack may not be fully charged (it may not be at 100% capacity) when it is installed. After a new battery pack is installed, the server performs tests and starts a conditioning cycle, which may take up to 24 hours. During the conditioning cycle, the full NVRAM content backup protection time of 72 hours cannot be guaranteed.

- If a server is left powered off, the battery will discharge slowly. This means that, when the server is powered up:

  - It will take up to 24 hours for the battery to reach full capacity if a conditioning cycle is started.

  - It will take up to 3 hours for the battery to reach full capacity if a conditioning cycle is not started.

During the time it takes for the battery back to become fully charged, the full 72 hours of NVRAM content protection cannot be guaranteed. The actual amount of time that the NVRAM content will be protected depends on the charge level of the battery pack.

- A battery pack may become fully discharged because of improper shutdown, a power outage longer than 72 hours, or a servers left unpowered for a long period.

  If the battery pack is fully discharged:

  - The battery pack may permanently lose some long term capacity.

  - Assuming a battery conditioning cycle is **not** started, a fully discharged battery pack takes up to 3 hours before it is fully charged. If a battery conditioning cycle is started, a fully discharged battery pack takes up to 24 hours before it is fully charged.

  - A battery conditioning cycle is started the first time a new server is powered up, on command, or if the server is powered down for longer than three months.

- A battery pack may be stored outside of the server for up to one year before it must be charged and/or conditioned. After one year without being charged and possibly conditioned, the battery capacity may be permanently reduced.

  If you store battery packs for more than one year, contact your BlueArc Global Services representative to find out about conditioning your battery packs.

- If the NVRAM is still being backed up by battery (indicated by the flashing NVRAM LED), the battery can be manually isolated using the reset button (see "Rear Panel," on page 20 for the location of the reset button).

When preparing a IS-NAS Server for shipment or if it will be powered down for any length of time, it is important that the IS-NAS Server has been shut down correctly before powering-off. Otherwise, if the IS-NAS Server is improperly shut down, the batteries supplying the NVRAM will become fully discharged. This also occurs if the system is powered down for too long without following the proper procedure.

Note: If the batteries become fully discharged, or the system is to be powered down for an extended period, see "Powering Down the IS-NAS Server for Shipment or Storage," on page 44. Contact BlueArc Technical Assistance Center (TAC) for information about recharging batteries.

To replace the NVRAM battery backup pack, see "Replacing the NVRAM Backup Battery Pack," on page 35.

Rear Panel

The following picture describes the ports, connectors, switches, and LEDs that are visible on the rear of the IS-NAS Server. The following sections describe each element in detail.

IS-NAS Server Rear Panel
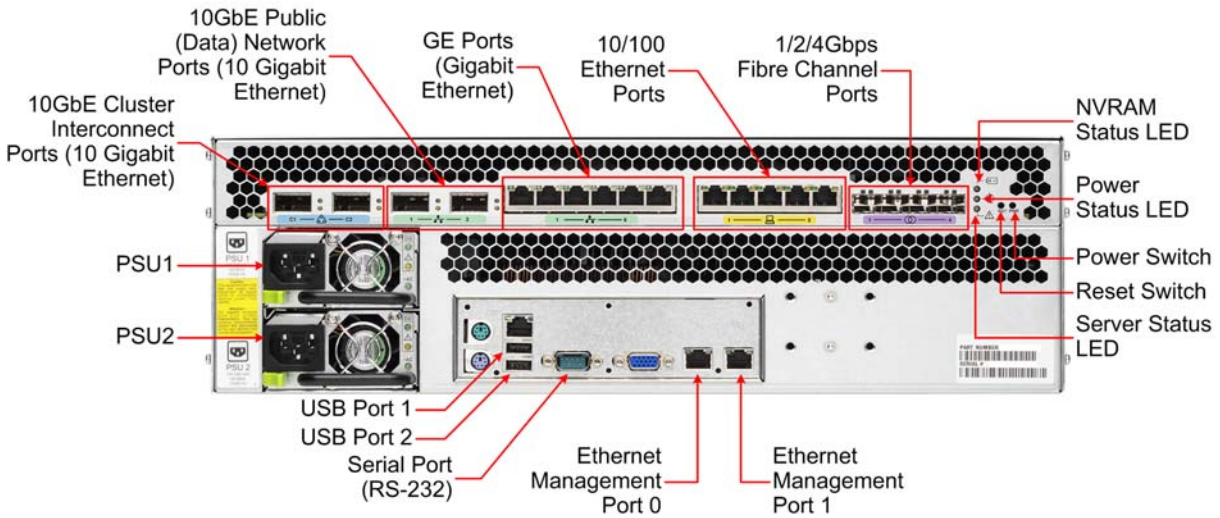
Note: Other than the ports and connectors described above, none of the other ports or connectors should be used without guidance from BlueArc Technical Assistance Center (TAC).

Rear Panel Server LEDs and Buttons

The rear panel of the IS-NAS Server contains three (3) status LEDs that indicate server status and two (buttons) that are used to power up and reset the server.

IS-NAS Server Rear LEDs and Buttons

Rear Panel LEDs

The NVRAM, Power, and Server Status LEDs indicate if the server is powered, its operational state, and if the NVRAM is currently being protected by battery backup power.

Table 3: NVRAM Status LED (Green/Amber)

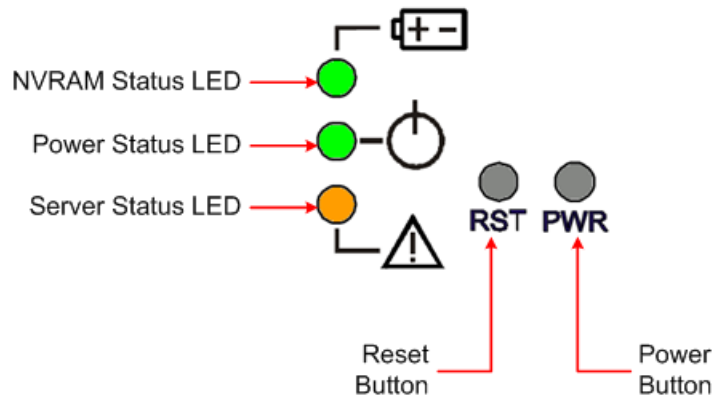| State	Meaning
Green (Solid)	Normal operation
Green (Flashing)	NVRAM contents are protected by battery power
Amber (Solid)	Battery pack is faulty or not fitted
Off	Disabled or NVRAM battery power exhausted

Table 4: Power Status LED (Green)

State	Meaning
Green	Normal operation with a single IS-NAS Server or an active IS-NAS Server in a clustered operation.
Slow Flash	The system has been shut down. Flashes once every three seconds.
Medium Flash	The IS-NAS Server is available to host file services but is not currently doing so. Flashes once every .8 seconds.
Fast Flash	The IS-NAS Server is rebooting. Flashes 5 times per second.
Off	The IS-NAS Server is not powered up.

Table 5: Server Status LED (Amber)

State	Meaning
Amber	Critical failure and the IS-NAS Server is not operational.
Slow Flash	System shutdown has failed. Flashes once every three seconds.
Medium Flash	The IS-NAS Server needs attention, and a non-critical failure has been detected. For example, a fan or power supply has failed. Flashes once every .8 seconds.
Off	Normal operation.

Power Button (PWR)

The power button may be used to restore power to the system when the server is in a standby power state. Normally, when power cables are connected to the PSUs, the server will power-up immediately. If, after 10 seconds, the LEDs on the power supplies are lit, but the Power Status LED is not lit, press the PWR button to restore power to the system.

Note: Do not use the PWR button during normal operation of the server. Pressing this button will cause an improper shutdown; immediately powering down the system, but the PSUs and system fans will continue to run.

Reset Button (RST)

The reset button has several functions.

- Pressing the reset button when the server is powered will cause a hard reset of the server.

  This reset occurs after a 30-second delay, during which the Server Status LED will flash rapidly and the server will attempt to shut down properly. Even with the delay, pressing the reset button does not guarantee a complete shutdown before rebooting. Pressing the reset button when the server is powered on should only be done to recover a server which has become unresponsive.

- Pressing the reset button when the server is not powered up will disable the NVRAM battery pack (which may be necessary prior to shipping if an incomplete shutdown occurred.) See "Powering Down the IS-NAS Server for Shipment or Storage," on page 44 for more information.

10GbE Ports

IS-NAS Server 10GbE Ports
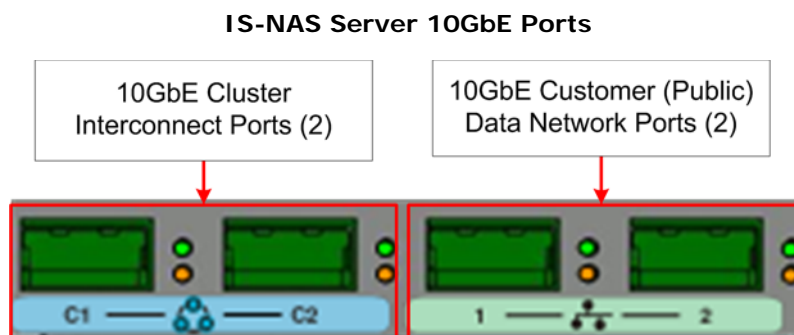
10GbE Cluster Interconnect Ports (2)

The 10GbE Cluster Interconnect ports are used to connect cluster nodes together and are used only in a cluster configuration. 10GbE ports operate at speeds of up to ten (10) gigabits per second, and require the use of a supported XFP (10 Gigabit Small Form Factor Pluggable) optical connector. Any port that contains an unsupported XFP will be disabled. Contact BlueArc Global Services for a list of supported XFP connectors.

10GbE Cluster Interconnect ports cannot be used to connect to the customer data network.

The 10GbE Cluster Interconnect ports are labelled as shown below:

10GbE Cluster Interconnect Ports Label

Once connected, each 10GbE port has two indicator LEDs; one green and one amber. These LEDs provide link status and network activity status information as follows:

Table 6: 10 Gigabit (10GbE) Cluster Interconnect Port LEDs

Status/Activity (Per Port)		Meaning
Status	Green (On, not flashing)	10 Gbps link present
	Green Flashing	10 Gbps link standby in a redundant configuration
	Green Off	No link
Activity	Amber Flash	Network activity
	Amber Off	No Network activity

10GbE Customer Data Network Ports (2)

The 10GbE Customer Data Network ports are used to connect the server or cluster node to the customer's data network (also called the public network), and these ports may be aggregated into a single logical port (refer to the IS-NAS Server *System Administration Guide* for more information on creating aggregations). 10GbE ports operate at speeds of up to ten (10) gigabits per second, and require the use of a supported XFP (10 Gigabit Small Form Factor Pluggable) optical connector. Any port that contains an unsupported XFP will be disabled. Contact BlueArc Global Services for a list of supported XFP connectors.

10GbE Customer Data Network ports cannot be used to connect cluster nodes.

The 10GbE Customer Data Network ports are labelled as shown below:

10GbE Customer Data Network Ports Label

Once connected, each 10GbE port has two indicator LEDs; one green and one amber. These LEDs provide link status and network activity status information as follows:

Table 7: 10 Gigabit (10GbE) Customer Data Network Port LEDs

Status/Activity (Per Port)		Meaning
Status	Green (On, not flashing)	10 Gbps link present
	Green Flashing	10 Gbps link standby in a redundant configuration
	Green Off	No link
Activity	Amber Flash	Network activity
	Amber Off	No Network activity

GE Customer Ethernet Network Ports (6)

The GE Customer Ethernet Network ports are used to connect the server or cluster node to the customer's data network (also called the public network), and these ports may be aggregated into a single logical port (refer to the IS-NAS Server *System Administration Guide* for more information on creating aggregations). GE ports operate at speeds of up to one (1) gigabit per second, and require the use of a standard RJ45 cable connector.

The GE Customer Ethernet Network ports are labelled as shown below:

GE Customer Ethernet Network Ports Label

Once connected, each GE port has two indicator LEDs; one green and one amber. These LEDs provide link status and network activity status information as follows:

Table 8: Gigabit Ethernet Port LEDs

Status/Activity (Per Port)		Meaning
Status	Green (On, not flashing)	1 Gbps link present
	Green Flashing	1 Gbps link standby in a redundant configuration
	Green Off	No link
Activity	Amber Flash	Network activity
	Amber Off	No Network activity

10/100 Private Management Ethernet Ports (5)

The 10/100 Private Management Ethernet Network ports function as an unmanaged switch for the private management network (refer to the IS-NAS Server *System Administration Guide* for more information on the private management network). These ports are used by the server and other devices (such as an external SMU and other cluster nodes) to form the private management network. There are no internal connections to the server from these ports; instead, when joining a server to the private management network, you must connect from one of these ports to the management interface port on the server (see "10/100/1000 Ethernet Direct Management Ports (2)," on page 28).

The 10/100 ports operate at speeds of up to 100 megabits per second, and require the use of a standard RJ45 cable connector.

The 10/100 Private Management Ethernet Network ports are labelled as shown below:

10/100 Private Management Network Ethernet Ports Label

Once connected, each 10/100 port has two indicator LEDs; one green and one amber. These LEDs provide link status and network activity status information as follows:

Table 9: 10/100 Ethernet Port LEDs

Status/Activity (Per Port)		Meaning
Status	Green (On, not flashing)	10 or 100 Mbps link present
	Green Off	No link
Activity	Amber Flashing	Network activity
	Amber Off	No network activity

Fibre Channel Network Ports (4)

The Fibre Channel (FC) Network ports allow you to connect the server with other FC devices, such as storage subsystems or FC switches. FC ports operate at speeds of up to four (4) gigabits per second, and require the use of a SFP (Small Form Factor Pluggable) optical connector.

The Fibre Channel (FC) Network ports are labelled as shown below:

Fibre Channel Network Ports Label

Once connected, each FC port has two indicator LEDs; one green and one amber. These LEDs provide link status and network activity status information as follows:

Table 10: Fibre Channel Port LEDs

Status/Activity (Per Port)		Meaning
Status	Green (On, not flashing)	2 or 4 Gbps FC link present
	Green Off	No link
Activity	Amber Flashing	Network activity
	Amber Off	No network activity

Power Supply Units (2)

The IS-NAS Server has dual, hot-swappable, load sharing, AC power supplies. The power supplies are accessible from the rear of the IS-NAS Server. The IS-NAS Server monitors the operational status of the power supply modules so that the management interfaces can indicate the physical location of the failed PSU. LED indicators provide PSU status information for the state of the PSU.

IS-NAS Server Power Supply
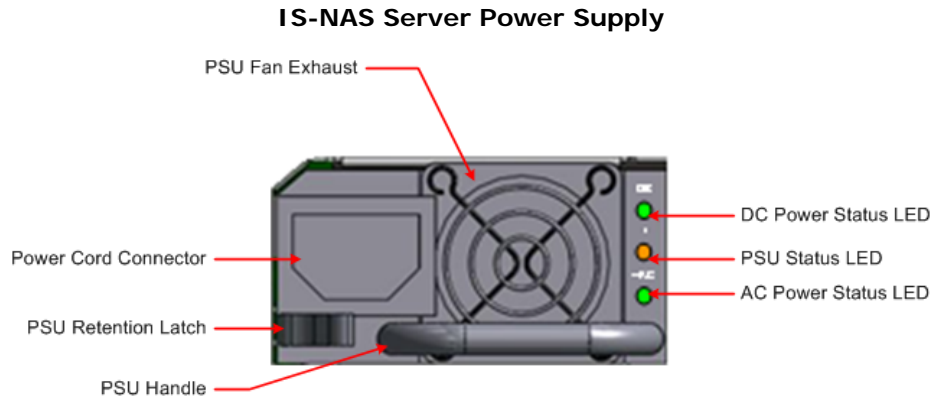
Note: There are no field-serviceable parts in the PSU. If a PSU unit fails for any reason, it must be replaced.

Table 11: DC Power Status LED (Green)

Status	Meaning
Green	DC output operating normally
Off	DC output not operating

If the DC Power Status LED is off, unplug the power cable, wait 10 seconds, then reconnect the cable. If the DC Power Status LED remains off, the PSU has failed and must be replaced. See "Replacing a PSU," on page 41 for more information on replacing a PSU.

Table 12: PSU Status LED (Amber)

Status	Meaning
Off	PSU operating normally
Amber	PSU internal failure (over temperature, fan, or internal component)

If the PSU Status LED is on, unplug the power cable, wait 10 minutes, then reconnect the cable. If the PSU Status LED remains off, the PSU has failed and must be replaced. See "Replacing a PSU," on page 41 for more information on replacing a PSU.

Table 13: AC Power Status LED (Green/Amber)

Status	Meaning
Green	Receiving AC power and operating normally
Off	Not receiving AC power (check mains and power cable connections)

Mains power connections are an IEC inlet in each power supply. Each PSU is only powered from its mains inlet. Two power feeds are required for the system. PSU units do not have an on/off switch. To turn on power, simply connect the power cable. To turn off the unit, remove the power cable.

When both PSUs are installed, if only one PSU is connected and receiving adequate power, the fans on both PSUs will operate, but only the PSU receiving power will provide power to the server.

Each power supply auto-ranges over an input range of 100V to 240V AC, 50 Hz to 60 Hz.

Serial Port (1)

A standard serial (RS-232) port, used to connect to the server for management purposes. See "RS-232 Serial Management Port," on page 30 for more information.

10/100/1000 Ethernet Direct Management Ports (2)

Standard 10/100/1000 Ethernet ports, used to connect to the server for management purposes. See "10/100/1000 Ethernet Management Ports," on page 29 for more information.

USB Ports (2)

Standard USB 2.0 (Universal Serial Bus 2.0) connectors. These ports are used to connect USB devices (such as flash drives or external hard drives) to the server during some management and upgrade/update/repair operations. These ports should not be used without guidance from BlueArc Technical Assistance Center (TAC).

Management Interfaces

The IS-NAS Server offers two types of physical management ports:

- 10/100/1000 Ethernet (RJ45)
- RS-232 Serial (DB-9)

IS-NAS Server Management Interfaces

Serial Port (RS-232)

Ethernet Management Port 1

Ethernet Management Port 0
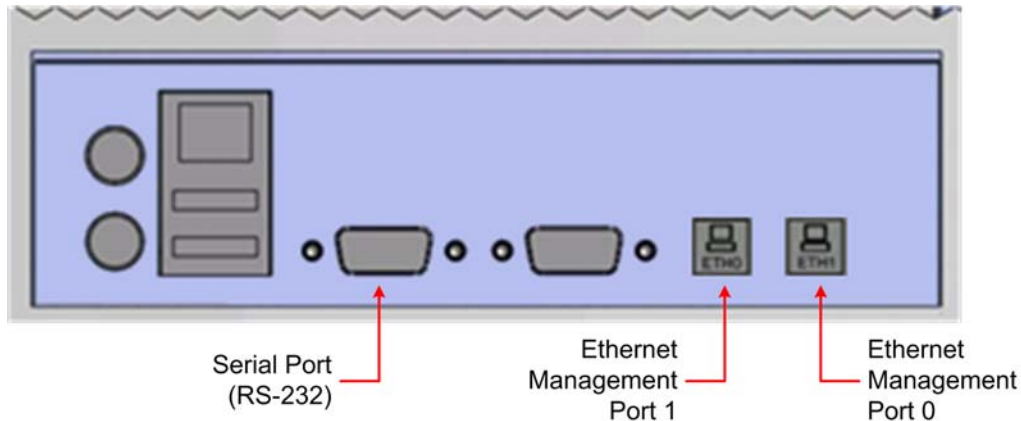
10/100/1000 Ethernet Management Ports

The 10/100/1000 Ethernet Direct Management ports are used to connect the server/node to the private management network, or to connect directly to another device for management purposes.

10/100/1000 Ethernet ports operate at speeds of up to one (1) gigabit per second, and require the use of a standard RJ45 cable connector. Once connected, each GE port has two indicator LEDs; one green and one amber. These LEDs provide link status and network activity status information as follows:

Table 14: 10/100/1000 Ethernet Port LEDs

Status/Activity (Per Port)		Meaning
Status	Green (On, not flashing)	1 Gbps link present
	Green Flash	1 Gbps link standby in a redundant configuration. Flashes once every 1.25 seconds.
	Green Off	No link
Activity	Amber Flash	Network activity
	Amber Off	No Network activity

RS-232 Serial Management Port

The IS-NAS Server has one RS-232 connection port, located on the rear panel of the server. This serial port is intended to be used during system setup. The serial port is not intended as a permanent management connection, and this port should not be used as the primary management interface for the server (the primary management interface to the server should be through the Web Manager GUI or through server's CLI which can be accessed through the network).

Any VT100 terminal emulation interface can be used to access to the CLI so that you can perform management or configuration functions. Connect the terminal to the serial port on the rear panel of the IS-NAS Server, then set the host settings to the values below to ensure proper communication between the terminal and the IS-NAS Server.
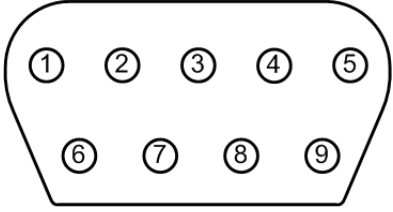
Once the initial setup has been completed, you should disconnect the serial cable. If you need to manage the server through a serial connection, connect to the serial port on the external SMU and use SSH to access the server's CLI. If your system does not include an external SMU, connect to the server's internal SMU and use SSH to access the server's CLI.

Table 15: Host Setting Values

Terminal	Requirement
Connection	Crossover (nullmodem) cable
Protocol	Asynchronous RS-232
Baud rate	115,200 Bps
Data bits	8
Stop bits	1
Parity	None
Flow control	None

The table below shows the pin layout for serial port 1.

Table 16: Serial Port 1 Pin Layout

Pin Positions	Signal	Abbreviation	Pin
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨	Data Carrier Detected	DCD	1
	Receive Data	RD	2
	Transmit Data	TD	3
	Data Terminal Ready	DTR	4
	Signal Ground	SG	5
	Data Set Ready	DSR	6
	Request To Send	RTS	7
	Clear To Send	CTS	8
	Ring Indicator	RI	9

Replacing System Components

This section describes how to replace the components in the IS-NAS Server. Follow the procedure if you are a qualified System Administrator, Network Administrator, or Technician.

Note: PSUs, NVRAM battery backup packs, and fan assemblies are the only hot-swappable components of a IS-NAS Server. **Motherboards and FPGA boards are not field-replaceable, and hard disks are not hot-swappable components**. The server must be shut down before replacing hard disks. See "Rebooting, Shutting Down, and Powering Off the SGI InfiniteStorage NAS Server," on page 42 for information on how to power down a server.

Removing and Replacing the Front Fascia

In order to access some field replaceable parts, you must first remove the front fascia. The fascia must then be replaced after the part replacement is complete. To remove and replace the fascia, you will need a Phillips #1 screwdriver.

Fascia Removal

There are four (4) retention screws that hold the fascia onto the chassis.

IS-NAS Server Front Fascia

To remove the fascia:

1. Using a Philips # 1 screwdriver, loosen each of the four (4) retaining screws.

2. Insert a finger into the cut-out down each side of the plastic (between the plastic and the rack) and thumbs into the outermost cut-out in the fascia (the arcs near the edges of the fascia).

3. Gently remove the fascia by pulling it straight away from the server.

Fascia Replacement

To replace the fascia:

1. Gently place the fascia on the server, making sure to align the screw holes and the Status LEDs.

2. Gently hold the fascia to the server chassis, and align the first retaining screw.

3. Using a Philips screwdriver, tighten the retaining screw until it holds the fascia in position.

4. Align and tighten the remaining retaining screws.

Replacing a Fan

Fans provide for front-to-back airflow to be consistent with other storage system components. The IS-NAS Server continues to operate following the failure of a single fan and during the temporary removal of a fan for replacement. A failed fan must be replaced as soon as possible.

The IS-NAS Server fans are contained within three assemblies, which are located behind the front fascia and are removable from the front of the IS-NAS Server. All IS-NAS Servers have three fans (one fan per assembly).

The IS-NAS Server's cooling airflow enables the system to operate in an ambient temperature range of 10°C to 35°C when mounted in a storage cabinet with associated components required to make up a storage system. The storage system administrator is responsible for ensuring that the ambient temperature within the rack does not exceed the 35°C operating limit for the IS-NAS Server.

Caution: If a fan has failed, replace the fan as soon as possible to avoid over-heating and damaging the IS-NAS Server.

To replace a fan:

1. Remove the IS-NAS Server front fascia (and the fan guard plate), see "Fascia Removal," on page 32 for more information. The fan assemblies will then be visible.

2. Identify the fan to be replaced. Fans are labelled on the chassis, and are numbered 1 to 3, with fan 1 on the left and fan 3 on the right.

3. Disconnect the fan lead from its connector by pressing down on the small retaining clip, as shown below.

Disconnecting the Fan Lead Connector

Press here to release connector, then pull gently
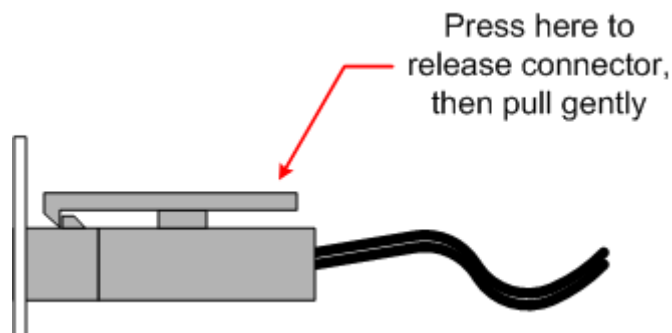
4. Remove the upper fan retention bracket and place it in a safe location. Note that the upper fan retention bracket helps to hold all three fan assemblies in position.

Fan Retention Brackets

Upper Fan Retention Bracket (1)

Lower Fan Retention Brackets (3)

5. For each fan assembly you are replacing, remove the lower fan retention bracket and place it in a safe location.

6. Remove the faulty fan assembly, and put the new fan assembly into place. Make sure to:

    •   Fit the new fan assembly in the same orientation as the old fan assembly (the arrow indicating the direction of airflow **must point into** the server).

    •   Align the fan lead and its protective sleeve in the space allotted for it on the bottom right side of the fan assembly mounting area.

    •   Fit the fan assembly between the left and right mounting guides.

    •   Gently press the fan assembly back into the chassis.

Fan Connector and Protective Sleeve

7. Secure the fan assembly in position by first replacing the lower retention bracket, then replacing the upper retention bracket.

8. Connect the fan lead into its connector.

9. Replace the IS-NAS Server front fascia (see "Fascia Replacement," on page 32 for more information).

Replacing the NVRAM Backup Battery Pack

To install a new NVRAM backup battery pack in a server, you will need a Phillips #1 screwdriver and the replacement battery pack. NVRAM backup battery pack replacement should be done as quickly as possible, and only when the new pack is present. **NVRAM contents are not backed up while the battery is disconnected.**

Note: If possible, the server should be shut down before replacing the NVRAM battery backup pack, but this is not required. During the replacement procedure, there will be a period of time when the NVRAM contents are not backed up by the battery pack. If a failure occurs during this period, NVRAM contents may be lost. See "Rebooting, Shutting Down, and Powering Off the SGI InfiniteStorage NAS Server," on page 42 for information on how to power down a server.

NVRAM Battery Backup Pack Location

NVRAM Battery Backup Pack
(behind front fascia)

The IS-NAS Server uses one of two types of chassis:

- Type 1: **Without** a battery retention bracket.
- Type 2: **With** a battery retention bracket.

This document explains how to change the battery pack in both types of chassis.

Note: Replacement battery pack wires may be unwrapped (as shown in "NVRAM Battery Replacement Procedure for Type 1 Chassis," on page 35), or they may be wrapped (as shown in "NVRAM Battery Replacement Procedure for Type 2 Chassis," on page 37). Wire routing is identical for both, but additional care is required when the wires are not wrapped to ensure that they are correctly placed and that they do not get pinched between parts.

NVRAM Battery Replacement Procedure for Type 1 Chassis

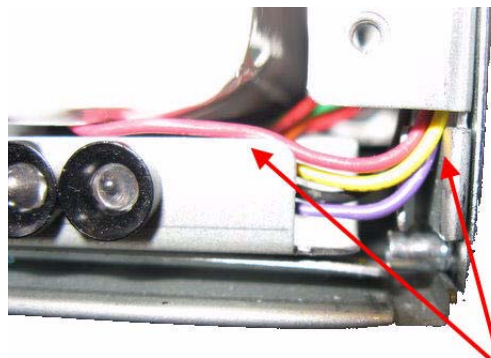To replace the NVRAM battery backup pack in a type 1 chassis:

1. Make sure you have the new battery pack present.

2. Remove the fascia (see "Fascia Removal," on page 32 for more information).

3. Gently remove the battery pack from the compartment, and disconnect the battery lead from connector in the lower right part of the battery pack compartment.

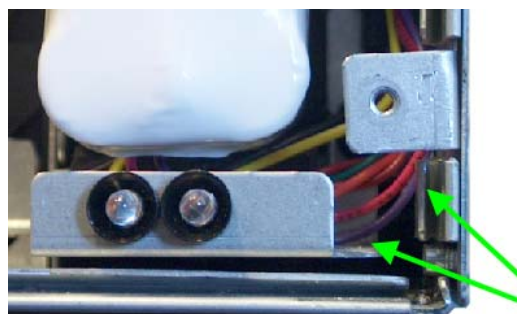**Type 1 Chassis NVRAM Battery Backup Pack Connector**
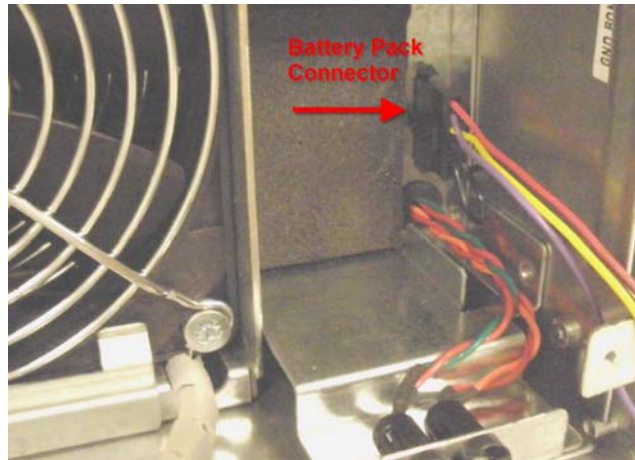
4. Connect the lead from the new battery to the connector in the lower right part of the battery pack compartment.

5. The new battery must be fitted in the same orientation with the lead exiting the back of the pack at the bottom.

6. Make sure that the battery leads are routed behind the tab holding the LEDs and the fascia mounting tab.

Incorrectly Routed Wires

Correctly Routed wires

7. Replace the fascia (see "Fascia Replacement," on page 32 for more information).

NVRAM Battery Replacement Procedure for Type 2 Chassis

To replace the NVRAM battery backup pack in a type 2 chassis:

1. Make sure you have the new battery pack present.

2. Remove the fascia (see "Fascia Removal," on page 32 for more information).

3. Disconnect the battery lead, located on the right side of the battery compartment.

Removing the NVRAM Battery Backup Pack Connector

4. Remove the battery retention bracket.

Removing the Battery Retention Bracket

5. Gently remove the battery pack from the compartment.

6. Place the new battery pack in the battery compartment. The new battery pack must be fitted with the lead exiting the back of the pack at the bottom.

7. Replace the battery retention bracket. Make sure that the battery wires are not routed inside the battery retention bracket.

Replacing the Battery Retention Bracket

8. Connect the lead from the new battery to the connector in the right part of the battery pack compartment.

Replacing the NVRAM Battery Backup Pack Connector

9. Route the battery wires so that they are along the right side of the battery compartment, over the battery retention bracket, and fully behind the fascia mounting tab and the LED mounting tab.

Correctly Routed Wires
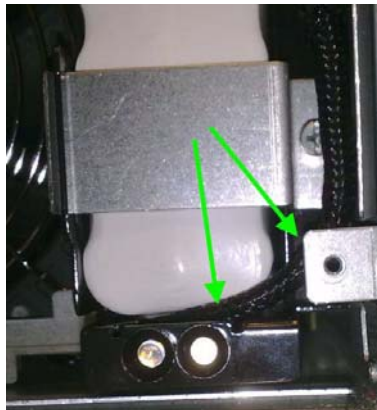
10. Replace the fascia (see "Fascia Replacement," on page 32 for more information).

Replacing a Hard Disk

If necessary, either of the hard disks in the IS-NAS Server can be replaced. Do not attempt to replace a hard disk unless instructed to do so by BlueArc Technical Assistance Center (TAC). Hard disk replacement is not a hot-swap operation; replacing a hard disk requires that the server be shut down and that the power cables are disconnected from the PSUs.

Hard disk replacement requires that you remove fan assemblies, and remove and replace the hard disks through the fan mounting area.
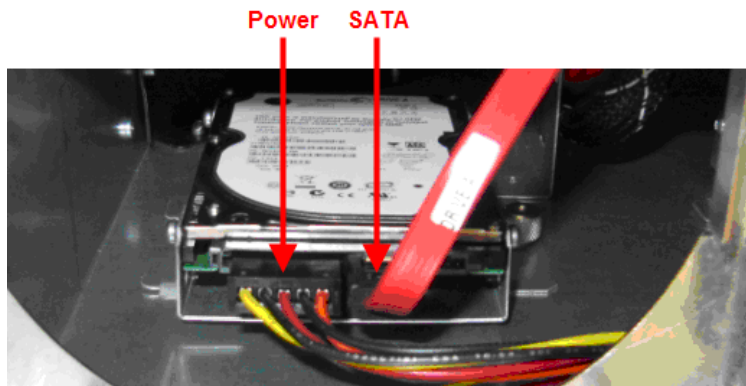
To replace a hard disk:

1. Make sure you have the new hard disk(s) present.

2. Shut down the server (see "Rebooting or Shutting Down a Server/Cluster," on page 42 for more information).

3. Remove the power cables from the PSUs.

   The hard disk(s) can now be replaced.

4. Remove the left and center fan assemblies (fan 1 and fan 2). See "Replacing a Fan," on page 33 for this procedure.

5. Identify the hard disk to replace.

   Note that there are two (2) hard disks in the IS-NAS Server. Hard disk A is on the left (behind fan assembly number 1) and hard disk B is on the right (behind fan assembly number 2). Labels on the chassis identify the disk drives.

6. Disconnect the power and SATA cables from the hard disk being replaced. (Do not remove the SATA cable from the motherboard.)

Hard Disk Cables

7. Remove the hard disk to be replaced.

   Each hard disk is in a carrier (bracket) held to the bottom of the chassis by a thumbscrew on the right side and a tab that fits into a slot on the chassis floor on the left side.

   To remove a hard disk:

   a. Remove the thumbscrew on the right side of the hard disk carrier.

b. Gently lift the right side of the hard disk about 1/8 inch (1/4 centimeter) and slide the disk carrier to the right.

c. Once the disk carrier is completely disengaged from the chassis, remove it from the server.

8. Install the replacement hard disk:

Note: The replacement hard disk should be mounted in the **lower** position of the carrier. If the hard disk is not mounted in a carrier, you can mount the replacement hard disk in the old carrier. If the hard disk is mounted in the upper position, it should be moved to the lower position in the carrier. In either of the cases described above, you must remove and reuse the four (4) TORX10 mounting screws that hold the hard disk in the carrier before mounting/ remounting the hard disk.

a. Insert the tabs on the left side of the disk carrier into the slots on the floor of the server chassis.

b. Move the carrier to the left until the tabs are fully engaged and the thumbscrew is aligned. (Note that the right side of the carrier must be elevated slightly to clear part of the chassis.)

c. Tighten the thumbscrew to secure the drive carrier. Do not overtighten the thumbscrew.

d. Connect the power and SATA cables to the replacement hard disk.

9. Replace the fan assemblies (see "Replacing a Fan," on page 33 for this procedure).

10. Replace the fascia (see "Fascia Replacement," on page 32 for more information).

11. Reconnect the power cables to the PSUs.

12. Start the server (see "Powering On an SGI IS-NAS Server/Cluster," on page 46 for more information).

13. Log in to the server as the root user.

a. Use SSH to connect to the server using the "manager" account. By default, the password for the "manager" account is "nasadmin," but this password may have been changed.

b. To gain access as root, enter "su –". You will then be prompted for the root password. Enter the password for the root user account. By default, the password for the "root" account is "nasadmin," but this password may have been changed.

14. Run the script `/opt/raid-monitor/bin/recover-replaced-drive.sh`, which will partition the disk appropriately, update the server's internal RAID configuration, and initiate rebuilding the failed disk.

After the script has finished, no further interaction is required. The RAID system rebuilds the disk as a background operation, and events are logged as the RAID partitions rebuild and become fully fault tolerant.

15. Log out.

16. Properly dispose of the old hard disk; do not attempt to re-install or re-use it.

Replacing a PSU

If necessary, a IS-NAS Server can operate on a single PSU, making it possible to replace a failed PSU without shutting down the server (a hot-swap replacement). If a PSU fails, it should be replaced as quickly as possible, because operating on a single PSU means that there is no redundancy in that area, increasing the risk of an interruption in service to clients.

To replace a PSU:

1. Remove the power cord from the PSU.

2. Move the retaining latch to the right (you may hear a slight click and the PSU may move slightly when the latch disengages).

3. Using the handle on the PSU, pull the PSU out from the back of the server until you can completely remove the PSU from the chassis.

IS-NAS Server Power Supplies
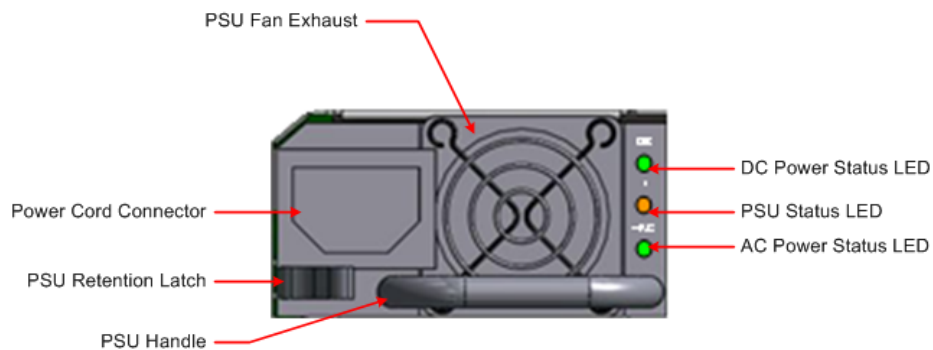
4. Insert the replacement PSU. The retention latch should click into position all the way to the left when the PSU is fully inserted.

5. Connect the power cord to the back of the PSU.

   The PSU should start as soon as the power connection is made.

   If the PSU does not start immediately, make sure the mains power circuit is live and that the other end of the power cable is connected to a live outlet.

Rebooting, Shutting Down, and Powering Off the SGI InfiniteStorage NAS Server

This section provides instructions on how to reboot, shut down, and power off a server or cluster. For information on starting a server or a cluster, see "Powering On an SGI IS-NAS Server/Cluster," on page 46.

Rebooting or Shutting Down a Server/Cluster

The IS-NAS Server can be reset or shut down if a manual reboot is necessary.

Using Web Manager, log in and select **Reboot/Shutdown** from the **Server Settings** page to display the **Restart, Reboot and Shutdown** page. Note that the page has different options depending on the configuration of your system.

The **Restart, Reboot and Shutdown** for a standalone server is shown below.

Server Restart Reboot and Shutdown Page

The **Reboot/Shutdown Server** page for a standalone server has several options:

- Click **restart** to restart file serving EVSs on the server.
- Click **stop** to stop file serving EVSs on the server.
- Click **Reboot** to stop file serving EVSs on the server, and then reboot the server. Note that rebooting may take up to five minutes.
- Click **Shutdown** to stop file serving EVSs on the server, and then shut down and power off the server.

Click the button for the action you want to perform.

The **Restart, Reboot and Shutdown** for a cluster node is shown below.

Cluster Node Restart Reboot and Shutdown Page

The **Reboot/Shutdown Server** page for a cluster node has several options:

- Restarting file serving EVSs on a node or the whole cluster. You can either:
    - To restart all file serving EVSs on a single node, select the "Restart on node" option and use the drop-down list to select a node.
    - To restart all file serving EVSs on all cluster nodes, select the "Restart on all nodes" option.

    Click **restart** to restart all file serving EVSs on the selected node or on all nodes of the cluster.

- Stopping file serving EVSs on a node or the whole cluster. You can either:
    - To stop all file serving EVSs on a single node, select the "Stop file serving on node" option and use the drop-down list to select a node.
    - To stop all file serving EVSs on all cluster nodes, select the "Stop file serving on all nodes" option.

    Click **stop** to stop all file serving EVSs on the selected node or on all nodes of the cluster.

- Rebooting a node or the whole cluster. You can either:
  - To reboot a single node, select the "Reboot node" option and use the drop-down list to select a node.
  - To reboot all cluster nodes, select the "Reboot all nodes" option.

  Clicking **Reboot** stops file serving EVSs on the selected node or all cluster nodes, then reboots the node/nodes. Note that rebooting may take up to five minutes.
- Shutting down a node or the whole cluster. You can either:
  - To shut down a single node, select the "Shutdown node" option and use the drop-down list to select a node.
  - To shut down all cluster nodes, select the "Shutdown all nodes" option.

  Clicking **Shutdown** stops file serving EVSs on the selected node or the cluster, then shuts down and powers off the selected node/all nodes in the cluster.

Powering Down the IS-NAS Server for Maintenance

This procedure should be followed whenever a IS-NAS Server is to be powered down and will be left off for less than a day. If, however, the system is being rebooted, this procedure is not necessary.

1. Shut down the IS-NAS Server(s) as described in "Rebooting, Shutting Down, and Powering Off the SGI InfiniteStorage NAS Server," on page 42.

2. If your system is configured with an external System Management Unit (SMU), depress the red button located on the right of the unit to turn it off (an internal SMU is turned off when the server shuts down).

3. Power off the storage subsystems, beginning with the enclosures that house the RAID controllers.

4. Power off the expansion enclosures for the storage subsystems.

Powering Down the IS-NAS Server for Shipment or Storage

This procedure should be followed whenever a IS-NAS Server is to be powered down and it will be left off for more than a day. If, however, the system is being restarted/power-cycled, this procedure is not necessary.

1. From the server console, run the CLI command `shutdown --ship --powerdown`.

2. Wait until the console displays the message "`Information: Server has shut down`" and the rear panel LEDs turn off. (Note that the PSU and system fans will continue to run, and the PSU LEDs will still be on.)

3. Power down the IS-NAS Server by removing the power cables from the PSU modules.

4. Wait 10-15 seconds, then check that the NVRAM Status LED on the rear panel of the server is off.

- If the NVRAM status LED is off, the battery backup pack will no longer power the NVRAM, and the PSUs are shut down correctly for storage and/ or shipment.

- If the NVRAM status LED is on (either on steady or flashing), press and hold the reset button for 5 seconds until the NVRAM Status LED begins to flash rapidly. Releasing the reset button will then disable the battery and the NVRAM Status LED will go out. Note that NVRAM contents will be lost. The battery will be re-enabled when power is restored to the server.

When the system is properly shut down, depending on the battery charge level, the battery may last up to one year without being charged or conditioned (see "NVRAM Backup Battery Pack," on page 18. Contact your BlueArc Global Services representative for special instructions if servers or NVRAM battery backup packs will be in storage for more than 1 year. Special provisions will be required for field or factory recharging and retesting of NVRAM battery backup packs.

Powering On an SGI IS-NAS Server/Cluster

To start/power on a server or cluster:

1. Verify that all servers are switched off.

2. Start **all** storage subsystems, beginning with expansion enclosures.

    Wait until the disk LEDs on all of the expansion enclosures have stopped blinking (which indicates that they are spinning up) or two minutes, whichever comes first, then start the storage subsystem RAID controller enclosures. Note that the disk drives in some storage enclosures will not spin up until commanded to do so by the RAID controller, so the LEDs may continue to blink until after the RAID controller enclosure has sent those commands and the drives have spun up.

3. For a cluster configuration, or when using an external System Management Unit (SMU), start the SMU by depressing the red button located on the right of the unit.

    Wait one minute to allow the external SMU to start.

4. Power up the IS-NAS Server or the first node in the cluster.

    To switch the power on for a server/node:

    *   If the power cables are not connected to the PSU, plug in the power cables. If, after 10 seconds, the PSU LEDs are lit but the Power Status LED on the rear panel is not lit, press the PWR button to restore power to the system boards.

    *   If the power cables are connected to the PSU, press the PWR (power) button on the rear of the server (see "Power Button (PWR)," on page 22 for more information).

5. If you are starting a cluster, wait 5-10 seconds before powering on the next node in the cluster.

Recovering from Power Standby

When the server is in a power standby state, the power supplies and system fans are powered and the PSU LEDs are lit, but the Power Status LED on the rear panel is not lit.

The server will enter a standby power state due to any the following:

- The command `shutdown --ship --powerdown` has been issued.
- The PWR button was pressed when the server is running.
- The server has shut down automatically due to an over temperature condition.

You can restore the server to its normal power state by either of the following methods:

- Pressing the PWR button (see "Power Button (PWR)," on page 22 for more information).
- Remove the power cables from both PSUs, wait for 10 seconds, then reconnect the cables to the PSUs.