

Hitachi Adaptable Modular Storage 2000 Host Installation Guide for Fibre Channel Attachment

Hitachi Virtual Storage Platform
Hitachi Universal Storage Platform V/VM
Hitachi TagmaStore® Universal Storage Platform

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Preface

This document provides guidelines about how to use the Universal Volume Manager to connect the Hitachi Adaptable Modular Storage (AMS) 2000 system with the Hitachi Universal Storage Platform V (USP V), Hitachi Universal Storage Platform VM (USP VM), or Hitachi Virtual Storage Platform (VSP). This document also provides information about where to find resources to ensure that the AMS 2000 system and USP V, USP VM, or VSP are working properly.

This guide assumes that the AMS 2000 system is installed and functioning correctly. If it is not, install the system before reading this guide.

This preface includes the following information:

- [Intended audience](#)
- [Document revision level](#)
- [Changes in this revision](#)
- [Document conventions](#)
- [Convention for storage capacity values](#)
- [Related documents](#)
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Intended audience

This document is intended for system administrators, authentication service providers, and users who create volumes by connecting AMS 2000 series storage arrays in USP V, USP VM, or VSP systems. Users are required to be well versed in general storage concepts and the specification of AMS 2000 series storage arrays.

Document revision level

This section provides a history of the revision changes to this document.

Revision	Date	Description
MK-90DF8231-00	November 2010	Initial Release
MK-90DF8231-01	December 2010	Rev 01, supersedes and replaces MK-90DF82310-00
MK-90DF8231-02	May 2011	Rev 02, supersedes and replaces MK-90DF82310-01

Changes in this revision

Added references to the Hitachi Virtual Storage Platform (VSP) and USP V.




Revised [Figure 1-1 on page 1-2](#), [Figure 1-2 on page 1-2](#), [Figure 1-3 on page 1-3](#), [Figure 1-4 on page 1-4](#), [Figure 1-5 on page 1-4](#), and [Figure 1-6 on page 1-6](#).

In [Setting USP V, USP VM, and VSP values on page 2-2](#), added note about the port queue depth.

Added last bullet under [Setting USP V, USP VM, and VSP values on page 2-2](#).

Document conventions

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.

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 .
<i>Italic</i>	Indicates a variable, which is a placeholder for actual text provided by you or the system. Example: copy <i>source-file target-file</i> Angled brackets (< >) are also used to indicate variables.
screen or code	Indicates text that is displayed on screen or entered by you. Example: # <code>pairdisplay -g oradb</code>
< > angled brackets	Indicates a variable, which is a placeholder for actual text provided by you or the system. Example: # <code>pairdisplay -g <group></code> 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.
{ } 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: [<u>a</u> b]

Convention for storage capacity values

Physical storage capacity values (e.g., 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 (e.g., 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
1 EB	1,024 PB or 1024 ⁶ bytes

Related documents

The AMS 2000 Family user documentation is available on the Hitachi Data Systems 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.

This documentation set consists of the following documents.


Release notes

- Adaptable Modular Storage System Release Notes
- Storage Navigator Modular 2 Release Notes



Please read the release notes before installing and using this product. They may contain requirements and restrictions not fully described in this document, along with updates and corrections to this document.

Installation and getting started

The following documents provide instructions for installing an AMS 2000 Family storage system. They include rack information, safety information, site-preparation instructions, getting-started guides for experienced users, and host connectivity information. The symbol  identifies documents that contain initial configuration information about Hitachi AMS 2000 Family storage systems.

 **AMS2100/2300 Getting Started Guide**, MK-98DF8152

Provides quick-start instructions for getting an AMS 2100 or AMS 2300 storage system up and running as quickly as possible.

 **AMS2500 Getting Started Guide**, MK-97DF8032

Provides quick-start instructions for getting an AMS 2500 storage system up and running as quickly as possible.

AMS 2000 Family Site Preparation Guide, MK-98DF8149

Contains initial site planning and pre-installation information for AMS 2000 Family storage systems, expansion units, and high-density expansion units. This document also covers safety precautions, rack information, and product specifications.

AMS 2000 Family Fibre Channel Host Installation Guide,
MK-08DF8189

Describes how to prepare Hitachi AMS 2000 Family Fibre Channel storage systems for use with host servers running supported operating systems.

AMS 2000 Family iSCSI Host Installation Guide, MK-08DF8188

Describes how to prepare Hitachi AMS 2000 Family iSCSI storage systems for use with host servers running supported operating systems.

Storage and replication features

The following documents describe how to use Storage Navigator Modular 2 (Navigator 2) to perform storage and replication activities.

Storage Navigator 2 Advanced Settings User's Guide, MK-97DF8039

Contains advanced information about launching and using Navigator 2 in various operating systems, IP addresses and port numbers, server certificates and private keys, boot and restore options, outputting configuration information to a file, and collecting diagnostic information.

Storage Navigator Modular 2 User's Guide, MK-99DF8208

Describes how to use Navigator 2 to configure and manage storage on an AMS 2000 Family storage system.

AMS 2000 Family Dynamic Provisioning Configuration Guide, MK-09DF8201

Describes how to use virtual storage capabilities to simplify storage additions and administration.

Storage Navigator 2 Storage Features Reference Guide for AMS, MK-97DF8148

Contains concepts, preparation, and specifications for Account Authentication, Audit Logging, Cache Partition Manager, Cache Residency Manager, Data Retention Utility, LUN Manager, Performance Monitor, SNMP Agent, and Modular Volume Migration.

AMS 2000 Family Copy-on-write SnapShot User Guide, MK-97DF8124

Describes how to create point-in-time copies of data volumes in AMS 2100, AMS 2300, and AMS 2500 storage systems, without impacting host service and performance levels. Snapshot copies are fully read/write compatible with other hosts and can be used for rapid data restores, application testing and development, data mining and warehousing, and nondisruptive backup and maintenance procedures.

AMS 2000 Family ShadowImage In-system Replication User Guide, MK-97DF8129

Describes how to perform high-speed nondisruptive local mirroring to create a copy of mission-critical data in AMS 2100, AMS 2300, and AMS 2500 storage systems. ShadowImage keeps data RAID-protected and fully recoverable, without affecting service or performance levels. Replicated data volumes can be split from host applications and used for

system backups, application testing, and data mining applications while business continues to operate at full capacity.

AMS 2000 Family TrueCopy Remote Replication User Guide,
MK-97DF8052

Describes how to create and maintain multiple duplicate copies of user data across multiple AMS 2000 Family storage systems to enhance your disaster recovery strategy.

AMS 2000 Family TrueCopy Extended Distance User Guide,
MK-97DF8054

Describes how to perform bi-directional remote data protection that copies data over any distance without interrupting applications, and provides failover and recovery capabilities.


AMS 2000 Data Retention Utility User's Guide, MK-97DF8019

Describes how to lock disk volumes as read-only for a certain period of time to ensure authorized-only access and facilitate immutable, tamper-proof record retention for storage-compliant environments. After data is written, it can be retrieved and read only by authorized applications or users, and cannot be changed or deleted during the specified retention period.

Storage Navigator Modular 2 online help

Provides topic and context-sensitive help information accessed through the Navigator 2 software.

Hardware maintenance and operation

The following documents describe how to operate, maintain, and administer an AMS 2000 Family storage system. They also provide a wide range of technical information and specifications for the AMS 2000 Family storage systems. The symbol  identifies documents that contain initial configuration information about Hitachi AMS 2000 Family storage systems.

 **AMS 2100/2300 Storage System Hardware Guide,** MK-97DF8010

Provides detailed information about installing, configuring, and maintaining AMS 2100 and 2300 storage systems.

 **AMS 2500 Storage System Hardware Guide,** MK-97DF8007

Provides detailed information about installing, configuring, and maintaining an AMS 2500 storage system.

 **AMS 2000 Family Storage System Reference Guide,** MK-97DF8008

Contains specifications and technical information about power cables, system parameters, interfaces, logical blocks, RAID levels and configurations, and regulatory information about AMS 2100, AMS 2300,

and AMS 2500 storage systems. This document also contains remote adapter specifications and regulatory information.

AMS 2000 Family Storage System Service and Upgrade Guide, MK-97DF8009

Provides information about servicing and upgrading AMS 2100, AMS 2300, and AMS 2500 storage systems.

AMS 2000 Family Power Savings User Guide, MK-97DF8045

Describes how to spin down volumes in selected RAID groups when they are not being accessed by business applications to decrease energy consumption and significantly reduce the cost of storing and delivering information.

Command and Control (CCI)

The following documents describe how to install the Hitachi AMS 2000 Family Command Control Interface (CCI) and use it to perform TrueCopy and ShadowImage operations.

AMS 2000 Family Command Control Interface (CCI) Installation Guide, MK-97DF8122

Describes how to install CCI software on open-system hosts.

AMS 2000 Family Command Control Interface (CCI) Reference Guide, MK-97DF8121

Contains reference, troubleshooting, and maintenance information related to CCI operations on AMS 2100, AMS 2300, and AMS 2500 storage systems.

AMS 2000 Family Command Control Interface (CCI) User's Guide, MK-97DF8123

Describes how to use CCI to perform TrueCopy and ShadowImage operations on AMS 2100, AMS 2300, and AMS 2500 storage systems.

Command Line Interface (CLI)

The following documents describe how to use Hitachi Storage Navigator Modular 2 to perform management and replication activities from a command line.

Storage Navigator Modular 2 Command Line Interface (CLI) Unified Reference Guide, MK-97DF8089

Describes how to interact with all Navigator 2 bundled and optional software modules by typing commands at a command line.

Storage Navigator 2 Command Line Interface Replication Reference Guide for AMS, MK-97DF8153

Describes how to interact with Navigator 2 to perform replication activities by typing commands at a command line.

Dynamic Replicator documentation

The following documents describe how to install, configure, and use Hitachi Dynamic Replicator to provide AMS Family storage systems with continuous data protection, remote replication, and application failover in a single, easy-to-deploy and manage platform.

Hitachi Dynamic Replicator - Scout Release Notes (RN-99DF8211)

Hitachi Dynamic Replicator - Scout Host Upgrade Guide (MK-99DF8267)

Hitachi Dynamic Replicator - Scout Host User Guide (MK-99DF8266)

Hitachi Dynamic Replicator - Scout Installation and Configuration Guide (MK-98DF8213)

Hitachi Dynamic Replicator - Scout Quick Install/Upgrade Guide (MK-98DF8222)

Getting help

If you need to contact the Hitachi Data Systems support center, please provide as much information about the problem as possible, including:

- The circumstances surrounding the error or failure.
- The exact content of any messages displayed on the host systems.
- The exact content of any messages displayed on Storage Navigator Modular 2.
- The Storage Navigator Modular 2 configuration information. This information is used by service personnel for troubleshooting purposes.

The Hitachi Data Systems customer support staff is available 24 hours a day, seven days a week. If you need technical support, please log on to the Hitachi Data Systems 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, number, and revision, and refer to specific sections and paragraphs whenever possible.

Thank you! (All comments become the property of Hitachi Data Systems.)

System configuration prerequisites

The AMS 2000 system is a high-performance, medium-capacity storage array, with added features for increasing data accessibility and enabling continuous user data access. The architecture of the AMS 2000 series empowers users to scale the system to meet a wide range of capacity and performance requirements. The AMS 2000 system supports connectivity from most open systems using Fibre Channel interfaces.

The key topics in this chapter are:

- ❑ [Planning your configuration](#)
- ❑ [Firmware update guidelines](#)

Planning your configuration

Before you connect the host server to the AMS 2000 system, we recommend you plan your configuration.

Configuration examples

Figure 1-1 shows an example of a configuration where an AMS 2000 system is connected directly to a pair of host servers.

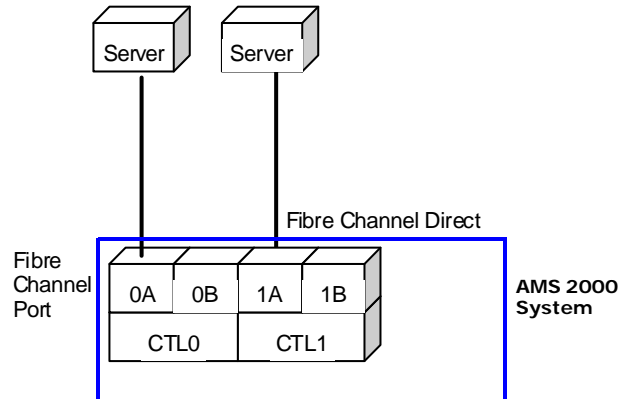


Figure 1-1: AMS 2000 Direct Connection to Two Hosts

Figure 1-2 shows an example of a configuration where an AMS 2000 Fibre Channel port is shared with two or more servers. To use this configuration, you must use Hitachi Volume Security (LUN Manager) on the AMS 2000 when the configuration involves:

- Different types of servers
- A configuration where separate LUs are accessed by each server on one Fibre Channel port

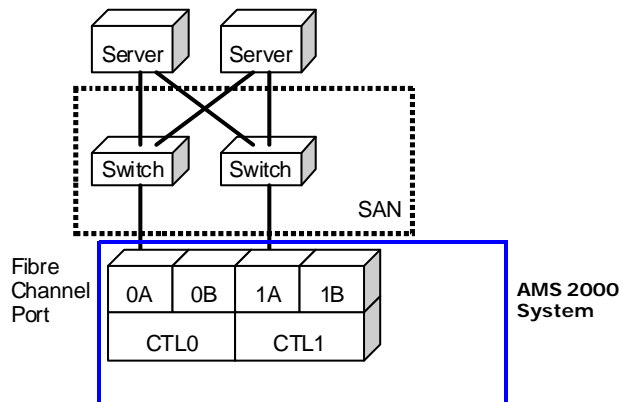


Figure 1-2: Two Servers Sharing One AMS 2000 Fibre Channel Port

Configuration guidelines

Your system design should consider:

- A USP V, USP VM, or VSP included with a host
- Assigning Host Groups and LUs to hosts or USP V

A Host Group is logically defined on the each AMS 2000 Fibre Channel port. Logical Units classified into groups and accessed from the host or VSP are associated to a Host Group using LU Mapping. When several hosts or VSPs are attached to one AMS 2000 Fibre Channel port, you can use LUN Manager to increase the Host Groups for each connected host or VSP. Host Group #0 (zero) is defined as default on the AMS 2000 Fibre Channel port.

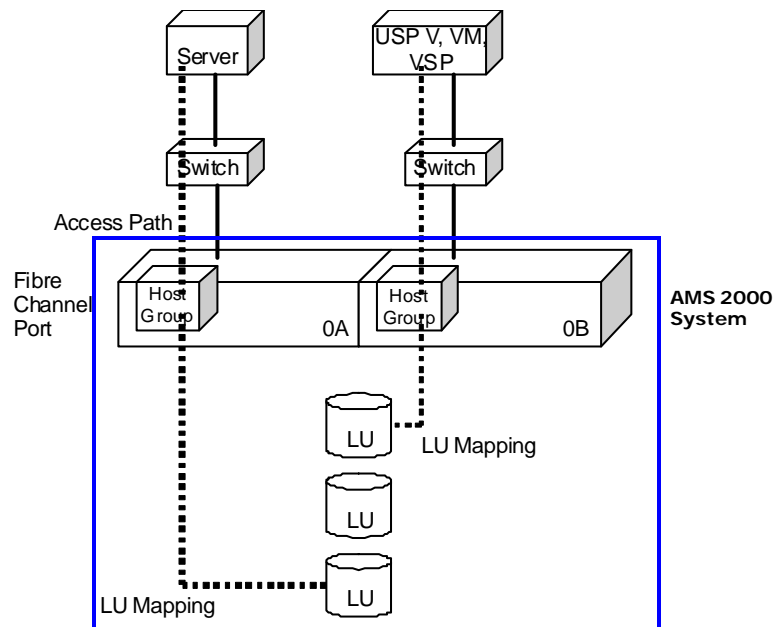


Figure 1-3: Connecting One Host per AMS 2000 Fibre Channel Port

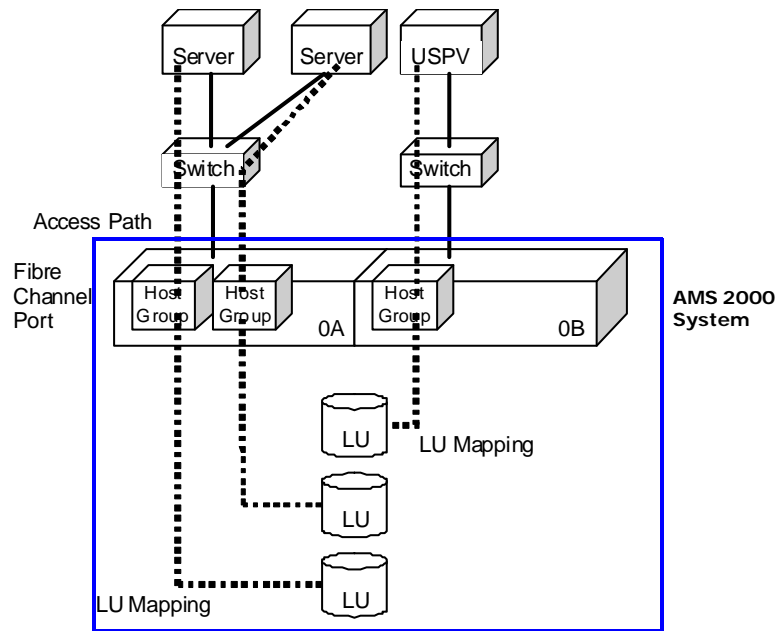


Figure 1-4: Example of Connecting Several Hosts on Fibre Channel Ports

Redundancy

The I/O path between a host and AMS 2000 array can be made redundant by using multipath software. With a redundant path between the host or USP V and AMS 2000 array, an I/O path can fail without losing access. As a result, data access continues uninterrupted, an I/O path failure is avoided, and the reliability of the system is increased.

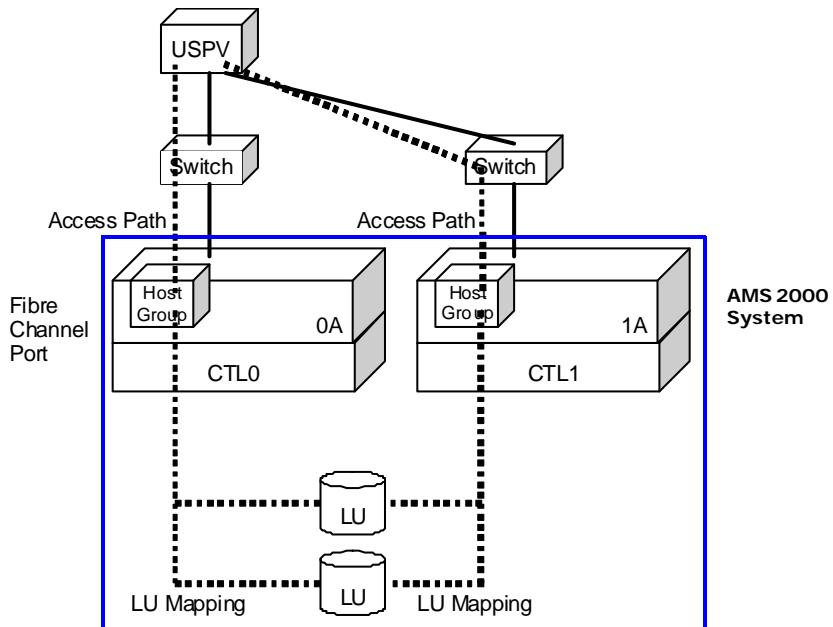


Figure 1-5: LU Mapping for Multipath Configuration

Windows Host Installation Prerequisites

Verify that the tasks in [Table 1-1](#) have been completed before trying to connect an AMS 2000 system to a USP V, USP VM, or VSP. For more information about the documents referenced in the following table, see the [Preface](#).

Table 1-1: Installation Tasks

Task	Notes
Configure the topology of the AMS 2000 Fibre Channel system.	Hitachi AMS 2000 hardware documents Hitachi Storage Navigator Modular 2 Help
Set up AMS 2000 series and create LUNs.	LUN Manager User's Guide, Hitachi Storage Navigator Modular 2 Help
Set the host group operation parameters using Hitachi Storage Navigator Modular 2.	Hitachi Storage Navigator Modular 2 documents

Host installation flow

This section describes the work flow associated with attaching an AMS 2000 system to a host (USP V, USP VM, or VSP).

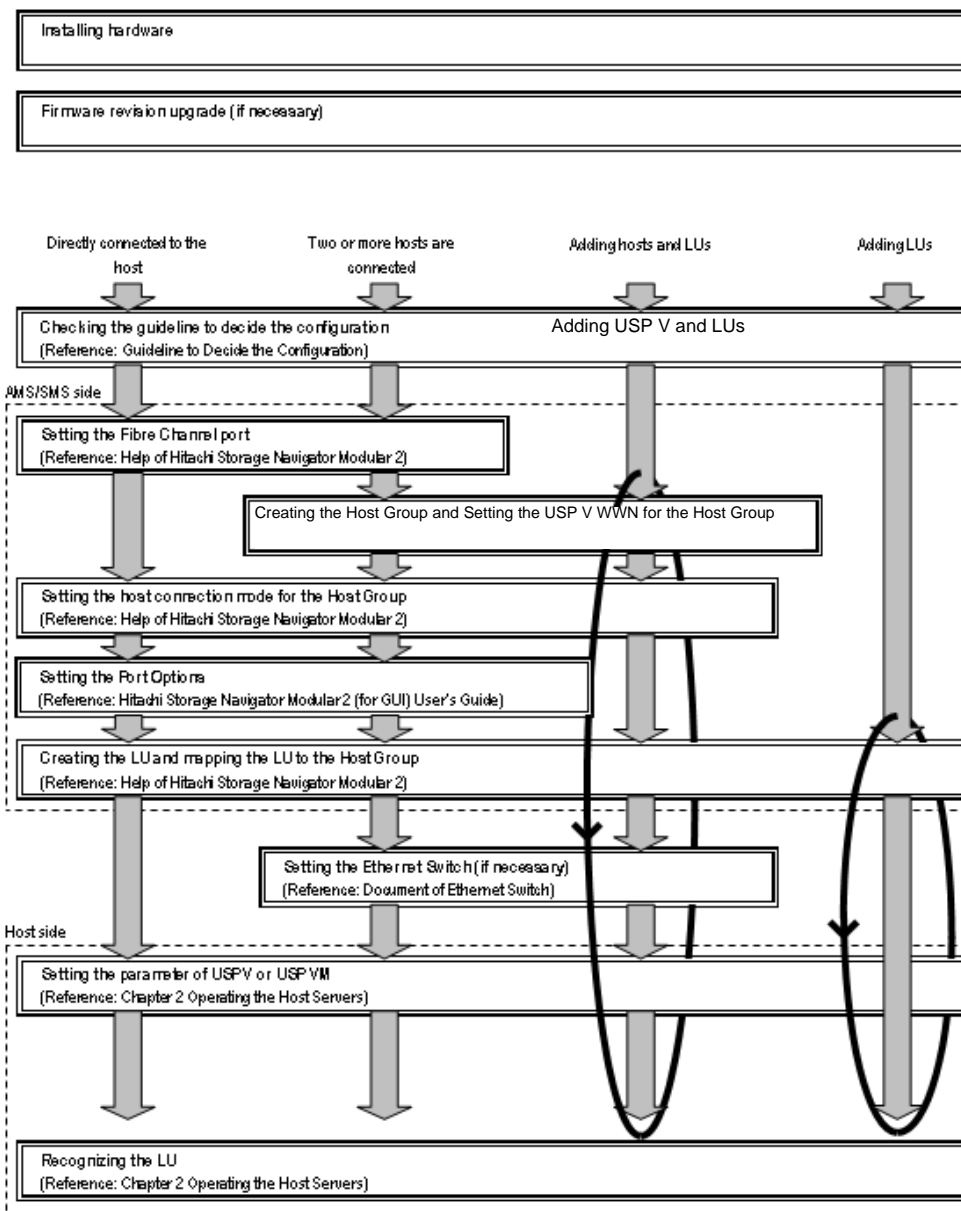


Figure 1-6: Host Installation Work Flow

The following steps describe the details shown in [Figure 1-6](#).

1. Decide on a configuration (see [Planning your configuration on page 1-2](#)).
2. Set Fibre Channel port parameters on the AMS 2000 system. This includes setting the topology and channel transfer rate to supported values.

3. Create a Host Group and assign the accessible USP V to the WWN. If you connect two or more hosts or USP Vs to an AMS 2000 Fibre Channel port, use LUN Manager to create a Host Group for each added host/USP V. The I/O access path between the host/USP V and LUs is determined by setting the WWN of the host/USP V that has access permission and LUs in each Host Group. A host/USP V's WWN is obtained after installing the HBA driver or Fibre Channel software initiator; set it to the AMS 2000 Host Group.
4. Set host environment options for the Host Group. Using Storage Navigator Modular 2, select the Platform and Middleware parameters for your connected host environment. Refer to the Storage Navigator Modular 2 documentation and online help to confirm the Platform and Middleware settings best suited for your environment.
5. Set Port Option parameters. For AMS 2500 storage arrays with hardware rev.0100, select **CPU Load Reduction for Cross-CTL I/O Mode** for all relevant ports.
6. Create LUs and you set the LU mapping to the Host Group of the AMS 2000 Fibre Channel port that permits access it.
7. Set parameters on your network switch. Set all appropriate network switch parameters, such as VLAN. For more information, refer to the documentation for your switch.
8. Set USP V, USP VM, or VSP parameters as necessary.
9. Discover LUs. Verify the discovery of LUs from USP V.

Firmware update guidelines

Updating the fault-tolerant firmware during times of peak I/O activity may cause the I/O to time-out.

Operating the host servers

The key topics in this chapter are:

- ❑ [Setting USP V, USP VM, and VSP values](#)
- ❑ [Performance guidelines](#)

Setting USP V, USP VM, and VSP values

Observe the following guidelines when setting USP V, USP VM, and VSP values.

- Limit the USP V, USP VM, or VSP Queue Depth. To change the Queue Depth value, use the USP V, USP VM, or VSP WWN parameter change window.
- Total command multiplicity to an AMS 2000 system should be less than 500. To calculate the total command multiplicity, use the following formula.

Total command multiplicity

QueueDepth × Number of paths for each external volume × Number of external volumes that are simultaneously accessed < 500

Number of received command tags for each LUN of AMS 2000 series can be referred via Performance Monitor on AMS 2000 series Hitachi Storage Navigator Modular 2, by selecting "Logical Unit" - "Tag count".



NOTE: Port queue depth is 512.

- If the AMS 2000 is connected as external storage to a USP V, USP VM, or VSP, reducing the number of paths to the LUs prevents the AMS 2000 from becoming overloaded by USP V, USP VM, or VSP accesses to each LU on all paths.
- Using AMS 2000 LUN mapping, configure the number of paths to two for each external volume. Assign the two paths to two separate ports on each AMS 2000 controller to keep path redundancy.
- If using an AMS 2000 external volume with USP V, USP VM, or VSP's Copy PP functions, schedule copy operations (initial copy etc.) for external volume of operated copy pairs according to multiple RAID group in the AMS 2000 system.

To avoid concentrated copy operation workload into the external volume on the specified RAID group in AMS 2000 series.

- If an AMS 2000 controller time-out lasts for 40-to-80 seconds, it may block all paths because the time-out period may exceed 40 seconds of "I/O TOV × 2 Path Watch". If this occurs, change the following timer's values.

I/O TOV: 25 seconds (the default value: 15 seconds)

Path Watch: 35 seconds (the default value: 10 seconds)

Server time-out value: above 60 seconds (the default value: I/O TOV × 2 margin (10 seconds))

- Set the USP V, USP VM, and VSP cache mode to disabled for AMS 2000 external volumes that receive heavy continuous write workloads.

Performance guidelines

Avoid performance degradation caused by AMS 2000 failures.

Controller failures

Controller failures can decrease performance of read/write operations by nearly half. Ensure that your system design provides for an average CPU utilization of less than 50%.

Backend (ENC) failures

Backend (ENC) failures can decrease read/write performance by nearly half.

Drive failures

Drive failures can decrease performance of read operations by nearly half and reduce write operations by nearly one-third.

Considering the performance degradation caused by these failures, it is recommended that you secure enough performance for the system to work well, even when problems occur.

Avoid AMS 2000 processes that may require high CPU utilization or cause significant HDD I/O activity.

The processes in [Table 2-1](#) can impact the performance of external connections. Therefore, ensure that your system can deliver the required performance, or perform these tasks when the AMS 2000 system is not busy.

Table 2-1: Processes That Can Impact Performance

Item	Operation and Status	Influence
LU format	LU format operation (to normal LU)	CPU, RAID group of operation LU
Online Micro update	Run Online Micro update	CPU
RAID group extension	Run RAID group extension	CPU, RAID group
HDP Pool Operation	Create	CPU, RAID group of operation POOL
	Extension	
	Recover	
HDP DP Vol Operation	Create	CPU, RAID group related to DP Vol
	Reduction	
	Delete	
	Pool rebalance	
	Format	
Operation of Copy function (SI)	Except SMPL, PSUS	CPU, RAID group of operation pair

Table 2-1: Processes That Can Impact Performance

Item	Operation and Status	Influence
Operation of Copy function (SS)	Except SMPL	Do not use the AMS 2000 copy function for external volume of USP V, USP VM, or VSP (refer to the Hitachi Universal Volume Manager User's Guide). Divide the RAID group for external volume of USP V, USP VM, or VSP and RAID group for copy pair.
Operation of Copy function (TC, TCE)	Except SMPL, PSUS	
Online force parity recovery	Recovery	CPU, RAID group of operation LU
Modular Volume Migration Operation	Start	CPU, RAID group of operation pair

Troubleshooting

For information about the AMS 2000, refer to [Related documents on page viii](#).

For information about the USP V, USP VM, or VSP, refer to *Hitachi Universal Volume Manager User's Guide*.



Glossary

This glossary provides definitions of general storage networking terms as well as specific terms related to the technology that supports your array. Click the letter of the glossary section to display that page.

A

array

A set of hard disks mounted in a single enclosure and grouped logically together to function as one contiguous storage space.

B

BIOS

Basic Input Output System, built-in software code that determines the functions that a computing device can perform without accessing programs from a disk.

Bps

Bits per second, the standard measure of data transmission speeds.

C

capacity

The amount of information (usually expressed in megabytes) that can be stored on a disk drive. It is the measure of the potential contents of a device; the volume it can contain or hold. In communications, capacity refers to the maximum possible data transfer rate of a communications channel under ideal conditions.

channel

The link between the central processor and the peripherals. A channel can be the physical cabling that connects the nodes on a network, an electronic signal traveling over a pathway, or a sub-channel in a carrier frequency.

CLI

See command line interface.

cluster

A group of disk sectors. The operating system assigns a unique number to each cluster and then keeps track of files according to which clusters they use.

cluster capacity

The total amount of disk space in a cluster, excluding the space required for system overhead and the operating system. Cluster capacity is the amount of space available for all archive data, including original file data, metadata, and redundant data.

Glossary–2

command line interface (CLI)

A method of interacting with an operating system or software using a command line interpreter. With Hitachi's Storage Navigator Modular Command Line Interface, CLI is used to interact with and manage Hitachi storage and replication systems.

D

data volume

A volume that stores database information. Other files, such as index files and data dictionaries, store administrative information (metadata).

direct access storage device (DASD) fast write (DFW)

An attribute of record caching (while DASD Fast Write Access is a function of record caching) in which a specified record ID is placed in the cache and nonvolatile storage when a file-type macro is issued. If the cache is not available or the nonvolatile storage is not available, the record is written directly to the DASD surface.

disk array

An enterprise storage system containing multiple disk drives. Also referred to as "disk array device" or "disk storage system."

E

Ethernet

Local area networking technology, based on transmission packets that go between physical ports over different types of electrical and optical media.

F

fabric

The hardware that connects workstations and servers to storage devices in a SAN. The SAN fabric enables any-server-to-any-storage device connectivity through the use of Fibre Channel switching technology.

failover

The automatic substitution of a functionally equivalent system component for a failed one. The term failover is most often applied to intelligent controllers connected to the same storage devices and host computers. If one of the controllers fails, failover occurs, and the survivor takes over its I/O load.

FC

See Fibre Channel.

FCP

Fibre-Channel Protocol.

Fibre Channel

A gigabit-speed network technology primarily used for storage networking.

firmware

Software embedded into a storage device. It may also be referred to as Microcode.

G**Gbps**

Gigabit per second.

GUI

Graphical user interface.

H**HBA**

See Host Bus Adapter

High Availability (HA) software

An application designed for use during a primary host or disk failure. The software switches the failed host to a standby host (fail-over). High Availability software must be installed on the primary and secondary hosts.

Host Bus Adapter

An I/O adapter that connects a host I/O bus to the memory system of a computer.

I**I/O**

Input/output.

Glossary-4

Initiator

A system component that originates an I/O command over an I/O bus or network, such as an I/O adapters or network interface cards.

L**LAN**

Local Area Network, a computer network that spans a relatively small area, such as a single building or group of buildings.

logical

Describes a user's view of the way data or systems are organized. The opposite of logical is physical, which refers to the real organization of a system. A logical description of a file is that it is a quantity of data collected together in one place. The file appears this way to users. Physically, the elements of the file could live in segments across a disk.

logical unit

See logical unit number.

logical unit number (LUN)

An address for an individual disk drive, and by extension, the disk device itself. Used in the SCSI protocol as a way to differentiate individual disk drives within a common SCSI target device, like a disk array. LUNs are normally not entire disk drives but virtual partitions (or volumes) of a RAID set.

logical volume

An area on a disk consisting of device files that are logically integrated using a volume manager.

LU

Logical unit.

LUN

See logical unit number.

LUN Manager

This storage feature is operated through Storage Navigator Modular 2 software and manages access paths among host and logical units for each port in your array.

M

microcode

The lowest-level instructions directly controlling a microprocessor. Microcode is generally hardwired and cannot be modified. It is also referred to as firmware embedded in a storage subsystem.

Middleware

Software that connects two otherwise separate applications. For example, a middleware product can be used to link a database system to a Web server. Using forms, users request data from the database; then, based on the user's requests and profile, the Web server returns dynamic Web pages to the user.

N

node

In networks, a node is a processing location. A node can be a computer or other device, such as a printer. Every node has a unique network address.

Q

queue depth

When a host queues successive commands to the array before execution of a previous command can complete, the number of times successive commands are issued is called queue depth. When two or more hosts are connected to a port of an array, the number of queue commands for the port is increased because the host issues commands to each array separately.

S

SAN

Storage Area Network, a network of shared storage devices that contain disks for storing data.

SCSI

Small Computer System Interface, a parallel interface standard that provides faster data transmission rates than standard serial and parallel ports.

SNM2

See Storage Navigator Modular 2.

Glossary–6

SNMP

Simple Network Management Protocol, a protocol used to facilitate monitoring and management of clusters through an external interface. SNMP sends notifications to IP addresses whenever certain types of events occur.

Storage Navigator Modular 2

A multi-featured scalable storage management application that is used to configure and manage the storage functions of Hitachi arrays. Also referred to as "Navigator 2".

T

target port

A port-type which differs from an "Initiator Port" or "Remote Control Unit Target Port". The target is used without configuration of Fibre Remote Copy. It allows LOGIN of host computers, but does not allow LOGIN of MCUs.

V

volume

A disk array object that most closely resembles a physical disk from the operating environment's viewpoint. The basic unit of storage as seen from the host.

W

World Wide Name (WWN)

A unique identifier for an open systems host. It consists of a 64-bit physical address (the IEEE 48-bit format with a 12-bit extension and a 4-bit prefix). The WWN is essential for defining the SAnTinel™ parameters because it determines whether the open systems host is to be allowed or denied access to a specified logical unit or a group of logical units.

Glossary-8

Hitachi Adaptable Modular Storage 2000 Host Installation Guide for Fibre Channel Attachment

A	B	C	D	E	F	G	H	I	M	N	Q	S	T	W
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MK-90DF8231-02