



SGI® NAS ISS3124-RP2 Server and
IS2224 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® NAS ISS3124-RP2 Server and IS2224 JBOD 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 installers, users and system administrators of the SGI ISS3124-RP2 and IS2224 JBOD 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 ISS3124-RP2 NAS system.

Chapter Descriptions

The following topics are covered in this guide:

- **Chapter 1, “Introduction,”** provides an overview of the ISS3124-RP2 based 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, “ISS3124-RP2 Server and IS2224 JBOD NAS System Hardware Installation,”** provides hardware, drive and cable installation instructions for SGI NAS system hardware. Rails, enclosures or other mounting hardware that did not come already installed in a system rack are covered, along with basic cabling guidelines.
- **Chapter 3, “ISS3124-RP2 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 NAS system.
- **Appendix A, “BIOS Error Codes,”** provides a brief listing of BIOS (beep) error codes.
- **Appendix B, “System Specifications and Regulatory Overview,”** provides basic environmental operating requirements and regulatory information for the SGI NAS system.

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 NAS CIFS User Guide Release 3.1.x*, publication number, 007-5949-00x

For customers who have purchased the optional SGI NAS common internet file system (CIFS) application software. This guide provides NAS users/administrators and general system administrators with information on how to create the CIFS share on the SGI NAS side and operate shares in workgroup and domain modes. Active directory integration tips are provided along with descriptions of how to give permissions to specified users, and create identity mappings.

- 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.

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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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- Contact your customer service representative and ask that an incident be filed in the SGI incident tracking system.
- Provide your comments to the SGI support center nearest you. For a list of support centers, see the SGI support website located at:

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

SGI values your comments and will respond to them promptly.

Introduction

The SGI ISS3124-RP2 NAS is a 2U rackmount system (see [Figure 1-1 on page 2](#) for an example).

In addition to the ISS3124-RP2 NAS head node controller board and chassis, various standard components have been included with each NAS system, as listed:

- An “open me first” kit (including this document)
- SAS or SSD drives and mounting brackets with labels
- Two power supplies (installed in the ISS3124-RP2 NAS server enclosure)
- One rackmount rail kit (already mounted if you ordered an SGI rack)
- One CD containing drivers and utilities

Important: SGI NAS 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:

- Optional expansion drive enclosures (IS2224 JBOD systems)
- An SGI computer equipment rack (D-Rack)

Note: If you ordered your ISS3124-RP2 NAS system with a rack, it should come with all enclosures already installed and cabled. See also, “[Inspecting a Shipment](#)” in [Chapter 2](#).

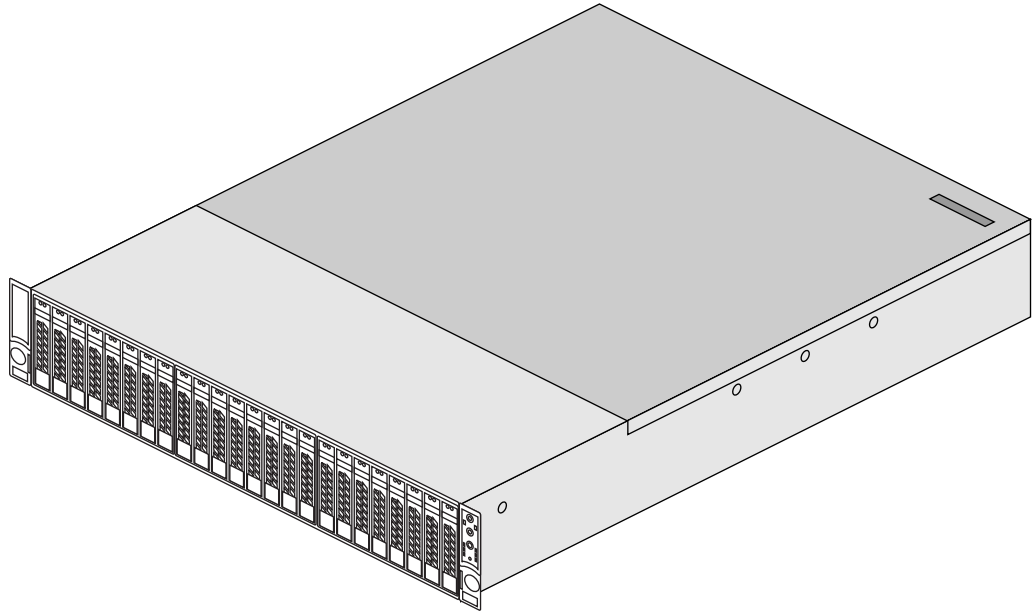


Figure 1-1 SGI ISS3124-RP2 NAS Enclosure Example (Top View)

System Overview

The SGI ISS3124-RP2 network-attached storage (NAS) server is a file-level compute data storage system connected to a computer network and providing data access to a heterogeneous group of clients. The ISS3124-RP2 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 ISS3124-RP2 NAS server supports direct-attached SAS, and SSD disks.

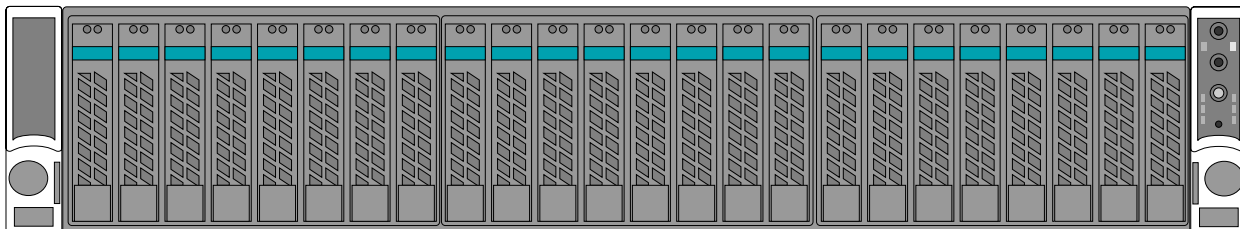


Figure 1-2 ISS3124-RP2 NAS Server Front View Example

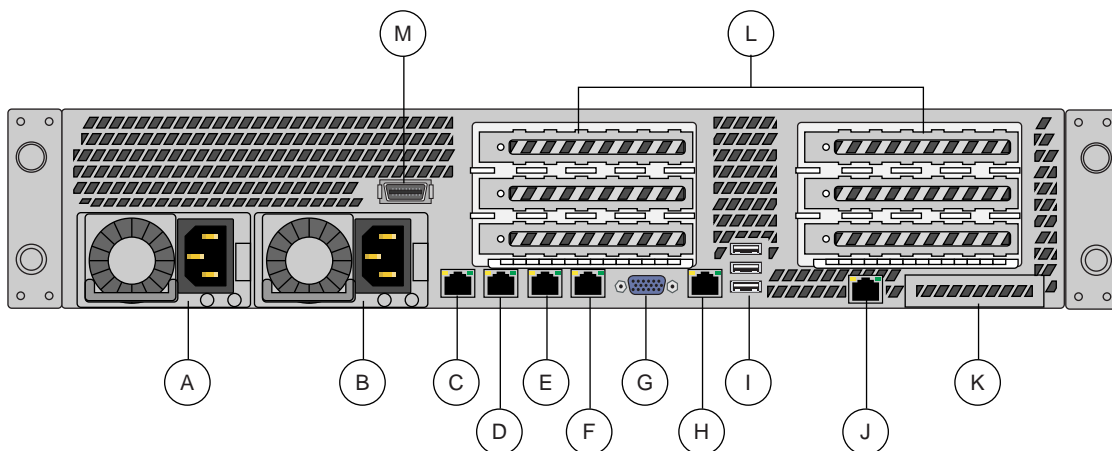


Figure 1-3 ISS3124-RP2 NAS Server Rear Components Example

The rear panel of the ISS3124-RP2 NAS server (see Figure 1-3) has multiple interface and functional components as follows:

(A) Power Supply Module #1 and (B) Power Supply Module #2, including the server's two power connectors. (C), (D), (E) and (F) are NICs one through four. (G) is the server's video connector, (H) is the server's primary RJ45 Serial-A port and (I) is USB ports 0, 1 and 2. (J) is a remote-management module (RMM4) NIC port, (K) is an optional I/O module ports/connectors slot, (L) shows the locations of add-in adapter slots via Riser Card 1 and Riser Card 2 and (M) shows the location of the Serial-B port (optional).

Optional IS2224 JBOD Storage

IS2224 JBODs are 2U, rack-mountable storage enclosures based on 6Gb/s SAS technology and powered by the LSI SAS2x36 6Gb/s SAS expander IC. They offer hot-swappable drive bays that support 3Gb/s and 6Gb/s SAS hard disk drives (HDDs) or solid-state drives (SSDs). The following paragraphs and illustrations provide an overview of the IS2224 JBOD; for more detailed information see the *SGI InfiniteStorage IS2224 Installation and Overview Guide*, P/N 007-5830-00.x.

IS2224 JBOD Front-Panel Features

The JBOD storage enclosure has a front control panel (1), slots for up to 24 drives (2) and plastic end caps as shown in (3) to cover the front-mounting hardware.

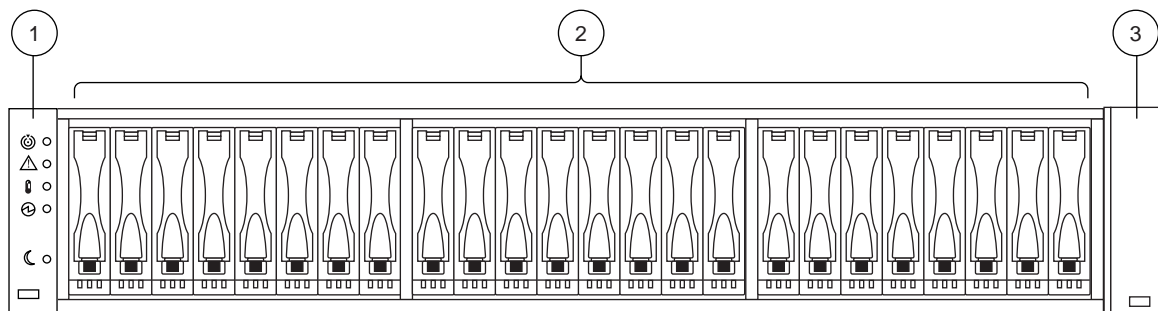


Figure 1-4 IS2224 JBOD Storage Enclosure Example (Front View)

The front-panel control LEDs (see callout (1) in Figure 1-4 and also [Figure 1-5 on page 5](#)) provide status and operational information for the JBOD enclosure. Note that during the power-up process these LEDs may flash intermittently until all sub-systems within the enclosure are fully powered on. Ensure that all storage enclosures in the system have powered on fully before bringing the system server online. The indicators have the following functions:

- (1) Storage enclosure identifier LED - this blue/white indicator is on for unit identification only
- (2) Amber service action required LED
- (3) Amber over temperature warning LED
- (4) Green “power good” LED lights when the enclosure is fully operational
- (5) Green “standby” power mode LED lights when power is available (but unit is not operational)

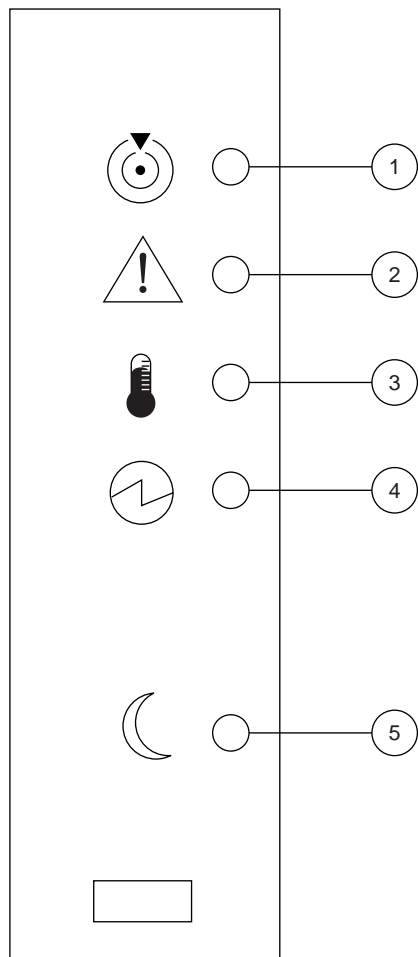


Figure 1-5 IS2224 JBOD Enclosure Front Status Panel Example

Retention of critical data is enabled by optional, fully redundant and hot-swappable Environmental Services Modules (ESMs). Each ESM features three 6Gb/s SAS ports, providing connectivity for two host devices and an expansion port to connect additional JBOD enclosures via SFF-8088 connections. LEDs on the power supplies, ESMs and each individual drive carrier allow all system components to be closely monitored to help system administrators ensure storage integrity. [Figure 1-4 on page 4](#) shows an example rear view of the IS2224 JBOD enclosure.

All system power, data interconnect and some status LEDs are located on the back of the system.

- (1) ESM A canister
- (2) Host SFF-8088 connector 1
- (3) Host SFF-8088 connector 2
- (4) Seven segment display indicators
- (5) Serial connector
- (6) Ethernet connector
- (7) Expansion port SFF-8088 connector
- (8) Power/Fan canisters
- (9) Power connectors
- (10) Power switch locations
- (11) ESM B canister location (not installed in this example)

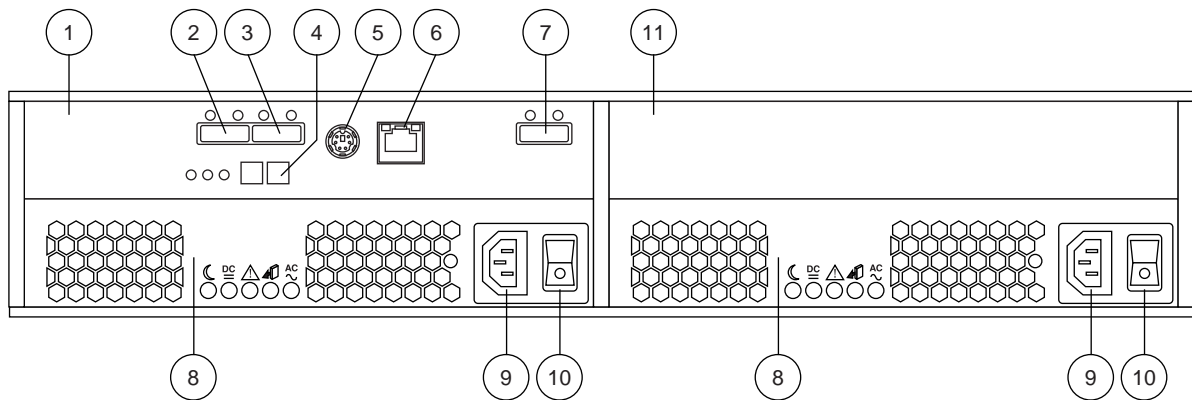


Figure 1-6 IS2224 JBOD Storage Enclosure Example (Rear View)

Next Steps

Important: Be sure to read the additional safety information related to your SGI 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 ISS3124 NAS hardware components and cables, go to [Chapter 2, “ISS3124-RP2 Server and IS2224 JBOD 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, “ISS3124-RP2 NAS Operation and GUI Startup.”](#)

Pre-Racked NAS System Setup

If the system chassis is pre-installed in a rack, system cabling can be confirmed using the example information in [Chapter 2, “ISS3124-RP2 Server and IS2224 JBOD NAS System Hardware Installation.”](#) When the system is ready to be plugged in and booted, go to [Chapter 3, “ISS3124-RP2 NAS Operation and GUI Startup.”](#)

ISS3124-RP2 Server and IS2224 JBOD NAS System Hardware Installation

This chapter provides a hardware setup checklist and instructions to help you get the SGI NAS system hardware operational. If the NAS hardware is already installed in a rack and cabled together as a system, continue on to [Chapter 3, “ISS3112-RP2 NAS Operation and GUI Startup,”](#) to start your system hardware and confirm your SGI NAS GUI operation settings.

Unpack the System Enclosures

Inspect the shipping containers that the NAS enclosure(s) were shipped in and note any damage to the containers or enclosures. If an 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 NAS enclosures. 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 10.

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

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: When lifting any of the NAS enclosures, 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.



Figure 2-1 Slide/Rail Equipment Usage Caution

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 drives and power supply modules to cool before touching them.

Rack Mounting Considerations

Use the guidelines in the following subsections when rack mounting servers or JBOD expansion units.

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. Always keep the rack's front door and all panels and components on the systems closed when not servicing to maintain proper cooling.

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 over-current 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).

Installing the ISS3124-RP2 NAS Server into a Rack

Use the following steps to install the ISS3124-RP2 NAS server rail kit in the rack.

See the information in “IS2224 JBOD Enclosure Cable Guide and Chassis Location” on page 23 to cable one or more IS2224 JBOD expansion units to the ISS3124-RP2 NAS server.

1. Attach the ISS3124-RP2 slide rails to the rack as shown in the example in [Figure 2-2](#).

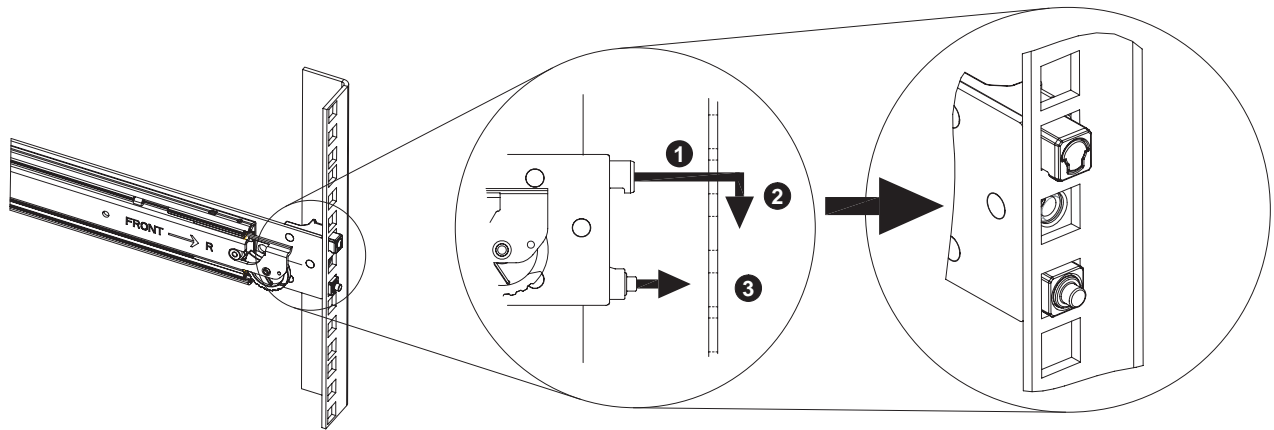


Figure 2-2 Attaching ISS3124-RP2 Rail Slides to the Rack

2. Fully extend the rail slides as shown in the example in [Figure 2-3](#).

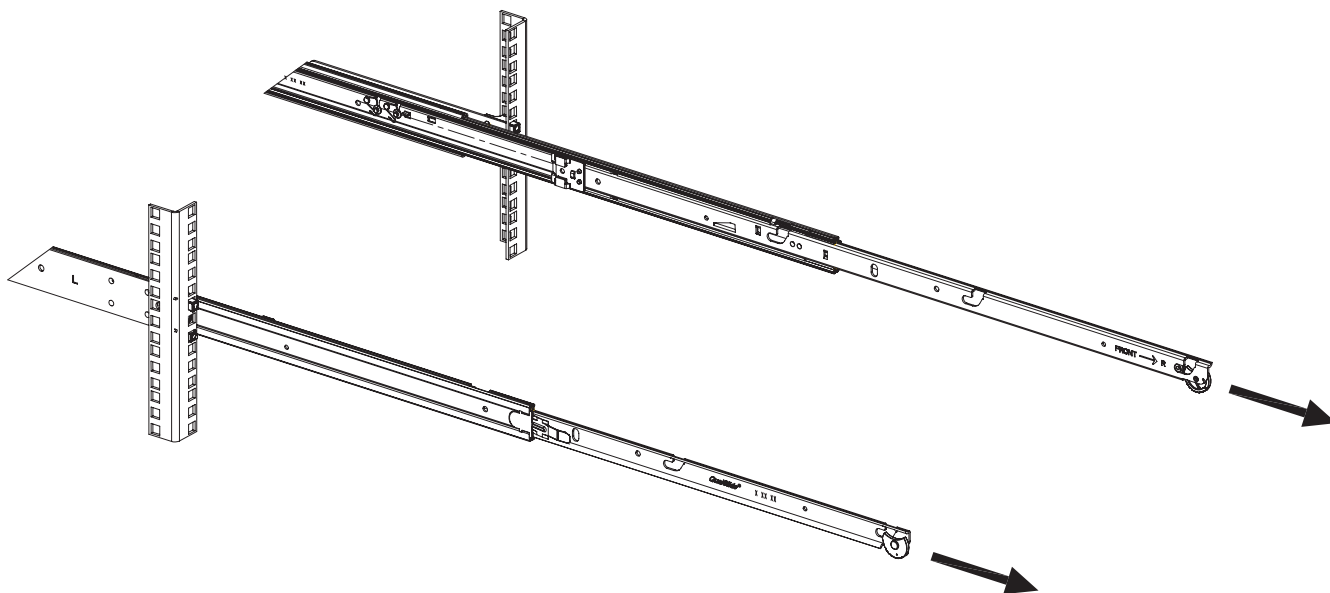


Figure 2-3 Extending ISS3124-RP2 Rail Slides Example

3. Attach the chassis to the rail slides as shown in the example in [Figure 2-4](#).

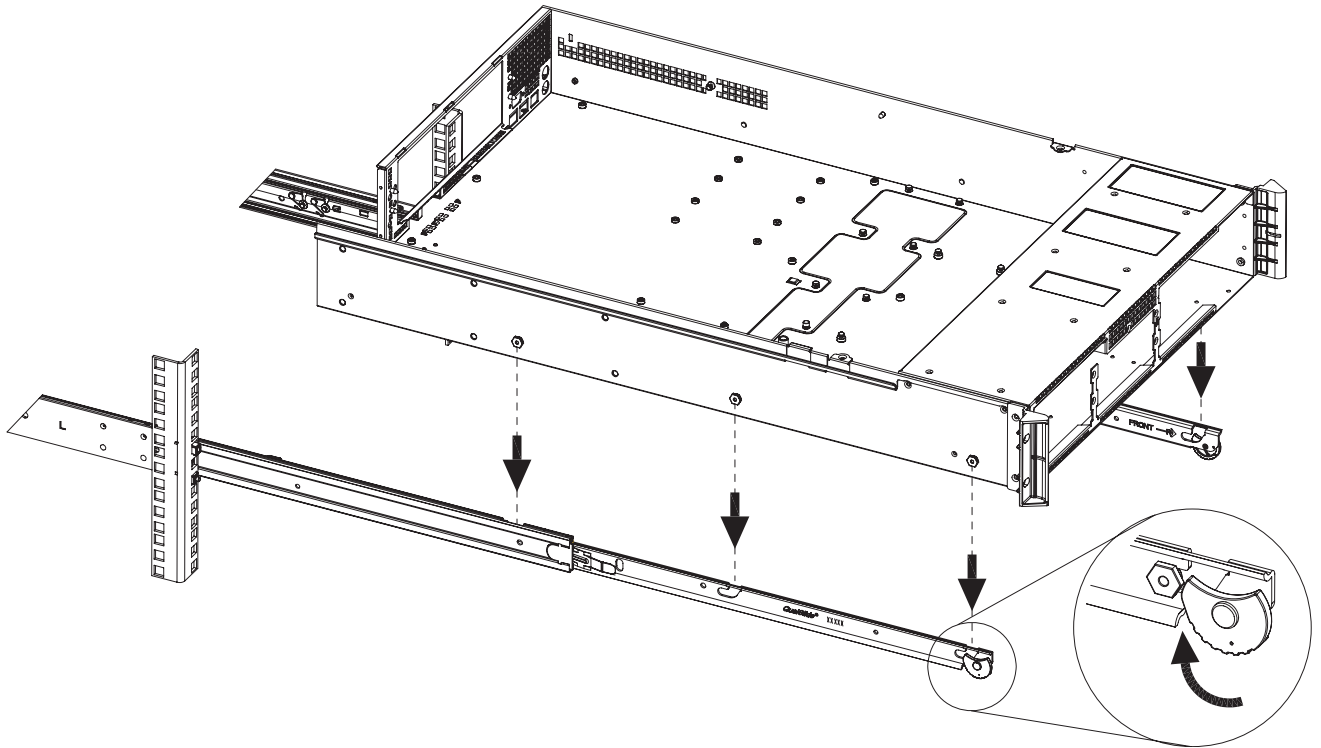


Figure 2-4 Attaching Chassis to Rail Slides

4. Push the release tab and push the chassis into the rack as shown in the example in [Figure 2-5](#).

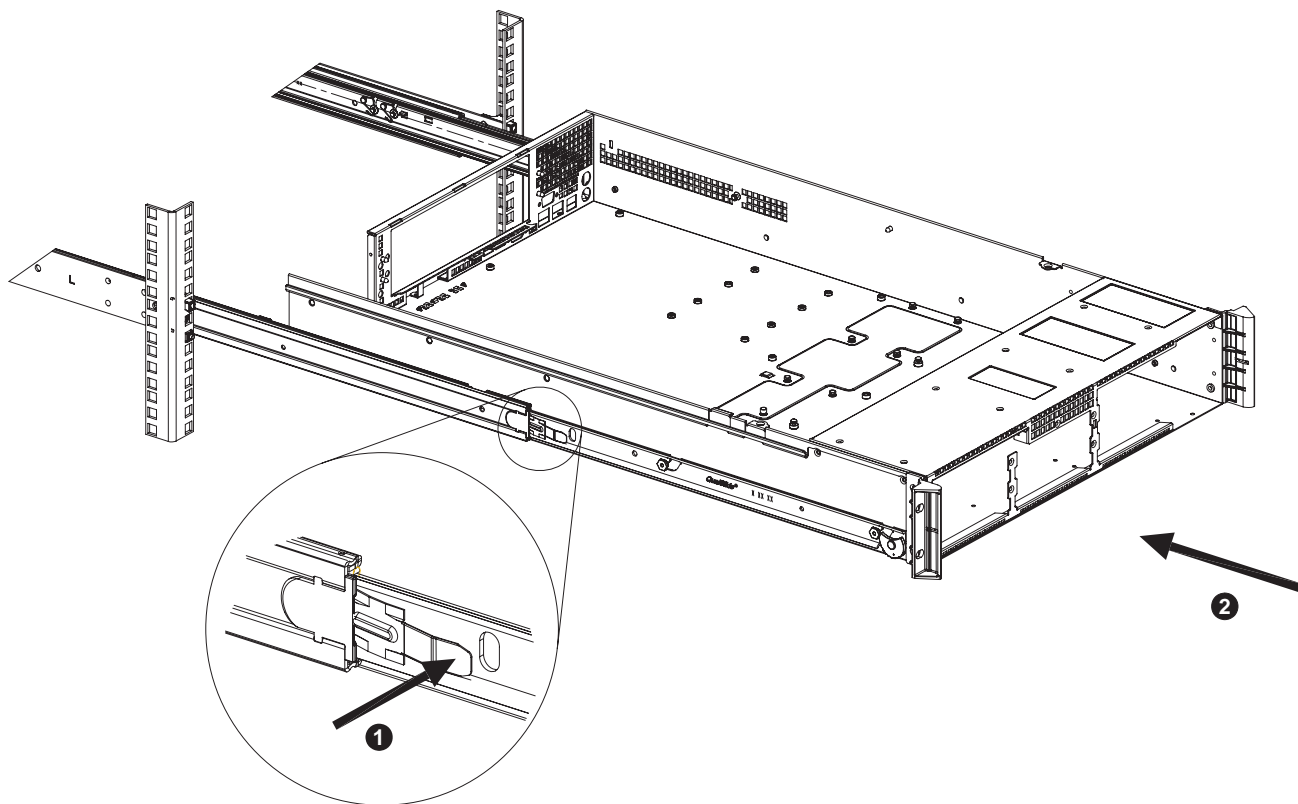


Figure 2-5 ISS3124-RP2 Server Chassis Rail Slide Release Tab Example

Rackmounting an Optional IS2224 JBOD Enclosure

Use two people whenever installing the IS2224 JBOD enclosure as the unit can weigh up to 40 lbs (18.1 kg). Be sure the airflow through the unit matches with other components installed in the rack, Figure 2-6 shows the airflow pattern from the front (1) to the rear (2).

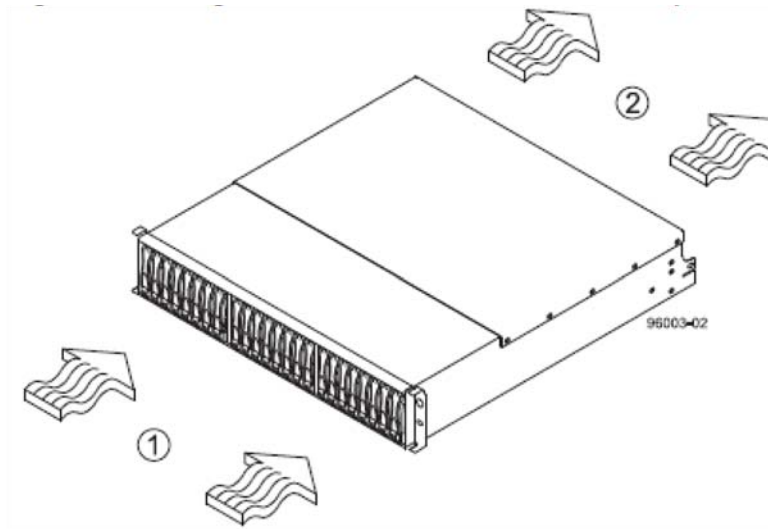


Figure 2-6 IS2224 JBOD Enclosure Airflow Example

Be sure to read the rackmounting guidelines listed in “[Rack Mounting Considerations](#)” on page 12 in this chapter. Use the following steps and illustrations to properly mount the unit in a rack.

Position the IS2224 Mounting Rails

Position the mounting rails in the rack using the following steps, see Figure 2-7 as a reference.

- (1) Mounting Rail
- (2) Existing Storage Enclosure
- (3) Clearance Above and Below the Existing Enclosure
- (4) Screws for Securing the Mounting Rail to the Rack rails (Front and Rear)
- (5) SGI D-Rack front panel or Industry Standard Cabinet

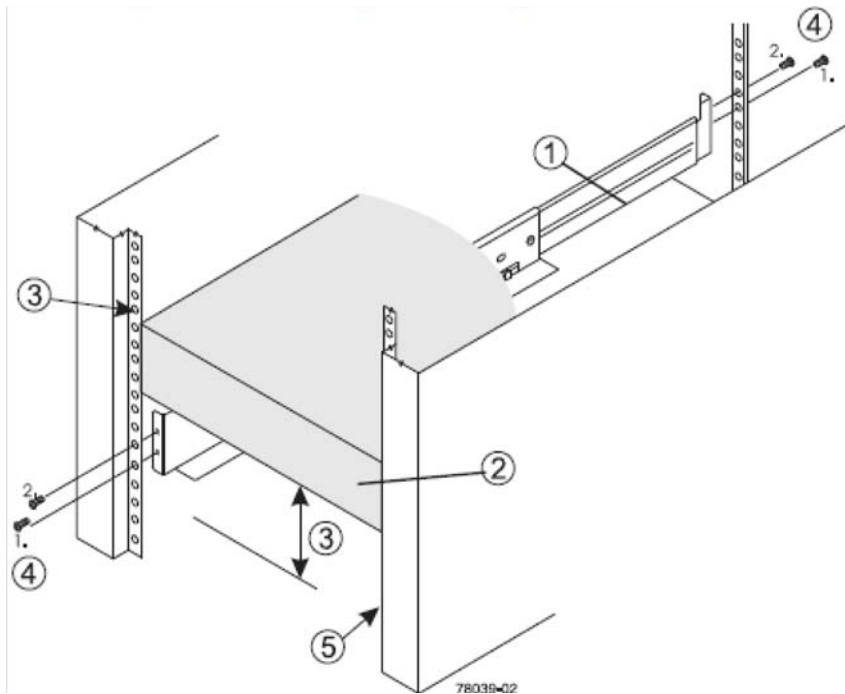


Figure 2-7 Position the Mounting Rails in the Rack

Tip: If you are installing the mounting rails above an existing storage enclosure, position the mounting rails directly above the storage enclosure. If you are installing the mounting rails below an existing storage enclosure, allow 8.8-cm (3.5-in.) vertical clearance for a storage enclosure.

1. Attach the mounting rails to the rack by performing these substeps:
 - Make sure that the adjustment screws on the mounting rail are loose so that the mounting rail can extend or contract as needed.
 - Place the mounting rail inside the cabinet, and extend the mounting rail until the flanges on the mounting rail touch the inside of the cabinet.
 - Ensure that the alignment spacers on the front flange of the mounting rail fit into the mounting holes in the cabinet (Figure 2-4 on page 2-6). Note that the front flange of each mounting rail has two alignment spacers. These alignment spacers are designed to fit into the mounting holes in the cabinet. The alignment spacers help position and hold the mounting rail.
- (1) Rack Rail Mounting Holes
 - (2) Adjustment Screws for locking the Mounting Rail Length
 - (3) Enclosure Mounting Rails
 - (4) Clip for Securing the Rear of the Storage Enclosure

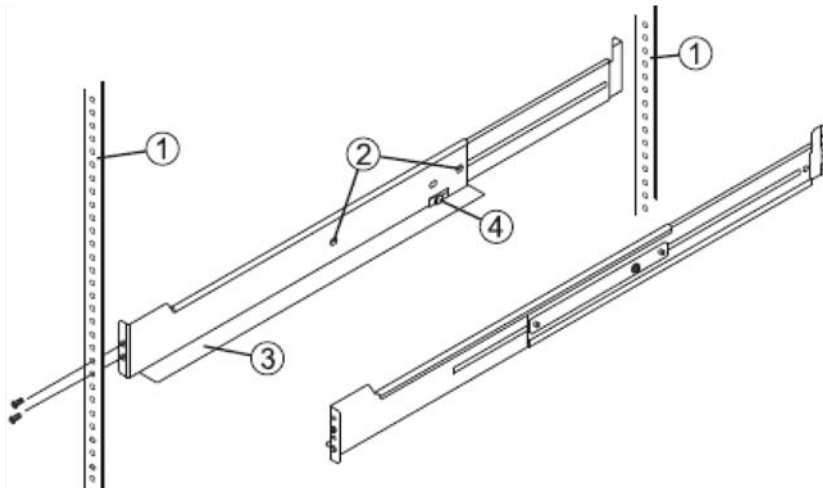


Figure 2-8 Attaching the Mounting Rails to the Cabinet

Installing the IS2224 Storage Enclosure on the Rails

Figure 2-9 shows an example (1) of the alignment spacers on an IS2224 mounting rail.

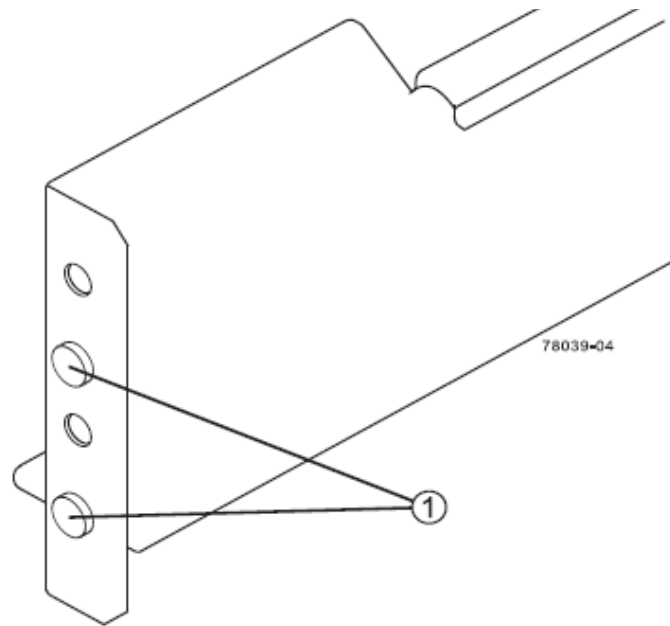


Figure 2-9 Alignment Spacers on the IS2224 Mounting Rail

Use the Alignment Spacers to help properly place the rails into the rack and follow these substeps to secure the rails in place.

1. Insert one M5 (12mm) screw through the front of the cabinet, and screw into the top captured nut in the mounting rail.
2. Insert two M5 (12mm) screws through the rear of the cabinet and screw into the captured nuts in the rear flange in the mounting rail.
3. Tighten the adjustment screws on the mounting rail.
4. Repeat the previous three steps with the additional rail to install the second mounting rail on the other side of the cabinet.
5. With the help of another person, slide the rear of the enclosure onto the mounting rails.
6. The rear edge of the storage enclosure must fit into the clip on the mounting rail.
7. The storage enclosure is correctly aligned when the following conditions are met on both mounting rails:

- The mounting holes on the front flanges of the storage enclosure align with the mounting holes on the front of the mounting rails.
- The rear edge of the storage enclosure sheet metal fits into the clip on the mounting rail (reference Figure 2-10).
- The holes in the storage enclosure sheet metal for the rear hold-down screws align with the captured nuts in the side of the mounting rails.

Mounting rail (1)

Mounting rail clip (2)

Partial view of the storage enclosure's rear sheet metal (3)

Align hole in the storage enclosure sheet metal with captured nut in the mounting rail (4)

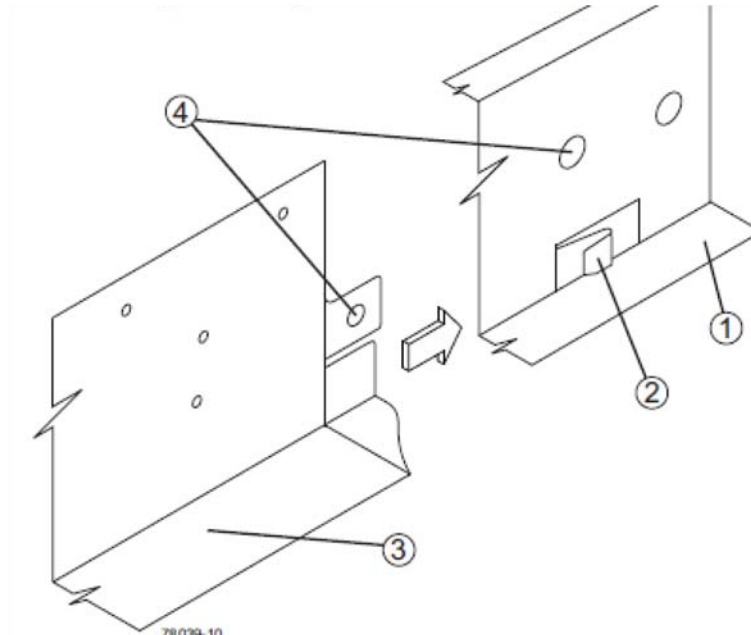


Figure 2-10 Sliding the Storage Enclosure into the Clip on the Mounting Rail

8. Secure the front of the storage enclosure to the cabinet. Use the two screws item (1) in Figure 2-11 to attach the flange on each side of the front of the storage enclosure to the mounting rails.

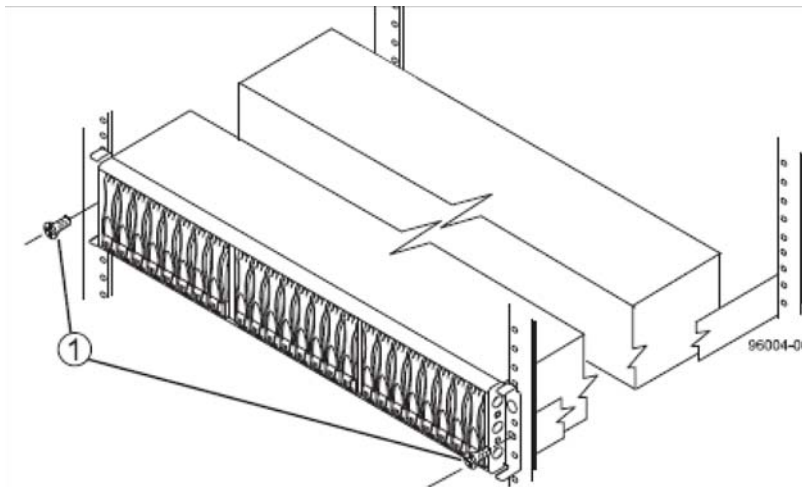


Figure 2-11 Securing the IS2224 Storage Enclosure to the Rack's Front

9. Insert one M5 (12mm) screw through the bottom hole of a flange on the storage enclosure so that the screw goes through the rack's vertical front rail and engages the bottom captured nut in the mounting rail.
10. Repeat this process for the opposite side of the enclosure and tighten the screws after both are properly aligned and in place.
11. Secure the enclosure's plastic front-end caps by referencing [Figure 2-12 on page 23](#) and performing the following substeps:
 - Put the top of the end cap on the hinge tab (1) that is part of the storage enclosure mounting flange.
 - Gently press on the bottom of the end cap until it snaps into place over the retainer (2) on the bottom of the storage enclosure mounting flange.

Note: The left end cap has holes so the LEDs can be seen through them after it is attached to the storage enclosure.

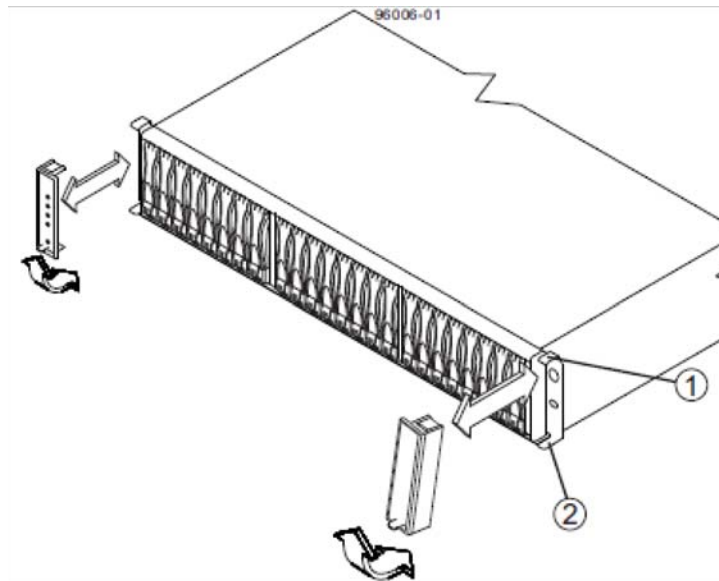


Figure 2-12 Attaching End Caps to the IS2224 Storage Enclosure

IS2224 JBOD Enclosure Cable Guide and Chassis Location

Figure 2-13 shows an example connection between the ISS3124-RP2 and one IS2224 JBOD unit. Your system may have different options than those shown, check with your service provider.

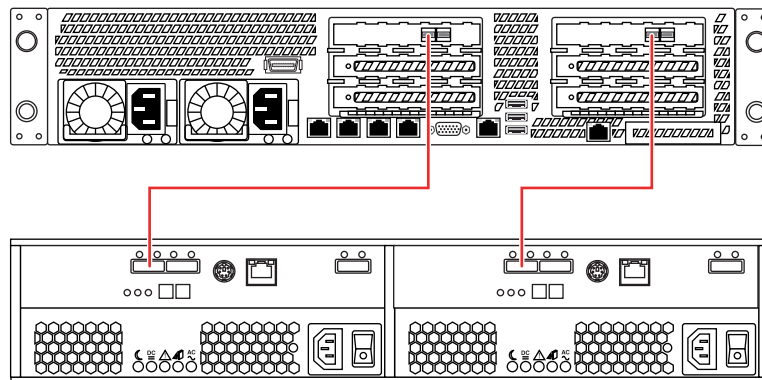


Figure 2-13 ISS3124-RP2 NAS Server with One IS2224 JBOD Expansion Cabling Example

Figure 2-14 shows example connections between the ISS3124-RP2 and two IS2224 JBOD units.

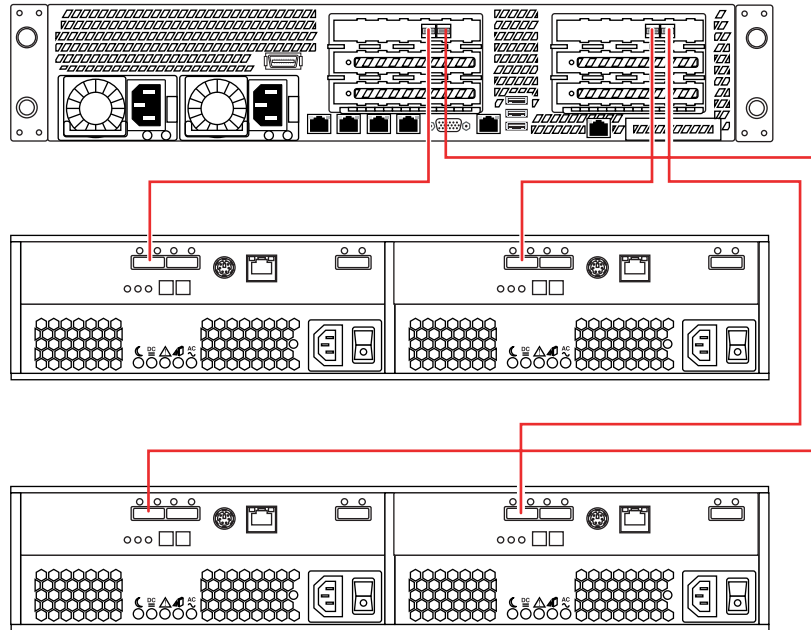


Figure 2-14 ISS3124-RP2 NAS Server with Two IS2224 JBOD Expansions Cabling Example

Figure 2-15 shows example connections between the ISS3124-RP2 and three IS2224 JBOD units.

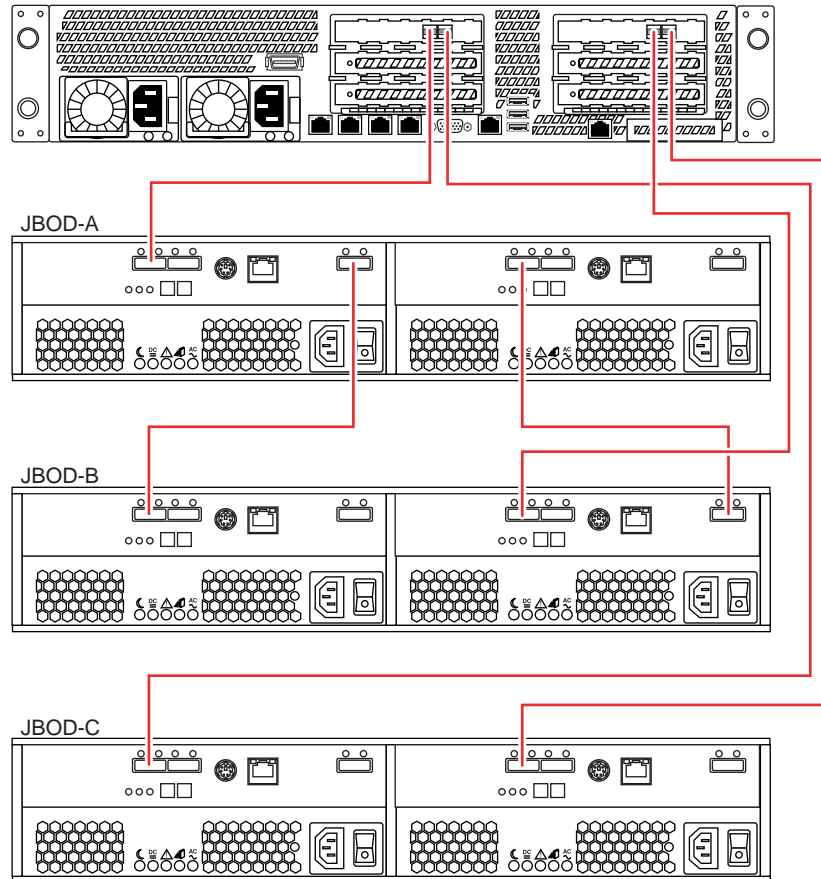


Figure 2-15 ISS3124-RP2 NAS Server with Three IS2224 JBOD Expansions Cabling Example

Figure 2-16 shows a cabling example for an ISS3124-RP2 NAS server interconnected with four IS2224 JBOD expansion units.

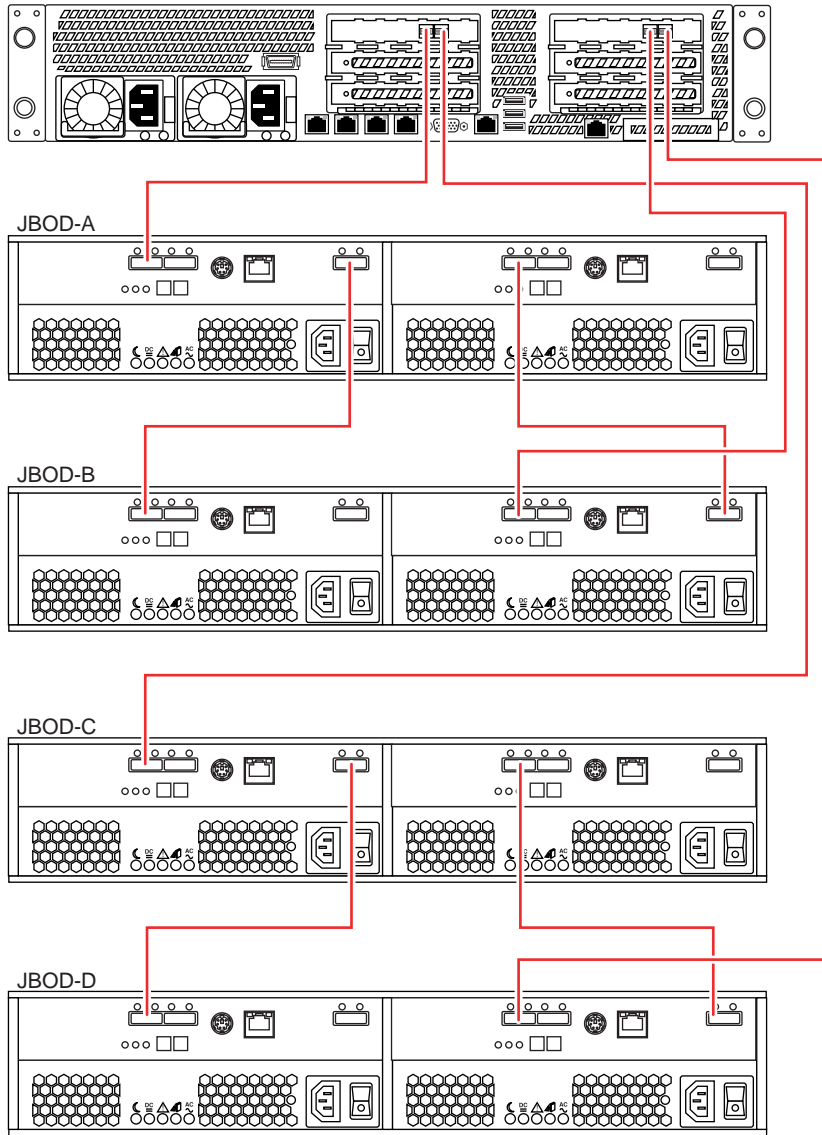


Figure 2-16 ISS3124-RP2 NAS Server with Four IS2224 JBOD Expansions Cabling Example

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.

ISS3124-RP2 NAS Operation and GUI Startup

Overview

This chapter covers basic hardware operation and GUI startup for your ISS3124-RP2 NAS system.

Front Bezel and Control Panels

On the chassis front you can see a control panel (reference Figure 3-1). There is a control panel on each ISS3124-RP2 NAS head server enclosure. There is also a status/control panel for each JBOD expansion unit on an SGI NAS.

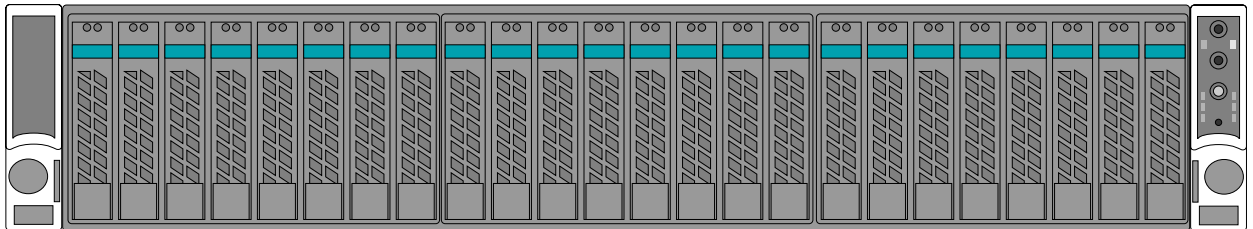


Figure 3-1 RP2 NAS Head Front Panel Example

[Figure 3-2 on page 30](#) shows an enlarged example of the front control and status panel on the ISS3124-RP2 NAS server. For more detailed information on the ISS3124-RP2 server see the *SGI Rackable RP2 Standard-Depth Servers User Guide*, publication #, 007-5837-00x.

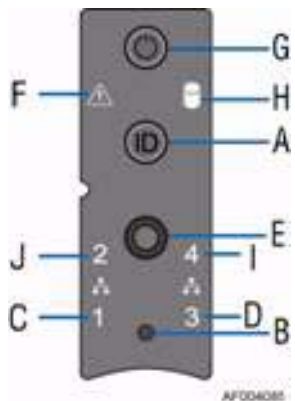


Figure 3-2 ISS3124 NAS Server Front Panel Controls and Indicators Example

Table 3-1 describes the control panel components and their functions.

Table 3-1 ISS3124-RP2 Control Panel Components and Functions

Label	Button/LED	Color	Condition	Function
A	System ID button with LED	Blue	On	Highlights targeted system. Can be activated by the button or software.
B	NMI button			Used for diagnostics. Recessed (tool required for use).
C, D, I, J	NIC- <i>x</i> Link/Activity LED	Green	On	Network link to NIC- <i>x</i> detected.
			Blink	NIC- <i>x</i> activity detected.
			Off	No link.
E	System Cold Reset button			When pressed, this button reboots and re-initializes the server.

Table 3-1 ISS3124-RP2 Control Panel Components and Functions **(continued)**

Label	Button/LED	Color	Condition	Function
F	System Status LED	Green	On	System ready/No alarm.
			Blink	System ready, but degraded: – Redundancy lost such as a pwr supply or fan fail. – Non-critical temp/voltage threshold. – Battery failure. – Predictive power supply failure.
		Amber	On	Critical Alarm: critical power modules failure, critical fans failure, voltage (power supply), critical temperature and voltage
			Blink	Non-Critical Alarm: Redundant fan failure, redundant power module failure, non-critical temperature and voltage
			Off	– Power off: System unplugged. – Power on: System powered off and in standby, no prior degraded\non-critical\critical state.
G	System Power button with LED	Green	On	Power On/ACPI S0 state
			Blink	Sleep/ACPI S1 state
			Off	Power Off/ACPI S5 state
H	Hard Drive Activity LED	Amber	On	Hard drives are available.
			Blink	Hard drive activity detected.
			Off	No hard drives are available.

Control panel notes:

- Blink rate is ~1 Hz at 50% duty cycle.
- It is also off when the system is powered off (S5) or in a sleep state (S1).
- The power LED sleep indication is maintained on standby by the chipset. If the system is powered down without going through the BIOS, the LED state in effect at the time of power off is restored when the system is powered on until the has BIOS cleared it.

- If the system is not powered down normally, it is possible the Power LED will blink at the same time the system status LED is off due to a failure or configuration change that prevents the BIOS from running.

ISS3124-RP2 NAS GUI Startup

The SGI ISS3124-RP2 NAS is a software based network attached storage (NAS) appliance that features unlimited snapshots, snapshot mirroring (replication), NFS v3/v4, optional 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 ISS3124-RP2 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 ISS3124-RP2 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 ISS3124-RP2 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 ISS3124-RP2 NAS Software

Boot the SGI ISS3124-RP2 NAS appliance. After the appliance boots up, review and accept the SGI 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:

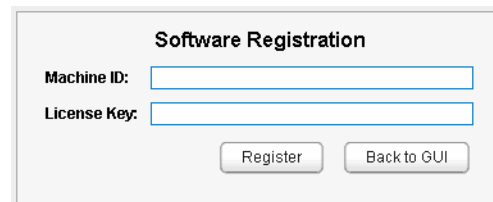
```
nmc:/$ show appliance license
```

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 3-3 SGI 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 3-4 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".

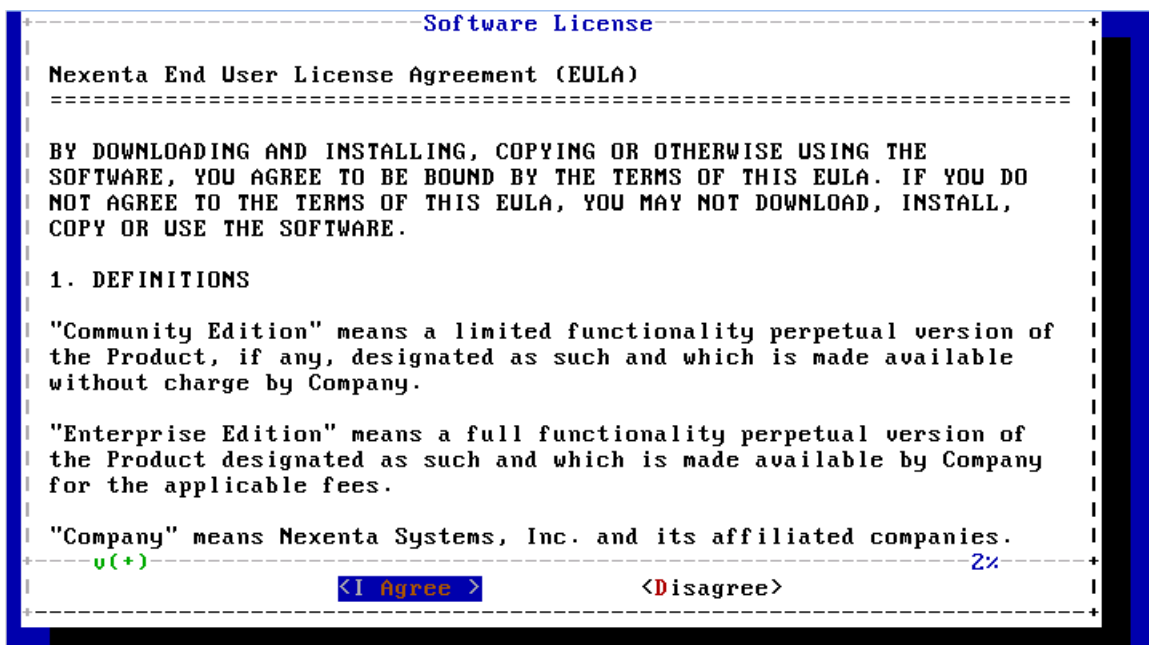


Figure 3-4 NAS Software License Agreement Screen Example

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 : [REDACTED]
Registration Key  : [REDACTED]
-----

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 3-5 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 3-6 on page 36](#). 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 3-6.

```

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 3-6 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 ISS3124-RP2 NAS WEB GUI (NMV). You can select either HTTP – fast and (plain text) unsecured, or HTTPS – secured, but less responsive.

Figure 3-7 on page 37 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
NMC 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 3-7 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 ISS3124-RP2 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 3-8 on page 38 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 3-8 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 3-8, use the displayed URL (in this example case it is `http://192.168.0.251:2000`) to connect your browser to the SGI 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 ISS3124-RP2 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).

NAS Node Serverboard Battery



Caution: There is a danger of explosion if an 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.

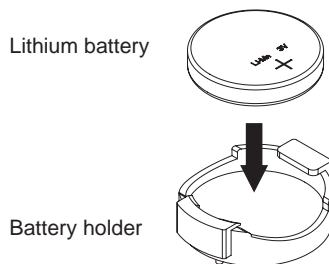


Figure 4-1 Installing the Onboard Battery

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 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 ISS3124-RP2 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 SGI NAS server 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.

ISS3124-RP2 NAS Server Disk Drive LEDs

[Figure 5-1 on page 47](#) shows the location of the drive's green and yellow disk drive activity and status LEDs.

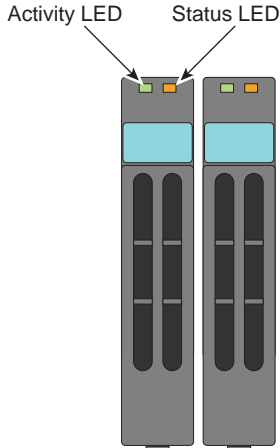


Figure 5-1 ISS3124-RP2 Disk Drive LEDs

Table 5-1 describes the meaning of the RP2 NAS server’s disk drive status LED.

Table 5-1 RP2 HDD Status LED Functions

LED Color	LED Behavior	Drive Status
Amber	Off	No access and no fault.
	Solid On	Hard drive fault has occurred.
	Blink	– RAID rebuild in progress (1Hz). – Identify (2Hz).

Table 5-2 describes the functions of the ISS3124-RP2 disk green drive activity LED.

Table 5-2 ISS3124-RP2 HDD Activity LED Functions

LED Color	Drive Condition	Drive Type	LED Behavior
Green	Power on with no drive activity	SAS	LED stays on.
	Power on with drive activity.	SAS	LED blinks off when processing a command.
	Power on and drive spun down	SAS	LED stays off.
	Power on and drive spinning up	SAS	LED blinks.

ISS3124-RP2 Server Power Supply LEDs

There is a single bi-color LED (green/amber) to indicate the ISS3124-RP2 server power supply status. [Table 5-3](#) describes the different states of the LED.

Table 5-3 ISS3124-RP2 Power Supply LED States

LED State	Power Supply (PS) State
Off	No AC power to any PS.
Green	Output on and Ok.
Green, 1Hz blink	AC present (only 12VSB on). PS off or PS in cold redundant state.
Green, 2Hz blink	PS firmware updating.
Amber	– PS critical event causing a shutdown/failure (OCP, OVP, fan failure) – AC cord unplugged or AC power lost. A second power supply in parallel still has AC input power.
Amber, 1Hz blink	PS warning events where the power supply continues to operate (high temperature, high power, high current, slow fan).

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 A, “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 [“No Video After Power-On” on page 48](#) 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 SGI 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 “[Front Bezel and Control Panels](#)” in Chapter 3).
- 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 IS2224 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 NAS server or JBOD units. Reduced airflow may cause an over-temperature (overtemp) condition in the NAS server 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 ISS3124-RP2 NAS server and IS2224 JBOD disk expansion.

Operating Environment

Table B-1 describes the technical specifications for the ISS3124-RP2 NAS server.

Table B-1 ISS3124-RP2 NAS Server Environmental Specifications

Attribute	Specifications
Operating temperature	+10°C to +35°C with the maximum rate of change not to exceed 10°C per hour
Non-operating temperature	-40°C to +70°C with the maximum rate of change not to exceed 20°C per hour
Non-operating humidity	90%, non-condensing at 35°C
Acoustic noise/Sound power	7.0 BA in operating condition at typical office ambient temperature (23°C +/- 2°C).
Shock, operating	Half sine, 2 g peak, 11 milliseconds
Shock, unpackaged	Trapezoidal, 25 g, velocity change 136 inches/second (40 lbs to less than 80 lbs)
Shock, packaged	Non-palletized free fall in height 24 inches (40 lbs to less than 80 lbs)
Vibration, unpackaged	5 Hz to 500 Hz, 2.20 g RMS random
ESD	+/- 12 KV, except I/O port +/- 8 KV per test specification
System cooling requirement in BTU/Hr	460 Watt Max – 1570 BTU/hour 750 Watt Max – 2560 BTU/hour
Maximum weight	100 lbs (45 kg)

Table [Table B-2](#) outlines the operating environment and specifications for the IS2224 JBOD disk enclosures.

Table B-2 IS2224 JBOD Enclosure Operating and Environmental Specifications

Attribute	Specifications
Operating temperature	+5°C to +45°C (up to 6,000 feet) +5°C to +35°C (6,000-10,000 feet) with the maximum rate of change not to exceed 10°C per hour
Non-operating temperature	-10°C to +50°C with the maximum rate of change not to exceed 20°C per hour
Transit temperature range	-40°C to +60°C
Operating humidity	20% to 80%
Non-operating humidity	10% to 90%, non-condensing at 35°C
Transit humidity range	5% to 95%
Enclosure weights	59.5 lbs (27.1 kg) [shipping weight 70 lbs (31.8 kg)]
Enclosure power supplies	585 W maximum per supply (2 per enclosure)
Chassis Dimensions	
Height	3.47" (88 mm)
Width	17.7" (449 mm)
Depth	19.2" (487 mm)

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”

