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Hitachi Unified Storage
Getting Started Guide

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Hitachi Data Systems

MK-91DF8303-07

043-100847-01

Contents

Preface

Welcome to the Hitachi Unified Storage Hardware Getting Started Guide.

This document describes how to set up, install, and configure Hitachi Unified Storage systems. This document includes a full table of contents, index, chapter task lists, and numerous cross-references to help you find specific information.

Read this document carefully to understand how to use this product, and maintain a copy for reference purposes.

This preface includes the following information:

Intended audience

This document is intended for system administrators, Hitachi representatives, and authorized service providers who install, configure, and operate Hitachi Unified Storage systems.

This document assumes the user has a background in data processing and understands storage systems and their basic functions, Microsoft Windows and its basic functions, and Web browsers and their basic functions.

Product version

This document applies to Hitachi Unified Storage firmware version 0950/A or later.

Document revision level

Revision	Date	Description
MK-910F8303-00	March 2012	Initial release.
MK-910F8303-01	July 2012	Supersedes and replaces MK-91DF8303-00.
MK-910F8303-02	August 2012	Supersedes and replaces MK-91DF8303-01.
MK-910F8303-03	October 2012	Supersedes and replaces MK-91DF8303-02.
MK-910F8303-04	November 2012	Supersedes and replaces MK-91DF8303-03.
MK-910F8303-05	February 2013	Supersedes and replaces MK-91DF8303-04.
MK-910F8303-06	May 2013	Supersedes and replaces MK-91DF8303-05.
MK-910F8303-07	August 2013	Supersedes and replaces MK-91DF8303-06.

Changes in this revision

- Added a new chapter, Hitachi Unified Storage overview (page 1-2).
- Added Managing storage subsystems with Hitachi Device manager (page 6-5) and Connecting the SMU to an HDvM server (page 6-5).

Document organization

Thumbnail descriptions of the chapters are provided in the following table. Click the chapter title in the first column to go to that chapter. The first page of every chapter or appendix contains links to the contents.

Chapter Title	Description
Chapter 1, Introduction	Describes the combination of block and file types in the HUS 100 family.
Chapter 2, Prepare for installation	Describes how to prepare your system for installation.
Chapter 3, Review the system	Provides an overview of the system components.
Chapter 4, Rack and review the hardware	Describes how to install your system.
Chapter 5, Connect and power on the system	Describes how to connect hardware and power cables, and how to power on system components.
Chapter 6, Configure the system	Describes how to configure your system.
Chapter 7, Complete the installation	Describes how to complete your installation.
Appendix A, Hitachi Unified Storage user guides by topic	Provides a list of all Hitachi Unified Storage user documentation, by topic

Related documents

A complete list of HUS block module and file module documentation is located in Appendix A, Hitachi Unified Storage user guides by topic.

Document conventions

The following typographic conventions are used in this document.

Convention	Description
Bold	Indicates text on a window, other than the window title, including menus, menu options, buttons, fields, and labels. Example: Click **OK**.
Italic	Indicates a variable, which is a placeholder for actual text provided by you or the system. Example: copy *source-file target-file* Angled brackets (< >) are also used to indicate variables.
screen or code	Indicates text that is displayed on screen or entered by you. Example: `# pairdisplay -g oradb`
< > angled brackets	Indicates a variable, which is a placeholder for actual text provided by you or the system. Example: `# pairdisplay -g <group>` Italic font is also used to indicate variables.
[ ] square brackets	Indicates optional values. Example: [a | b] indicates that you can choose a, b, or nothing.

Convention	Description
{ } braces	Indicates required or expected values. Example: { a | b } indicates that you must choose either a or b.
| vertical bar	Indicates that you have a choice between two or more options or arguments. Examples: [a | b] indicates that you can choose a, b, or nothing. { a | b } indicates that you must choose either a or b.
underline	Indicates the default value. Example: [a | b]

This document uses the following symbols to draw attention to important safety and operational information.

Symbol	Meaning	Description
	Tip	Tips provide helpful information, guidelines, or suggestions for performing tasks more effectively.
	Note	Notes emphasize or supplement important points of the main text.
	Caution	Cautions indicate that failure to take a specified action could result in damage to the software or hardware.

Convention for storage capacity values

Physical storage capacity values (for example, disk drive capacity) are calculated based on the following values:

Physical capacity unit	Value
1 KB	1,000 bytes
1 MB	1,000 KB or $1{,}000^2$ bytes
1 GB	1,000 MB or $1{,}000^3$ bytes
1 TB	1,000 GB or $1{,}000^4$ bytes
1 PB	1,000 TB or $1{,}000^5$ bytes
1 EB	1,000 PB or $1{,}000^6$ bytes

Logical storage capacity values (for example, logical device capacity) are calculated based on the following values:

Logical capacity unit	Value
1 block	512 bytes
1 KB	1,024 (2^{10}) bytes
1 MB	1,024 KB or 1024^2 bytes
1 GB	1,024 MB or 1024^3 bytes
1 TB	1,024 GB or 1024^4 bytes
1 PB	1,024 TB or 1024^5 bytes

Logical capacity unit	Value
1 EB	1,024 PB or 1024^6 bytes

Accessing product documentation

The Hitachi Unified Storage user documentation is available on the HDS Support Portal: https://portal.hds.com. Please check this site for the most current documentation, including important updates that may have been made after the release of the product.

Getting help

The Hitachi Data Systems customer support staff is available 24 hours a day, seven days a week. If you need technical support, log on to the HDS Support Portal for contact information: https://portal.hds.com.

Comments

Please send us your comments on this document: doc.comments@hds.com. Include the document title and number, including the revision level (for example, -07), and refer to specific sections and paragraphs whenever possible. All comments become the property of Hitachi Data Systems.

Thank you!

1

Introduction

The following topics are included in this chapter:

- Hitachi Unified Storage overview

Hitachi Unified Storage overview

The Hitachi Unified Storage 100 family of midrange storage integrates block, file, and object data management in a single storage platform. With block storage, raw volumes of storage are created and each block can be controlled like an individual hard drive. Block storage is usually deployed in a storage area network (SAN) and is accessible using Fibre Channel or iSCSI. Block storage is flexible and versatile, and it delivers efficient and reliable data transportation with high levels of performance. With flexibility, however, comes added management complexity.

With file storage, access is provided to a file system. File level storage is familiar and simple to use and implement. It is the storage that we interact with most on a daily basis because file systems are something that the operating systems provide on all PCs. In a shared environment, file storage is often seen as a network drive. Simply having a centralized, highly available, and accessible place to store files and folders remains the most critical need in most organizations. These file level devices, usually Network Attached Storage (NAS) devices, provide a lot of space at what is generally a lower cost than block storage. And file storage is usually easier to set up than block level devices.

HUS 100 family systems combine both file and block storage types, so you do not have to choose between two different storage types and instead can get the advantages of both.

HUS 100 family systems are the fastest midrange storage systems available today. With the best combination of random and sequential performance for both file and block data, HUS 100 family can help you achieve performance goals at the lowest possible price. High-end storage functionality, such as dynamic load balancing and auto-tiering, make performance levels predictable even in rapidly changing workload environments. Each model can be configured to full capacity with solid state disks for maximum performance.

Block storage is accomplished through high-performance, high-density dynamic virtual controllers that automate load balancing and tiering to deliver the utmost random and sequential performance with predictable results. HUS 100 family uses Hitachi Dynamic Provisioning to pool file and block storage with maximum flexibility that can drastically improve capacity utilization rates.

File storage relies on a unique, hardware-accelerated, object-based file system using custom field-programmable gate arrays, which support intelligent file tiering and migration, and virtual NAS functionality, without compromising performance or scalability.

2

Prepare for installation

The following topics are included in this chapter:

Prepare your site

Planning the proper location and layout of a Hitachi Unified Storage system is essential for successful operation. The site where you install the system can affect performance. For example, equipment placed too close together or in an inadequately ventilated area can cause over-temperature conditions. In addition, poor placement can make the rear panel inaccessible.

To ensure normal operation and avoid unnecessary maintenance, plan your site configuration and prepare your site before installation. The site you choose for the system should:

- Be cool and dry, with a maximum temperature of 104º F (40ºC), and a relative non-condensing humidity range between 8% and 80%.
- Be free of strong electromagnetic field generators such as motors.
- Be free of vibration and dust.
- Not be exposed to direct sunlight.
- Provide a sturdy, level surface that can support a system that weighs up to 2000 pounds (907 kg).
- Be within six feet (1.82 meters) of power outlets.
- Provide at least 39.4 inches (1000 mm) of space at the front and 23.6 inches (600 mm) at the back of the system.
- Be free of anything that blocks the flow of air through the system ventilation slots.

Identify user-supplied items

In addition to the contents supplied with the storage system, the following items supplied by the user are required to perform the installation.

NOTE: For the latest information about supported operating systems, iSCSI initiators, network-interface cards (NICs), and host bus adapters (HBAs), refer to the interoperability matrix at the following address:

http://www.hds.com/products/interoperability/.

Items for all users

Following is a list of items for all users:

- An Hitachi or equivalent rack.
- Two AC outlets per Controller Box and Drive Box, 100 V to 120 or 200 V to 240 V.
- A personal computer (PC) that will act as a management console. See Items for storage system management on page 2-4.
- A management server. See Items for storage system management on page 2-4.
- Internet access via Internet Explorer with pop-up blockers disabled.

Items for Fibre Channel users

Following is a list of items for Fibre Channel users.

- A multi-mode fiber optic cable for each Fibre Channel port that connects to your storage network. See Table 2-1.
- A host server containing an operating system supported by the storage system and one or more HBAs supported by the storage system, with the latest supported drivers installed.

Table 2-1: Fibre Channel cable distances

Data Transfer Rate (MB/s)	Distance from Host			
	100	200	400	800
Max 62.5/125 µm multimode Fibre (OM1) cable length	984.25 feet (300 m)	493 feet (150 m)	229.6 feet (70 m)	68.9 feet (21 m)
Max 50/125 µ m multimode Fibre (OM2) cable length	1640.4 feet (500 m)	984.25 feet (300 m)	493 feet (150 m)	164 feet (50 m)
Max 50/125 µm multimode Fibre (OM3) cable length	2821.5 feet (860 m)	1640.4 feet (500 m)	1246.7 feet (380 m)	493 feet (150 m)

Items for 1 Gb iSCSI users

Following is a list of items for 1 Gb iSCSI users.

- An IP address, subnet mask, gateway if applicable, and a Category 5e or Category 6 Ethernet cable for each 1 Gb iSCSI data port that connects to your storage network (see Table 2-2). For more information about iSCSI, refer to the *Hitachi Unified Storage Hardware Installation and Configuration Guide*.
- A host server containing an operating system supported by the storage system, a 1 Gb iSCSI initiator supported by the storage system and operating system, and one or more 1 Gb NICs or 1 Gb iSCSI HBAs supported by the storage system, with the latest supported drivers installed.
- (Optional) A 1 Gb Ethernet switch if the storage system will be used in a switch configuration.

Table 2-2: 1 Gb iSCSI cable information

Cable Type	Transmission Band	Cable	Connector
Category 6	1000BASE-TX	STP. You must use STP cables to suppress radio noise.	RJ-45

Items for 10 Gb iSCSI users

Following is a list of items for 10 Gb iSCSI users.

- An IP address, subnet mask, gateway if applicable, and a 10 G Base-T optical cable for each 10 Gb iSCSI data port that will connect to your storage network (see Table 2-3 on page 2-4). For more information

about iSCSI, refer to the *Hitachi Unified Storage Hardware Installation and Configuration Guide*.

- A host server containing an operating system supported by the storage system, a 10 Gb iSCSI initiator supported by the storage system and operating system, and one or more 10 Gb NICs or 10 Gb iSCSI HBAs supported by the storage system, with the latest drivers installed.
- (Optional) A 10 Gb switch if the storage system will be used in a switch configuration.

Table 2-3: 10 Gb iSCSI cable Information

Cable Type	Interface	Cable Mode	Nominal		
			Cable	Connector	
				One Side	Other Side
SC-LC cable	Optical	Equivalent to sumitomo 3M 170AC-AAAA-XXX	50/125 µm Multimode Wavelength: 300 nm	SC connector (JIS C 5973)	LC connector
LC-LC cable				LC connector	LC connector

Items for storage system management

Following is a list of items for storage system management.

- An IP address for each storage system management port.
- An environment that meets the minimum server and client requirements listed in the following sections.

NOTE: For information about running Hitachi Storage Navigator Modular 2 from the command-line interface, refer to the *Hitachi Unified Storage Command Line Interface Reference Guide*.

Microsoft Windows server environments

Table 2-4: Supported operating systems

Microsoft Windows operating systems	Service packs
Microsoft Windows XP (x86)	SP2 and SP3
Microsoft Windows Server 2003 (x86)	SP1 and SP2
Microsoft Windows Server 2003 R2 (x86)	None, SP2
Microsoft Windows Server 2003 R2 (x64)	None, SP2
Microsoft Windows Vista (x86)	SP1
Microsoft Windows Server 2008 (x86)	None, SP2
Microsoft Windows Server 2008 (x64)	None, SP2
Microsoft Windows 7 (x86)	None, SP1
Microsoft Windows 7 (x64)	None, SP1
Microsoft Windows Server 2008 R2 (x64)	None, SP1

Intel Itanium is not supported. Apply the latest (KB922760 or newer) Windows Update.

Table 2-5 lists the minimum hardware requirements for the servers.

Table 2-5: Minimum hardware requirements

Hardware	Minimum requirements
Processor	1 GHz (2 GHz or faster is recommended)
Random Access Memory (RAM)	1 GB or more (2 GB or more is recommended)
Available disk space	1.5 GB or more

Microsoft Windows client environments

Table 2-6: Supported operating systems

Microsoft Windows operating systems	Service packs
Microsoft Windows XP (x86)	SP2 and SP3 Internet Explorer is not supported with SP3
Microsoft Windows Server 2003 (x86)	SP1 and SP2
Microsoft Windows Server 2003 R2 (x86)	None, SP2
Microsoft Windows Server 2003 R2 (x64)	None, SP2
Microsoft Windows Vista (x86)	SP1
Microsoft Windows Server 2008 (x86)	None, SP2
Microsoft Windows Server 2008 (x64)	None, SP2
Microsoft Windows 7 (x86)	None, SP1
Microsoft Windows 7 (x64)	None, SP1
Microsoft Windows Server 2008 R2 (x64)	None, SP1

Only the 64-bit Windows operating systems in Table 2-6 are supported. Intel Itanium is not supported. Apply the latest (KB922760 or newer) Windows Update.

Table 2-7 lists the supported Windows guest operating systems for virtual host operating systems.

Table 2-7: Host and guest operating systems

Host operating systems	Guest operating systems
VMware ESX Server 3.x	Microsoft Windows XP
	Microsoft Windows Server 2003 R2
VMware 4.1	Microsoft Windows Server 2008 SP2 (x64)
	Microsoft Windows Server 2008 R2 (x64)
Windows Server 2008 R2 (x64) (Hyper-V2)	Windows Server 2008 R2 (x64)

Table 2-8 lists the minimum requirements for the Hitachi Storage Navigator Modular 2 and SMU client.

Table 2-8: Minimum requirements

Hardware/software	Minimum requirements
Browser	Internet Explorer 6.0 (SP1, SP2, SP3) or Internet Explorer 7.0 64-bit Internet Explorer 6.0 (SP1, SP2, SP3) is supported on Windows Server 2003 R2 (x64) and 64-bit IE7.0 on Windows Server 2008 (x64) Internet Explorer 8.0 (x86, x64) is supported on Windows 7 and Windows Server 2008 R2
Java Runtime Environment	JRE 1.6.0_30, 1.6.0_25, 1.6.0_22, 1.6.0_20, 1.6.0_15, 1.6.0_13, 1.6.0_10 Download from http://java.com/en/download/
Processor	1 GHz or faster is recommended
Random Access Memory (RAM)	1 GB or more (2 GB or more is recommended)
Available disk space	100 MB or more
Video	800 x 600, 1024 x 768, or more is recommended, 256 color or more

Red Hat Linux environments

Table 2-9: Host requirements

Requirement description	Operating system
Red Hat Enterprise Linux AS 4.0 (x86), Update 1	• Red Hat Enterprise Linux AS 4.0 (x86), Update 5 • Red Hat Enterprise Linux 5.3 (x86) • Red Hat Enterprise Linux 5.4 (x86) • Red Hat Enterprise Linux 5.4 (x64) • Red Hat Enterprise Linux 5.5 (x86) • Red Hat Enterprise Linux 5.5 (x64) • Red Hat Enterprise Linux 5.6 (x86) • Red Hat Enterprise Linux 5.6 (x64)
Processor	1 GHz (2 GHz or faster is recommended)
Random Access Memory (RAM)	1 GB or more (2 GB or more is recommended)
Available disk space	800 MB or more

Table 2-10: Client requirements

Requirement	Description
Operating system	• Red Hat Enterprise Linux AS 4.0 (x86), Update 1 • Red Hat Enterprise Linux AS 4.0 (x86), Update 5 • Red Hat Enterprise Linux 5.3 (x86) • Red Hat Enterprise Linux 5.4 (x86) • Red Hat Enterprise Linux 5.4 (x64) • Red Hat Enterprise Linux 5.5 (x86) • Red Hat Enterprise Linux 5.5 (x64) • Red Hat Enterprise Linux 5.6 (x86) • Red Hat Enterprise Linux 5.6 (x64)
Browser	Mozilla 1.7
Java runtime environment	JRE 1.6.0_30, 1.6.0_25, 1.6.0_22, 1.6.0_20, 1.6.0_15, 1.6.0_13, 1.6.0_10 Download from http://java.com/en/download/.
Processor	1 GHz or faster is recommended
Random Access Memory (RAM)	1 GB or more (2 GB or more is recommended)
Available disk space	100 MB or more
Video	800 x 600, 1024 x 768, or more is recommended, 256 color or more

Solaris environments

Table 2-11: Host requirements

Requirement	Description
Operating systems	• Solaris 8 (SPARC) • Solaris 9 (SPARC) • Solaris 10 (SPARC) • Solaris 10 (x64)
Processor	SPARC 1 GHz (2 GHz or faster is recommended) • For Solaris 10 (x64): 1.8 GHz (2 GHz or faster is recommended) • Solaris 10 (x64) is supported using 64 bits kernel mode on Sun Fire x64 server family systems only. Do not change the kernel mode from 64 bits after installing Hitachi Storage Navigator Modular 2 • x86 processors such as Opteron are not supported
Random Access Memory (RAM)	1 GB or more (2 GB or more is recommended)
Available disk space	800 MB or more
Java	Development Kit JDK1.5.0 is required for Solaris 10 (x64) environments

Table 2-12: Client requirements

Requirement	Description
Operating systems	• Solaris 8 (SPARC) • Solaris 9 (SPARC) • Solaris 10 (SPARC) • Solaris 10 (x86) • Solaris 10 (x64)
Processor	SPARC 1 GHz (2 GHz or faster is recommended) • For Solaris 10 (x64): 1.8 GHz (2 GHz or faster is recommended) • Solaris 10 (x64) is supported using 64 bits kernel mode on Sun Fire x64 server family systems only. Do not change the kernel mode from 64 bits after installing Hitachi Storage Navigator Modular 2 • x86 processors such as Opteron are not supported
Random Access Memory (RAM)	1 GB or more (2 GB or more is recommended)
Available disk space	100 MB or more
Java runtime environment	JRE 1.6.0_30, 1.6.0_25, 1.6.0_22, 1.6.0_20, 1.6.0_15, 1.6.0_13, 1.6.0_10 Download from http://java.com/en/download/.
Browsers	Mozilla 1.7, Firefox 2

Review the pre-installation checklist

Complete the checklists below to verify that all installation requirements for the storage system have been met. Successful completion of these checklists will ensure smooth and efficient installation of the storage system.

Definition of terms

Following are definitions of the terms used in the installation and planning checklist.

- Data center—The room at the customer site in which the storage systems are installed.
- Equipment—The hardware.
- Location—The specific location in the data center where the storage system is be installed.

Checklist for contact information

Table 2-13 on page 2-9 lists the contact information checklist. Print this checklist to record pertinent contact information.

Table 2-13: Contact information checklist

Customer information		**Date:**	
Company:			
Address:			
Contact:		Phone:	
		Mobile:	
		Email:	
Contact:		Phone:	
		Mobile:	
		Email:	
Hitachi Data Systems information			
Contact:		Phone:	
		Mobile:	
		Email:	
Contact:		Phone:	
		Mobile:	
		Email:	
Notes			

Checklist for planning and installation

Table 2-14 lists the installation and planning checklist.

Table 2-14: Installation and planning checklist

Installation and planning checklist	Yes	No
Safety		
Is the data center equipped to protect equipment from fire?		
Is the data center free of hazards (for example, cables that obstruct access)?		
Delivery		
Is the receiving area adequate for equipment delivery and unloading?		
Does the equipment fit through doors, halls, elevators, and stairs?		
Do the floors, elevators, stairs, and ramps support the weight of the equipment?		
Storage		
If the equipment will be stored after delivery and prior to installation, does the storage location meet the environmental requirements for the Hitachi Unified Storage system?		
Facilities		
Is the data center fully operational (for example, power, air conditioning, cabling, fire protection system)?		
Does the data center have a tiled raised floor?		
Does the data center provide adequate Electro-static Discharge (ESD) protection?		
Does the data center provide adequate protection from electrical/radio frequency interference?		
Does the data center provide adequate acoustic insulation for operation of the Hitachi Unified Storage system?		
Is the customer-supplied hardware (for example, connectors, receptacles, cables) ready for the installation?		
Physical		
Does the location meet the requirements for service clearance and cable routing (for example, floor cutouts)?		
Does the location meet the requirements for floor load rating?		
Power		
Does the data center meet the AC input power requirements?		
Does the data center meet the circuit breaker and plug requirements?		
Does the data center meet the requirements for connection to the Hitachi Unified Storage system?		
Environmental		
Does the data center meet the requirements for temperature?		
Does the data center meet the requirements for humidity?		
Does the data center meet the requirements for altitude?		
Does the data center meet the requirements for air flow?		
Does the data center meet the requirements for vibration and shock?		
Operational		
Does the data center provide a LAN (or phone line)?		
Does the data center provide a LAN for Storage Navigator?		
Does the location meet the cable length requirements for the front end directors?		
Does the location meet the requirements for attaching external storage to the Hitachi Unified Storage system?		

Unpack your system

Perform the following steps to unpack your HUS system, and to ensure that your contents arrived intact.

NOTE: If the storage system arrives in cold weather, do not unpack it until it has been allowed to reach room temperature, approximately one to two hours. Immediately exposing the system to warm temperature can cause condensation to occur, which could damage electronic circuits.

1. Inspect all shipping cartons for signs of damage.
2. Loosen the band around the cartons and open all cartons.
3. Compare the items in the carton to the packing list.
4. Remove all packing materials, envelopes, and boxes from the cartons.
5. Open and remove the bag in which the storage system is enclosed.
6. Keep all packing materials and cartons in case you need to transport or ship the storage system.

WARNING! Unpacking should be done by two or more persons. Following are the approximate weights of the storage system components:

- **CBXSS/CBSS = 88 lbs (40 kg)**
- **CBXSL/CBSL = 94.7 lbs (43 kg)**
- **CBL = 103.6 lbs (47 kg)**
- **DBS = 50.7 lbs (23 kg)**
- **DBL = 59.5 lbs (27 kg)**

Following are the items you should find in the shipping carton:

- Front bezel
- Accessory box
- Pads
- Shipping box
- Desiccating agent
- Installation and documentation CDs

Reference additional information

For more information about preparing your site, refer to the following chapters in the *Hitachi Unified Storage Hardware Installation and Configuration Guide*.

- Chapter 3, Preparing your site
- Appendix A, Registration, resources, and checklists
- Appendix C, Rack information

What's next?

You have prepared your site and identified items that you will need to supply yourself. You have also reviewed the installation checklist. You are now ready to unpack and review your storage system. To unpack and review your system, go to Chapter 3, Review the system.

3

Review the system

The following topics are included in this chapter:

Review system components

Use Figure 3-1, Figure 3-2, Figure 3-3, Figure 3-4, and Figure 3-6 to review the components in your HUS system.

Matching Controller Boxes and Drive Boxes

Hardware components on Hitachi Unified Storage systems vary, depending on the Controller Box and Drive Box. To find the hardware components on your Hitachi Unified Storage system, use Table 3-1 to find your storage system's Controller Box and Drive Box(es).

Table 3-1: Matching Controller Boxes and Drive Boxes

This Hitachi Unified Storage model	Can use these Controller Boxes	And these Drive Boxes
110	CBXSS	
	CBXSL	
		DBS
		DBL
130	CBSS	
	CBSL	
		DBS
		DBL
		DBX
		DBW
150	CBL/CBLD	
		DBS/DBSD
		DBL/DBLD
		DBX
		DBW

Controller Boxes

Figure 3-1 shows the Controller Boxes.

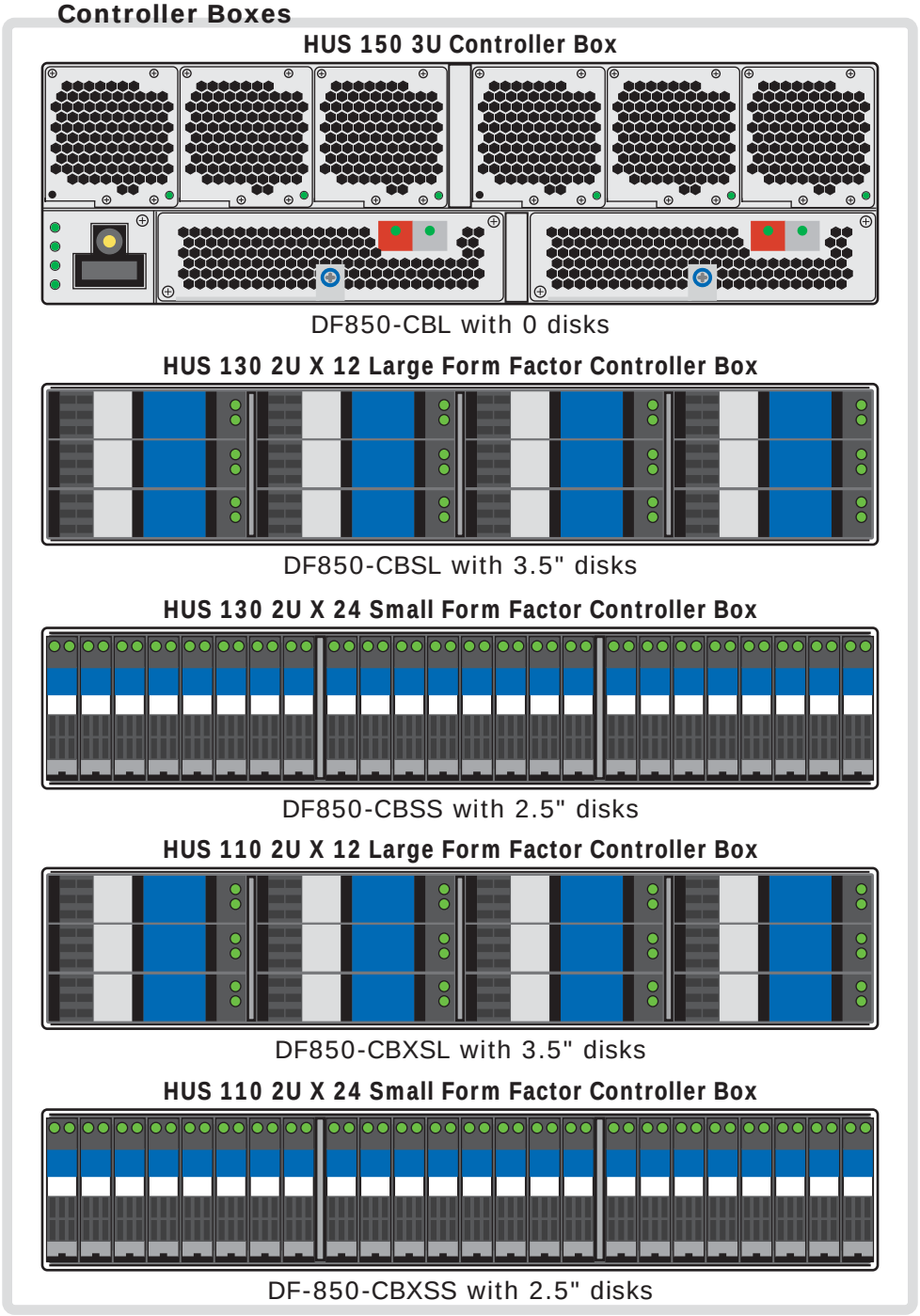


Figure 3-1: Controller Boxes

Drive Boxes

Figure 3-2 shows the Drive Boxes.

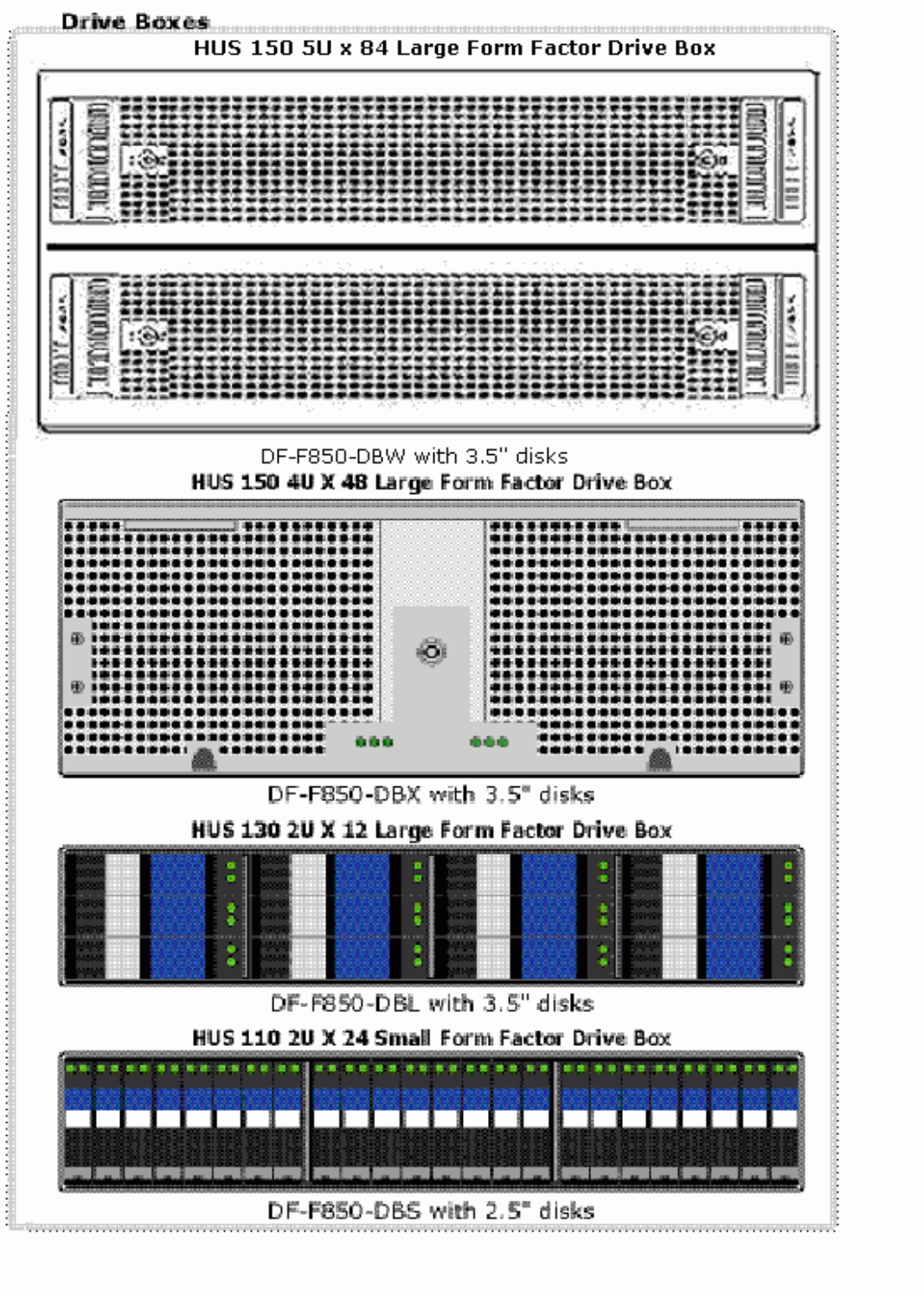


Figure 3-2: Drive Boxes

File Modules

Figure 3-3 shows the File Modules.

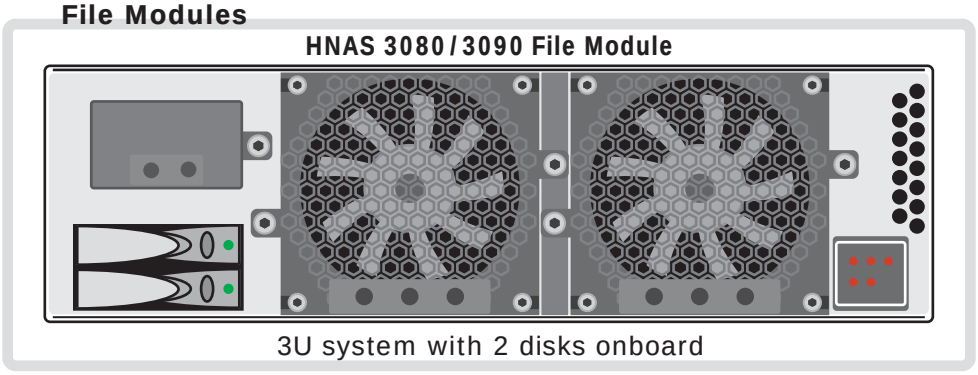


Figure 3-3: File Module

Servers

Figure 3-4 shows the recommended Hitachi CR210H appliance server and Figure 3-5 shows the SMU server.

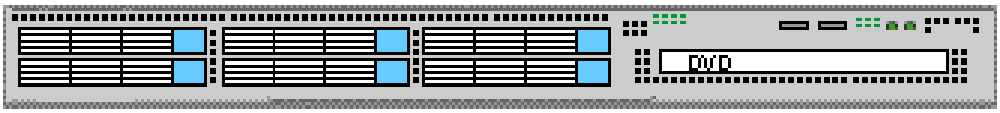


Figure 3-4: HCS Server

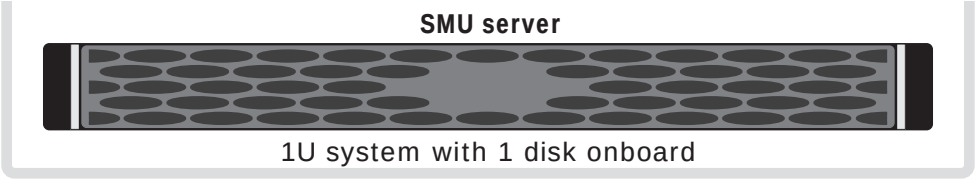


Figure 3-5: SMU Server

Switches

Figure 3-6 shows the switches.

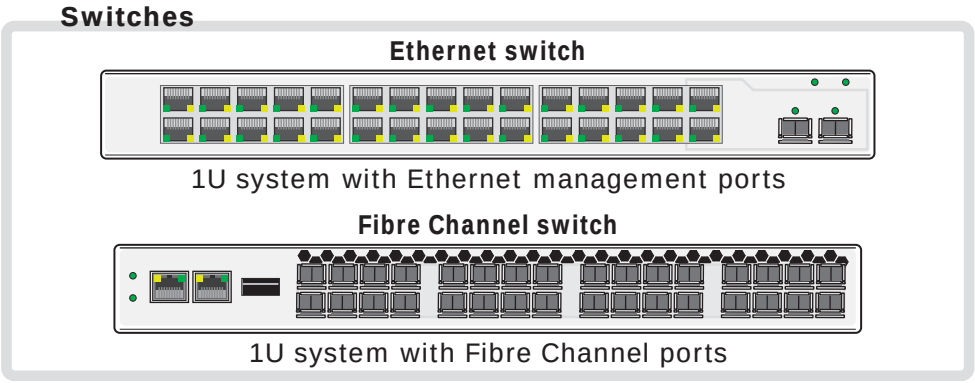


Figure 3-6: Switches

Review basic system layouts

Use Figure 3-7, Figure 3-8, Figure 3-9, Figure 3-10, Figure 3-11, Figure 3-12, and Figure 3-13 in the following sections to review the HUS basic system layouts.

Block and File system diagram

Figure 3-7 shows a basic system layout configuration with file modules in two racks.

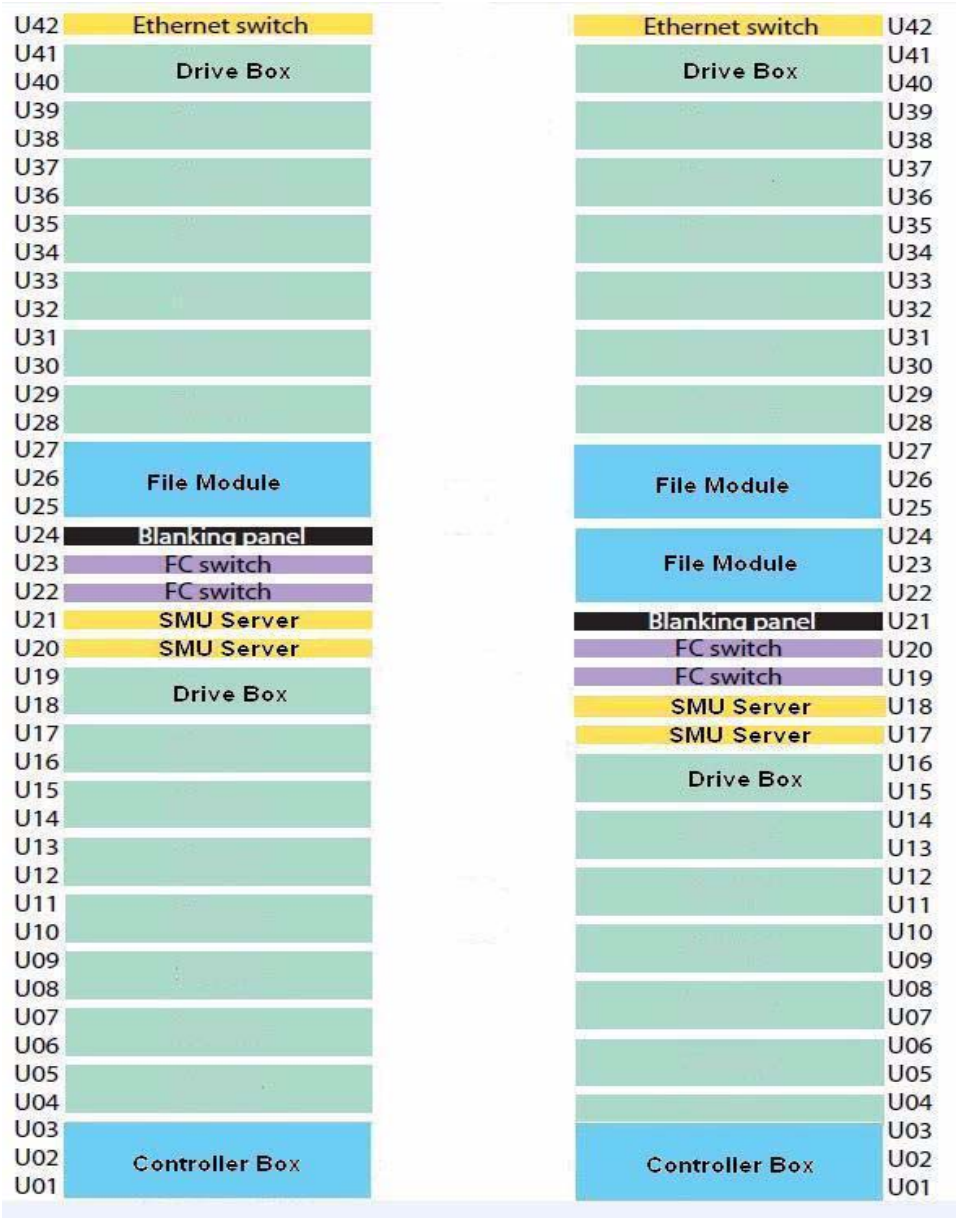


Figure 3-7: Basic system layout with File Modules in two racks

HUS 150 basic system layouts

Figure 3-8 and Figure 3-9 on page 3-9 and shows the HUS 150 basic system layouts.

HUS 150 basic system layout

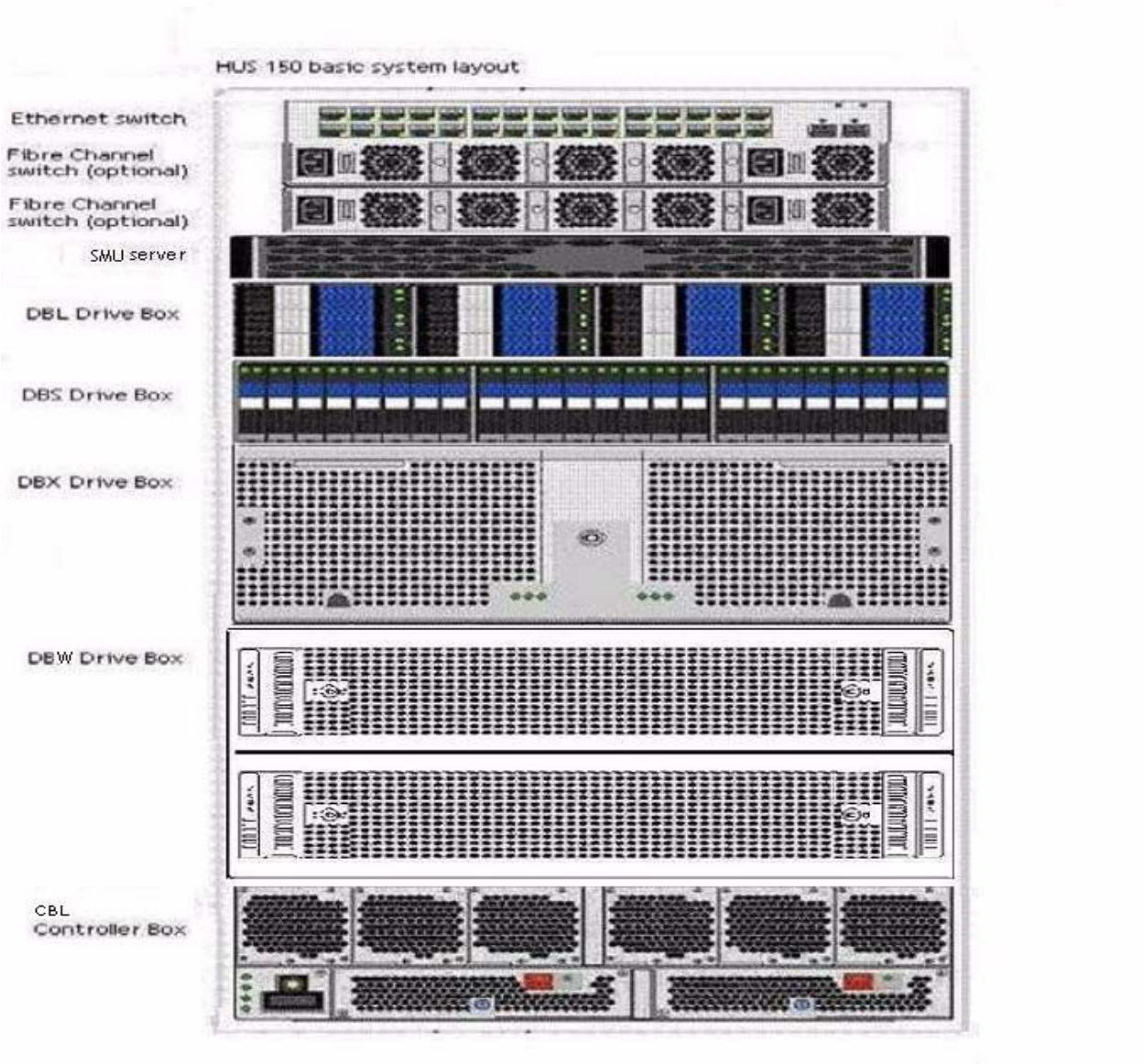


Figure 3-8: HUS 150 basic system layout

This example of a possible configuration of the HUS 150 storage system contains the DBW, DBX, DBS, and DBL Drive Boxes, CBL Controller Box, the SMU server, and two Fibre Channel switches. Figure 3-8 shows these components with front bezels off. See Review system components for component details. There is a DC model of the HUS 150, see *Hitachi Unified Storage Hardware Installation and Configuration Guide*, for details on the CBLD controller box and DBSD and DBLD drive boxes.

HUS 150 basic system layout with File Modules

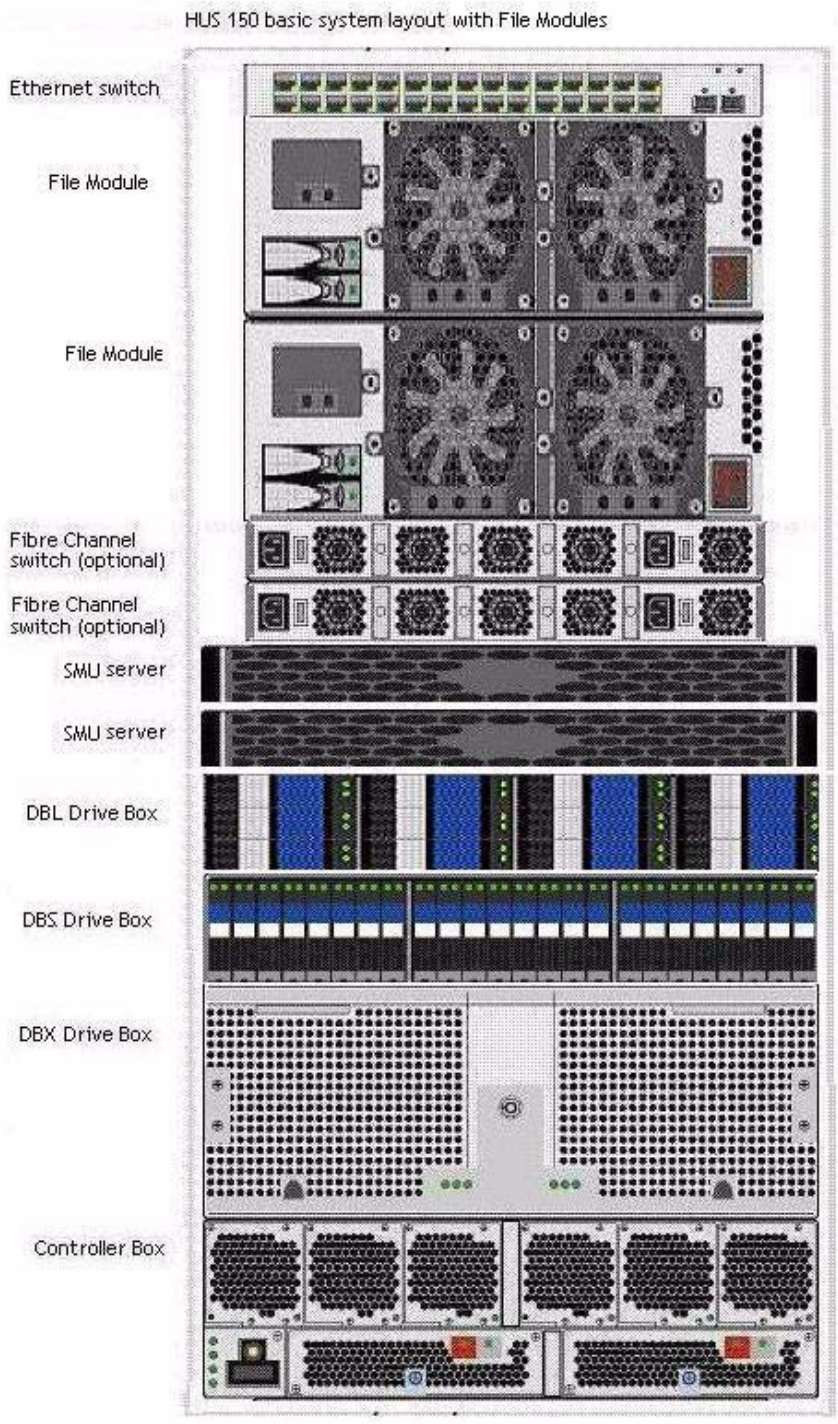


Figure 3-9: HUS 150 basic system layout with File Modules

HUS 130 basic system layouts

Figure 3-10 and Figure 3-11 on page 3-11 shows the HUS 130 basic system layouts

HUS 130 basic system layout

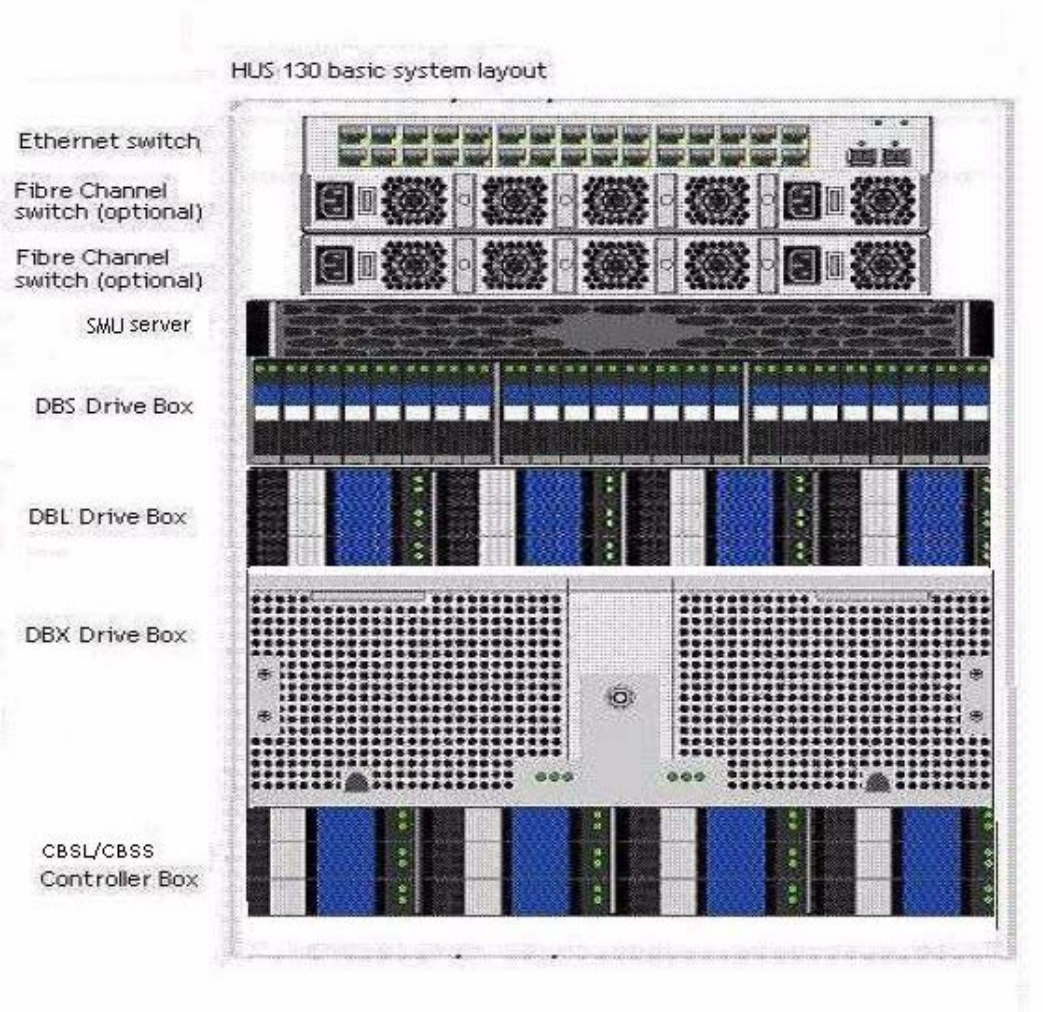


Figure 3-10: HUS 130 basic system layout

This example of a possible configuration of the HUS 130 storage system contains the DBX, DBS. and DBL Drive Boxes, the CBSL/CBSS Controller Box, the SMU server, and two Fibre Channel switches. Figure 3-10 shows these components with front bezels off. See Review system components for component details.

HUS 130 basic system layout with File Modules

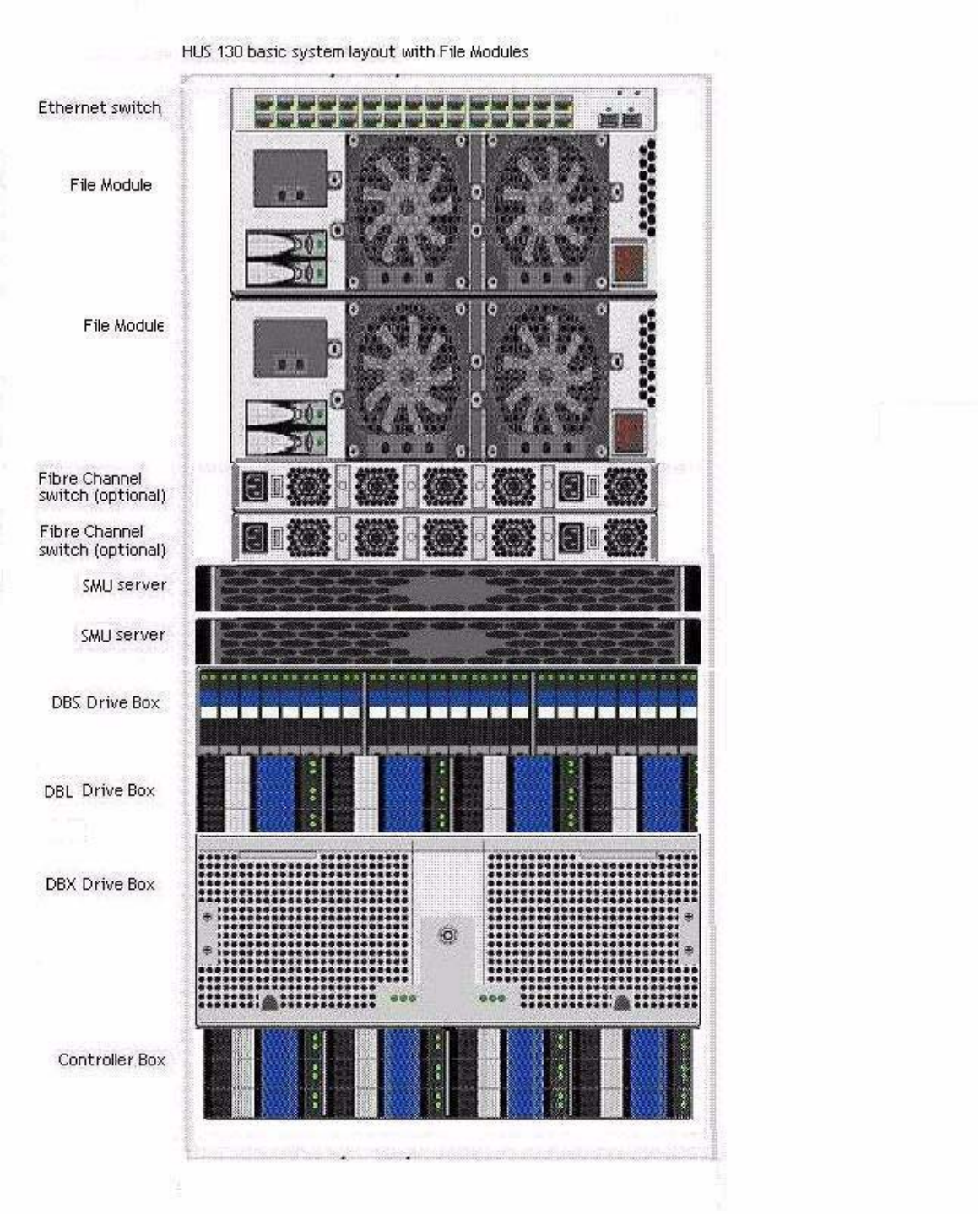


Figure 3-11: HUS 130 basic system layout with File Modules

HUS 110 basic system layouts

Figure 3-12 and Figure 3-13 on page 3-13 and shows the HUS 110 basic system layouts.

HUS 110 basic system layout

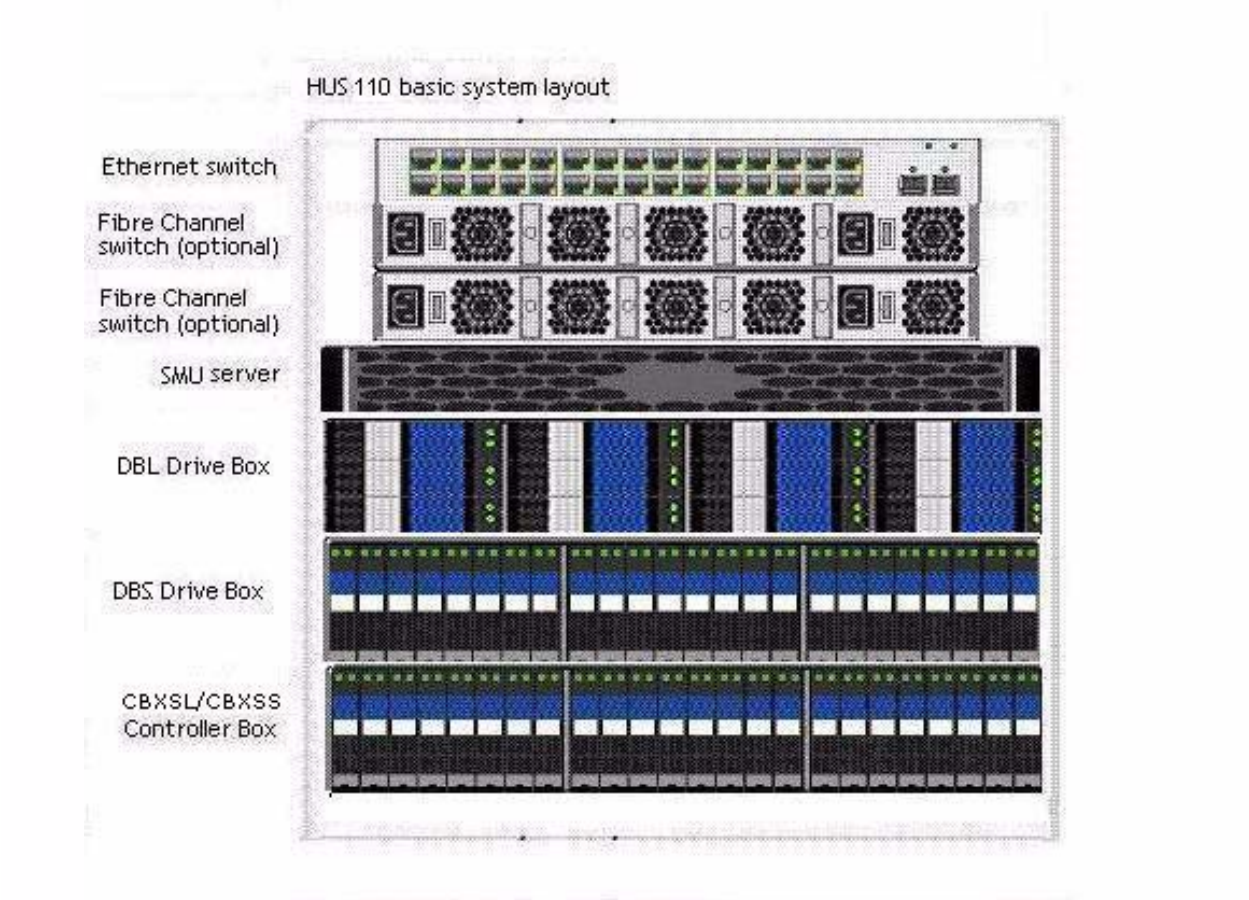


Figure 3-12: HUS 110 basic system layout

This example of a possible configuration of the HUS 110 storage system contains the DBS and DBL Drive Boxes, the DF850-CBXSL/CBXSS Controller Box, the SMU server and two Fibre Channel switches. Figure 3-12 shows these components with front bezels off. See Review system components for component details.

HUS 110 basic system layout with File Modules

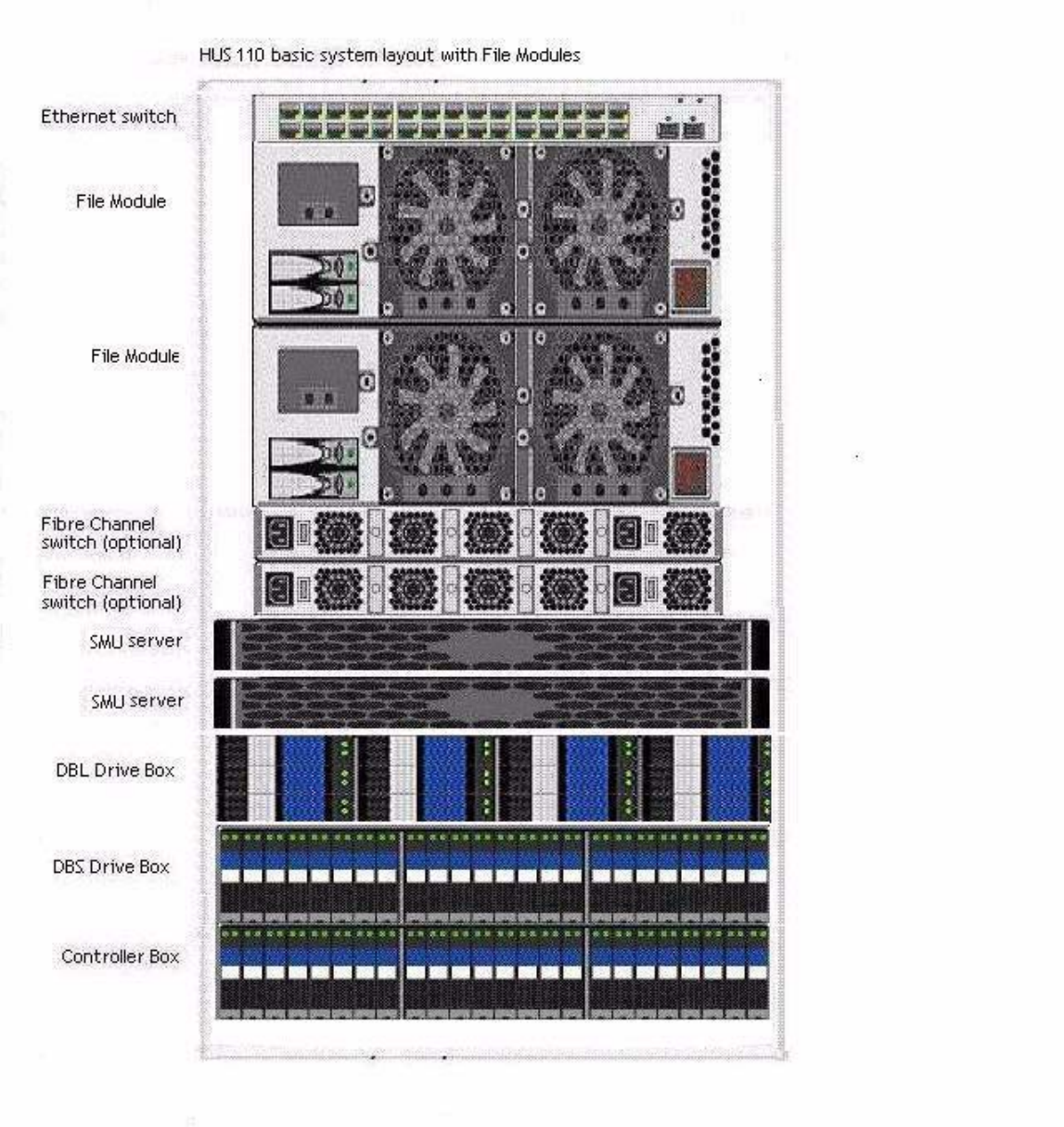


Figure 3-13: HUS 110 basic system layout with File Modules

Review system cabling

Use Figure 3-14, Figure 3-15, Figure 3-16 and Figure 3-17 to review system cabling.

Direct connection

Figure 3-14 shows a cabling diagram for a direct connection.

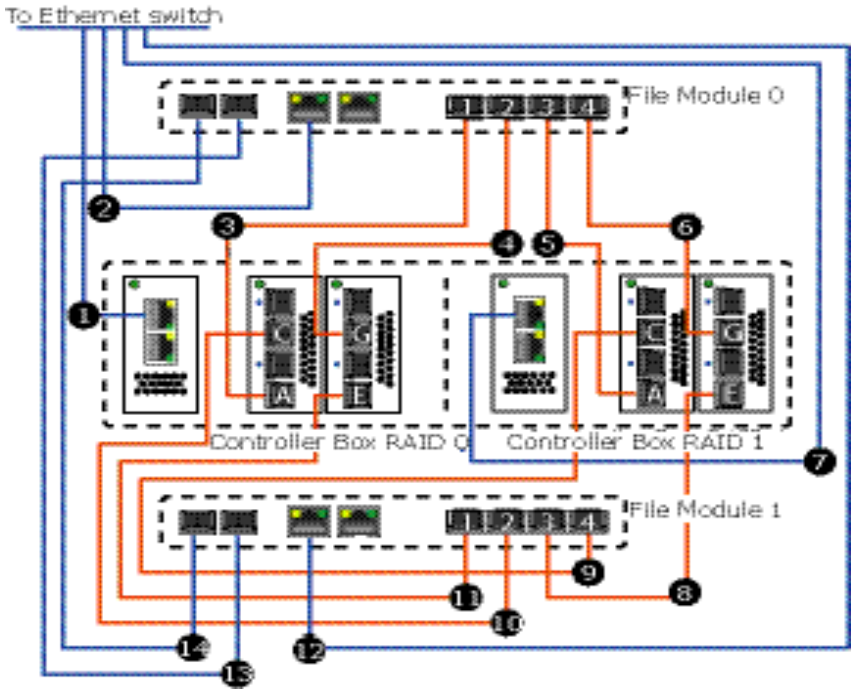


Figure 3-14: Cabling a direct connection

1	Management port on Controller Box RAID 0 connects to the Ethernet switch using an Ethernet cable	**2**	Management port on File Module 0 connects to the Ethernet switch using an Ethernet cable
3	1/2/4 Gbps Fibre Channel port **1** on File Module 0 connects to host I/O port **A** on Control Box RAID 0 using a fibre cable	**4**	1/2/4 Gbps Fibre Channel port **2** on File Module 0 connects to host I/O port **G** on Controller Box RAID 0 using a fibre cable
5	1/2/4 Gbps Fibre Channel port **3** on File Module 0 connects to host I/O port **A** on Controller Box RAID 1 using a fibre cable	**6**	1/2/4 Gbps Fibre Channel port **4** on File Module 0 connects to host I/O port **G** on Controller Box RAID 1 using a fibre cable
7	Management port on Controller Box RAID 1 connects to the Ethernet switch using an Ethernet cable	**8**	1/2/4 Gbps Fibre Channel port **3** on File Module 1 connects to host I/O port **E** on Controller Box RAID 1 using a fibre cable

9	1/2/4 Gbps Fibre Channel port **4** on File Module 1 connects to host I/O port **C** on Controller Box RAID 1 using a fibre cable	**10**	1/2/4 Gbps Fibre Channel port **2** on File Module 1 connects to host I/O port **C** on Controller Box RAID 0 using a fibre cable
11	1/2/4 Gbps Fibre Channel port **1** on File Module 1 connects to host I/O port **E** on Controller Box RAID 0 using a fibre cable	**12**	Management port on File Module 1 connects to the Ethernet switch using an Ethernet cable
13	10 Gb cluster interconnect port on File Module 0 connects to 10 Gb cluster interconnect port on File Module 1	**14**	10 Gb cluster interconnect port on File Module 0 connects to 10 Gb cluster interconnect port on File Module 1

Fibre Channel switches

Figure 3-15 shows a cabling diagram for Fibre Channel switches.

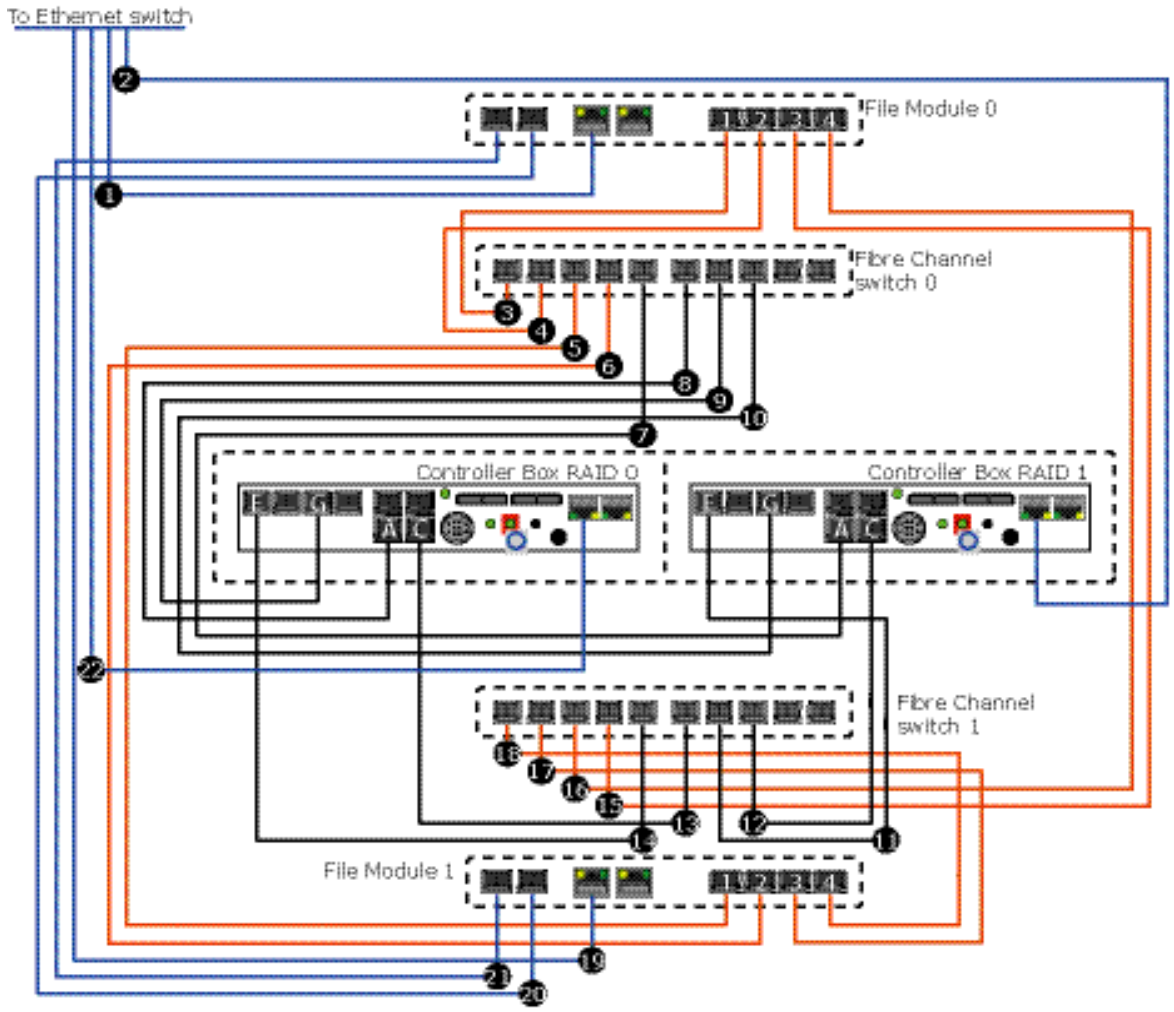


Figure 3-15: Cabling through Fibre Channel switches

1	Management port on File Module 0 connects to the Ethernet switch using an Ethernet cable	**2**	Management port on Controller Box RAID 1 connects to the Ethernet switch using an Ethernet cable
3	1/2/4 Gbps Fibre Channel port **1** on File Module 0 connects to Fibre Channel switch 0 using a fibre cable	**4**	1/2/4 Gbps Fibre Channel port **2** on File Module 0 connects to Fibre Channel switch 0 using a fibre cable
5	1/2/4 Gbps Fibre Channel port **1** on File Module 1 connects to Fibre Channel switch 0 using a fibre cable	**6**	1/2/4 Gbps Fibre Channel port **2** on File Module 1 connects to Fibre Channel switch 0 using a fibre cable
7	Host I/O port **A** on Controller Box RAID 1 connects to Fibre Channel switch 0 using a fibre cable	**8**	Host I/O port **A** on Controller Box RAID 0 connects to Fibre Channel switch 0 using a fibre cable
9	Host I/O port **G** on Controller Box RAID 0 connects to Fibre Channel switch 0 using a fibre cable	**10**	Host I/O port **G** on Controller Box RAID 1 connects to Fibre Channel switch 0 using a fibre cable
11	Host I/O port **E** on Controller Box RAID 1 connects to Fibre Channel switch 1 using a fibre cable	**12**	Host I/O port **C** on Controller Box RAID 1 connects to Fibre Channel switch 1 using a fibre cable
13	Host I/O port **C** on Controller Box RAID 0 connects to Fibre Channel switch 1 using a fibre cable	**14**	Host I/O port **E** on Controller Box RAID 0 connects to Fibre Channel switch 1 using a fibre cable
15	1/2/4 Gbps Fibre Channel port **4** on File Module 0 connects to Fibre Channel switch 1 using a fibre cable	**16**	1/2/4 Gbps Fibre Channel port **3** on File Module 0 connects to Fibre Channel switch 1 using a fibre cable
17	1/2/4 Gbps Fibre Channel port **3** on File Module 1 connects to Fibre Channel switch 1 using a fibre cable	**18**	1/2/4 Gbps Fibre Channel port **4** on File Module 1 connects to Fibre Channel switch 1 using a fibre cable
19	Management port on File Module 1 connects to the Ethernet switch using an Ethernet cable	**20**	10 Gb cluster interconnect port on File Module 0 connects to 10 Gb cluster interconnect port on File Module 1
21	10 Gb cluster interconnect port on File Module 0 connects to 10 Gb cluster interconnect port on File Module 1	**22**	Management port on Controller Box RAID 0 connects to the Ethernet switch using an Ethernet cable

Controller Box

Figure 3-16 shows a cabling diagram for one Controller Box.

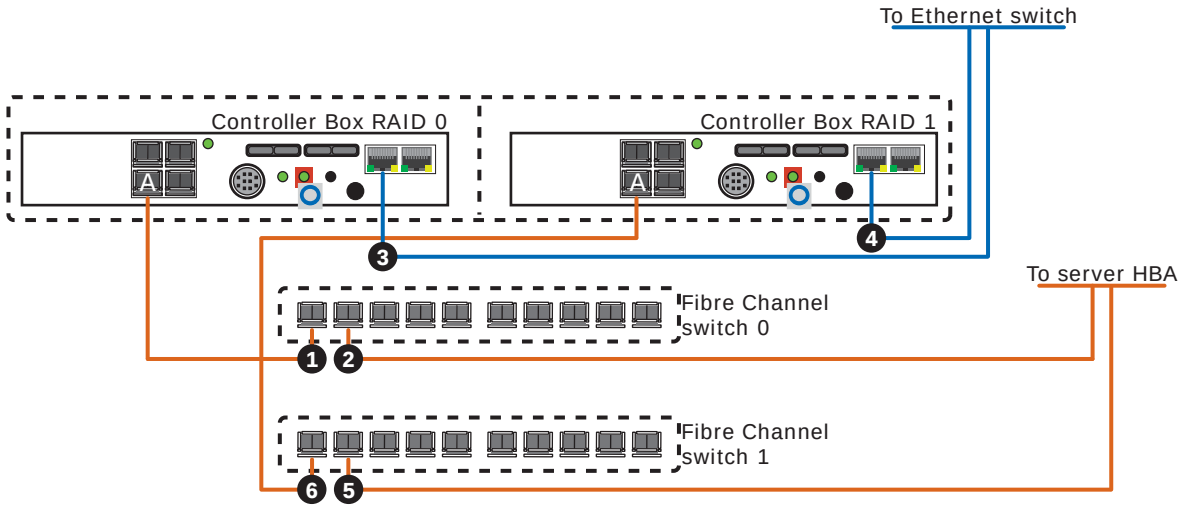


Figure 3-16: Cabling one Controller Box

1	Host I/O port **A** on Controller Box RAID 0 connects to Fibre Channel switch 0 using a fibre cable	**2**	Server HBA connects to Fibre Channel switch 0 using a fibre cable
3	Management port on Controller Box RAID 0 connects to the Ethernet switch using an Ethernet cable	**4**	Management port on Controller Box RAID 1 connects to the Ethernet switch using an Ethernet cable
5	Server HBA connects to Fibre Channel switch 1 using a fibre cable		Host I/O port **A** on Controller Box RAID 1 connects to Fibre Channel switch 1 using a fibre cable

Drive Boxes

Figure 3-17 shows a cabling diagram for Drive Boxes.

Figure 3-17: Cabling Drive Boxes

1	**IN** port of Controller 0-0 connects to the **OUT** port of Controller 0-2	**2**	**IN** port of Controller 1-0 connects to the **OUT** port of Controller 3-0
3	**IN** port of Controller 0-0 connects to the **OUT** port of Controller 0-2	**4**	**IN** port of Controller 1-1 connects to the **OUT** port of Controller 3-1
5	**IN** port of Controller 3-1 connects to the **OUT** port of Controller 5-1	**6**	**IN** port of Controller 4-1 connects to the **OUT** port of Controller 4-1
7	**IN** port of Controller 4-1 connects to an I/O port on I/O Module 1	**8**	**IN** port of Controller 5-1 connects to an I/O port on I/O Module 1
9	**IN** port of Controller 4-0 connects to the **OUT** port of Controller 5-0	**10**	**IN** port of Controller 4-0 connects to an I/O port on I/O Module 0
11	**IN** port of Controller 5-0 connects to an I/O port on I/O Module 0	**12**	**IN** port of Controller 2-0 connects to the **OUT** port of Controller 4-0

Reference additional information

For more information unpacking and reviewing your system, see the following chapters in the *Hitachi Unified Storage Hardware Installation and Configuration Guide*.

- Chapter 2, Hitachi Unified Storage hardware description
- Chapter 4, Installing storage systems

What's next?

You have unpacked your storage system. You have also reviewed individual system components, system layouts, and system cabling. You are now ready to rack and review your hardware. To rack your system and review your hardware, go to Chapter 4, Rack and review the hardware.

4

Rack and review the hardware

The following topics are included in this chapter:

Rack your system

HUS (Hitachi Unified Storage) systems are designed to be installed in a Hitachi rack or equivalent. Perform the following procedures to rack the system.

NOTE: For more information about the Hitachi rack, see the *Hitachi Unified Storage Hardware Installation and Configuration Guide*.

WARNING! To prevent injury, use a mechanical lifter during rack installation or removal.

CAUTION! To avoid electrostatic discharge damage to the system, wear an anti-static wrist strap. Connect the clip to an unpainted part of the rack to safely channel any static electricity to ground. If no wrist strap is available, ground yourself by touching an unpainted part of the rack.

Observe all safety guidelines in the *Hitachi Unified Storage Hardware Installation and Configuration Guide.*

1. Verify the rack is secure and is in no danger of falling over, and that all rack stabilizers are mounted.
2. Adjust the length of the mounting rails as needed.

   The rear rail slides inside the front rail. The rail halves are riveted together and use no adjustment screws.
3. Attach the mounting rail assemblies to the outside of the rack posts, using the attaching screws and flange nuts from your rack system.

   Be sure the front rail support is on the bottom facing inward. The alignment pins fit into the rack holes above and below the attaching screws. Use the attaching screws and flange nuts from your rack system. Tighten the screws and flange nuts according to your rack system instructions.

Controller Box

Perform the following procedure to rack the Controller Box.

1. Place the Controller Box on the rails, and secure it to the rack.
   a. Insert one screw on each side, in the upper hole only, using the attaching screws and flange nuts from your rack system.
   b. Tighten the screws and flange nuts according to your rack system instruction.
2. Place the HCS server on the rails, and secure it to the rack by repeating steps a and b.
3. Place any additional Drive Boxes on the rails, and secure them to the rack by repeating steps a and b.

File Module

Perform the following procedure to rack the File Module.

1. Place the File Module on the rails, and secure it to the rack by repeating steps a and b.
2. Place the SMU server on the rails, and secure it to the rack by repeating steps a and b.

Switches

Perform the following procedure to rack the switches.

1. Place both Fibre Channel switches on the rails, and secure it to the rack by repeating steps a and b.
2. Place the Ethernet switch on the rails, and secure it to the rack by repeating steps a and b.

Review Controller Box hardware

Use Figure 4-1, Figure 4-2, Figure 4-3, Figure 4-4, Figure 4-8, and Figure 4-9, to review Controller Box front and back panel hardware.

HUS 150 Controller Box front panel

Figure 4-1 shows the HUS 150 Controller Box front panel.

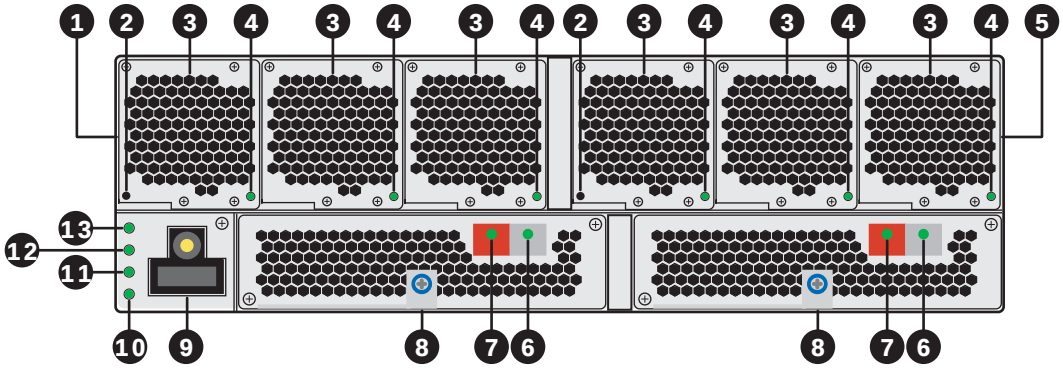


Figure 4-1: HUS 150 Controller Box front panel

1	**Controller 0**	**2**	Reset switch
3	Fan	**4**	**FAN-ALM** LED
5	**Controller 1**	**6**	**RDY** LED
7	**ALM** LED	**8**	Cache backup battery
9	Main switch	**10**	**ALM** LED
11	**WARN** LED	**12**	**RDY** LED
13	**PWR** LED		

HUS 150 Controller Box back panel

Figure 4-2 shows the HUS 150 Controller Box back panel.

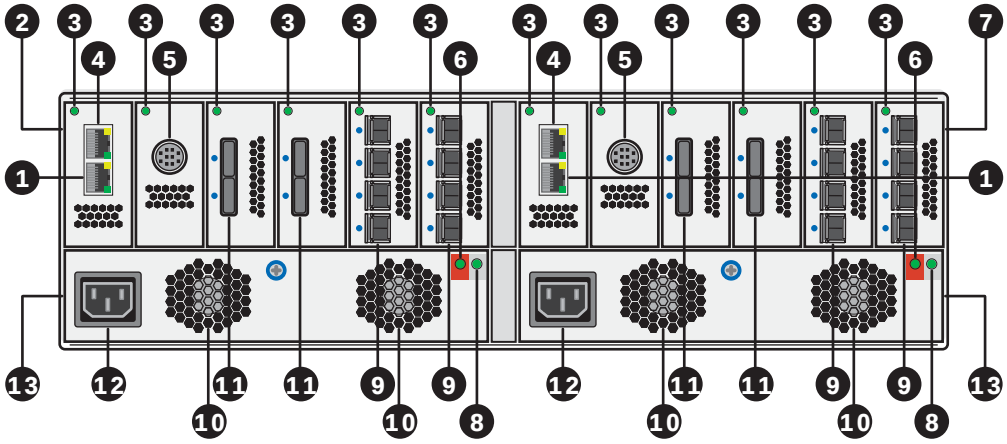


Figure 4-2: HUS 150 Controller Box back panel

1	LAN 0 maintenance port	**2**	**Controller 0**
3	**STATUS** LED	**4**	LAN 1 management port
5	Uninterruptible power supply port	**6**	**ALM** LED
7	**Controller 1**	**8**	**RDY** LED
9	Host I/O ports	**10**	Fan
11	Drive I/O port	**12**	AC power socket
13	Power unit		

HUS 130 LFF/SFF Controller Box back panel

Figure 4-3 shows the HUS 130 large form factor (LFF)/small form factor (SFF) Controller Box back panel.

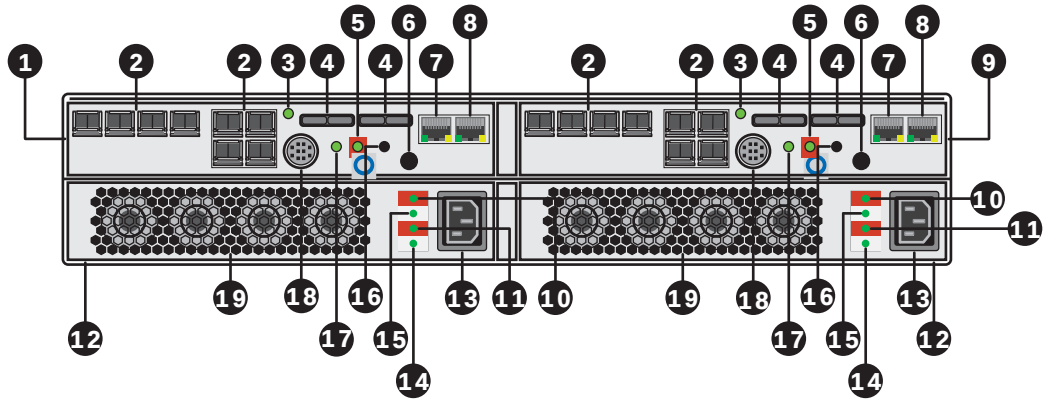


Figure 4-3: HUS 130 LFF/SFF Controller Box back panel

1	**Controller 0**	**2**	Host I/O port
3	I/O module status LED	**4**	Drive I/O port
5	**ALM** LED	**6**	Main switch
7	LAN 0 maintenance port	**8**	LAN 1 management port
9	**Controller 1**	**10**	**P-RDY** LED
11	**B-RDY** LED	**12**	Power unit
13	AC power socket	**14**	**B-ALM** LED
15	**P-ALM** LED	**16**	Reset switch
17	**STATUS** LED	**18**	Uninterruptible power supply port
19	Fan		

HUS 110 LFF/SFF Controller Box back panel

Figure 4-4 shows the HUS 110 large form factor (LFF)/small form factor (SFF) Controller Box back panel.

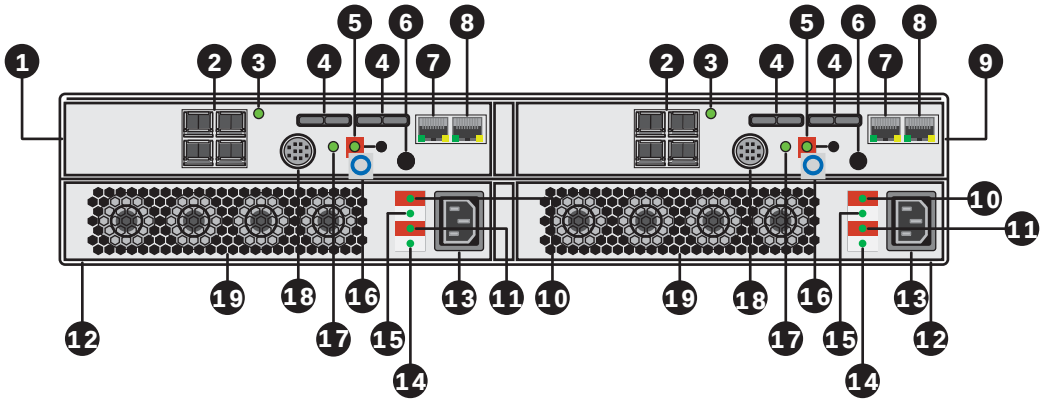


Figure 4-4: HUS 110 LFF/SFF Controller Box back panel

1	**Controller 0**	**2**	Fibre Channel port
3	I/O module status LED	**4**	Drive I/O port
5	**ALM** LED	**6**	Main switch
7	LAN 0 maintenance port	**8**	LAN 1 management port
9	**Controller 1**	**10**	**P-RDY** LED
11	**B-RDY** LED	**12**	Power unit
13	AC power socket	**14**	**P-ALM** LED
15	**B-ALM** LED	**16**	Reset switch
17	**STATUS** LED	**18**	Uninterruptible power supply port
19	Fan		

Review Drive Box hardware

Use Figure 4-5, Figure 4-6, and Figure 4-7 to review the Drive Box front and back panel hardware.

HUS 150 LFF Drive Box front panel

Figure 4-5 shows the HUS 150 large form factor (LFF) Drive Box front panel.

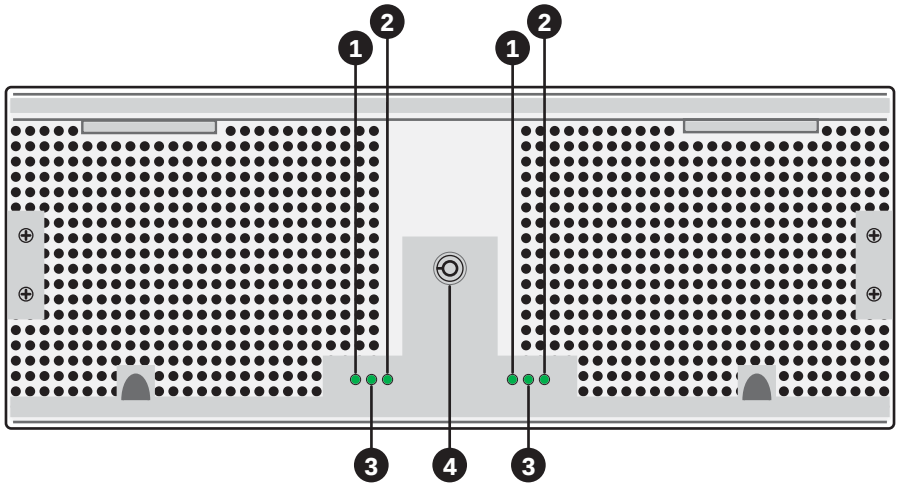


Figure 4-5: HUS 150 LFF Drive Box front panel

1	**LOCATE** LED	**2**	**READY** LED
3	**POWER** status LED	**4**	Bezel lock

HUS 150 LFF Drive Box back panel

Figure 4-6 shows the HUS 150 large form factor (LFF) Drive Box back panel.

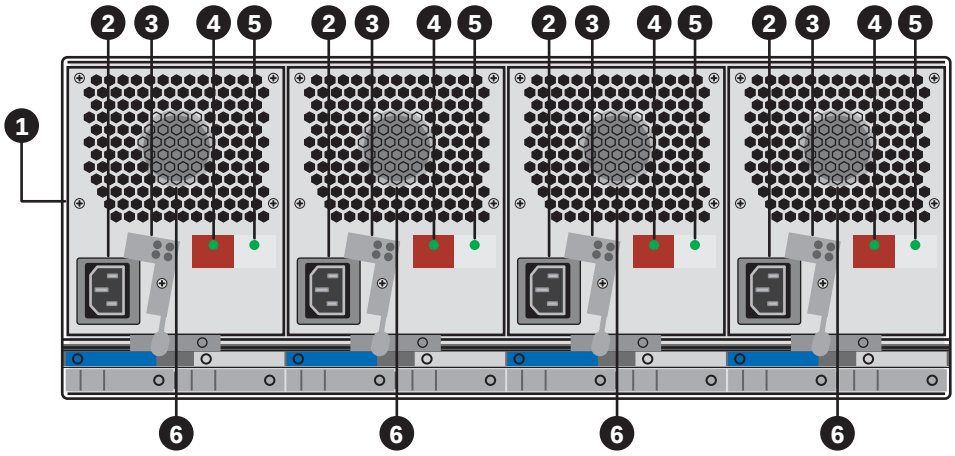


Figure 4-6: HUS 150 LFF Drive Box back panel

1	Power unit	**2**	AC power socket
3	AC power plug retainer	**4**	**ALM** status LED
5	**RDY** LED	**6**	Fan

HUS 130/HUS 110 LFF/SFF Drive Box back panel

Figure 4-7 shows the HUS 130/HUS 110 large form factor (LFF)/small form factor (SFF) Drive Box back panel.

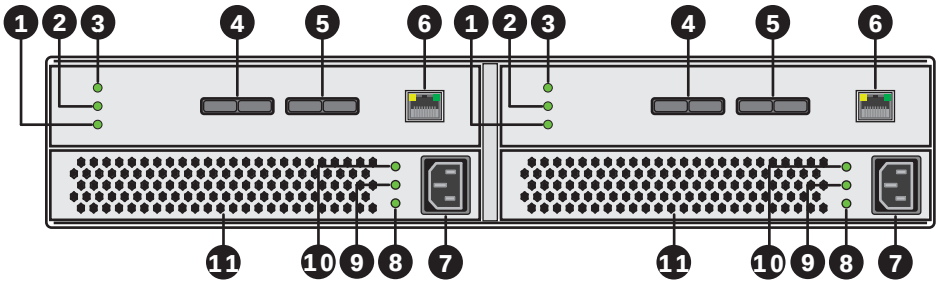


Figure 4-7: HUS 130/HUS 110 LFF/SFF Drive Box back panel

1	**ALARM** LED	**2**	**LOCATE** LED
3	**POWER** status LED	**4**	**IN** port
5	**OUT** port	**6**	**CONSOLE** port
7	AC power socket	**8**	**ALM** LED
9	**AC-IN** status LED	**10**	**RDY** LED
11	Fan		

Review File Module hardware

Use Figure 4-8 and Figure 4-9 to review File Module front and back panel hardware.

HNAS 3080/3090 File Module front panel

Figure 4-8 shows the HNAS 3080/3090 File Module front panel.

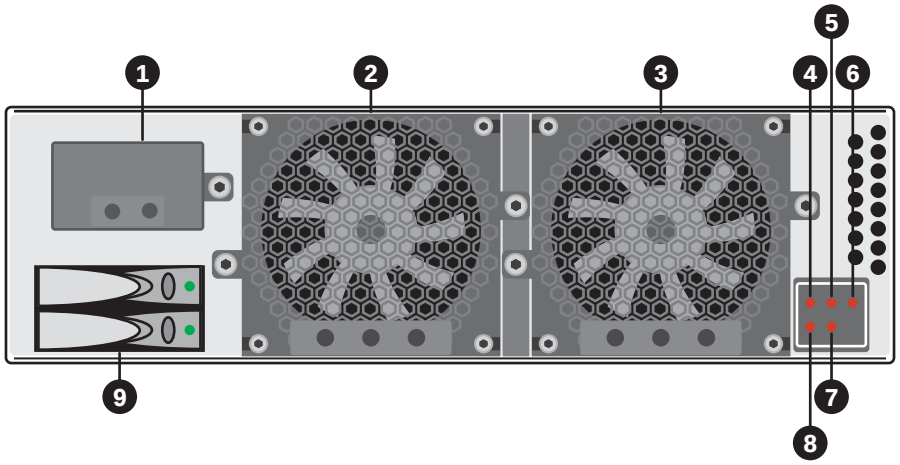


Figure 4-8: HNAS 3080/3090 File Module front panel

1	NVRAM backup battery	**2**	Fan 1
3	Fan 2	**4**	NVRAM battery backup status LED
5	Fan 1 status LED	**6**	Fan 2 status LED
7	Power status LED	**8**	Server status
9	Hard drives A and B (top to bottom)		

HNAS 3080/3090 File Module back panel

Figure 4-9 shows the HNAS 3080/3090 File Module back panel.

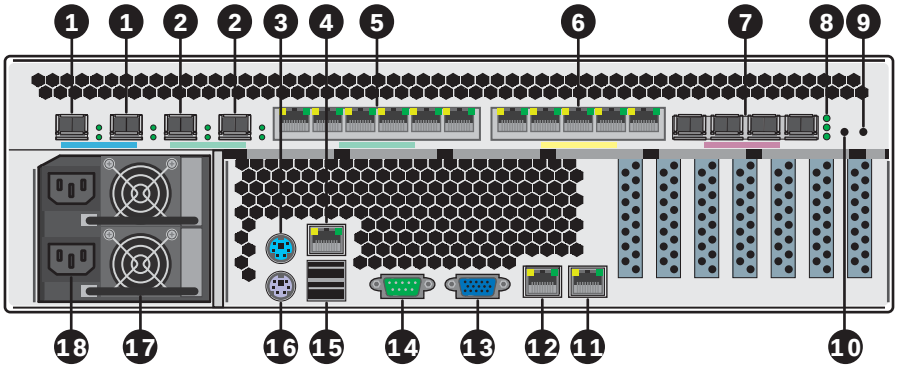


Figure 4-9: HNAS 3080/3090 File Module back panel

1	10 Gb interconnect port	**2**	1 0 GbE data network port
3	Mouse port	**4**	Ethernet port
5	GE ports	**6**	10/100 Ethernet ports
7	1/2/4 Gbps Fibre Channel ports	**8**	Power and server status LEDs
9	Reset button	**10**	Main power switch
11	Ethernet management port, **Eth1**	**12**	Ethernet management port, **Eth0**
13	Monitor port	**14**	Serial port
15	USB ports	**16**	Keyboard port
17	Fans	**18**	AC power sockets

Review server hardware

Use Figure 4-10 and Figure 4-11 to review server back panel hardware.

Server back panels

HCS server

Figure 4-10 shows the HCS server back panel.

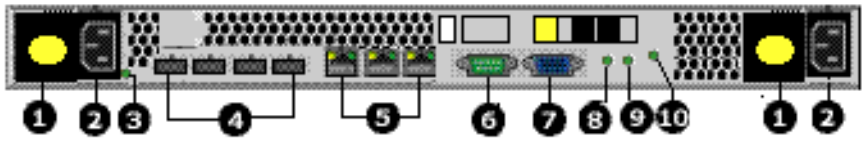


Figure 4-10: HCS server back panel

1	Power supply slots	**2**	AC connector
3	Power supply LED	**4**	USB connectors (4)
5	Network LAN port (3)	**6**	Serial interface connector
7	VGA connector	**8**	NMI switch
9	Service switch LED	**10**	Power LED

SMU server

Figure 4-11 shows the SMU server back panel.

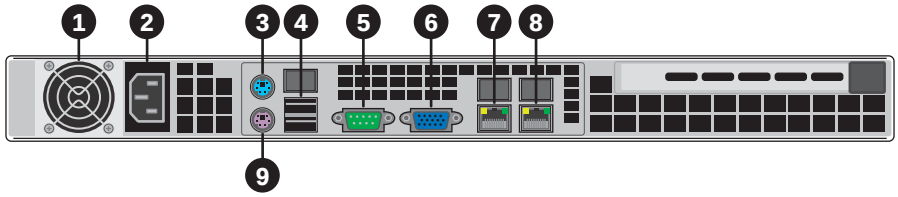


Figure 4-11: SMU server back panel

1	Fan	**2**	AC power socket
3	Mouse port	**4**	USB port
5	Serial port	**6**	Video port
7	LAN 1 port	**8**	LAN 2 port
9	Keyboard port		

Reference additional information

For complete information about racking and reviewing your hardware, see the following chapters in the *Hitachi Unified Storage Hardware Installation and Configuration Guide*.

- Chapter 1, Introduction
- Chapter 2, Hitachi Unified Storage hardware description
- Appendix C, Rack information

What's next?

You have racked your system and reviewed your hardware. You are now ready to connect your storage system. To connect your system, go to Chapter 5, Connect and power on the system.

5

Connect and power on the system

- Connect the power cables
- Connect the Controller Box
- Connect the Drive Boxes
- Connect the HCS server
- Connect the File Modules
- Connect the SMU server
- Power on the system
- Reference additional information
- What's next?

Connect the power cables

Perform the following procedure to connect power cables.

1. Verify that the main switch on all boxes, servers and switches is off.
2. Route each power cable through the cable retainers at the rear of the enclosure.
3. Plug each power cable into the power distribution system on the rack.

NOTE: A fan can start automatically when a power cable is plugged into an AC power source.

Connect the Controller Box

Perform the following procedure to connect the Controller Box. Refer to Figure 3-16 for specific connections.

1. Connect one of the Fibre Channel data ports on each controller to your Fibre Channel switch.
2. Connect the management ports on the Controller Box and the File Modules to the Ethernet switch.
3. Connect your Fibre Channel switch to the Fibre Channel HBA card on each host computer or server.

Connect the Drive Boxes

Perform the following procedures to connect Drive Boxes.

HUS 130/HUS 110 Controller Box to a HUS 130/HUS 110 Drive Box

Perform the following procedure to connect a HUS 130/HUS 110 Controller Box to a HUS 130/HUS 110 Drive Box.

1. Connect one end of a SAS (ENC) cable to the **PATH 0** port on the back panel of the Controller Box.
2. Connect the other end to the **IN** port on the I/O Module at the rear of the Drive Box.
3. To connect a second Drive Box, plug one end of a SAS (ENC) cable to the **PATH 1** port on the back panel of the Controller Box.
4. Connect the other end to the **IN** port on the I/O Module at the rear of the second Drive Box.
5. (Optional) To connect additional Drive Boxes, plug one end of a SAS (ENC) cable to the **OUT** port on the back panel of a Drive Box.
6. Connect the other end to the **IN** port on the next Drive Box.

HUS 150 Controller Box to a HUS 150 Drive Box

Perform the following procedure to connect a HUS 150 Controller Box to a HUS 150 Drive Box.

1. Connect one end of a SAS cable to the SAS connector on HUS 150 **Controller 0**.
2. Connect the other end of the cable to the **IN** port on **Drive I/O Module 0** of the Drive Box.
3. Connect one end of a SAS cable to the SAS connector on HUS 150 **Controller 1**.
4. Connect the other end of the cable to the **IN** port on **Drive I/O Module 1** of the Drive Box.
5. (Optional) Daisy-chain additional Drive Boxes.

Connect the HCS server

Perform the following procedure to connect the HCS server to a network such as a LAN or WAN.

1. Connect a **network interface connector** on the rear side of the server to a switching hub, using a LAN cable.

Connect the File Modules

Perform the following procedures to connect the File Modules. Use this procedure when the storage system contains the File Module.

Two Modules to one Controller Box directly

Perform the following procedure to connect two File Modules to a Controller Box directly. Refer to Figure 3-14 for specific connections.

1. Connect RAID-0 on the Controller Box to the File Modules.
2. Connect RAID-1 on the Controller Box to the File Modules.
3. Connect the management ports on the Controller Box and the File Modules to the Ethernet switch.

Two File Modules to one Controller Box through a Fibre Channel switch

Perform the following procedure to connect two File Modules to a Controller Box through a Fibre Channel switch. Refer to Figure 3-15 for specific connections.

1. Connect RAID-0 and RAID-1 on the Controller Box to the Fibre Channel switch.
2. Connect the 1/2/4 Gbps Fibre Channel ports on both File Modules to the Fibre Channel switch.
3. Connect the management ports on the Controller Box and the File Modules to the Ethernet switch.

Connect the SMU server

Perform the following procedure to connect the SMU server. Use this procedure when the storage system contains the File Module.

1. Connect **Eth1** on the server to an Ethernet switch.
2. Connect **Eth0** on the server to your network.

Power on the system

Perform the following procedures to power on the system.

Power on the Drive Boxes

Drive Boxes power on when you connect the power cables to the Drive Box power socket.

Perform the following procedure to verify power LED behavior.

1. For DBS/DBL Drive Boxes, verify the following LED behavior.
   a. The green **READY** LED on the front bezel is on, usually four minutes after attaching the power cables.
   b. The green **POWER** LED on the back panel is on once the port are linked up.
2. For DBX Drive Boxes, verify the following LED behavior.
   a. The green **READY** LED on the front bezel is on, usually five minutes after attaching the power cables.
   b. The green **POWER** LED on the back panel is on once the port are linked up.

Power on the Controller Box

Perform the following steps to power on the Controller Box.

1. To power on a CBL Controller Box:
   a. Press the main power switch on the front panel.
   b. Verify that the **PWR** and **RDY** LEDs on the front panel glow green after approximately five minutes.
2. To power on a CBSL/CBSS/CBXSL/CBXSS Controller Box:
   a. Press the main power switch on the back panel.
   b. Verify that the **PWR** and **RDY** LEDs on the front panel glow green after approximately five minutes.

Power on the HCS server

Perform the following procedure to power on the HCS server.

1. Press the main power switch on the front panel.
2. Verify that the **PWR** LED on the front panel glows green after approximately two minutes.

Power on the File Modules

Perform the following procedure to power on File Modules. Use this procedure when the storage system contains the File Module.

1. Press the main power switch on the back panel.
2. Verify that the **PWR** LED on the front panel glows green after approximately five minutes.

Power on the SMU server

Perform the following procedure to power on the SMU server. Use this procedure when the storage system contains the File Module.

1. Press the main power switch on the back panel.
2. Verify that the **PWR** LED on the front panel glows green after approximately two minutes.

Reference additional information

For complete information about connecting and powering on your system, see the following chapters in the *Hitachi Unified Storage Hardware Installation and Configuration Guide*.

- Chapter 4, Installing storage systems
- Appendix E, Data and power cables

What's next?

You have connected and powered on your storage system. You are now ready to configure your storage system. To configure your storage system, go to Chapter 6, Configure the system.

6

Configure the system

The following topics are included in this chapter:

Set up the Ethernet switch

Perform the following procedure to set up the Ethernet switch.

1. Connect any front-end LAN switch ports on the switch to any appropriate networks.
2. Configure a management VLAN and a maintenance VLAN on the switch.
3. Ensure that system speed and duplex are set to auto-negotiate on the switch.

NOTE: System speed and duplex settings default to auto-negotiate. The networking switch or hub to which the system is connected must also be configured to auto-negotiate. Otherwise, network throughput or connectivity to the system may be impacted.

Configure the Controller Box

Perform the following procedure to configure the Controller Box.

1. Verify the default Controller Box IP addresses:
   a. Enter 192.168.0.16 in your web browser to connect to **Controller 0**.

      When you connect, 192.168.0.16 is verified.

   b. Enter 192.168.0.17 in your web browser to connect to **Controller 1**.

      When you connect, 192.168.0.17 is verified.
2. Log into Hitachi Storage Navigator Modular 2 using **system** as the user name and **manager** as the password.
3. Click **Add Array** in the **Arrays** area.

   The **Add Array Wizard** appears.
4. Read the introduction and then click **Next**.
5. Enter the controller 0 default IP address in the **Controller 0** field.
6. Enter the controller 1 default IP address in the **Controller 1** field.
7. Click **Secure Port** and then click **Next**.

Set up the HCS server

Perform the following procedure to set up the HCS server.

1. Install Windows.
2. Install the following Hitachi software:
   a. Hitachi Storage Navigator Modular 2

   b. **Hitachi Command Suite** (HCS)

   Some operating systems require certain configuration settings before logging in to Hitachi Storage Navigator Modular 2. Red Hat Enterprise Linux, for example, requires certain kernel settings. For more information, refer to the *Hitachi Unified Storage Operations Guide*.
3. Connect a PC to the management server.

4. Change the PC IP address to 192.168.0.x, where x is a number from 1 to 254, excluding 16 and 17.
5. Disable any pop-up blockers, anti-virus software, and proxy settings.

Configure the File Modules

Perform the following procedure to configure the File Modules. Use this procedure when the storage system contains the File Module.

1. Connect a KVM or RS-232 null-modem cable to the serial connector on your PC.
2. Connect the other end of the cable to the serial connector on the back panel of the File Module.
3. Power on the server and wait for the command prompt.
4. Log into the server as **manager** with the default password of **nasadmin**.
5. Enter **evsipaddr -l** to display the default IP addresses.
6. Enter **evsipaddr -e 0 -a -i admin_public_IP -m netmask -p eth0** to customize the administrative EVS public IP address for your local network.

   This configures the administrative EVS public IP address of **Eth0** on the server, which is used to access the system using Web Manager.
7. Connect the local network Ethernet cable to **Eth0**.

Set up HNAS on the SMU server

Perform the following procedure to set up HNAS on the SMU server. Use these procedures when the storage system contains the File Module.

Server Settings

Perform the following procedure to set up the server.

1. Install Windows, and then install the SMU software.
2. Enter **http://admin_public_IP** to launch Web Manager.
3. Click **Server Settings** > **Server Setup Wizard**.

   The **Server Setup Wizard** appears.

   Figure 6-1 shows the **Server Setup Wizard**

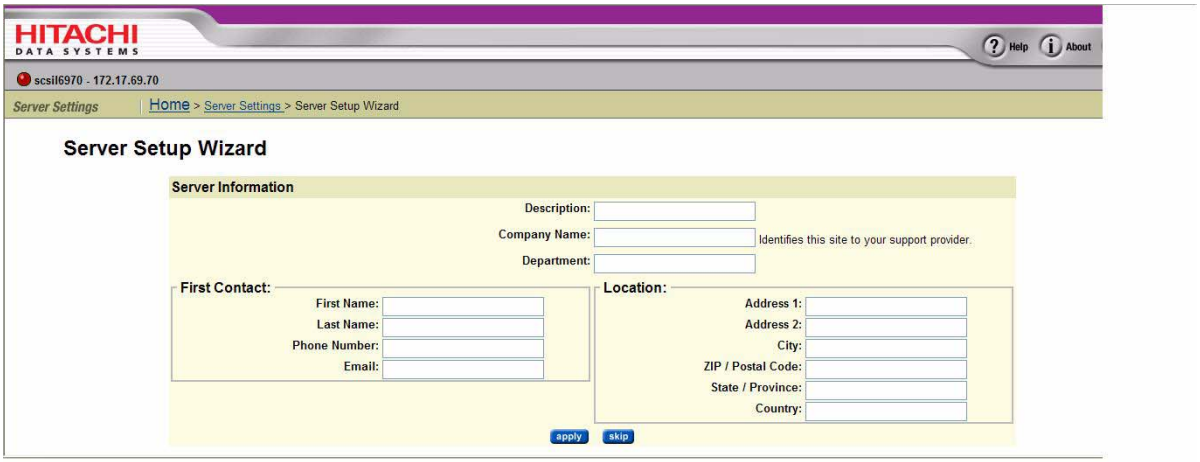


Figure 6-1: Server Setup Wizard

4. In the **Server Information** area enter any information, and click **Apply**.
5. In the **IP Addresses** area modify the Administrative EVS name, cluster node, and EVS settings.
6. In the **IP Addresses** area ensure that **Port** is set to **ag1**, and click **Apply**.
7. In the **Name Services** area enter DNS server IP addresses, domain search order, WINS server, NIS domain, and name services ordering, and click **Apply**.
8. In the **Date/Time** area specify the time zone, NTP server, time and date, and click **Apply**.
9. (Optional) In the **CIFs Settings** area modify CIFS settings, and click **Apply**.
10. In the **Email Profiles** area, specify the email server to which the server can send and relay event notification emails, check the **Enable the Support Profile** option, enter the contact's email address, and click **Apply**.
11. In the **Passwords** area, change the supervisor password, and click **Apply**.
12. In the **Create Test File System, Share and Export area,** create test file systems, shares, and exports:
    a. Check the **Creates NFS** option if this will be a NFS file server.
    b. Check the **Create a CIFS** option if this will be a CIFS file server.
    c. Check both options if this will be a mixed environment.
13. Click **Apply**.
14. Click **Server Settings** > **Server Status** to verify that all components are functioning properly.

Managing storage subsystems with Hitachi Device manager

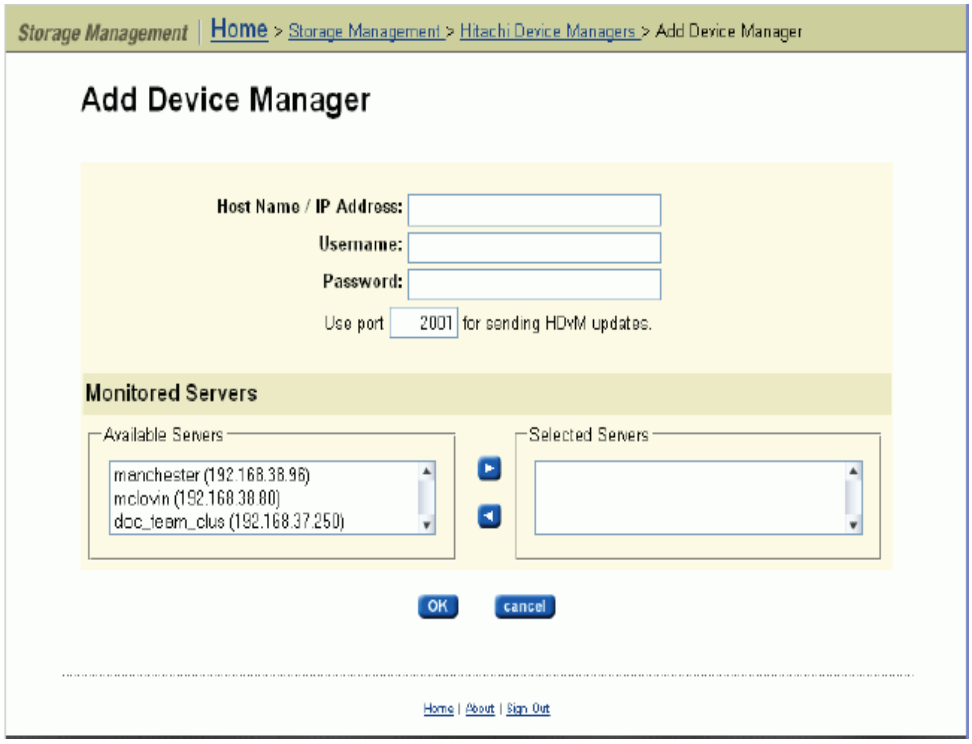
The Hitachi Device Manager (HDvM) can be used to monitor HDS storage subsystems attached to Hitachi NAS Platform managed by an SMU. This functionality is enabled using Web Manager to configure a connection from the SMU to the HDvM server, then using the HDvM GUI to configure the HDvM to display information about the HDS storage subsystems attached to the servers managed by the SMU. (For information about configuring or using the Hitachi Device Manager, refer to your Hitachi Device Manager documentation, or contact Hitachi Data Systems.)

After an HDvM server has been specified, the SMU provides HDvM with information about the system drives (SDs) on the HDS storage subsystems attached to the NAS Platforms managed by the SMU.

Connecting the SMU to an HDvM server

Specifying connection details allows the SMU to communicate with the HDvM server and send information to HDvM.

1. Navigate to **Home** > **Storage Management** > **Hitachi Device Managers** to display the **Hitachi Device Managers** page.
2. Click **add** to display the **Add Device Manager** page.



3. Specify HDvM server host name or IP address, valid HDvM user account name and password, and port for communicating with the HDvM server.
4. From the **Available Servers** list, select the servers with HDS storage subsystems to be monitored through HDvM.

5. Click **OK** to update the SMU's list of connections.

The SMU sends information about HDS storage subsystems attached to the Hitachi NAS Platforms to the HDvM at 3:00 AM every morning.

6. Using the Hitachi Device Manager's GUI, add the storage subsystems attached to the Hitachi NAS Platforms managed by the SMU to the list of managed storage subsystems.

For information about configuring or using the Hitachi Device Manager, refer to your Hitachi Device Manager documentation, or contact Hitachi Data Systems.

Quorum services

Perform the following procedure to view and manage quorum services.

1. Navigate to the Quorum Services page.
2. Start, stop, or restart selected quorum devices.

CAUTION! Incorrectly stopping or restarting a quorum device may disrupt services.

License keys

Perform the following procedure to add a license key.

1. Click **Server Settings** > **License Keys**.
2. If you are entering the key manually, enter the key number in the License Key field and then click **Add**.

   If you have received the license key electronically, to avoid errors, you should copy the license key from the file and paste it into the License Key field.
3. If you have a file that contains the license key click **Browse** and then click **Import**.
4. After all the keys have been entered, follow the instructions to reboot the system.

Configure basics using Hitachi Command Suite (HCS)

You use HCS to configure the system.

HCS is a group of storage management software products that allow you to manage storage resources in large-scale, complex SAN environments. HCS includes Hitachi Device Manager, Hitachi Tiered Storage Manager, Hitachi Dynamic Link Manager, Hitachi Global Link Manager, Hitachi Tuning Manager, Hitachi Replication Manager, and Hitachi Compute Systems Manager.

HCS contains the following functionality:

- Storage task operations
- Storage resource management
- User management
- Controlled resource access
- Security

For information about how to install HCS, refer to the *Hitachi Command Suite Installation and Configuration Guide*.

Perform the following procedures to configure the system using HCS.

1. Set Java runtime parameters:

NOTE: If you intend to use Advanced Settings in Hitachi Storage Navigator Modular 2 on clients running Microsoft Windows, Solaris, or Linux, install JRE v6.0. If JRE v6.0 is not installed, you will not be able to use Advanced Settings.

   a. Download JRE v6.0.
   b. Install JRE v6.0.
   c. Click **Java** in **Control Panel**.
   d. Click the Java tab on the **Java Control Panel** page.
   e. Set Java runtime parameters.
2. Change controller IP addresses.
3. Log into HCS using a browser and the following format:

   http://<management server IP address>
   :23015/DeviceManagerWebService/

   The HCS home page appears.

   Figure 6-2 shows the HCS home page.

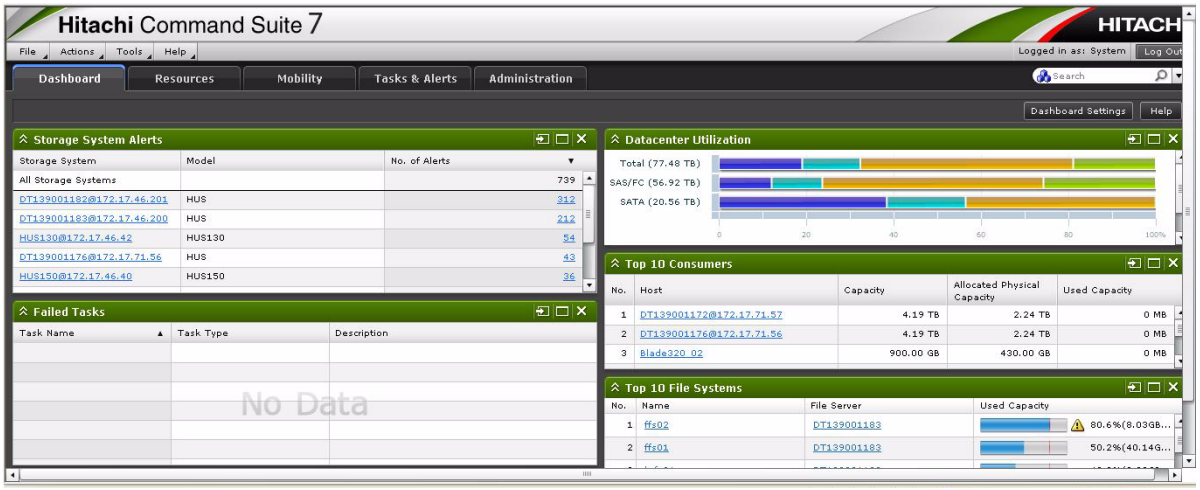


Figure 6-2: HCS home page

4. Log into Hitachi Storage Navigator Modular 2 from HCS:
   a. Select **Storage Systems** on the **Resources** tab.
   b. Select a storage system.
   c. Select **Element Manager** from the **Actions** menu.

   The Hitachi Storage Navigator Modular 2 home page appears.

   Figure 6-3 on page 6-8 shows the Hitachi Storage Navigator Modular 2 home page.

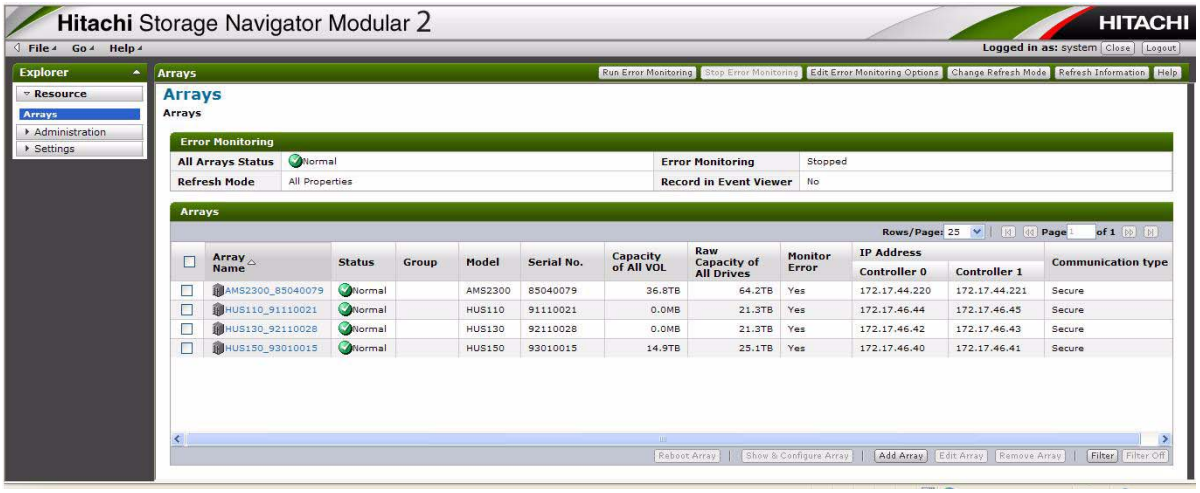


Figure 6-3: Hitachi Storage Navigator Modular 2 home page

5. Use the **Setup Array Wizard** to perform initial setup:
   a. Check the appropriate array in the **Array Name** column.
   b. Click **Show and Configure Array** in the **Arrays** area.
   c. Click **Initial Setup** in the **Common Array Tasks** area.

   The **Setup Array Wizard** appears.

   Figure 6-4 shows the **Setup Array Wizard**.

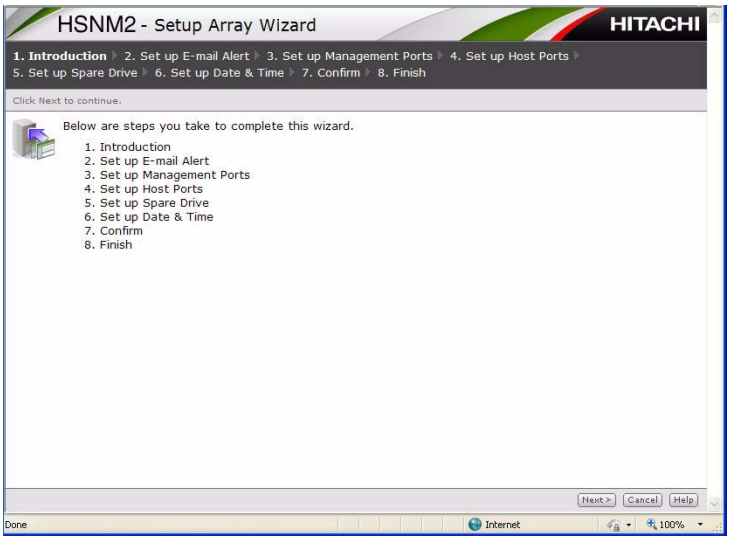


Figure 6-4: Setup Array Wizard

d. Use the wizard to set up the following features:
   - Email alerts
   - Management ports
   - Host ports
   - Spare drives
   - Date and time

6. Use the **Add Array Wizard** to add storage systems:
   a. Check the appropriate array in the **Array Name** column.
   b. Click **Add Array** in the **Arrays** area.

      The **Add Array Wizard** appears.

      Figure 6-5 shows the Add Array Wizard.

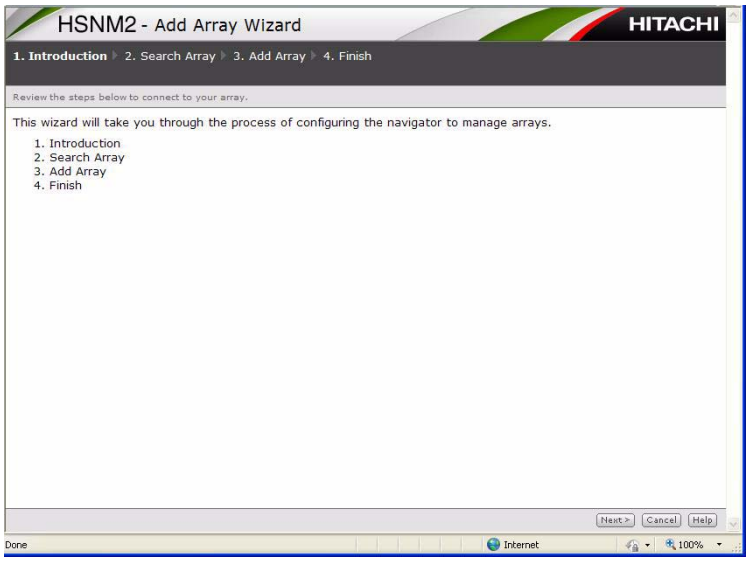


Figure 6-5: Add Array Wizard

c. Use the wizard to perform the following tasks:

- Search for arrays
- Add arrays

7. Use the **Create & Map Volume Wizard** to create volumes:
   a. Check the appropriate array in the **Array Name** column.
   b. Click **Show and Configure Array** in the **Arrays** area.
   c. Click **Create Volume & Mapping** in the **Common Array Tasks** area.

      The **Create & Map Volume Wizard** appears.

      Figure 6-7 on page 6-11 shows the **Create & Map Volume Wizard**.

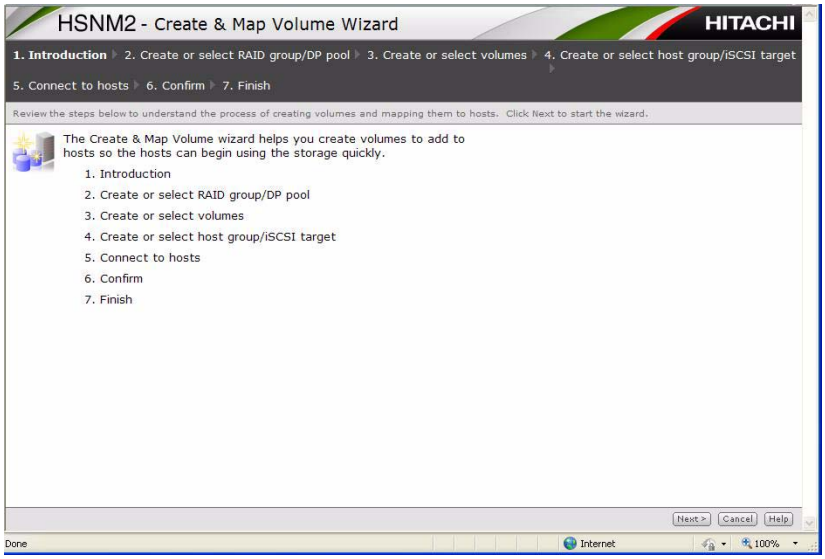


Figure 6-6: Create & Map Volume Wizard

   d. Use the wizard to perform the following tasks:

- Create or select RAID groups or DP pools
- Create or select volumes
- Create or select host group or iSCSI targets
- Connect to hosts

8. Select platform-specific settings for iSCSI targets:
   a. Click **iSCSI Targets** in the **Groups** area.
   b. Check the appropriate iSCSI target on the **iSCSI Targets** tab.
   c. Click **Edit Target**.

      The **Edit iSCSI Target** page appears.

      Figure 6-7 shows the **Edit iSCSI Target** page.

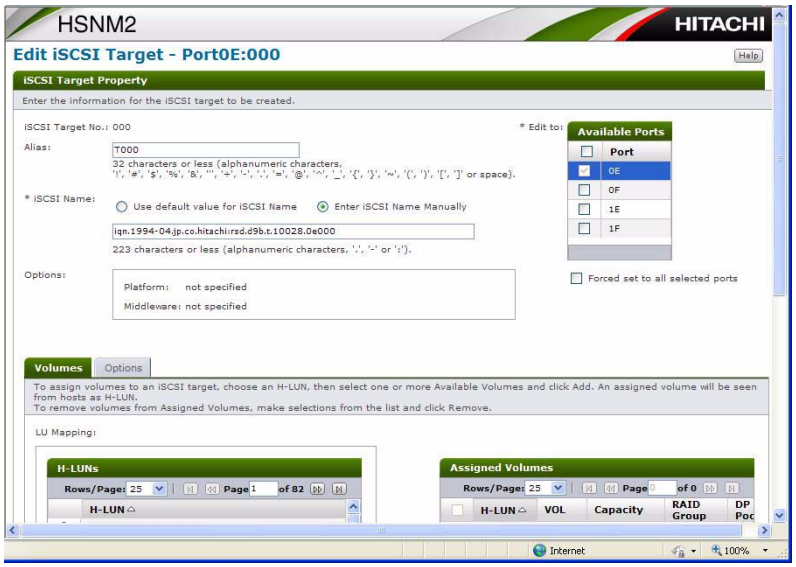


Figure 6-7: Edit iSCSI Target page

d. Click the **Options** tab, and then select the appropriate host operating system on the **Platform** drop-down list.

e. Select the appropriate middleware on the **Middleware** drop-down list.

f. Click **OK**, and then click **Close**.

9. Select platform-specific settings for Fibre Channel host groups:

a. Check the appropriate array in the **Array Name** column.

b. Click **Show and Configure Array** in the **Arrays** area.

c. Expand the **Groups** node, and then click **Host Groups** under the **Groups** node.

d. Check the appropriate group, and then click **Edit Host Group** in the **Host Groups** area.

The **Edit Host Group** page appears.

Figure 6-8 shows the **Edit Host Group** page.

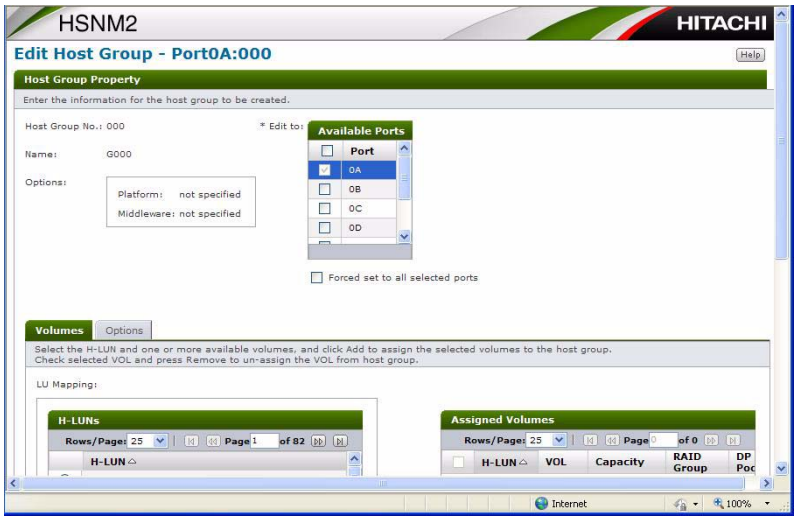


Figure 6-8: Edit Host Group page

e. Click the **Options** tab, and then select the appropriate host operating system on the **Platform** drop-down list.

f. Select the appropriate middleware on the **Middleware** drop-down list.

g. Click **OK**, and then click **Close**.

Reference additional information

For complete information about configuring your system, see the following chapters in the *Hitachi Unified Storage Hardware Installation and Configuration Guide*:

- Chapter 6, Configuring the storage system
- Chapter 7, Fibre Channel host configuration
- Chapter 8, iSCSI host configuration

What's next?

You have configured your storage system. You are now ready to complete your installation. To complete your installation, go to Chapter 7, Complete the installation.

7

Complete the installation

The following topics are included in this chapter:

Register your system

Before you start using your Hitachi Unified Storage system for the first time, use the HDS Support Portal to register your storage system. As part of this procedure, you will create a new user account if you do not already have one.

If you already have a user account, skip to Logging in to the HDS Support Portal on page 7-3.

NOTE: If you encounter a problem, visit https://portal.hds.com/index.php/contact-us or contact the Hitachi Global Contact Center (GCC):

- From the US: (800) 446-0744
- Outside the US: (858) 547-4526
- Web: portal.support@hds.com
- EMEA assistance: hdsservicerequests@hds.com or call +44 1753 216064.

When calling the GCC, please have the following information available:

- Customer site ID
- Product model and serial number
- Contact name, phone number, and e-mail address

Creating a user account

The first time you log in to the HDS Support Portal, you must create a user account before you register your Hitachi storage system. The following procedure describes how to create a user account.

1. Launch a browser and go to the HDS Support Portal:

   https://portal.hds.com

2. When the Portal page appears, click **Need to register?** under **Login** at the bottom-right area of the page.

   Figure 7-1 shows the Portal page.

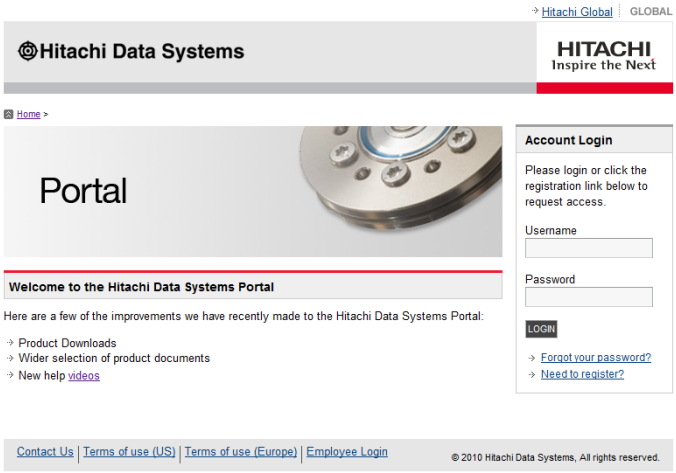


Figure 7-1: Portal page

3. On the User Registration page, click your country or region, and then click **Submit**.
4. On the Global Personal Data Protection & Privacy Policy page, read the policy. When you finish, click **I accept**.

   You must accept the policy to continue with the registration process.
5. On the User Type page, select a user type.
6. Click **Next**.
7. On the Contact Info page, enter your customer contact information.

NOTE: In the **Registering with a Company** field, enter your company's site ID to ensure accurate user to site matching.

8. When you finish, click **Next**.
9. Follow the remaining on-screen instructions.
10. On the Confirmation page, confirm that the information shown is correct. Use the following procedure if you need to change the information:
    a. Click the appropriate topic link in the bread crumbs at the top of the page or on the body of the page.
    b. Edit the information.
    c. Click **Next** until the Confirm page appears.
11. Click **Register**.

    The storage system is registered, the Landing page appears, and a login password is sent to the email address you specified during product registration. You can use the email address and password to log in to the HDS Support Portal using the instructions in Logging in to the HDS Support Portal on page 7-3.

Logging in to the HDS Support Portal

After you create a user account and receive a password, you can log in to the HDS Support Portal to register additional Hitachi storage systems.

To log in to the HDS Support Portal:

1. On the Login page, enter your log in credentials:
    a. **Username**—Enter the email address you specified when you created your user account.
    b. **Password**—Enter the case-sensitive password you received by email when you created your user account. For security, each typed password character is masked with a dot (•).
2. Click **LOGIN**.
3. Confirm that all of your products are registered by clicking the **My Products** link at the top of the page or the bottom-right of the page.

   If all of your products are shown under **My Products** for all of your sites, your Hitachi storage systems are registered.

Otherwise, perform the following steps to register additional products:

a. Click the **Register Additional Product** link at the top of the page or at the bottom-right of the page.

b. At the Product Registration page, under **Product Information**, click the **Product Category** drop-down list and select the product category for the product you are registering.

   Figure 7-2 shows the Product Registration page.

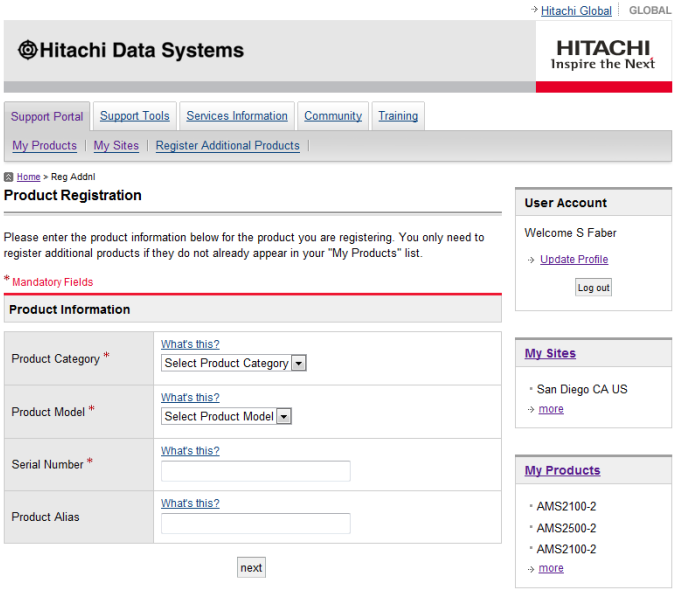


Figure 7-2: Product Registration page

c. Click the **Product Model** drop-down list and select the product you are registering.

d. Click in the **Serial Number** field and enter the serial number for your product.

NOTE: For convenience, Hitachi Unified Storage system models 110 and 130 provide a serial number label on the top of the enclosure.

e. (Optional) Click in the **Alias** field and enter a name for the product you are registering.

f. Click **Next**.

g. On the Site Information page, click an existing site or click **Create a New Site** and complete the on-screen site information.

h. On the Confirm Registration page, click **Register** at the bottom of the page.

   Wait 15 minutes, and then click **My Products Page** to confirm that your storage systems are registered.

Record configuration settings

We recommend that you make a copy of the following table and record your configuration settings for future reference.

Table 7-1: Configuration settings

Field	Description
Storage system name	
Email Notifications	
Email Notifications	Disabled Enabled (record your settings below)
Domain Name	
Mail Server Address	
From Address	
Send to Address Address 1: Address 2: Address 3:	
Reply To Address	
Management Port Settings	
Controller 0	
Configuration	Automatic (Use DHCP) Manual (record your settings below)
IP Address	
Subnet Mask	
Default Gateway	
Controller 1	
Configuration	Automatic (Use DHCP) Manual (record your settings below)
IP Address	
Subnet Mask	
Default Gateway	
Host Port Settings	
Fibre Channel Port:_____	Port Address: Transfer Rate: Topology:
Fibre Channel Port:_____	Port Address: Transfer Rate: Topology:

Table 7-1: Configuration settings

Field	Description
Fibre Channel Port:_____	Port Address: Transfer Rate: Topology:
Fibre Channel Port:_____	Port Address: Transfer Rate: Topology:
Fibre Channel Port:_____	Port Address: Transfer Rate: Topology:
Fibre Channel Port:_____	Port Address: Transfer Rate: Topology:
Fibre Channel Port:_____	Port Address: Transfer Rate: Topology:
Fibre Channel Port:_____	Port Address: Transfer Rate: Topology:
iSCSI Port:_____	IP Address: Subnet Mask: Default Gateway:
iSCSI Port:_____	IP Address: Subnet Mask: Default Gateway:
iSCSI Port:_____	IP Address: Subnet Mask: Default Gateway:
iSCSI Port:_____	IP Address: Subnet Mask: Default Gateway:
VOL Settings	
RAID Group	
Free Space	
VOL	
Capacity	
Stripe Size	
Format the volume	Yes No

Download the latest firmware

Download the latest Hitachi Unified Storage firmware from the Hitachi Data Systems Portal:

https://portal.hds.com

For firmware download and installation instructions for the Hitachi Unified Storage block module, refer to the Hitachi Unified Storage Hardware Installation and Configuration Guide.

Perform additional tasks

HDS Support Portal allows access to HDS technical information, product downloads, case management and more. If you encounter a problem registering your storage system, visit http://www.hds.com/solutions/smb/.

You can perform the following additional tasks based on your storage requirements.

- Create and back up more volumes
- Enable more license keys
- Create, edit, initialize, delete, and filter targets
- Create, edit, split, resync, restore, and delete replication tasks

Reference additional information

For complete information about completing your installation, see the following chapters in the *Hitachi Unified Storage Hardware Installation and Configuration Guide*:

- Chapter 8, Troubleshooting
- Appendix A, Registration, resources, and checklists

Product documentation

Refer to the supplied documentation CD or visit the Hitachi Web Portal at the following address:

http://www.hds.com/products/storage-systems/

Product interoperability

Refer to the interoperability matrix at the following address:

http://www.hds.com/products/interoperability/

Global Services

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A

Hitachi Unified Storage user guides by topic

This section provides a list of all Hitachi Unified Storage user documentation, by topic. The Hitachi Unified Storage system includes both the block module and the file module systems.

Hitachi Unified Storage user guides by topic

Table A-1 provides a list of all Hitachi Unified Storage user documentation, by topic.

Table A-1: Hitachi Unified Storage user documentation, by topic

Type of manual / topic	HUS manual name	File Module Manual Name
Introductory	*Hitachi Unified Storage Getting Started Guide* MK-91DF8303	*Hitachi Unified Storage Getting Started Guide* MK-91DF8303
Current information	*Hitachi Unified Storage Firmware Release Notes* RN-91DF8304	*Hitachi Unified Storage (HUS) File Module NAS Operating System SU 11.1 and SMU 11.1 Release Notes* RN-92USF016
Hardware	*Hitachi Unified Storage Hardware Service Guide* MK-91DF8302	*Hitachi Unified Storage File Module Hardware Reference* MK-92USF001
System Configuration and management	*Hitachi Unified Storage Hardware Installation and Configuration Guide* MK-91DF8273	• *Hitachi Unified Storage File Module System Installation Guide* (technical support only) • *Hitachi Unified Storage File Module Storage Subsystem Administration Guide* MK-92USF006 • *Hitachi Unified Storage File Module File Services Administration Guide* MK-92USF004
Storage Management	• *Hitachi Unified Storage Operations Guide* MK-91DF8275 • *Hitachi Storage Navigator Modular 2 Release Notes* RN-91DF8305	• *Hitachi Unified Storage File Module Storage Subsystem Administration Guide* MK-92USF006 • *Hitachi Unified Storage File Module Server and Cluster Administration Guide* MK-92USF007 • *Hitachi Unified Storage File Module NDMP Backup Administration Guide MK-92USF012*
Security	*Hitachi Unified Storage Operations Guide* MK-91DF8275	*Hitachi Unified Storage File Module Antivirus Administration Guide* MK-92USF010

Table A-1: Hitachi Unified Storage user documentation, by topic

Type of manual / topic	HUS manual name	File Module Manual Name
Provisioning	*Hitachi Unified Storage Provisioning Configuration Guide* MK-91DF8277	*Hitachi Unified Storage File Module Storage Subsystem Administration Guide* MK-92USF006 • *Hitachi Unified Storage File Module Server and Cluster Administration Guide* MK-92USF007 • *Hitachi Unified Storage File Module System Access Guide* MK-92USF002
Host Configuration	*Hitachi Unified Storage Operations Guide* MK-91DF8275	N/A
Virtualization	*Hitachi Unified Storage Operations Guide* MK-91DF8275	*Hitachi Unified Storage File Module File Services Administration Guide* MK-92USF004
Replication	*Hitachi Unified Storage Replication User Guide* MK-91DF8274	• *Hitachi Unified Storage File Module Network Administration Guide* MK-92USF003 • *Hitachi Unified Storage File Module Replication and Disaster Recovery Administration Guide* MK-92USF009 • *Hitachi Unified Storage File Module Snapshot Administration Guide* MK-92USF008
Command line entry	*Hitachi Unified Storage Command Control Interface Installation and Configuration Guide* MK-91DF8306	Hitachi NAS Platform Command Line Reference (accessed through HNAS Web Manager
Performance	*Hitachi Unified Storage Operations Guide* MK-91DF8275	• *Hitachi Unified Storage File Module Server and Cluster Administration Guide* MK-92USF007 • *Hitachi Unified Storage File Module Storage Subsystem Administration Guide* MK-92USF006

Table A-1: Hitachi Unified Storage user documentation, by topic

Type of manual / topic	HUS manual name	File Module Manual Name
System Maintenance	*Hitachi Unified Storage Hardware Service Guide* MK-91DF8302	• *Hitachi Unified Storage File Module Server and Cluster Administration Guide* MK-92USF007 • *Hitachi Unified Storage File Module Storage Subsystem Administration Guide* MK-92USF006
Backup Operations	N/A	*Hitachi Unified Storage File Module NDMP Backup Administration Guide* MK-92USF012
Troubleshooting	• *Hitachi Unified Storage Hardware Service Guide* MK-91DF8302 • *Hitachi Unified Storage Hardware Installation and Configuration Guide* MK-91DF8273	*Hitachi NAS Platform Troubleshooting Guide* (technical support only)

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