



SGI® NAS MIS Server and
JBOD Setup Guide

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About This Guide

This Setup Guide provides an overview of the hardware and software general setup steps necessary to installing the SGI® Modular InfiniteStorage™ (MIS) NAS system. Booting information and descriptions of the major components in the system are covered. This guide also provides basic troubleshooting and maintenance information, BIOS references, and important safety and regulatory specifications.

Audience

This guide is written for users, installers and system administrators of the SGI Modular IS NAS systems. It is written with the assumption that the reader has a good working knowledge of Network Attached Storage, computer interface cabling and computer systems. This guide may also be useful to service personnel looking for overview information on the Modular IS NAS system.

Chapter Descriptions

The following topics are covered in this guide:

- **Chapter 1, “Introduction,”** provides an overview of the Modular IS NAS system and its various components. Information is provided to guide the user to the setup steps they will need to take to get their system setup and operational.
- **Chapter 2, “MIS NAS System Hardware Installation,”** provides hardware, drive and cable installation instructions for MIS NAS system hardware. Rails, enclosures or disks that did not come already installed in a system rack are covered, along with basic cabling guidelines.
- **Chapter 3, “MIS NAS Operation and GUI Startup,”** describes the control panel as well as the drives and lists the steps necessary to bring the enclosures and drives online. GUI software necessary for basic system setup is also covered.
- **Chapter 4, “System Safety,”** provides general system safety information necessary for proper setup and operation of the system.

- [Chapter 5, “Troubleshooting Information,”](#) provides best practice procedures to identify, troubleshoot and correct minor problems with an SGI MIS NAS system.
- [Appendix A, “BIOS Error Codes,”](#) provides a brief listing of BIOS (beep) error code information.
- [Appendix B, “System Specifications and Regulatory Overview,”](#) provides basic environmental operating requirements and regulatory information for the MIS NAS server.

Related Publications

The following SGI documents may be relevant to the use of your Modular IS NAS server:

- *SGI NAS Quick Start Guide*, publication number, 007-5865-00x
This quick start guide describes the basic installation and use of the SGI NAS system application software used with your system. It provides guidelines on loading and registering the Appliance Software License, configuring the primary network interface and performing essential configuration tasks.
- *SGI NAS User Guide*, publication number, 007-5860-00x
This document provides information on multiple aspects of working with SGI NAS APIs, including basic terminology, SGI NAS Management View (NMV) and NAS Management Console (NMC) managing instructions.
- *SGI NAS HA Cluster User Guide Release 3.1.x*, publication number, 007-5899-00x
This user guide is intended for customers who purchase the HA Cluster optional storage volume sharing service cluster “middleware” application. This software package (along with the required hardware) ensures critical applications and services are kept running in the event of system failures. HA cluster consists of two or more SGI NAS systems running a defined set of services and monitoring each other for failures.
- *SGI NAS VM Data Center User Guide Release 3.1.x*, publication number, 007-5901-00x
For customers purchasing the optional NAS VM Data Center software, this document covers the optional Virtual Machine Data Center plug-in (also called **VMDC**) which provides integration of infrastructure virtualization software with the SGI NAS system. VMDC supports “hypervisors” such as:
 - VMware ESX
 - Citrix Xen

The pluggable module is designed to provide a single point of control to manage all storage related aspects of a virtualized infrastructure.

- *SGI NAS FC Plug-in User Guide Release 3.1.x*, publication number, 007-5902-00x

For users who have purchased the optional SGI NAS FC plug-in software, this guide provides information on how the software continuously monitors system configuration, and can take snapshots of the system at configurable intervals without user intervention. The NAS FC plug-in can also generate intelligent reports for system administrators and support personnel and provides the capability to revert the NAS system to the (previously snapshot-ed) system configuration.

- *SGI NAS Namespace Cluster User Guide Release 3.1.x*, publication number, 007-5903-00x

For customers who have purchased the optional SGI NAS Namespace Cluster plug-in software package, this guide provides information on the management of multiple NFS servers, as well as advanced graphics and statistics. Namespace Cluster allows you to extend existing infrastructure with new servers and spread the workload between a group of servers instead of centralizing it on a single server. The optional Namespace Cluster plug-in software also lets you manage all the NFS servers from every node.

- *SGI MIS Platform User Guide*, publication number, 007-5818-00x

This user guide should be used **only** as a reference source in understanding the general hardware aspects of the Modular InfiniteStorage platform that serves as the basis for the SGI MIS NAS system. It describes the features and components of the platform and its two main enclosure configurations (NAS server plus storage, or JBOD—Just a Bunch Of Disks). The guide covers the different configurations, their respective components, interface panels, indicator lights and meanings, software, maintenance, and troubleshooting.

- *SGI Modular InfiniteStorage (MIS) 1.5 Platform User Guide*, publication #, 007-5916-00x

This user guide should be used **only** as a reference source in understanding the general hardware aspects of the Modular InfiniteStorage platform that serves as the basis for the SGI MIS NAS system.

- Man pages (online)

You can obtain SGI documentation, release notes, or man pages in the following ways:

- Refer to the SGI Technical Publications Library at <http://docs.sgi.com>. Various formats are available. This library contains the most recent and most comprehensive set of online books, release notes, man pages, and other information.
- You can also view man pages by typing `man <title>` on a command line.

The release notes, which contain the latest information about software and documentation in this release, are in a file named `SGI-PRODUCT-VERSION-readme.txt` in the docs directory of the SGI software product media.

SGI systems include a set of Linux® man pages, formatted in the standard UNIX® “man page” style. Important system configuration files and commands are documented on man pages. These are found online on the internal system disk (or DVD-CD) and are displayed using the `man` command. For additional information about displaying man pages using the `man` command, see `man(1)`.

In addition, the `apropos` command locates man pages based on keywords. For example, to display a list of man pages that describe disks, type the following on a command line:

```
apropos disk
```

For information about setting up and using `apropos`, see `apropos(1)`.

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.
<i>variable</i>	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.
[]	Brackets enclose optional portions of a command or directive line.
...	Ellipses indicate that a preceding element can be repeated.
man page(<i>x</i>)	Man page section identifiers appear in parentheses after man page names.
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.

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

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Introduction

The Modular InfiniteStorage (MIS) NAS is a 4U rackmount system (see [Figure 1-1 on page 2](#) for an example).

In addition to the NAS head node controller board and chassis, various standard components have been included with each MIS NAS system, as listed:

- An “open me first” kit (including this document)
- SAS or SATA drives and mounting brackets with labels (in a separate box)
- Up to four power supplies (installed in the MIS NAS or JBOD enclosure)
- One rackmount rail kit (already mounted if you ordered an SGI rack)
- One CD containing drivers and utilities

Important: SGI Modular InfiniteStorage systems may require driver versions that are not included in the original operating system release. When required, SGI provides these drivers on an SGI Driver CD, which may ship with the system, or (when applicable) on the system disk (pre-installed in the factory). For more information on this topic check with your sales or service representative.

Optional hardware components include:

- Expansion drive enclosures (JBOD systems)
- An SGI computer equipment rack (D-Rack)

Note: If you ordered your Modular IS NAS system with a rack, it should come with all enclosures already installed and cabled. See also, “[Inspecting a Shipment](#)” on page 5.

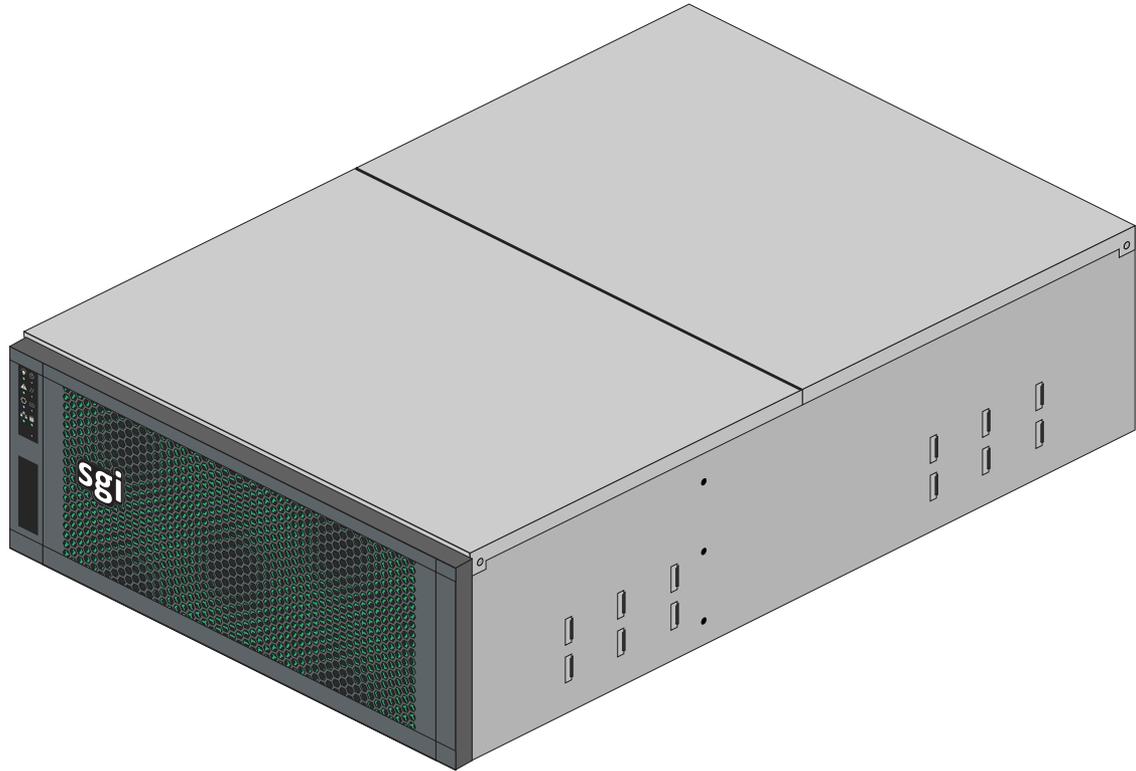


Figure 1-1 SGI Modular InfiniteStorage NAS Enclosure Example

System Overview

The SGI Modular IS network-attached storage (NAS) is a file-level compute data storage connected to a computer network providing data access to a heterogeneous group of clients. The MIS NAS system not only operates as a file server but is specialized for this task by its hardware, software, and configurations of those elements.

SGI NAS is a software-based storage appliance based on the Zetta File System (ZFS) from OpenSolaris. SGI NAS supports file and block storage and a variety of advanced storage features such as replication between various storage systems and virtually unlimited snapshots and file sizes. The SGI MIS NAS supports direct-attached SCSI, SAS, and SATA disks.

The SGI Modular InfiniteStorage NAS system is a high-density, integrated storage server platform. The MIS NAS always uses a 4U rackmount system, and can be either a compute and storage server, or a “Just Bunch Of Disks” expansion storage unit (MIS NAS JBOD unit). The MIS NAS Server Platform and up to 4 MIS NAS JBOD enclosures can be mounted into an SGI 42U (D-Rack). Other third-party 19" racks may be used if they are capable of supporting the MIS NAS structural weight requirements. Check with your SGI sales or service representative for more information on third-party racks.

Features of the modular design of the MIS NAS system include:

- Storage drives can be 3.5" or 2.5" SAS drives.
- Up to 72 (3.5" or 2.5") storage drives in the MIS NAS Server enclosure (two are reserved for boot purposes).
- Up to 81 (3.5" or 2.5") storage drives in an MIS NAS JBOD enclosure.
- 4U chassis: height 6.94" (176mm), width 16.9" (429.2mm), depth 36" (914.4mm).

Caution: SATA drives are not supported and cannot be included in the MIS NAS enclosures due to vibration conflicts with SAS drives.

- Up to four MIS JBOD units can be attached to one MIS NAS server head node.
- The MIS NAS server uses two Intel® Xeon® series processors per NAS motherboard.
- Eight DDR3 DIMMs are used per MIS NAS motherboard.
- Up to 4 HBAs for a single server, full-height (4.25") and half-depth (3.375"), externally or internally facing.
- There are an additional two internally facing, half-height and half-depth HBAs per NAS server module, used by the system.
- Up to 3 PCIe riser cards for an MIS NAS system.
- The two SAS boot drives per MIS NAS server are configured as ZFS mirrored drives.
- Dual Gb-Enet networking ports onboard, with optional Gb-Enet, 10-Gb Enet or 8-Gb FibreChannel PCIe cards.

Caution: Floor loading has a maximum weight allowance of 250 lbs per square foot, not including the service area. Floor loading must be less than 250 lbs per square foot, including the service area. For maximum efficiency and performance, it is recommended that the maximum number of enclosures in a single D-Rack is **one MIS NAS enclosure with 4 JBODs**.

Next Steps

Important: Be sure to read the additional safety information related to your SGI MIS NAS system prior to completing the setup of the hardware, reference [Chapter 4, “System Safety.”](#)

Un-Racked NAS System Setup

If you need to install and configure the MIS NAS hardware components and cables, go to [Chapter 2, “MIS NAS System Hardware Installation.”](#) Continue the drive and cable installation using the subsections that follow in Chapter 2. Finish the system setup using the information in [Chapter 3, “MIS NAS Operation and GUI Startup.”](#)

Pre-Racked NAS System Setup

If the system chassis is pre-installed in a rack, locate the drive modules and install them using the information in [“Installing Drives in the MIS or JBOD Enclosure”](#) on page 25. System cabling can be confirmed using the information in [“Cable Guide & Chassis Location”](#) on page 28. When the system is ready to be plugged in and booted, go to [Chapter 3, “MIS NAS Operation and GUI Startup.”](#)

MIS NAS System Hardware Installation

This chapter provides a hardware setup checklist and instructions to help you get the Modular IS NAS operational. If the MIS NAS hardware is already installed in a rack and cabled together as a system, continue on to [Chapter 3, “MIS NAS Operation and GUI Startup,”](#) to start your system hardware and confirm your SGI NAS GUI operation settings.

Unpack the System

Inspect the shipping container that the Modular IS NAS was shipped in and note if it was damaged in any way. If the enclosure shows damage, file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack that supports the weight, power requirements, and environmental requirements of the Modular IS NAS enclosure. It should be situated in a clean, dust-free environment that is well ventilated. Avoid areas where heat, electrical noise, and electromagnetic fields are generated. Place the enclosure rack near a grounded power outlet. Refer to [“Warnings and Precautions” on page 6.](#)

Inspecting a Shipment

It is important that you inspect all equipment received from a shipping carrier before signing for the shipment. Be sure to do the following when you arrive at a site to install equipment and when you receive equipment directly from a shipping carrier:

1. Inspect the shipment.
 - Does the number of pieces received match the bill of lading?
 - Have boxes been opened or is there damage to the packaging?
 - Has the Tiltwatch indicator been triggered, indicating that the shipment was tipped?
 - Has the Tiltwatch indicator been removed?
 - After removing the packaging, is there any visible damage?

2. Record any issues/problems (if applicable):
 - Use the bill of lading to record any issues discovered during the inspection.
 - Sign for the shipment after making notes on the bill of lading.
3. Report the issues to SGI:

Contact the SGI Customer Support Center (CSC) at 1-800-800-4744 (in the United States; refer to <http://www.sgi.com/support/supportcenters.html> for international numbers) to begin the replacement process. Take photos of any damage and in your message, please send a brief description of the problem to ships@sgi.com. A coordinator will contact you about the problem.

Prepare for Setup

The shipping container should include a special D-Rack “Stiffener bracket,” two sets of rail assemblies, two rail mounting brackets and the mounting screws that you will use to install the system into a rack. Read the Warnings and Precautions section in its entirety before you begin the installation procedure.

Choose a Setup Location

Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches) and approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.

Warnings and Precautions



Warning: Do NOT attempt to transport/move a fully loaded MIS NAS system. An MIS NAS system can weigh up to 220 lbs (100 kg) when fully loaded. If the system must be moved, first remove the drives from the chassis. When lifting the system, two people (one at each end) should lift slowly with feet spread apart to distribute the weight. Always follow safe lifting practices when moving heavy objects, failure to do so may result in serious injury. More information on moving large objects, requiring a two-person team, is available in the Centers for Disease Control’s, “Ergonomic Guidelines for Manual Material Handling” (<http://www.cdc.gov/niosh/docs/2007-131/pdfs/2007-131.pdf>)



Warning: Extend the leveling jacks on the bottom of the rack to the floor with the full weight of the rack resting on them. Failure to do so can result in serious injury or death.



Warning: Attach stabilizers to the rack in single rack installations. Failure to do so can result in serious injury or death.



Warning: Couple racks together in multiple rack installations. Failure to do so can result in serious injury or death.



Warning: Be sure the rack is stable before extending a component from the rack. Failure to do so can result in serious injury or death.



Warning: Extend only one component at a time. Extending two or more components simultaneously may cause the rack to tip over and result in serious injury or death.

General Enclosure Precautions

- Review the electrical and general safety precautions.
- Determine the placement of each component in the rack before you install the rails.
- Install the heaviest enclosure components in the bottom of the rack first, and then work up.
- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges and voltage spikes and to keep your system operating in case of a power failure.
- Allow the hot-pluggable SAS/SATA drives and power supply modules to cool before touching them.
- Always keep the rack's front door and all panels and components on the systems closed when not servicing to maintain proper cooling.

Rack Mounting Considerations

Ambient Operating Temperature

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (35° C or 95° F).

Reduced Airflow

Equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised.

Mechanical Loading

Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

Circuit Overloading

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Ground

A reliable ground must be maintained at all times. To ensure this, the rack itself should be grounded. Particular attention should be given to power supply connections other than the direct connections to the branch circuit (for example, the use of power strips, and so on).

Install the System into a Rack

This section provides information on installing the Modular IS NAS into a rack. If the system has already been mounted into a rack, refer to the sections [“Installing Drives in the MIS or JBOD Enclosure” on page 25](#) and [“Check, Adjust or Install NAS Cables” on page 27](#).

To reduce the chassis weight for shipping and installation, the system ships with the drives in drive carriers, removed from the chassis. You will need to install the drives into the locations specified on the attached labels after the chassis is installed in the rack.

The rail kit that ships with the system must be used to support the product. This rail kit enables the system to slide forwards and backwards in the rack for service access.

The procedures required to install a system will depend on which configuration is ordered:

If an SGI D-Rack configuration is ordered, one or more chassis ship in the rack and the drives ship in separate boxes. Each MIS or JBOD (disk expansion) chassis is pre-mounted and the chassis are installed in the rack. You must install the drives into the chassis in the locations specified on the attached labels. Refer to [“Installing Drives in the MIS or JBOD Enclosure” on page 25](#) for additional information.

If a configuration without a rack is ordered, the chassis, rail kit and drives ship in separate boxes. Install the rail kit in the customer’s rack and use at least two people to install each chassis. See [“Installing MIS Platforms” on page 11](#) and the subsections that follow for more information. You must then install the drives into the locations specified on the attached labels. Refer to [“Installing Drives in the MIS or JBOD Enclosure” on page 25](#) for more details.

Caution: Ensure that any third party rack used is certified to hold up to 1,100 lbs (500 kg) of rack-mounted computer equipment. Damage to flooring or the third-party rack equipment structure may occur if weight carrying capacity is exceeded.

Important: There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly or require special equipment or shelving. Refer to the installation instructions that came with the rack unit you are using. SGI cannot guarantee rail compatibility with all rack equipment.

Acclimatization

If the equipment has been in transit for more than 24 hours to reach the install site, wait **4 to 8 hours** for the equipment to acclimate to the data center or lab environment before proceeding with the installation.

Caution: Failure to let equipment acclimate may cause condensation damage to the equipment.

Preparing to Install

Uncrate the rack and inspect the shipment for any damage. (Refer to “[Inspecting a Shipment](#)” on page 5).

Be aware that the increased weight and size of the tall racks can cause the racks to tip over if the racks are improperly handled. To minimize your own personal risk of injury, use extra care and allow extra time when moving racks.

Be sure to evaluate the path you will be moving a rack along before moving the rack. Plan the move by anticipating any issues and removing any obstacles. Use extra caution during the actual move and roll the rack on to the data center floor.

Required Tools

The following tools are required:

- #1 and #2 Phillips screwdrivers,
- Long #2 Phillips screwdriver,
- Flat-head screwdriver,
- Thin-tipped flat-head screwdriver
- 10mm hexagonal socket wrench,
- A wheeled cart with brakes, sturdy enough to hold the chassis, and on which to work.

Note: Screwdrivers with magnetic tips are recommended.

Installing MIS Platforms

After a shipment has been inspected (“Inspecting a Shipment” on page 5) and acclimated (“Acclimatization” on page 10) to the location, there are two scenarios for installing MIS NAS platforms (server and/or JBOD). One way is to install the platforms into a rack that is already on location (D-Rack or other supported rack systems). The next scenario is installing MIS NAS platforms that have been shipped in an SGI D-Rack. In this scenario, the chassis are already installed into the rack, and the drives were shipped separately.

To install an MIS NAS platform into a rack that is already on location, first locate all boxes in the shipment. There should be a single box that holds each chassis and multiple boxes with drives for each chassis (each box holds up to 20 drives).

Next, the rolling rails that support the MIS chassis in the rack must be installed, and the chassis placed into the rack, following the rack placement guide provided in the cabling guide (page 28). These procedures requires two people.

Once the chassis is installed into the rack, the drives can be installed into their carriers, and the drives with carriers can be installed into the system. Following this, the chassis can be returned to the rack in the stowed position. When that is complete, the system can be cabled and powered on. If there are no faults, the system can then be zoned to its desired configuration.

To install a system that is shipped in a D-Rack, first locate all boxes in the shipment. There should be a single box that holds the D-Rack and multiple boxes with drives for each chassis (each box holds up to 20 drives). Go straight to the instructions for “Sliding the Chassis Forward/Backwards” on page 23, and continue following the instructions from there.

D-Rack Stiffener

Note: The following procedure is for installing into a D-Rack *already on location*, where the installer is required to install the outer rails into the SGI D-Rack. **These instructions are for SGI D-Racks on location ONLY.** SGI D-Racks shipped with an MIS NAS chassis inside will come pre-installed with rolling rails and a D-Rack Stiffener.

If you are installing rails into an SGI D-Rack on location, it will require installation of the D-Rack Stiffener (Figure 2-1 on page 12). This item is two brackets with a wedge-shaped cut-out and interlocking tabs. These two pieces come together to form a single unit, held together by a top bolt. Orient the two pieces together so that the tabs of both pieces will eventually face outward, towards

the sides of the rack. The brackets combine with a vertical 6x16 metric hex flange bolt to make the D-Rack Stiffener assembly.

Note: Installation and use of the D-Rack Stiffener assembly is important because of the extremely heavy system weights that can occur with SGI MIS NAS configurations.

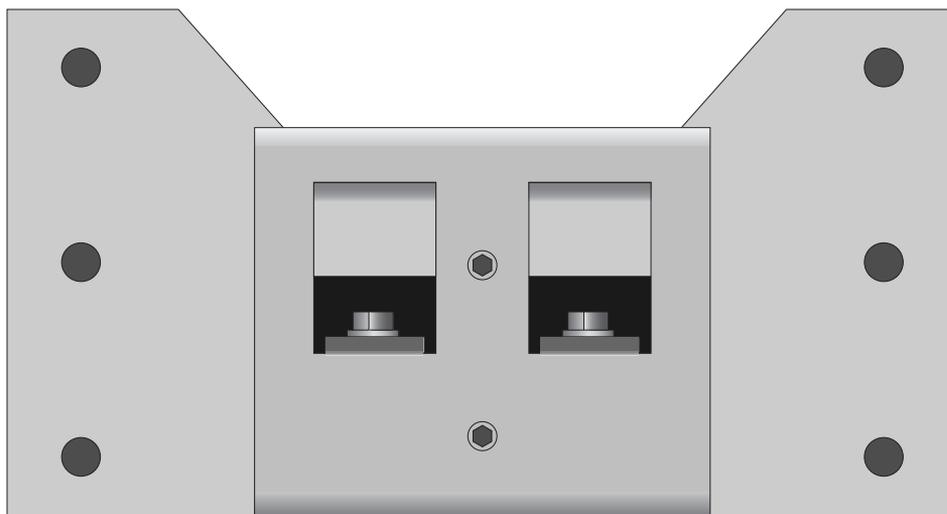


Figure 2-1 D-Rack Stiffener Example

Due to their construction, it is easiest to attach the outer bracket to the rack first, before joining with the inner bracket to make the D-Rack Stiffener.

1. Attach the outer bracket of the D-Rack Stiffener to the D-Rack using the four support screws. There are six holes available for the screws, but two will be blocked. Use the remaining four holes.

Note: The screws that attach the D-Rack Stiffener to the rack can be tightened all the way.

2. Attach the inner bracket to the outer bracket using the vertical bolt and socket wrench (Figure 2-2). Do **not** tighten these bolts all the way. They will be used later for altering rail alignment using the alignment tool.

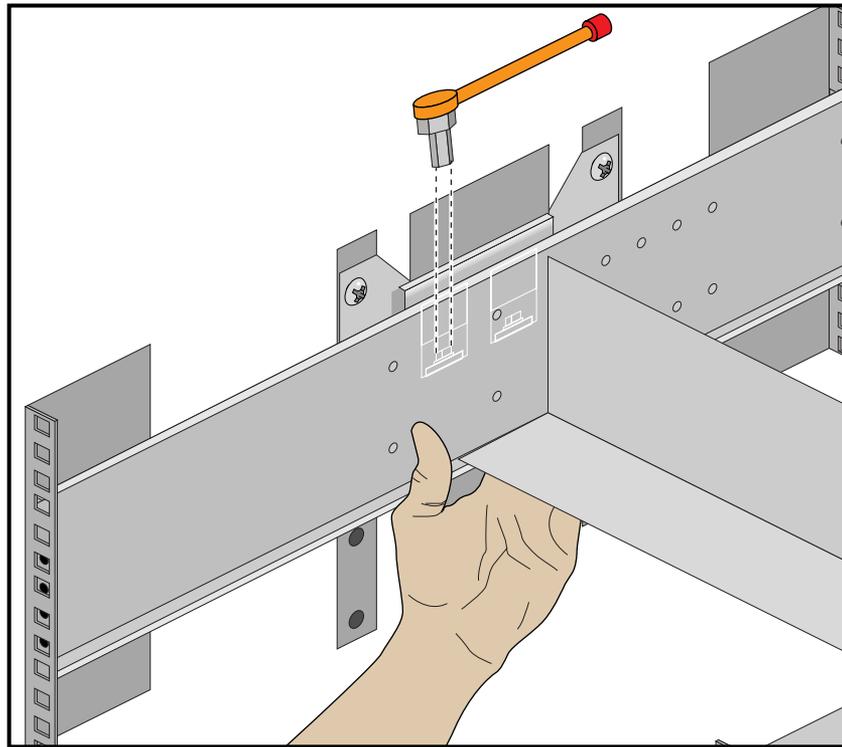


Figure 2-2 Alignment with the D-Rack Stiffener Vertical Bolt

Installing the Rolling Rails

These instructions are for installing the rolling rails on chassis shipped separately (i.e., not in a rack).

The rolling rails are used to support the chassis in the rack and provide ease of movement out the front and back of the rack, for easier and safer serviceability (see detail in [Figure 2-3 on page 14](#)).

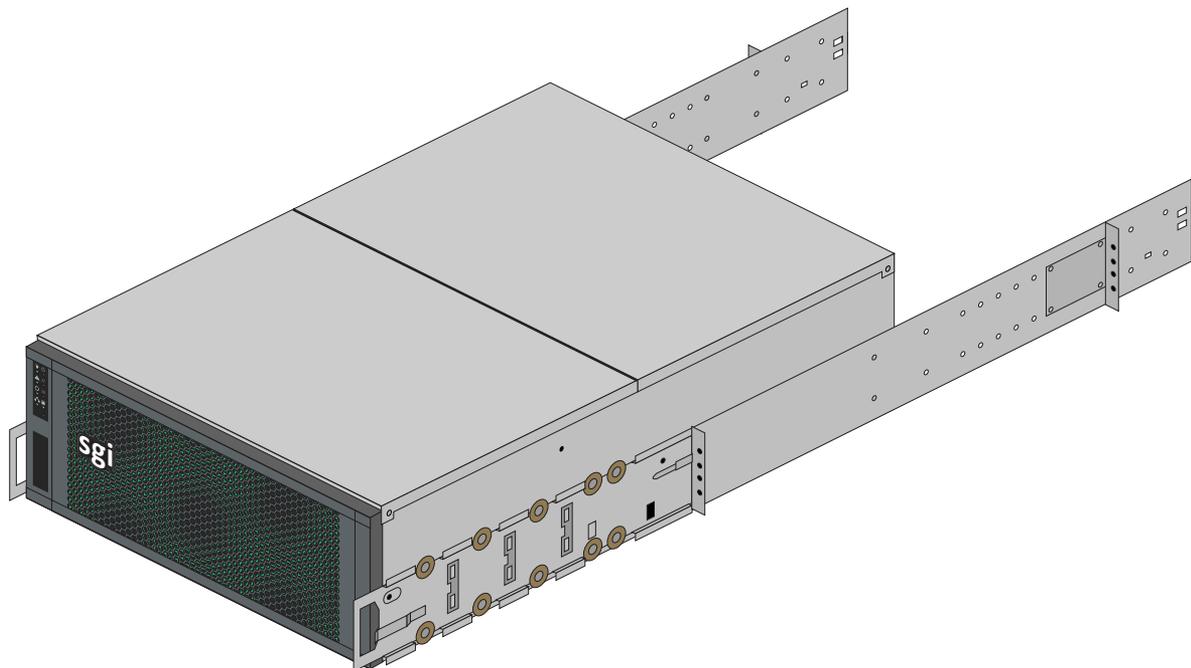


Figure 2-3 Rolling Rails Example

Installing the Outer Rails

1. Hold up the outer rails to the rack to determine if the depth is correct.
2. If the rail cannot be secured to the rack at the front and rear, perform the following steps.
 - a. Remove the four screws that hold the rear mounting plate to the rail.
 - b. Move the rear mounting plate until the depth of the rail is correct for the depth of the rack.
 - c. Secure the screws on the adjustment plate firmly in place.

For these next steps, it is helpful to use two people.

Note: If installing in a D-Rack with the D-Rack Stiffener (see [Figure 2-1 on page 12](#)), leave the vertical bolts loose. Then, using the small screws provided, attach the outer rail to the D-Rack Stiffener and secure the screws firmly. Make sure the screw heads are counter-sunk, so as not to catch on anything rolling in the rack. The vertical bolts in the D-Rack Stiffener will allow the rails to be adjusted later using the alignment tool.

3. Use the long phillips screwdriver to fasten the rear screws of the rail to the rack. Keep the screws loose for later adjustment.
4. Attach the rail to the rack at the front using the screws provided, keeping them loose for later adjustment.

Aligning the Outer Rails



Important: These steps must be taken or the wheels of the inner rail can get bound to the outer rail, causing the chassis to get stuck.

1. Tighten the screws on the left rail *completely*: middle bolts first (for D-racks), then the front screws, and lastly, the rear.
2. Using the included alignment tool, insert it into the rails so that it rests on the inner track of the outer rails, just as a chassis would.
3. Adjust the right rail until it is flush with the alignment tool and the left rail. Insure that the tool can be slid smoothly from the front to rear of the rack. This step is also best accomplished with two people, as shown in [Figure 2-4 on page 16](#).

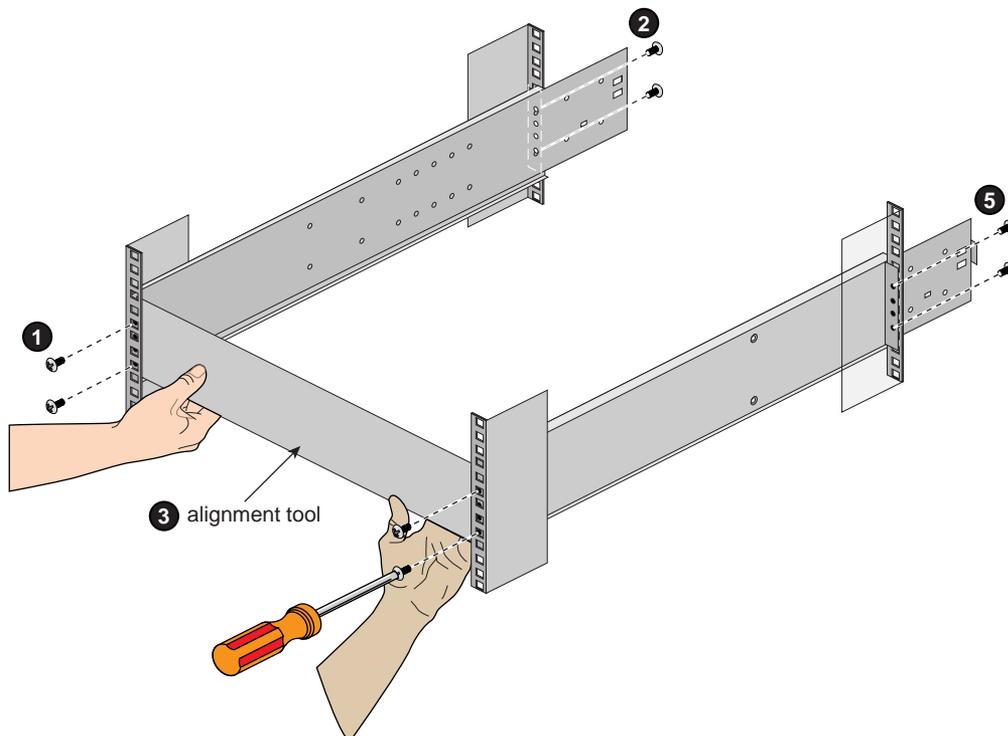


Figure 2-4 Adjustment Using the Alignment Tool

4. Tighten the screws on the right rail in order of front then back, leaving the middle bolts last (for D-Racks), so as to keep as straight an alignment as possible.
5. Double-check the alignment by moving the alignment tool through the rack. There should be no play between the alignment tool and the rails, see [Figure 2-5 on page 17](#) for an example.

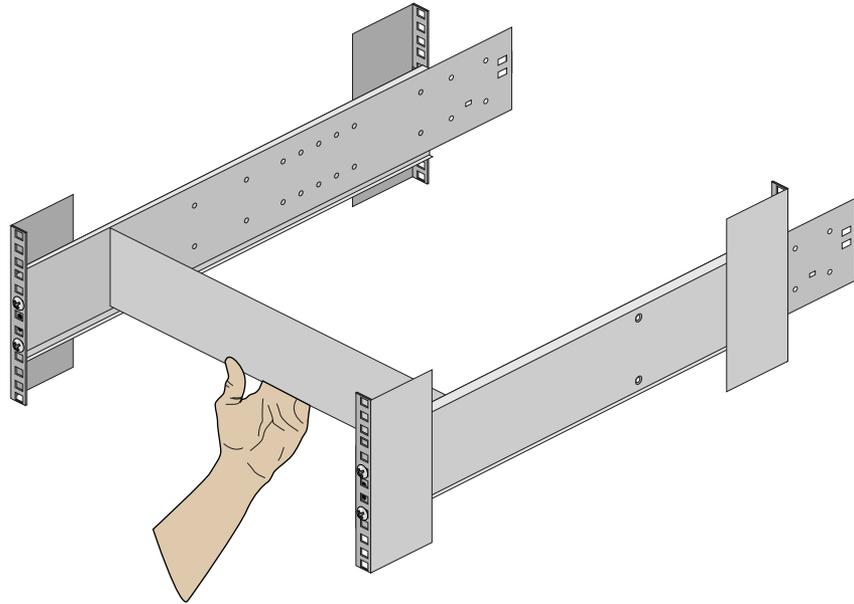


Figure 2-5 Slide the Alignment Tool from Front to Back

6. When satisfied, remove the alignment tool from the rack.

Installing the Air Ducts

1. Place the left air duct above the left rail, see [Figure 2-6 on page 18](#) for an example.
2. Using its mounting screws, attach the air duct to the rack.

Note: Some air ducts use a Velcro strip in place of a second screw. If this is the case, place the hook side of the Velcro on the air duct tab, and the fuzzy side of the Velcro on the outside of the outer rail.

3. Repeat this for the right side.

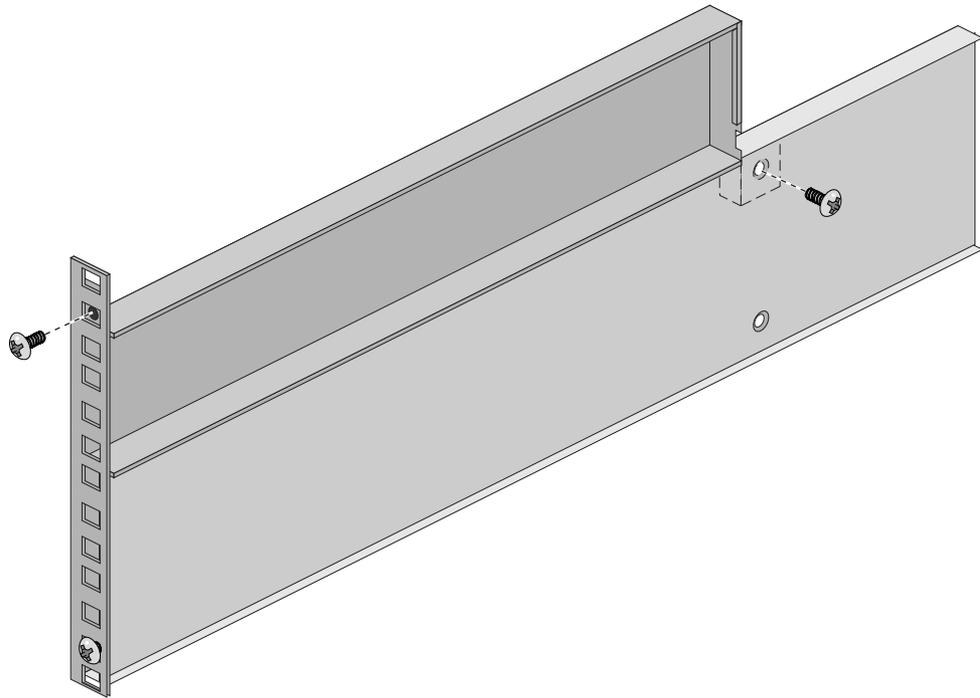


Figure 2-6 Air Duct Above Outer Rail

Installing the Inner Rolling Rails

1. Align the rolling rails to the chassis so that the word “**FRONT**” is at the front of the chassis

Note: The word “**FRONT**” will be upside-down on one side of the chassis, reference [Figure 2-7](#).

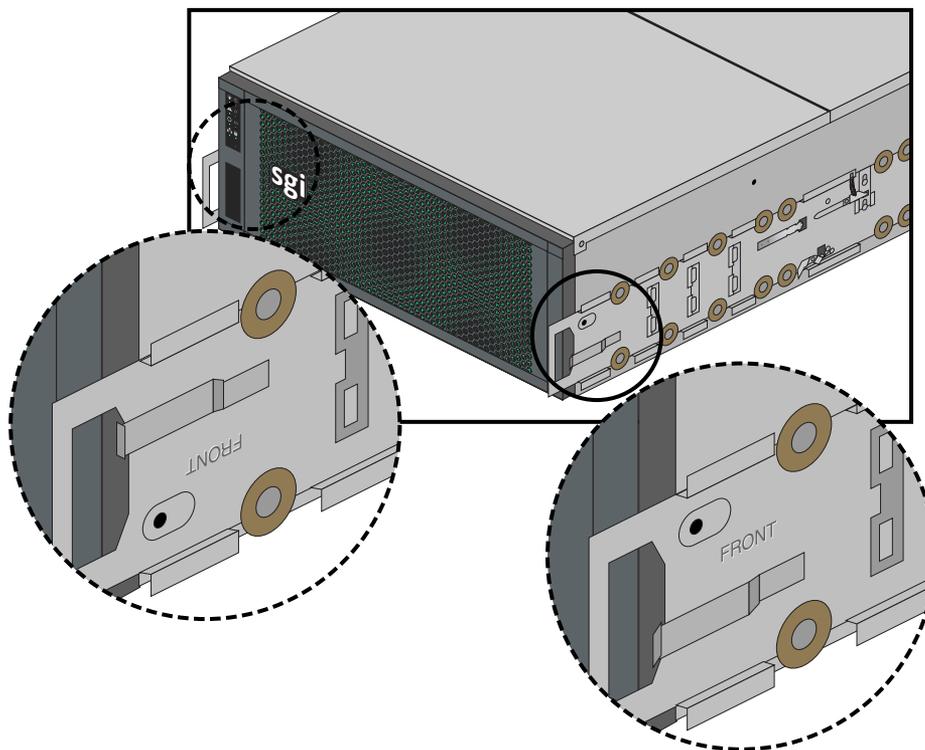


Figure 2-7 Align Rails to Front

2. Locate the six support tabs along the side of the chassis (see [Figure 2-8](#) on page 20).

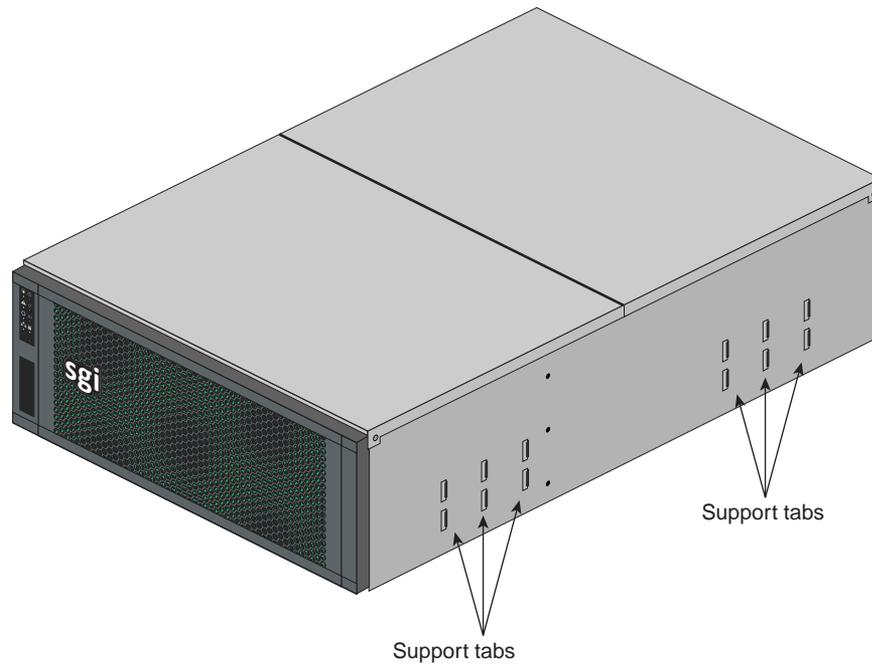


Figure 2-8 Support Tabs

3. Slide the rolling rail beneath the support tabs on the side of the chassis until it locks firmly into place (see [Figure 2-9 on page 21](#)).

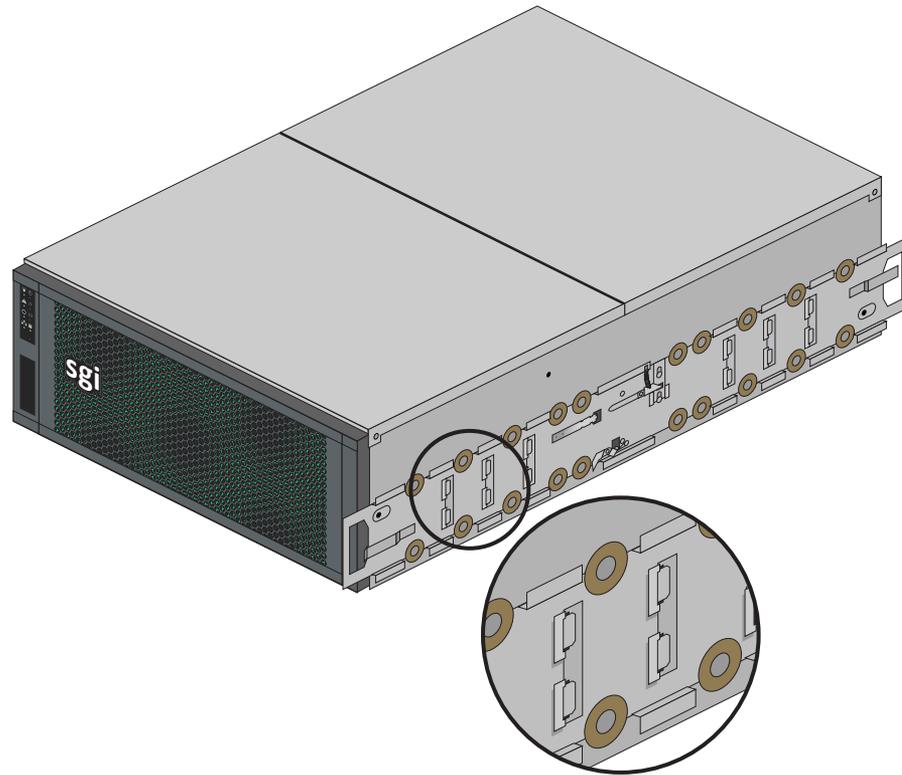


Figure 2-9 Lock on to Support Tabs

4. Using the included screws, attach the rolling rail to the chassis. Make sure the screw heads are counter-sunk, so as not to catch on anything when rolling in the rack.
5. You may have to move aside a safety latch in order to install some rolling rail screws. Be sure to set the safety latches back to their home positions after rolling rail installation is complete (see [Figure 2-10](#) on page 22).
6. Do this for both sides.

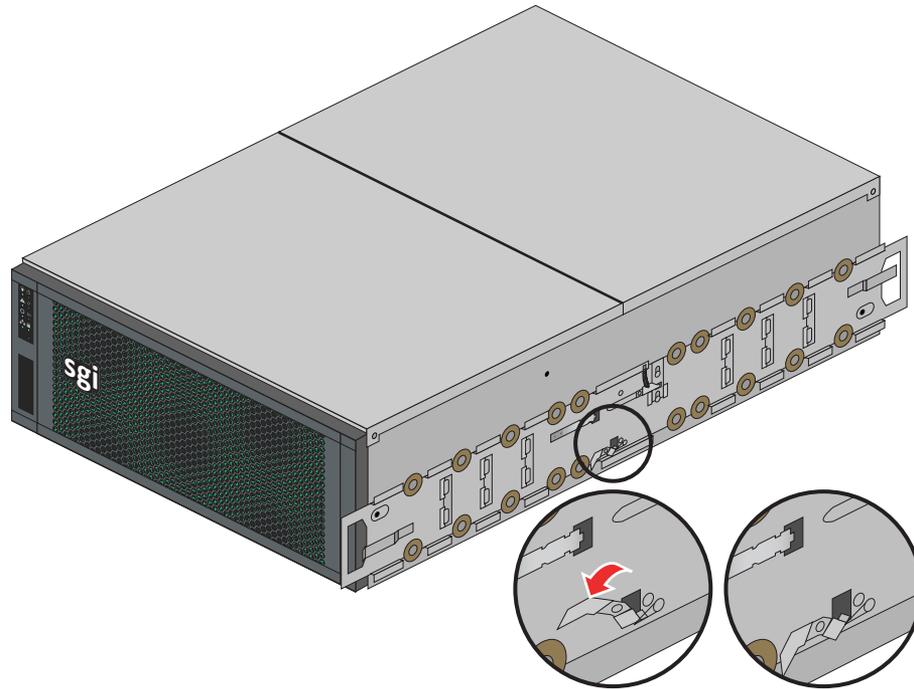


Figure 2-10 Return Latch to Home Position

Install the Chassis Into the Rack

1. Using two people, line up the inner rails on the chassis with the outer rails in the rack. Slide the chassis into the rack.
2. Motion into the rack will stop, by design, when the first set of safety latches on the inner rails catch in position on the outer rails. Move the safety latches to the unlatched position and continue to place the chassis into the rack.
3. Test the motion of the chassis in the rack by moving it forward and backwards in the rack, see the next subsection. It should only require one person to roll the chassis forwards or backwards. The chassis should catch and latch at 20 inches (51 cm) out from either side of the rack.

Sliding the Chassis Forward/Backwards

To slide the chassis out in either direction, follow these steps:

1. Push the two release latches in, at the left and right sides and in the center of the rail mounts, towards the center of the chassis.
2. Pull the chassis out using the handles. The chassis will latch at the 20-inch (51-cm) limit.
3. To slide the chassis back in, depress the two release latches near the rail and slide it back in.

Caution: Make sure that only *one* person moves the chassis at any given time. It is possible to get your fingers caught in the latches on either end if, while you're trying to push the chassis back into a locked position, someone else accidentally *pulls* from the other side. This can trap your finger between the metal edges of the rail mount and the rack (potentially resulting in injury). For more rack precautions, please see [Chapter 4, "System Safety,"](#) and review the rack usage guidelines.

Removing the Front or Rear Chassis Cover

Important: When a chassis cover is removed while an MIS NAS or JBOD system is **powered on**, an intrusion sensor monitored by the BMC will detect its removal. If the cover is off for more than 15 minutes or any system temperature sensor exceeds its threshold limit, the server will perform an automatic orderly shutdown and power-off.

As shown in [Figure 2-11 on page 24](#), the top of the chassis is bifurcated; that is, there is a front and rear chassis cover. Except for power supply maintenance, all service actions require that you remove the front or rear chassis cover, detailed below.

1. To remove a chassis cover, first follow the instructions in ["Removing the Front or Rear Chassis Cover"](#) on page 23.
2. Remove the single security screw from the cover.
3. Push the detent, and slide the cover out and up from the chassis.

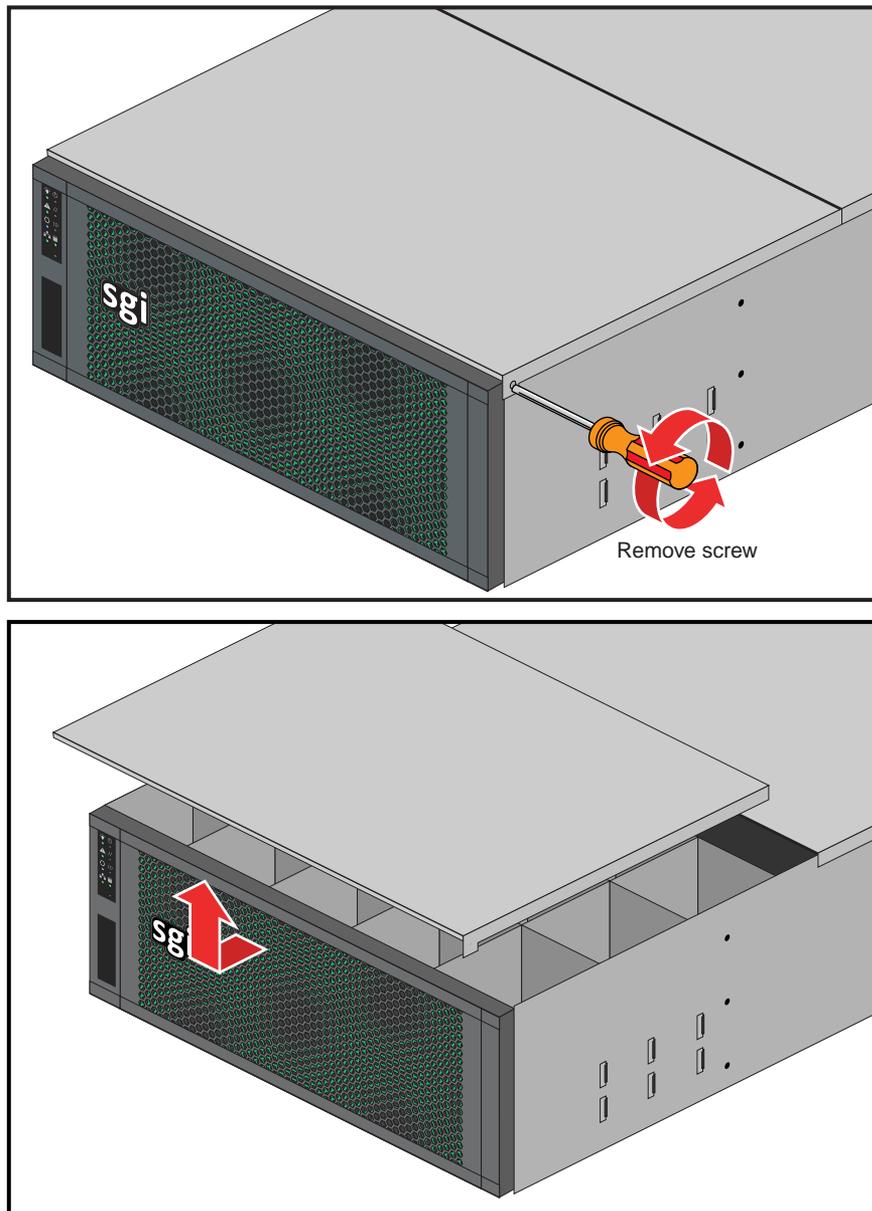


Figure 2-11 Chassis Cover Removal Example

Installing Drives in the MIS or JBOD Enclosure

Drives are labeled with chassis, StorBrick, and drive information, reference [Figure 2-12](#) and also [Figure 2-13 on page 26](#). To install the drives, first slide the chassis forward (see “Sliding the Chassis Forward/Backwards” on page 23) out of the rack to access StorBricks 0 through 4.

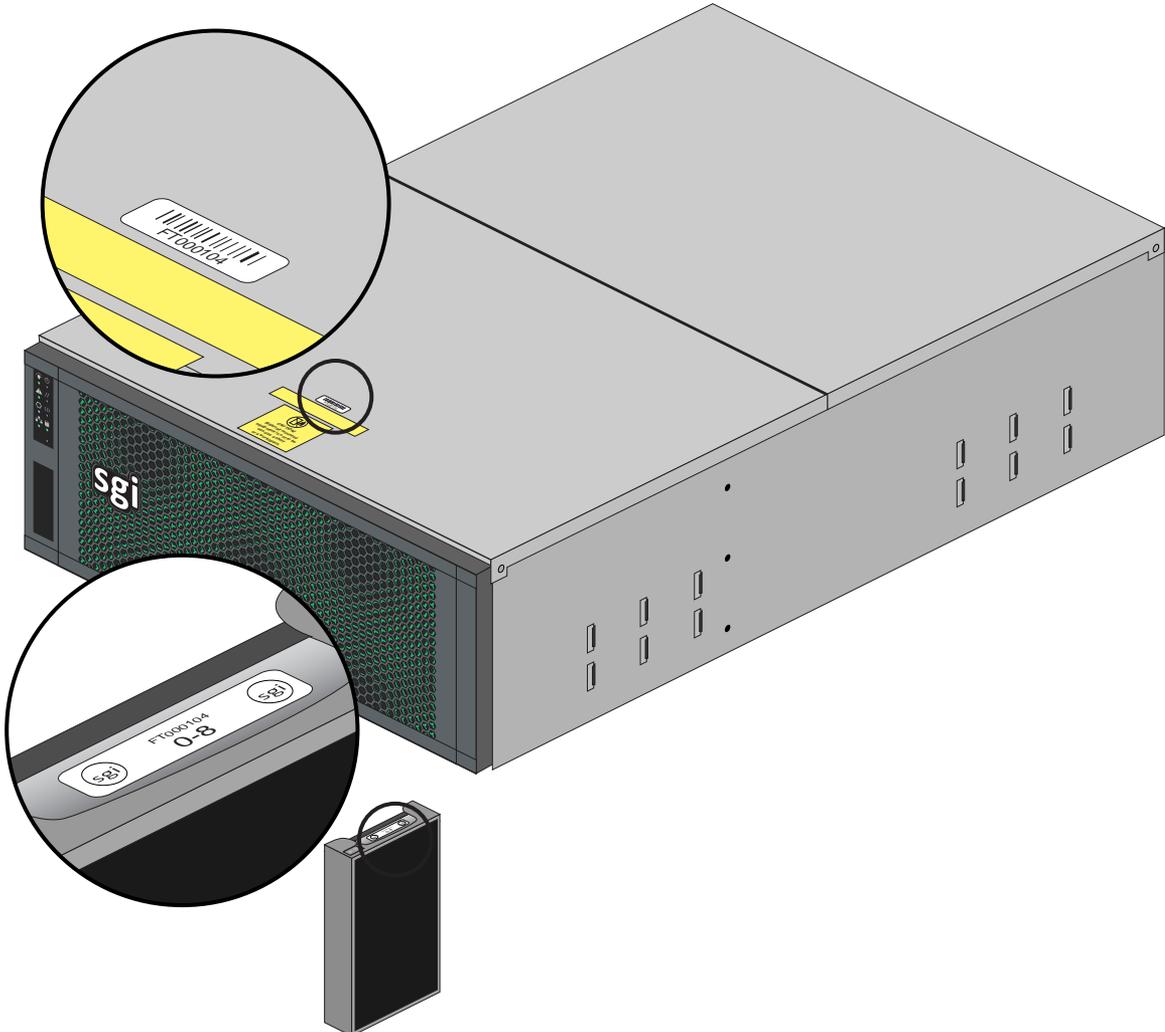


Figure 2-12 MIS NAS Chassis and Drive Label Location Example

Drives must first be installed in drive carriers before being installed into the StorBricks. To install a hard drive assembly into the StorBrick, perform the following steps:

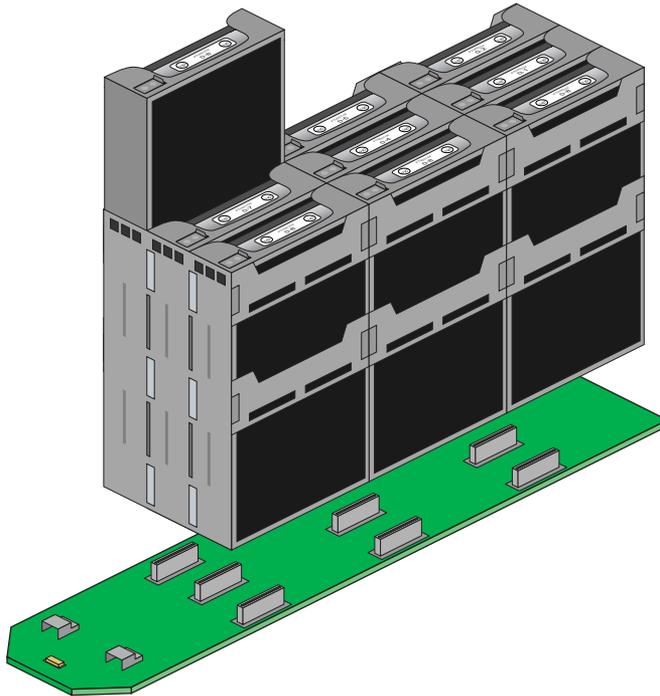


Figure 2-13 Example StorBrick Module with Drive in Carrier

1. Locate the drives for StorBricks 0-4 and order them on a cart according to the labels on the drive carriers.
2. Pull the chassis from the front of the rack (see [“Sliding the Chassis Forward/Backwards”](#) on page 23).
3. If you have not already done so, remove the front chassis cover by first removing its safety screw, then by pressing the top cover button and lifting the cover from the chassis (see [“Removing the Front or Rear Chassis Cover”](#) on page 23 if you need additional information).
4. Place the corresponding drive into its drive slot and press firmly into the StorBrick, see the example in [Figure 2-14](#) on page 27. You will know the drive is in place when the latch on the top of the drive carrier snaps into place.

5. When all drives are in their correct slots, replace the top cover on the chassis and secure it with its safety screw.
6. Move the chassis to the stowed position in the rack.
7. From the rear of the rack, move the chassis out backwards and repeat the above steps for the rear of the chassis (StorBricks 5-8 for a MIS NAS server, and 5-9 for a JBOD).

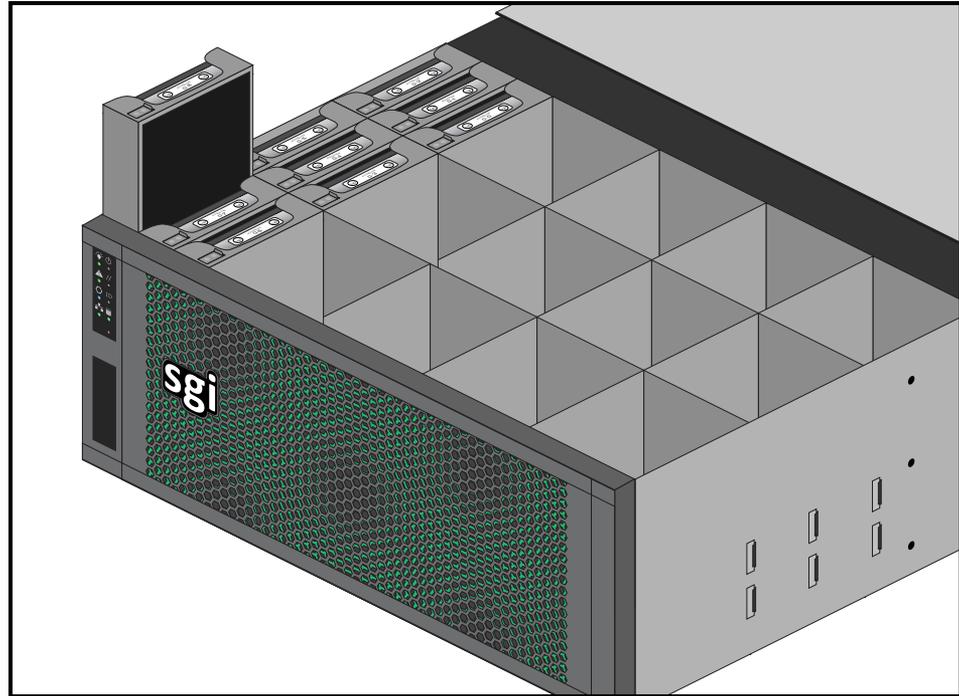


Figure 2-14 Drive Installation in StorBrick Module Example

Check, Adjust or Install NAS Cables

The following sections are intended to help you check the NAS cabling, adjust it if necessary, or properly install all cables in the case of a newly mounted system. You should always confirm that all needed cable connections have been made prior to booting the Modular IS NAS system.

Procedures to check already installed cabling are listed in “Check all Cable Connections and Airflow”. If your MIS NAS system is being installed on-site, install the needed cables as directed in the following subsections.

Cable Guide & Chassis Location

For systems that have multiple chassis, determine the proper location for each chassis in the rack: an MIS NAS Server can support up to four MIS JBOD enclosures. The NAS server is always located between multiple JBOD enclosures, as seen in the example layouts in Figure 2-16 through Figure 2-18 (cable colors are for clarity and do not correspond with actual cable colors). MIS NAS servers are connected to JBODs using SAS cables, while JBODs are connected to each other using SAS HD cabling.

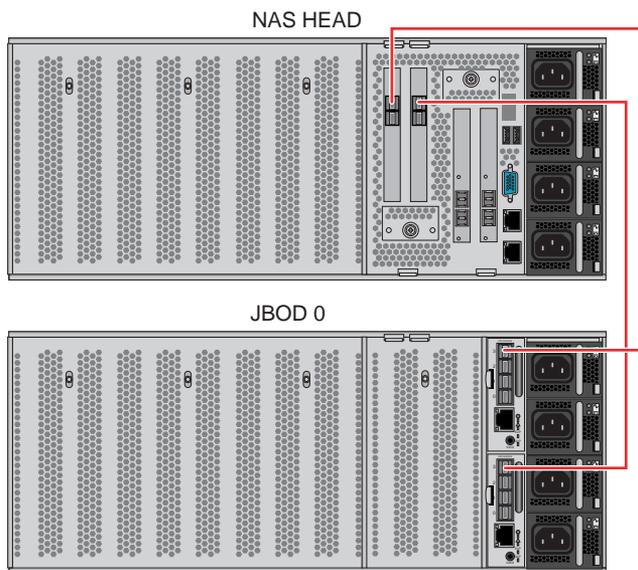


Figure 2-15 Cable Guide – Single Server with One JBOD

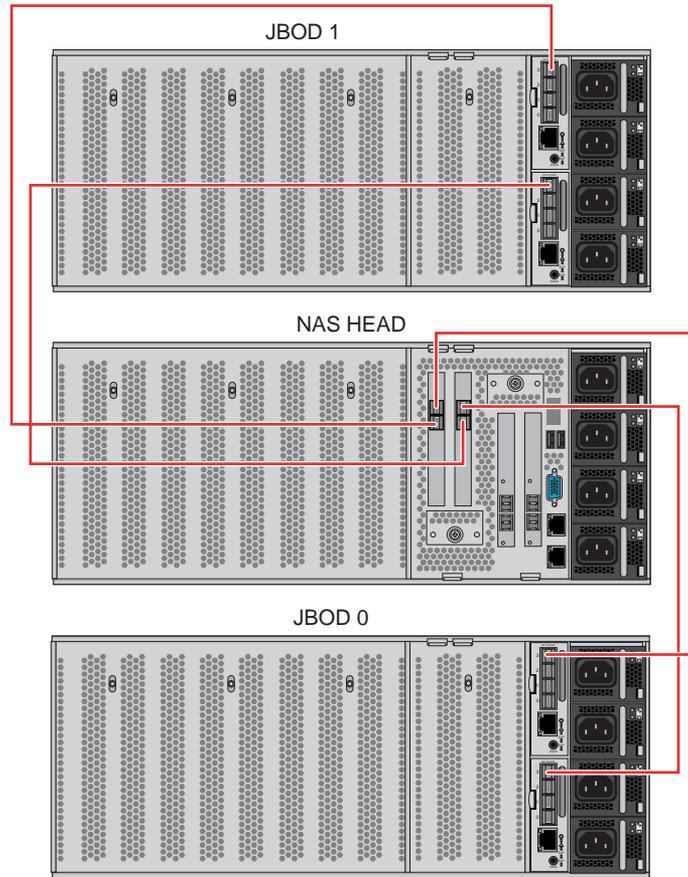


Figure 2-16 Cable Guide – Single Server with two JBODs

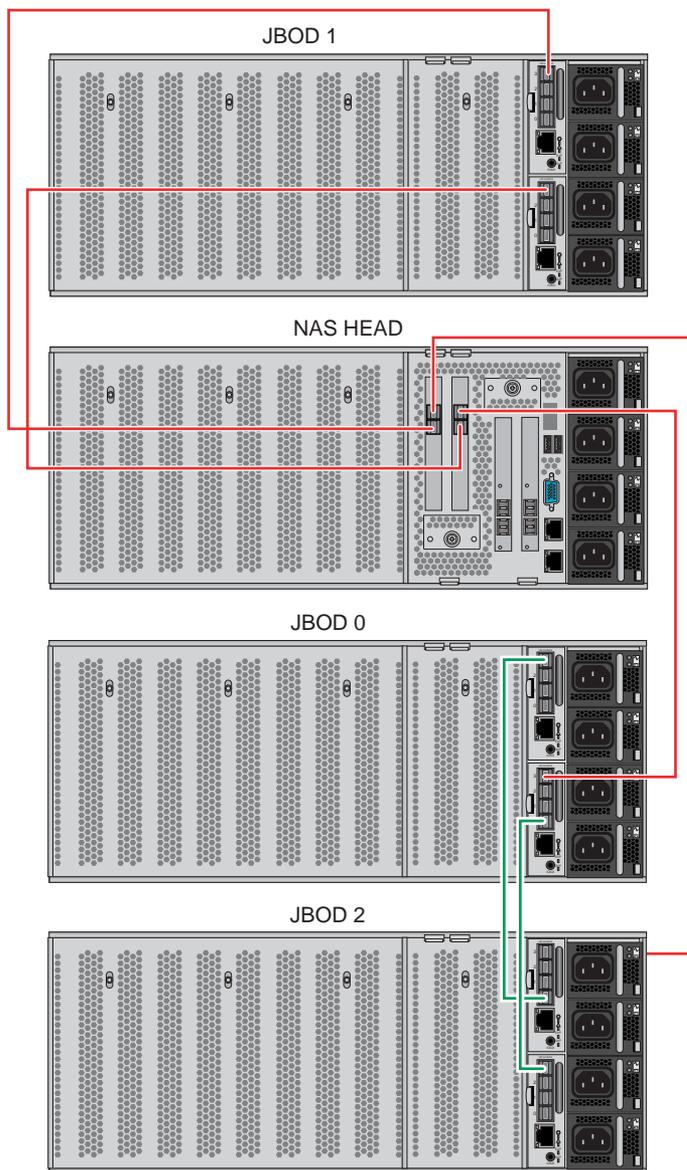


Figure 2-17 Cable Guide – Single Server With Three JBODs

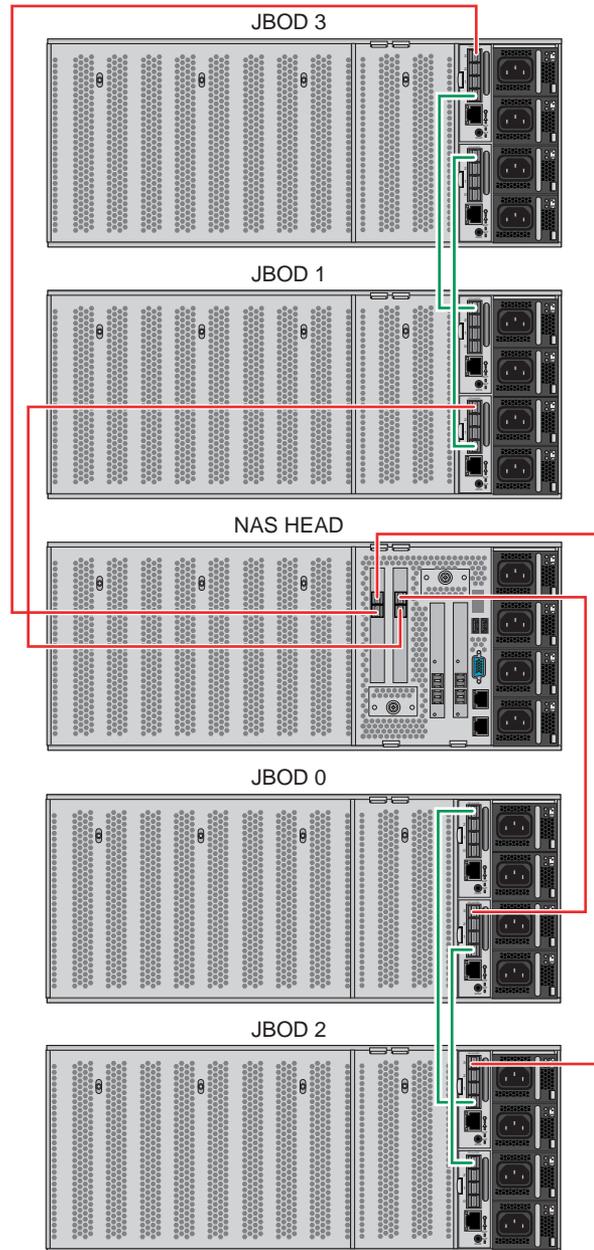


Figure 2-18 Cable Guide – Single Server With Four JBODs

Check all Cable Connections and Airflow

Make sure all power and data cables are properly connected and not blocking the system airflow.

Check the Airflow

The system component layout was carefully designed to direct sufficient cooling airflow to the components that generate the most heat.

Note: Make sure that all power and data cables have been routed in such a way that they do not block the airflow generated by the enclosure fans.

Supply Power to the System

Connect the power cords from all the power supply modules (located at the rear of each enclosure) into a power strip or power distribution unit (PDU). An optionally available uninterruptible power supply (UPS) can ensure power availability if primary power fails.

MIS NAS Operation and GUI Startup

Overview

This chapter covers basic hardware operation and GUI startup for your MIS NAS system.

Front Bezel and Control Panels

On the chassis, next to the bezel grille, you can see a control panel (reference Figure 3-1). There is a control panel for each MIS NAS head server board in an SGI MIS NAS enclosure. There is also a control panel for each I/O unit on an SGI NAS JBOD expansion enclosure.

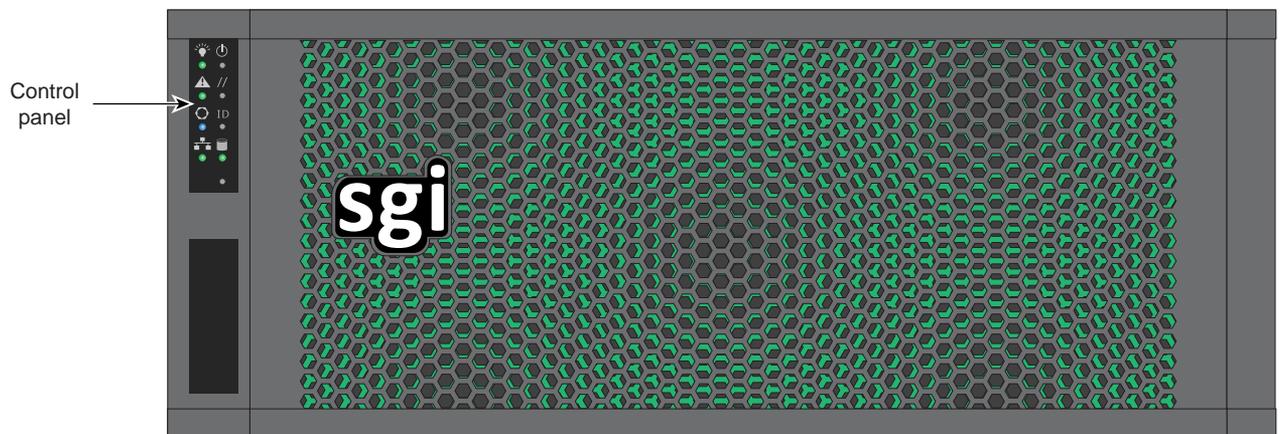


Figure 3-1 MIS NAS Front Panel Example

Control Panel LED/Button Descriptions

The following list explains the control panel buttons and LEDs shown in Figure 3-2:

Power LED When this green LED is lit, the power is on.

Power button If the system is off, push this button to power on the system. If the operating system is running, push this button to shut down the operating system and power down gracefully.

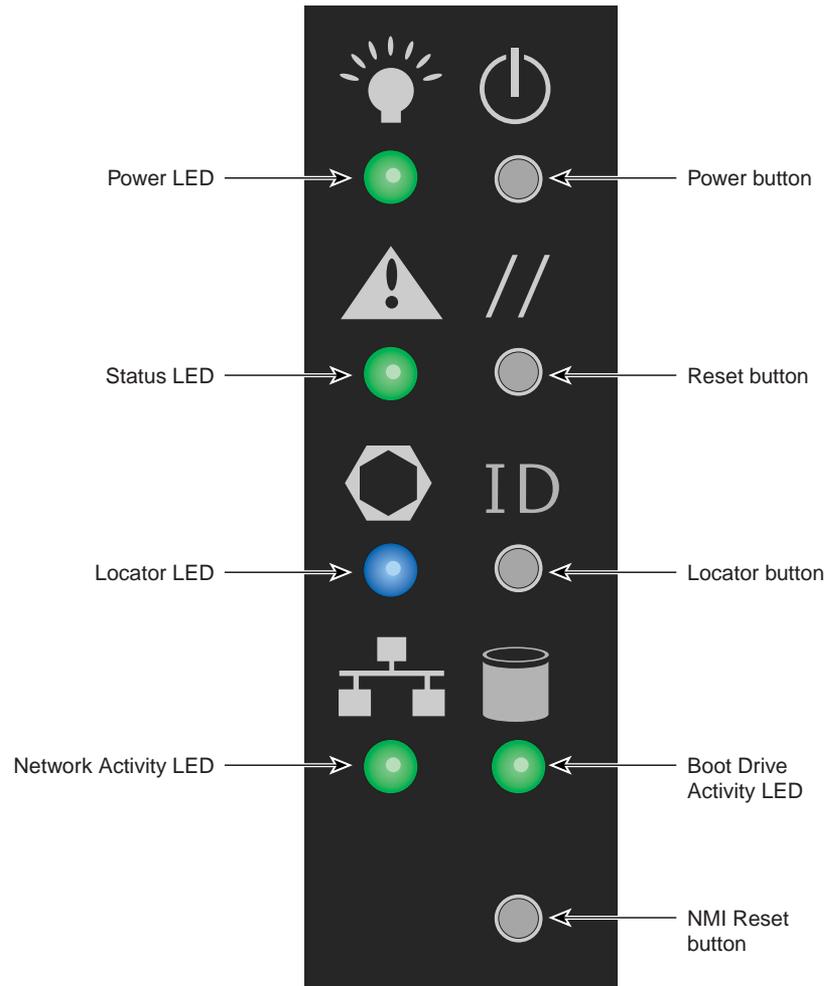


Figure 3-2 MIS NAS Control Panel Buttons, Icons and LEDs

Tip: If the operating system is hung, you can hold the power button down continuously for 10 seconds or more to power off the system. This is a hard reset.

Status LED When lit, AC power is available to the power supply modules, whether or not the unit is on or off. When green, the system is in good working order. When yellow, a problem exists and service is required.

Service reset button When pushed, this service reset button reboots the server. If the problem clears after the reset, the status LED turns green.

Locator LED The locator LED lights blue on the front and back to help locate the unit in a rack.

Locator button When pushed, the locator button lights blue. There is a corresponding LED on the back of the server that also lights blue. When pushed again, the locator button LED turns off.

Tip: You can use the Intel BMC Web Console to activate this button remotely by pressing the virtual button or by using the Linux IPMI terminal tool:

```
-H ip_addr -P passwd -U user chassis identification
```

NIC activity LED This green LED is lit whenever network traffic occurs on the baseboard NIC ports.

Boot drive activity LED This LED is lit whenever the boot drives are accessed. This LED is present, but inactive, on SGI MIS NAS JBOD enclosures.

Nonmaskable interrupt (NMI) reset button Reserved for use by SGI technical support staff members.

Note: Do not press the NMI button unless instructed to do so by an SGI technical support representative.

There are also multiple LEDs on the drive carriers and power supplies to keep you constantly informed of the overall status of the system.

MIS JBOD Control Panel

The control panel for the MIS NAS JBOD enclosure is exactly the same as the MIS NAS Server Platform. However, some of the buttons do not have the same function as they do on the MIS

Server. Since there is no boot drive module in a JBOD, the Boot Drive Activity LED, located next to the Network Activity LED, is present, but inactive.

Important: When there are two I/O modules on a JBOD, the top control panel connects to the bottom I/O module on the back of the unit while the bottom control panel accesses the top I/O module.

Safe Power-Off

There are several safe power-off methods for an MIS NAS Server or JBOD. They include:

- Using the OS GUI power-off button at the console screen, if a keyboard/mouse/video monitor is connected.
- Pushing and holding the Power button on the front panel (refer to the figure “[Control Panel LED/Button Descriptions](#)” on page 34).
- When logged in via an ssh session and executing a “shutdown” or “poweroff” command.
- When logged in to the BMC and using the power control page to power off the sever.
- Using the remote console screen GUI power-off button, if a KVM RMM4Lite session is established through the BMC.

Rear Panel Components

The appearance of the chassis rear panel differs somewhat depending on the modules that are installed inside. All rear panels feature silk-screened labels next to each port. Each SGI MIS Server or SGI MIS JBOD enclosure can have two or four power supplies, with the additional two power supplies providing redundancy. See [Figure 3-3 on page 37](#) for a rear-view example of the MIS NAS enclosure using four power supplies and one NAS head (serverboard). Each power supply includes its own AC power input connector and cable, and each is a high-efficiency, hot-swappable unit rated at 1100 Watts.

Note: In Figure 3-3 the NIC1 port is the same as Eth0 and the NIC2 port is Eth1. Optional PCIe components are shown in the drawing that may not be installed in your system.

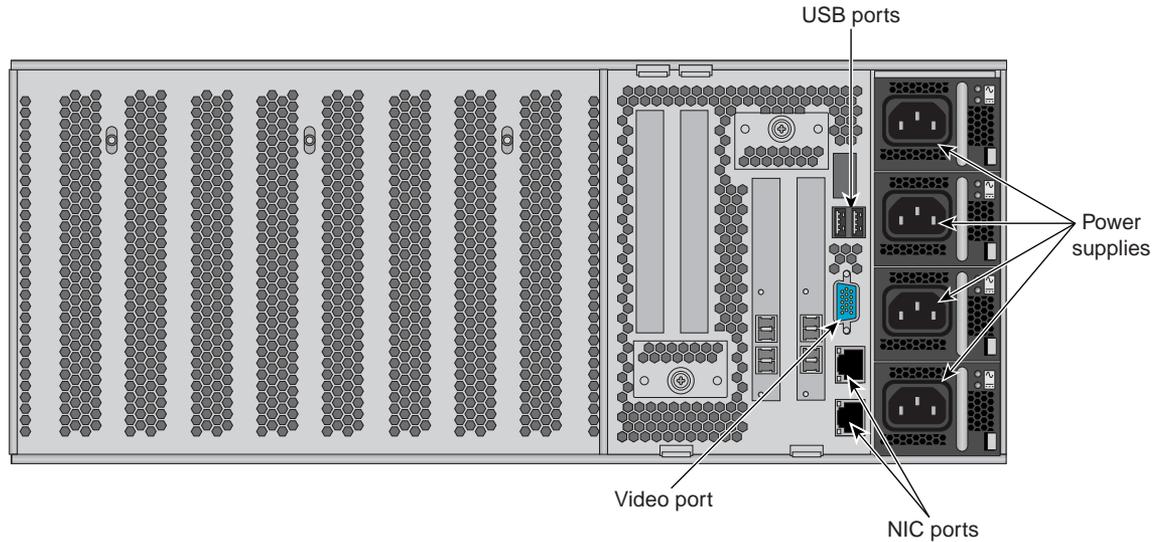


Figure 3-3 Single MIS NAS Head Node Rear Interface Components Example

Modular InfiniteStorage (MIS) NAS GUI Startup

The SGI MIS NAS is a software based network attached storage (NAS) appliance that features unlimited snapshots, snapshot mirroring (replication), NFS v3/v4, CIFS, and easy management of extremely large storage pools. Contact your SGI representative if you need more information on hardware compatibility.

The information in the following subsections is intended to help start and setup your SGI MIS NAS. For more detailed information on using the NAS GUI, see the following documents:

- *SGI NAS Quick Start Guide*, publication number, 007-5865-00x
- *SGI NAS User Guide*, publication number, 007-5860-00x

SGI MIS NAS is pre-configured with administrative user accounts: **root** and **admin**. The default password for both accounts is "**nasnas**".

Tip: To ensure added security, don't forget to change the system's default password.

Obtain a Permanent Software License Key

To obtain your permanent software license key for each system running the SGI MIS NAS software, open an SGI Supportfolio™ case using the following webpage:

<https://support.sgi.com/caseview/CreateNewCase>

In North America you may also obtain a key by calling 1.800.800.4744.

You must provide the following information to obtain a key:

- Sales Order Number(s)
- System Serial Number(s)
- Company Name
- End User Name
- Email Address
- Telephone

Your permanent key(s) will be emailed to you. If your purchase was for add-on plug-ins only, open a Supportfolio case as described earlier and SGI will upload the functionality for the plug-in to your original base software key(s).

Registering the SGI MIS NAS Software

Boot the SGI MIS NAS appliance. After the appliance boots up, review and accept the SGI MIS NAS software license agreement.

You can display licensing information in NAS Management View (NMV) by selecting the '**About**' link or use the following NAS Management Console (NMC) command:

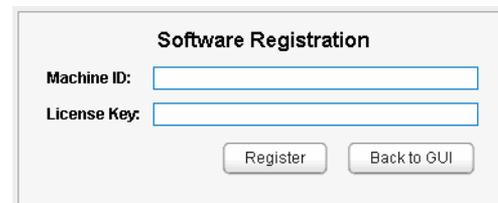
```
nmc:/$ show appliance license
```

This will indicate whether you are using the trial or commercial edition, and how many days are left in the case of a trial edition.

After obtaining the commercial license, you can register in NMC using the command:

```
nmc:/$ setup appliance register
```

Alternately, you can click on the '**Register**' link at the top of the page in NMV. In NMV a form similar to the following will appear, where you can enter the new license key:



The screenshot shows a web form titled "Software Registration". It contains two text input fields: "Machine ID:" and "License Key:". Below these fields are two buttons: "Register" and "Back to GUI".

Figure 3-4 MIS NAS Registration Panel Example

SGI NAS licenses are based on raw disk drive capacity and log, cache and spare devices are excluded from the calculation.

Follow the instructions on the appliance's NAS management console (NMC) screen to register the appliance software.

Note: The screenshots in this document are examples and may show different configuration information than what you see. Ensure you enter the product registration key exactly as it appears in the email sent when you register.

For successful appliance registration, you need to provide a machine “signature”, a unique 9-character code that identifies your machine at the Software License registration page. Figure 3-5 shows an example Software License Agreement Screen, also known as an end-user license agreement (EULA). Contact SGI to obtain a valid license “Registration Key”.

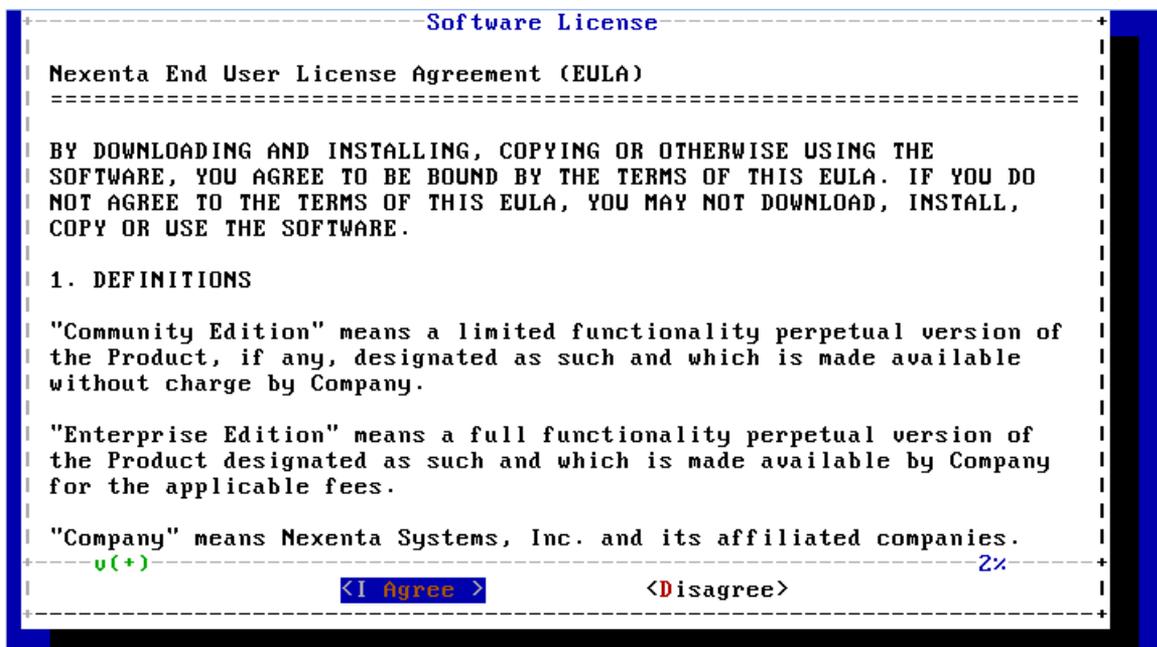


Figure 3-5 NAS Software License Agreement Screen Example

The software key is case sensitive. Make sure to enter the key exactly as specified in the auto-generated e-mail. The ‘-’ separating groups of key characters needs to be entered as well.

```
Welcome to Open Storage Appliance!
-----
Model           : SGI (Enterprise Edition)
Software Version : 3.1.4.1
Release Date    : Wed Apr 10 08:17:29 2013
UUID S/N       : 00000000-0000-0000-0000-000000000000

Product registration
-----
Machine Signature : 75000000
Registration Key  :

-----
Please enter product registration key. To obtain your permanent software
license key for each system running the SGI NAS software, open a
Supportfolio(tm) case using the webpage
https://support.sgi.com/caseview/CreateNewCase or by calling 1.800.800.4744.
You must provide the following information:
* Sales Order Number(s)
* System Serial Number(s)
* Company Name
* End User Name
* Email Address
* Telephone
Your permanent key(s) will be emailed to you. For information on applying
your key, please see the SGI NAS Quick Start Guide.
```

Figure 3-6 Appliance Product Registration Screen Example

Configure the Primary Network Interface

To reconfigure the primary network interface, log in to the system console and execute the setup appliance init command:

```
nmc: /$ setup appliance init
```

Next, you will be prompted to reconfigure the primary network interface. You may opt to choose DHCP, if your environment supports it, as in [Figure 3-7 on page 42](#). Or, you can set up the interface statically (you will need to specify the device's IP address, subnet mask, default gateway, and DNS server addresses).

Tip: In most cases it is preferable to configure the appliance's primary IP interface statically. Follow your general local area network administration guidelines.

After you have reconfigured the Primary Network Interface, you should see an “Enabling message” on the screen similar to:

Enabling ae0 via DHCP...OK.

After choosing your primary IP settings, you need to select **no** to the reconfigure prompt at the bottom of the interface screen, see Figure 3-7.

```

Configure primary network interface
-----
Interface rtls0 (PRIMARY) : Configured as 192.168.110.195/255.255.0.0 with mtu
1500
Default Gateway           :
DNS #1                    :
DNS #2                    :
DNS #3                    :

Reconfigure? Yes
Option ? dhcp
Enabling rtls0 via DHCP ... OK.

Interface rtls0 (PRIMARY) : Using DHCP as 192.168.0.251/255.255.255.0
Default Gateway via DHCP : 192.168.0.2
DNS #1 via DHCP          : 192.168.0.2
DNS #2 via DHCP          :
DNS #3 via DHCP          :

Reconfigure? (y/n) _

```

Figure 3-7 Primary Network Interface Selection Screen Example

Choosing SGI NAS Web GUI Transport Protocols

After you have configured the primary network interface, you must choose a transport protocol for the SGI MIS NAS WEB GUI (NMV). You can select either HTTP – fast and (plain text) unsecured, or HTTPS – secured, but less responsive.

Figure 3-8 on page 43 shows an example screen with a WEB GUI port selected to **2000** (the default).

The example screen also shows the primary networking interface and its (configured) settings. At this point you should be able to ping the appliance from an external host.

```
Option ? dhcp
Enabling rtls0 via DHCP ... OK.

Interface rtls0 (PRIMARY) : Using DHCP as 192.168.0.251/255.255.255.0
Default Gateway via DHCP : 192.168.0.2
DNS #1 via DHCP          : 192.168.0.2
DNS #2 via DHCP          :
DNS #3 via DHCP          :

Reconfigure? No

Your primary interface is : rtls0
Web GUI protocol          : HTTP
Web GUI port              : 2000_

-----
Choose port for the Web GUI (NMU) interface. Note that you can always re-run
MMC command 'setup appliance init' later to change the setting. Reserved
ports: 2001, 2002, 2003, 4000. Your firewall settings may prevent accessing
the selected port. If this is the case, please, consult your network
administrator.. Press Ctrl-C to exit.
```

Figure 3-8 WEB GUI Protocol and Port Selection Screen Example

Note: During the process of network configuring you can specify the WEB GUI port. The default is 2000, but you can change it to 2001, 2002 or other ports if they are not being used by other services. For more info about TCP ports used by the SGI MIS NAS, see the *SGI NAS User Guide*.

At this point the appliance is installed and can be accessed via the appliance's WEB GUI "Initial Configuration Wizard". [Figure 3-9 on page 44](#) shows an example screen pointing the installer to the Initial Configuration Wizard login.

```
Enabling rtls0 via DHCP ... OK.

Interface rtls0 (PRIMARY) : Using DHCP as 192.168.0.251/255.255.255.0
Default Gateway via DHCP : 192.168.0.2
DNS #1 via DHCP          : 192.168.0.2
DNS #2 via DHCP          :
DNS #3 via DHCP          :

Reconfigure? No

Your primary interface is : rtls0
Web GUI protocol          : HTTP
Web GUI port              : 2000

Available on http://192.168.0.251:2000/

Please point your Internet browser to the URL above - Appliance
Initial Configuration Wizard will help you to get started.
The Quick Start Guide document is available on the website -
have it handy during initial configuration of the appliance.

Open Storage Appliance (v3.1.3)

myhost console login: _
```

Figure 3-9 Initial Configuration Wizard URL Access Screen Example

You will notice a brief instruction set displayed on the console above the login prompt. It is **essential** to follow these instructions and use the internet browser to perform a few basic configuration steps.

Finishing Initial Configuration

The appliance is now almost ready for use. As per the instructions shown in Figure 3-9, use the displayed URL (in this example case it is `http://192.168.0.251:2000`) to connect your browser to the SGI MIS NAS GUI-based **Initial Configuration Wizard**. The Wizard will guide you through the most essential appliance setup steps – for more information refer to the *SGI NAS User Guide* (P/N 007-5860-00x).

Tip: If your internet browser does not connect to the appliance, it is likely because the primary networking interface is misconfigured. Recheck the procedures you executed in the previous two subsections. You may be able to fix the configuration by logging in to the console and running the following command:

```
nmc:/$ setup appliance init
```

Preconfigured Storage Pool (Volume)

The appliance is preconfigured with a storage pool or volume, tank0, that is optimized for your hardware configuration. To view the volume status, log in to the system console and execute the setup status command:

```
nmc: /$ setup tank0 status
```

Use the preconfigured volume to create folders for CIFS or NFS shares or zvols or virtual block devices for SCSI targets. Refer to the SGI NAS User Guide for further details on managing the appliance.

System Safety

This chapter describes basic safety precautions for working with the SGI Modular InfiniteStorage NAS systems.

Electrical Safety Precautions

Basic electrical safety precautions should be followed to protect yourself from harm and the Modular InfiniteStorage system from damage, as follows:

- Be aware of the locations of the power on/off buttons on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.
- Do not work alone when working with high voltage components.
- Power should always be disconnected from the system when removing or installing main system components, such as the power supplies and disk drives. When disconnecting power, you should first power down the operating system and then unplug the power cords. The unit can have more than one power supply cord. Disconnect all power supply cords before servicing to avoid electrical shock.
- When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power if necessary.
- Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they come into contact with.
- Do not use mats designed to decrease static electrical discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.
- The power supply power cords must include a grounding plug and must be plugged into grounded electrical outlets or power distribution unit (PDUs).

MIS NAS Node Serverboard Battery



Caution: There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarities (see [Figure 4-1](#)). This battery must be replaced only with the same or an equivalent type recommended by the manufacturer. Check with your service representative if you have any questions. Dispose of used batteries according to the manufacturer's instructions.

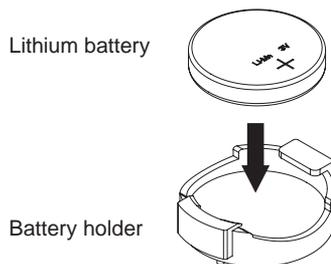


Figure 4-1 Installing the Onboard Battery

Mainboard Replaceable Soldered-in Fuses

Important: If your system comes with self-resetting PTC (Positive Temperature Coefficient) fuses on the NAS head node serverboard, they must be replaced by trained service technicians only. The new fuse must be the same or equivalent as the one replaced. Contact your technical support organization for details and support.

General Safety Precautions

Follow these rules to ensure general safety:

- Keep the area around the system clean and free of clutter.
- When fully equipped with drives an MIS NAS system weighs approximately 220 lbs (100 kg.). The system drives and/or power supply units should be removed prior to moving.

When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.

- Place the chassis top cover and any system components that have been removed away from the system or on a table so that they won't accidentally be stepped on.
- While working on the system, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.
- Remove any jewelry or metal objects from your body, which are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.
- After accessing the inside of the system, close the system back up and secure it in the rack unit after ensuring that all connections have been made.

ESD Precautions



Caution: Electrostatic discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards.

The following measures are generally sufficient to neutralize this difference before contact is made to protect your equipment from ESD:

- Use a grounded wrist strap designed to prevent static discharge.
- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.
- When handling chips or modules, avoid touching their pins.
- Put the head node serverboard and peripherals back into their antistatic bags when not in use.

- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

Troubleshooting Information

This chapter includes basic troubleshooting information and best practice procedures to work with an SGI Modular InfiniteStorage NAS system. This chapter covers the following troubleshooting topics:

- Detecting Component Failures
- No Video
- Loss of System Setup Configuration
- Safe Power-Off
- Checking System Air Flow

Note: Some software products are protected with software license keys derived from the Media Access Control (MAC) Ethernet address. If your system requires the replacement of a NAS controller head (node) board, the MAC Ethernet address changes. If you are using such a product, you must request a new license key after replacement of the MIS NAS node board. Contact your local customer support office:

<http://www.sgi.com/support/supportcenters.html>



Caution: Always re-install the chassis cover after you have accessed any internal components to ensure proper airflow and cooling for the system. Failure to re-install the cover may cause thermal over-temperature conditions and automatic shut-down of the system.

Handling NAS Internal Components



Caution: Electrostatic discharge (ESD) can damage electrostatic-sensitive devices inside the NAS enclosure. Use the ESD precautions described below when you handle printed circuit boards or other components in the system. The following measures are generally sufficient:

- Use a grounded wrist strap designed to prevent electrostatic discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle each printed circuit board (PCB) by the edges; do not touch the components, peripheral chips, memory modules, or gold contacts on the PCB.
- When handling any device with exposed chips or modules, avoid touching the pins.
- Place the NAS head node board, drives, or other boards and components into antistatic bags when not in use.
- Make sure your system chassis provides a conductive path between the power supply, the case, the mounting fasteners, and the node board to chassis ground.

Detecting Component Failures

Use the information in the following subsections to determine if any errors are occurring in the drives or system power supplies.

Disk Drive LEDs

Figure 5-1 shows the green/yellow (upper-right) and blue (below) disk drive status LEDs.

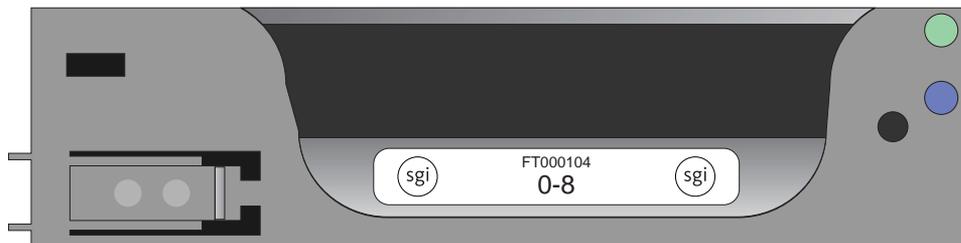


Figure 5-1 Disk Drive LEDs

Table 5-1 describes the meaning of the disk drive LEDs.

Table 5-1 Disk Drive LEDs

Bi-color LED	Blue LED	Drive Status
Off	Off	Drive is off and can be removed.
Green	Off	Drive is on.
Yellow	Off	Service required.
Off/Green/Yellow	On	Indicates drive location.

Power Supply LEDs

There are two LEDs located on the face plate of the power supply, one green (upper right), and one bi-color yellow/green below it, see Figure 5-2.

Table 5-2 describes the function of the power supply LEDs

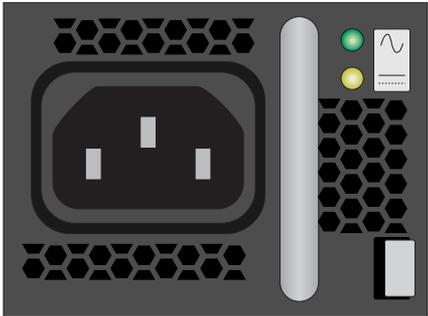


Figure 5-2 Power Supply LED Locations

Table 5-2 Power Supply LED Status Indicators

Green LED	Bi-color LED	Power Supply Status
Off	Off	No AC power to the supply, power is off on the front of the machine.
Off	Yellow	Problem indicated (voltage, fan failure, AC failure, etc.)

Table 5-2 Power Supply LED Status Indicators **(continued)**

Green LED	Bi-color LED	Power Supply Status
On	Blinking Yellow	AC available, power supply in standby mode (powered off on the front)
On	Green	AC available to the power supply, power supply is on and functioning normally.

No Video After Power-On

If the power is on and the system has had adequate time to boot, but there is no video, check all add-on cards and cables. Tighten or re-plug any loose cable connections. Be sure your monitor is powered up and switched to the **On** position.

Use the speaker to determine if any beep codes exist. Refer to [Appendix B, “BIOS Error Codes”](#) for details.

If video output is still absent, check with your system administrator or service provider.

Loss of System Setup Configuration

Make sure that your power supplies are operating properly, see [“Power Supply LEDs” on page 53](#) for guidelines. An improperly operating power supply may cause the system to lose the CMOS setup information. If this does not fix the Setup Configuration problem, consult your system administrator or contact your service organization for repairs.

Safe Power-Off

There are several safe power-off methods for an MIS NAS Server or JBOD. They include,

- Using the OS GUI power-off button at the console screen, if a keyboard/mouse/video monitor is connected.
- Pushing and holding the Power button on the front panel (see [“Control Panel LED/Button Descriptions” on page 34](#)).
- When logged in via an ssh session and executing a “shutdown” or “poweroff” command.

- When logged in to the BMC and using the power control page to power off the sever.
- Using the remote console screen GUI power-off button, if a KVM RMM4Lite session is established through the BMC.

For an MIS NAS JBOD Unit, the power button on the front panel will turn off the power to that I/O module. If an additional JBOD module is installed and powered on, it, the fans and the drives will remain on until it, too, is powered off.

Checking System Airflow

Ensure that rack internal cabling is not blocking the front or rear airflow through the MIS NAS or JBOD units. Reduced airflow may cause an over-temperature (overtemp) condition in the MIS NAS or JBOD enclosures.

Important: Failing to keep the enclosure cover(s) in place during operation may cause airflow interruption to critical internal components and consequent overheating and shutdown.

Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches) and approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.

BIOS Error Codes

During Power-On Self-Test (POST) routines, which are performed each time the system is powered on, errors may occur. Non-fatal errors are those which, in most cases, allow the system to continue the boot-up process. The error messages normally appear on the screen.

The BMC may generate beep codes upon detection of failure conditions that do not allow the system to fully boot. Beep codes are sounded each time the problem is discovered (for example, on each power-up attempt) but are not sounded continuously. Common supported codes are listed in [Table A-1](#).

In [Table A-1](#), each digit in the code is represented by a sequence of beeps whose count is equal to the digit.

Table A-1 BMC Beep Codes

Beep Code	Reason for Beep	Associated Sensors	Supported
1-5-2-1	No CPUs installed or first CPU socket is empty.	CPU Missing sensor	Yes
1-5-2-4	MSID Mismatch.	MSID Mismatch sensor.	Yes
1-5-4-2	Power fault: DC power is unexpectedly lost (power good dropout).	Power unit—power unit failure offset.	Yes
1-5-4-4	Power control fault (power good assertion time-out).	Power unit—soft power control failure offset.	Yes
1-5-1-2	VR Watchdog Timer sensor assertion	VR Watchdog timer	
1-5-1-4	The system does not power on or unexpectedly powers off and a power supply unit (PSU) is present that is an incompatible model with one or more other PSUs in the system.	PSU status	

System Specifications and Regulatory Overview

This appendix provides basic environmental operating requirements and regulatory information for the MIS NAS server.

Operating Environment

Table B-1 describes the technical specifications for the SGI MIS platform.

Table B-1 Technical Specifications

Attribute	Specification
Overview	
Profile	4U Standard-depth chassis
Product type	SGI MIS NAS Server Platform, or SGI MIS JBOD Unit
Connectivity	Up to four SGI MIS NAS JBOD units per SGI MIS NAS Server
Mount	<ul style="list-style-type: none"> –Standard 19-inch rack-compatible rail mount (weight-dependent) –SGI 19-inch Destination Rack (D-Rack), 42U –Up to 5 chassis maximum per D-Rack
Chassis Dimensions	
Height	6.94" (176 mm)
Width	16.9" (429.2 mm)
Depth	36" (914.4 mm)
Max weight	220 lbs.
Power	
AC Input	100–240 VAC (50-60Hz), single or three phase

Table B-1 Technical Specifications (continued)

Attribute	Specification
Safety	–UL/CSA certified to UL6050-1 –CE/CB certified to EN60950/IEC60950
EMC	–North America FCC Class A –Europe EN55022/EN55024
Operating Environment	
Operating temperature range	–41° to 95° F (5° to 35° C) –processor cores automatically allowed to run faster than the base operating frequency, if the cores are operating below power, current, and temperature specification limits (< 35°C ambient)
Non-operating temperature range	–40° to 140° F (minus 40° to 60° C)
Operating humidity range	10% to 90% non-condensing
Non-operating Humidity	10% to 95% non-condensing
SGI MIS NAS Server Specifications	
Servers/System	–One server module per system with dual-socket processors per server
Processor support	–Supports Intel® Xeon® series processors –Supports Intel Turbo Boost Technology 2.0
Max cores	16 per server
Memory	8 DDR3 DIMMs (16 GB each) on the motherboard
Boot drives	–Two per server, using ZFS mirror configuration –3.5" or 2.5" –SAS drives only
Networking	Up to four user-specified PCIe HBAs, full-height (4.25") and half-depth (3.375"), externally or internally facing
Expansion slots	Single server: 6 x PCIe Gen2
External storage attachment	Up to 4 SGI MIS JBOD Units via PCIe cards

Table B-1 Technical Specifications **(continued)**

Attribute	Specification
Internal storage	Up to 72 SAS 2.5" or 3.5" drives (70 data drives) Two drives are reserved as boot disks in the controller enclosure
SGI MIS NAS JBOD Specifications	
Internal Storage	Up to 81 SAS 2.5" or 3.5" hard disk drives
Connectivity	8 SAS ports on each MIS JBOD (two I/O modules)

Regulatory Compliance

Electromagnetic Emissions: FCC Class A, EN 55022 Class A, EN 61000-3-2/-3-3, CISPR 22 Class A

Electromagnetic Immunity: EN 55024/CISPR 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)

Safety: CSA/EN/IEC/UL 60950-1 Compliant, UL or CSA Listed (USA and Canada), CE Marking (Europe)

California Best Management Practices Regulations for Perchlorate Materials: This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. "Perchlorate Material-special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate"

