HITACHI
DATA SYSTEMS

Hitachi TagmaStore®
Adaptable Modular Storage and Workgroup Modular Storage

Windows® XP Host Installation Guide

MK-95DF783-01

Trademarks

Notice of Export Controls

Export of technical data contained in this document may require an export license from the United States government and/or the government of Japan. Please contact the Hitachi Data Systems Legal Department for any export compliance questions.

Document Revision Level

Revision	Date	Description
MK-95DF783-00	February 2006	Initial Release
MK-95DF783-01	April 2006	Revision 1, supersedes and replaces MK-95DF783-00

Source Document(s) for this Revision

RSD document *RSD-95DF783-02.*

Changes in this Revision

- Updated the document to include *Hitachi TagmaStore® Adaptable Modular Storage Model AMS1000 User and Reference Guide* (MK-95DF780) and *Hitachi TagmaStore Workgroup Modular Storage Model WMS100 User and Reference Guide* (MK-95DF738).
- Updated the conventions for storage capacity values in the Front Matter.
- Updated Appendix A (iSCSI information).

Preface

This host installation guide describes and provides instructions for configuring devices on the Hitachi Adaptable Modular Storage and Workgroup Modular Storage systems for operation with the Windows® XP operating system. This guide assumes that the user:

- Has a background in data processing and understands direct-access storage device systems and their basic functions.
- Is familiar with the Hitachi Adaptable Modular Storage or Workgroup Modular Storage system.
- Is familiar with the Windows XP operating system and fibre-channel adapters.

Note: The terms "Adaptable Modular Storage" and "Workgroup Modular Storage" refer to the entire Hitachi Adaptable and Workgroup Modular Storage system family, unless otherwise noted. Refer to the *Hitachi TagmaStore Adaptable Modular Storage Model AMS1000 User and Reference Guide* (MK-95DF780), *Hitachi TagmaStore Adaptable Modular Storage Model AMS500 User's Guide* (MK-95DF714), *Hitachi TagmaStore Adaptable Modular Storage Model AMS200 User's Guide* (MK-95DF713), or *Hitachi TagmaStore Adaptable Modular Storage Model AMS1000 User and Reference Guide* (MK-95DF780) for more information about the Adaptable Modular Storage and Workgroup Modular Storage systems.

For more information about Windows XP, please consult the Windows XP online help and/or user documentation, or contact Microsoft® technical support.

Notice: The use of Hitachi TagmaStore Adaptable Modular Storage and Workgroup Modular Storage and all other Hitachi Data Systems products is governed by the terms of your agreement(s) with Hitachi Data Systems.

Microcode Version

This document applies to the Hitachi TagmaStore Adaptable Modular Storage and Workgroup Modular Storage microcode versions 0730/A and higher.

Convention for Storage Capacity Values

Storage capacity values for hard disk drives (HDDs) on the AMS and WMS systems are calculated based on the following values:

1 KB (kilobyte) = 1,000 bytes
1 MB (megabyte) = $1,000^2$ bytes
1 GB (gigabyte) = $1,000^3$ bytes
1 TB (terabyte) = $1,000^4$ bytes

Storage capacity values for logical units (LUs) on the AMS and WMS systems are calculated based on the following values:

1 KB (kilobyte) = 1,024 bytes
1 MB (megabyte) = $1{,}024^2$ bytes
1 GB (gigabyte) = $1{,}024^3$ bytes
1 TB (terabyte) = $1{,}024^4$ bytes

Referenced Documents

- *Hitachi TagmaStore® Adaptable Modular Storage and Workgroup Modular* Storage: *Storage Navigator-Modular Command Line Interface (CLI) User's Guide,* MK-95DF712
- *Hitachi TagmaStore® Adaptable Modular Storage and Workgroup Modular Storage: Storage Navigator-Modular Graphical User Interface (GUI) User's Guide*, MK-95DF711
- *Hitachi TagmaStore® Adaptable Modular Storage: Storage Navigator Web User's Guide*, MK-95DF719
- *Hitachi TagmaStore® Adaptable Modular Storage Model AMS1000 User and Reference Guide*, MK-95DF780
- *Hitachi TagmaStore® Adaptable Modular Storage Model AMS500 User and Reference Guide,* MK-95DF714
- *Hitachi TagmaStore® Adaptable Modular Storage Model AMS200 User and Reference Guide,* MK-95DF713
- *Hitachi TagmaStore® Workgroup Modular Storage Model WMS100 User and Reference Guide*, MK-95DF738
- *Hitachi TagmaStore® Adaptable Modular Storage Series Windows® 2000/Windows 2003 Server Host Installation Guide*, MK-95DF737

Comments

Please send us your comments on this document. Make sure to include the document title, number, and revision. Please refer to specific section(s) and paragraph(s) whenever possible.

- **E-mail:** doc.comments@hds.com
- **Fax:** 858-695-1186
- **Mail:**
  Technical Writing, M/S 35-10
  Hitachi Data Systems
  10277 Scripps Ranch Blvd.
  San Diego, CA 92131

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

Contents

Chapter 1 Introduction

1.1 Adaptable Modular Storage System 10
1.2 Guidelines 11

Chapter 2 Preparing for New Device Configuration

2.1 Configuration Requirements 14
2.2 Installing an Adaptable Modular Storage System 15
2.3 Preparing to Connect Adaptable Modular Storage 16
2.4 Connecting Adaptable Modular Storage System to the Windows System 17

Chapter 3 Configuring New Devices

3.1 Writing Signatures 20
3.2 Creating and Formatting Partitions 22
3.3 Verifying File System Operations 27
3.4 Verifying Auto-Mount 30
3.5 Disabling “Write Cache Option” on Hitachi Data Systems External Disks 31

Chapter 4 Troubleshooting

4.1 Troubleshooting 33
4.2 Calling Hitachi Data Systems Support Center 34

Appendix A Using Microsoft iSCSI Software Initiator

A.1 Requirements for Using iSCSI 36
A.2 Download Microsoft iSCSI Software Initiator 37
A.3 Install Microsoft iSCSI Software Initiator 38
A.4 Setting Up Microsoft iSCSI Software Initiator 40

Acronyms and Abbreviations 49

List of Figures

Figure 3.1 Writing Signatures 20
Figure 3.2 Disk Management Window Showing New Devices 21
Figure 3.3 Create Partition Wizard Dialog Box 22
Figure 3.4 Specify Partition Size Dialog Box 23
Figure 3.5 Assign Drive Letter or Path Dialog Box 23
Figure 3.6 Format Partition Dialog Box 24
Figure 3.7 Opening the Format Dialog Box 24
Figure 3.8 Format Dialog Box 25
Figure 3.9 Verifying the Formatted Partition 26
Figure 3.10 Displaying Connected Devices 27
Figure 3.11 Properties Dialog Box 28
Figure 3.12 Verifying File Copy Operation 29
Figure 3.13 Disabling Enable Write Cache Setting 31
Figure 3.14 Example of Enable Write Cache Setting Already Disabled 32

Figure A.1 Software Update Installation Wizard Dialog Box 38
Figure A.2 Microsoft iSCSI Initiator Installation Dialog Box 38
Figure A.3 License Agreement Dialog Box 39
Figure A.4 Software Update Installation Wizard Dialog Box 39
Figure A.5 iSCSI Initiator Properties Dialog Box 40
Figure A.6 CHAP Secret Setup Dialog Box 40
Figure A.7 iSCSI Initiator Properties, Discovery Tab 41
Figure A.8 iSCSI Initiator Properties (iSNS Server Address) 41
Figure A.9 Add Target Portal Dialog Box 42
Figure A.10 Advanced Settings Dialog Box 42
Figure A.11 iSCSI Initiator Properties Dialog Box 43
Figure A.12 iSCSI Initiator Properties, Target Tab 44
Figure A.13 Log On to Target Dialog Box 44
Figure A.14 Advanced Settings, General Tab 45
Figure A.15 Advanced Settings, Target Secret 46
Figure A.16 Verifying iSCSI Initiator Properties 47

List of Tables

Table 4.1 Troubleshooting 33

Chapter 1 Introduction

Welcome to the Windows® XP Host Installation Guide for Hitachi TagmaStore® Adaptable Modular Storage and Workgroup Modular Storage.

This guide describes the requirements and procedures for connecting Adaptable Modular Storage and Workgroup Modular Storage systems to a Microsoft® Windows XP system. It also describes how to configure the new Adaptable Modular Storage disk devices for operation with the Windows XP operating system. The Hitachi Data Systems representative performs the initial physical installation of the Adaptable Modular Storage system. The user then configures the new Adaptable Modular Storage devices with assistance as needed from the Hitachi Data Systems representative.

Configuration of the Adaptable Modular Storage disk devices for Windows XP involves the following steps:

- Configuring the host's Internet Small Computer System Interface (iSCSI) interface (section 2.1)
- Writing the signatures (section 3.1)
- Partitioning and labeling the new devices (section 3.2)
- Creating and mounting the file systems (sections 3.3 and 3.4)

Note on the term "SCSI disk": The Adaptable Modular Storage logical devices are defined to the host as SCSI disk devices, even though the interface is fibre channel.

1.1 Adaptable Modular Storage System

The Hitachi Adaptable Modular Storage Series system is a high-performance, medium-capacity storage system, with added features for increasing data accessibility and enabling continuous user data access. The architecture of the Adaptable Modular Storage enables the user to scale the system to meet a wide range of capacity and performance requirements. The Adaptable Modular Storage system provides connectivity to most open systems through a standard fibre-channel interface.

For more information about the Adaptable Modular Storage system, refer to the *Hitachi TagmaStore Adaptable Modular Storage Model AMS500 User's Guide* (MK-95DF714), the *Hitachi TagmaStore Adaptable Modular Storage Model AMS200 User's Guide* (MK-95DF713), or contact your Hitachi Data Systems account team.

1.2 Guidelines

Observe the following guidelines when using iSCSI with Windows XP hosts:

- iSCSI is not available when a host (OS or driver) cannot identify an LU without LUN0. You must set H-LUN = 0 to the target.
- The computer running Windows XP must be powerful enough to run the OS without stress. We recommend using a computer equipped as follows:
  - Processor: Intel® Pentium® 4
  - Clock: 2 GHz or faster
  - Random Access Memory (RAM): At least 512 MB
- The host computer equipped with the NIC and running iSCSI software initiator must also be sufficiently powerful. Otherwise, concurrent applications running on the host may suffer from performance degradation.
- Do not change the Challenge Handshake Authentication Protocol (CHAP) authentication settings that correspond to hosts that are logging in to the DF700. If you disable CHAP authentication for the DF700 iSCSI while it is communicating with Microsoft iSCSI software initiator using CHAP authentication, the host will not be able to access the target device without rebooting.
- We recommend you use Microsoft-approved NICs that have the Microsoft logo.
- Use all service packs and patches for the latest version of the OS and NIC drivers.
- Use Microsoft iSCSI software initiator version 2.0. The DF700 iSCSI does not support earlier versions of Microsoft iSCSI software initiator. For the higher version, please refer to the most recent product announcement or contact your local Hitachi sales office for information on feature and product availability.
- We recommend you stop all other services used by operating systems and applications that are not being used to eliminate extraneous operations and reduce server loads.

Chapter 2 Preparing for New Device Configuration

This chapter describes how to prepare for the new device configuration.

The topics covered in this chapter are:

- Configuration requirements (section 2.1)
- Installing an Adaptable Modular Storage system (section 2.2)
- Preparing to connect Adaptable Modular Storage (section 2.3)
- Connecting the Adaptable Modular Storage system to a Windows XP system (section 2.4)

2.1 Configuration Requirements

The requirements for undertaking an Adaptable Modular Storage Windows XP configuration are:

- **Hitachi Adaptable Modular Storage system**

  The Resource Manager Adaptable Modular Storage software is required to configure the iSCSI ports.

  Note: The availability of Adaptable Modular Storage features and functions depends on the level of microcode installed on the Adaptable Modular Storage system.

- **Microsoft Windows XP**

  Please refer to the Microsoft user documentation for PC server hardware requirements.

- **Microsoft Windows XP operating system**

  For information about supported Windows XP versions, contact Hitachi Data Systems.

  Important: Contact Microsoft to make sure the most current OS patches are installed.

Note: In addition to these configuration requirements, refer to section 1.2 and Appendix A for iSCSI requirements and guidelines.

2.2 Installing an Adaptable Modular Storage System

The Adaptable Modular Storage subsystem comes with all the hardware and cabling required for installation. Installation of the Adaptable Modular Storage subsystem involves the following activities:

Hardware installation. Perform hardware installation as specified in Hitachi Data Systems documentation and Hitachi, Ltd. source documentation. Follow all precautions and procedures in this documentation. Check all specifications to ensure proper installation and configuration. Hardware installation includes:

- Assembling all hardware (including the iSCSI interface board) and cabling
- Upgrading to the latest microcode level
- Creating RAID groups and LUNs and formatting LUNs using the Resource Manager Adaptable Modular Storage software. For information and instructions about using Resource Manager, refer to the *Hitachi TagmaStore Adaptable Modular Storage-Storage Navigator-Modular Graphical User Interface (GUI) User's Guide* (MK-95DF711).

2.3 Preparing to Connect Adaptable Modular Storage

Before connecting an Adaptable Modular Storage system, the NIC and iSCSI software initiator must be installed on the host. For more information, see sections A.1 and A.2.

2.4 Connecting Adaptable Modular Storage System to the Windows System

The Adaptable Modular Storage system comes with all the hardware and cabling required for connection to the host system(s). Adaptable Modular Storage system connection involves the following steps. Some of these steps are performed by a Hitachi Data Systems representative, while other steps are performed by the user.

Note: The Hitachi Data Systems representative must use the Adaptable Modular Storage maintenance manual during all installation activities. Follow all precautions and procedures in the maintenance manual, and always check all specifications to ensure proper installation and configuration.

1. **Shut down the Windows XP system.** The user shuts down and powers off the Windows system before connecting the Adaptable Modular Storage:
   a) Shut down the Windows XP system.
   b) When shutdown is complete, power off the Windows system display.
      Note: You do not have to shut down the Windows system display.
   c) Power off all peripheral devices, except the Adaptable Modular Storage system.
   d) Power off the Windows system. You can now connect the Adaptable Modular Storage system.
2. **Connect the Adaptable Modular Storage to the Windows XP system.** The Hitachi Data Systems representative installs the Category 5e or 6 network cables between the Adaptable Modular Storage and the Windows system.
3. **Power on the Windows XP system.** The user or Hitachi Data Systems representative powers on the Windows XP system after connecting the Adaptable Modular Storage subsystem:
   a) Power on the Windows XP system display.
   b) Power on all peripheral devices. The Adaptable Modular Storage subsystem should already be on and the iSCSI ports should already be configured. If the Adaptable Modular Storage iSCSI ports are configured after the Windows system is powered on, the system must be restarted to recognize the new devices.
   c) Confirm the ready status of all devices.
   d) Power on the Windows XP system.
4. **Perform an iSCSI login from the Windows XP system to the Adaptable Modular Storage**. See section A.3.

Chapter 3 Configuring New Devices

After Adaptable Modular Storage installation and connection procedures have been performed, the new Adaptable Modular Storage devices are ready to be configured for use. Adaptable Modular Storage device configuration is performed by the user and administrator access to the Windows XP system.

This chapter covers the following Adaptable Modular Storage device configuration procedures:

- Writing the signatures on the new devices (section 3.1)
- Creating and formatting the partitions on the new devices (section 3.2)
- Verifying system access to the new devices (section 3.3)
- Verifying auto-mount of the new devices (section 3.4)
- Disabling the Write Cache Option on Hitachi Data Systems external disks (section 3.5)

3.1 Writing Signatures

The first step in configuring the new devices is to write a signature on each device using the Windows XP Disk Management. You must write a signature on each disk device to enable the Windows XP system to vary the device online. The 32-bit signature identifies the disk to the Windows XP system. If the disk's TID and/or LUN are changed, or if the disk is moved to a different controller, the Disk Management and Windows XP fault-tolerant driver will continue to recognize it.

Note: Windows XP assigns the disk numbers sequentially starting with the local disks and then by adapter, and by TID/LUN. If the Adaptable Modular Storage is attached to the first adapter (displayed first during system start-up), the disk numbers for the new devices will start at 1 (the local disk is 0). If the Adaptable Modular Storage is not attached to the first adapter, the disk numbers for the new devices will start at the next available disk number. For example, if 40 disks are attached to the first adapter (disks 1–40) and the Adaptable Modular Storage is attached to the second adapter, the disk numbers for the Adaptable Modular Storage will start at 41.

To write the signatures on the new disk devices, use the following procedure:

1. Click **Start**, point to **Programs**, point to **Administrative Tools (Computer Management)**, and click **Disk Management** to start the Disk Manager. Initialization takes a few seconds.
2. When the Disk Management notifies you that one or more disks have been added, click **OK** to allow the system configuration to be updated.

   Notes:

   – Disk Management will also notify you if you removed any disks.

   – You may want to reboot your system after adding new devices.
3. Disk Management displays each new device by disk number and asks if you want to write a signature on the disk (see Figure 3.1). You may only write a signature once on each device. For all SCSI disk devices, click **OK** to write a signature.

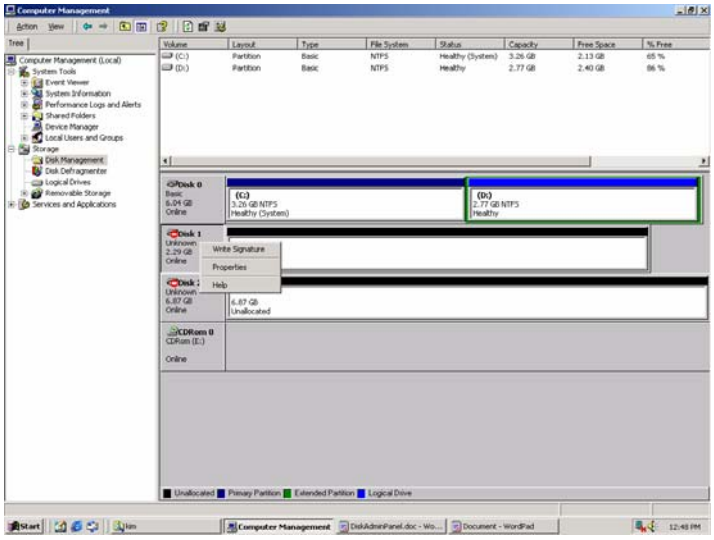

Figure 3.1 Writing Signatures

4. After you write (or decline to write) a signature on each new device, the Disk Management main window displays the devices by disk number (see Figure 3.2). The total capacity and free space are displayed for each disk device with a signature. **Configuration information not available** or an "Unknown" status indicates no signature. Do not exit the Disk Manager yet. You will create partitions on the new SCSI disk devices next.

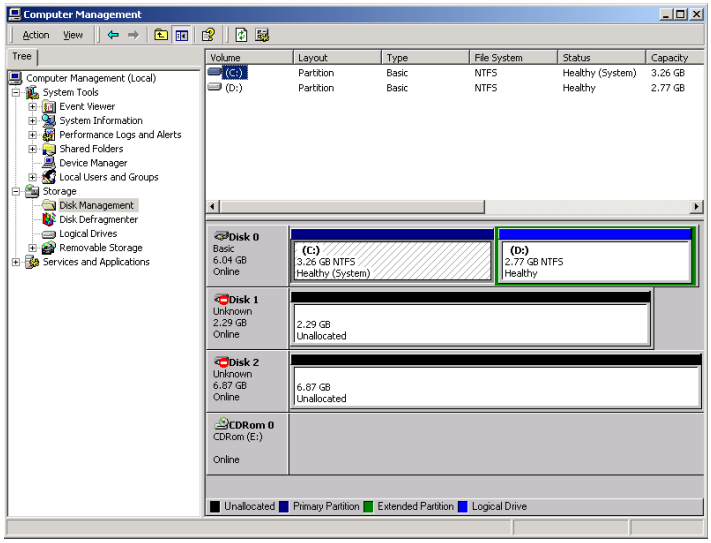

Figure 3.2 Disk Management Window Showing New Devices

3.2 Creating and Formatting Partitions

After you write signatures on the new devices, create and format the partitions on the new SCSI disk devices. Dynamic Disk is supported with no restrictions for the Adaptable Modular Storage connected to the Windows XP operating system. For more information, please refer to Microsoft's online help.

To create and format partitions on the new disk devices, use the following procedure:

1. On the Disk Management main window, select the unallocated area for the SCSI disk you want to partition, and select the **Create Partition** menu. The Create Partition Type wizard starts (see Figure 3.3).

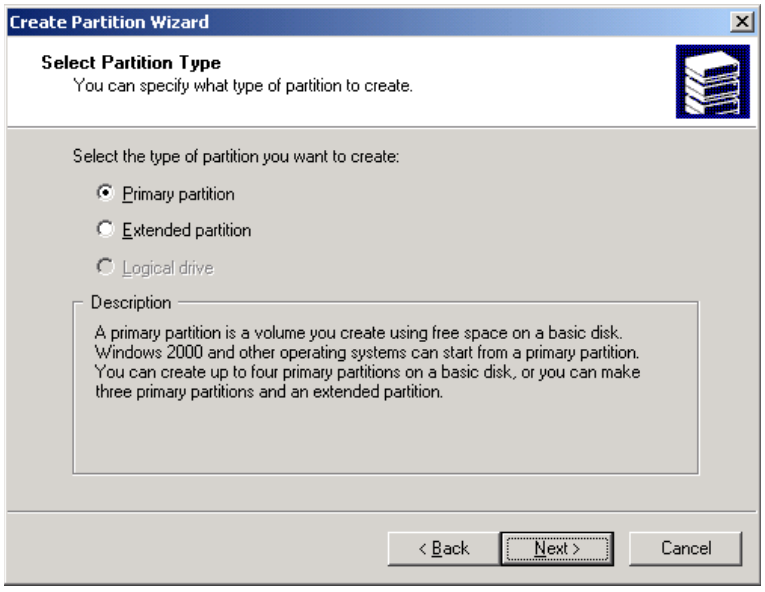

Figure 3.3 Create Partition Wizard Dialog Box

2. Select the desired type of partition (primary or extended) and click **Next**. The Specify Partition Size dialog box displays (see Figure 3.4).

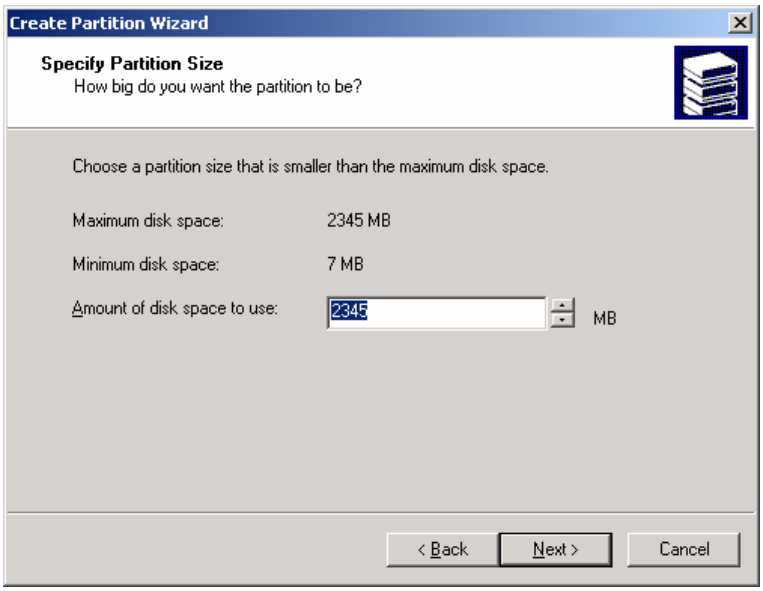

Figure 3.4 Specify Partition Size Dialog Box

3. Specify the desired partition size. If the size is greater than 1024 MB, the Disk Management requests confirmation to create the partition.
4. Click **Next.** The Assign Drive Letter or Path dialog box displays (see Figure 3.5).

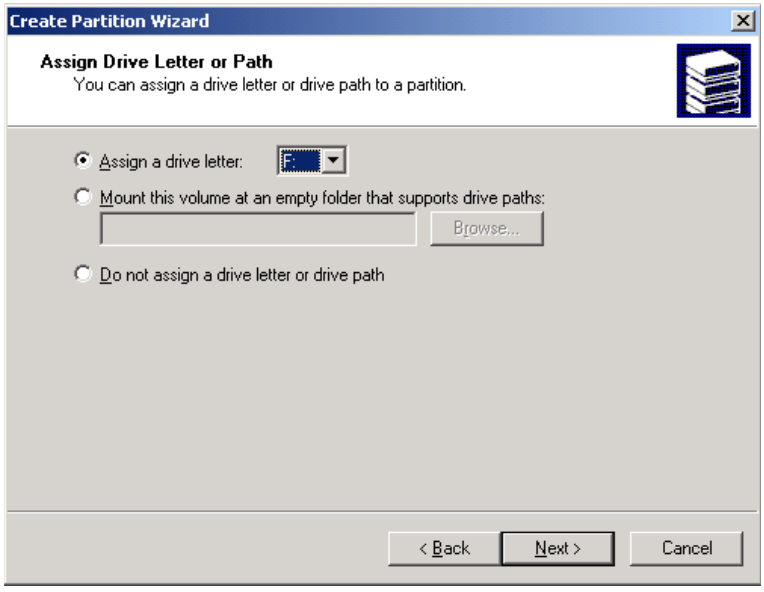

Figure 3.5 Assign Drive Letter or Path Dialog Box

5. Select a drive letter or do not assign a drive letter or drive path.
6. Click **Next**. The Format Partition dialog box displays (see Figure 3.6).

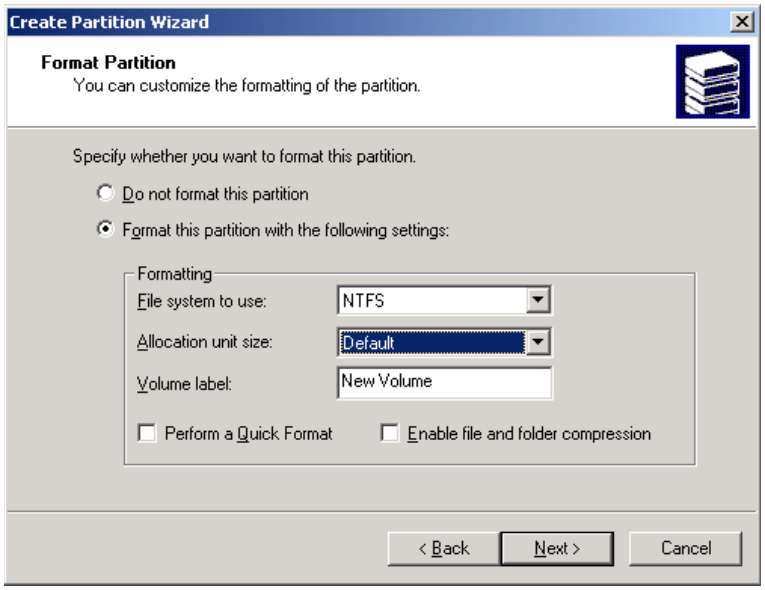

Figure 3.6 Format Partition Dialog Box

7. Click **Next**.
8. A window confirms that all partitions have been completed successfully and lists your selections. **Healthy** displays next to each device that has been successfully added.
9. On the **Tools** menu, click **Format** (see Figure 3.7). The options in Figure 3.8 display.

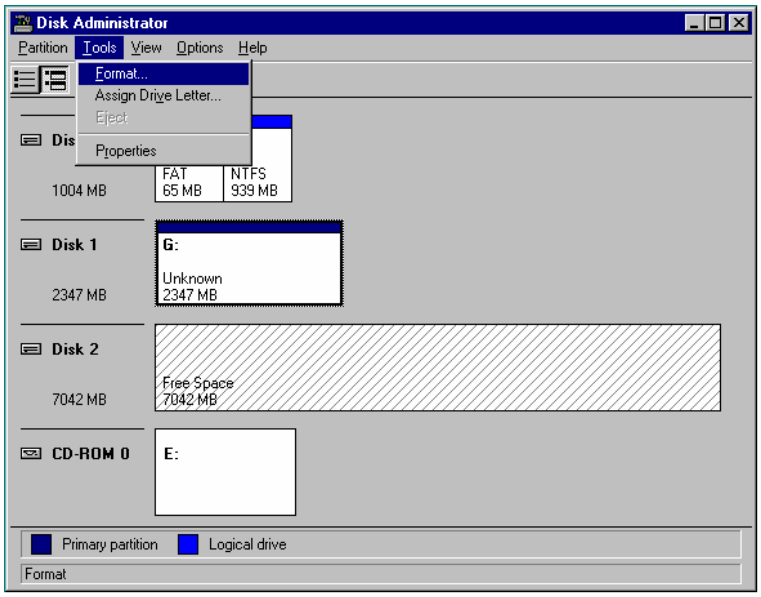

Figure 3.7 Opening the Format Dialog Box

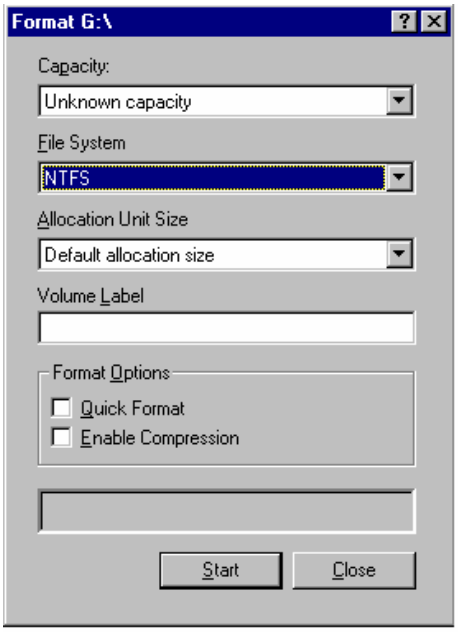

Figure 3.8 Format Dialog Box

10. Enter the following information on the Format dialog box:
    - **File System to use:** Select **NTFS** to let the Windows XP system write to the disk.
    - **Allocation unit size: Default allocation size**. Do not change this entry.
    - **Volume label:** Enter a volume label, or leave this field blank for no label.
    - **Format Options:** Select **Perform a Quick Format** to decrease the time required to format the partition. Select **Enable file and folder compression** to enable compression.
11. Click **Start** to format the partition as specified. When a message warns you that the new format will erase all existing data on disk, click **OK** to continue. The Format dialog box displays the progress of the format partition operation.
12. When the format complete message is displayed, click **OK** and then click **Finish** to close the Format panel. Verify that the Disk Manager main window shows the correct file system (NTFS) for the formatted partition (see Figure 3.9).

    Note: In Figure 3.9, the drive letter of the partition being formatted is **G:**

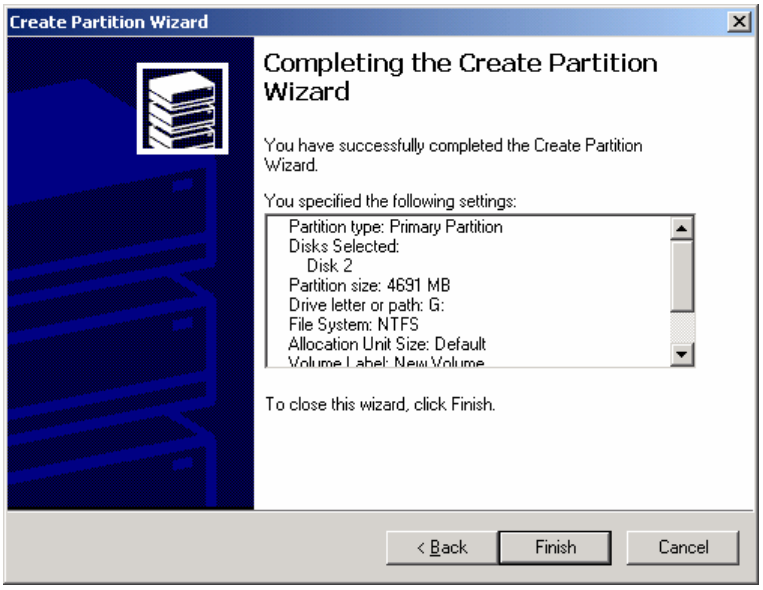

Figure 3.9 Verifying the Formatted Partition

Note: After committing the changes, the newly created partition changes from **Unformatted** to **Unknown**.

13. Repeat this procedure for each additional new disk device. When you finish creating and formatting partitions, exit the Disk Manager by clicking **Exit** on the **Partition** menu. When the disk configuration change message displays, click **Yes** to save your changes.
14. Use `RDISK.EXE` to make your new Emergency Repair Dis.

3.3 Verifying File System Operations

After you create and format partitions, verify that the file system is operating properly on each new SCSI disk device (OPEN-*x*, OPEN VIR, and LUSE). The file system lets the Windows XP system access the devices. To verify file system operation, copy a file onto each new device. If the file is copied successfully, this verifies that the file system is operating properly and that the Windows XP system can access the new device.

To verify file system operations for the new SCSI disk devices:

1. From the Windows XP desktop, double-click **My Computer** to display all connected devices. All newly partitioned disks appear in this window (see Figure 3.9).

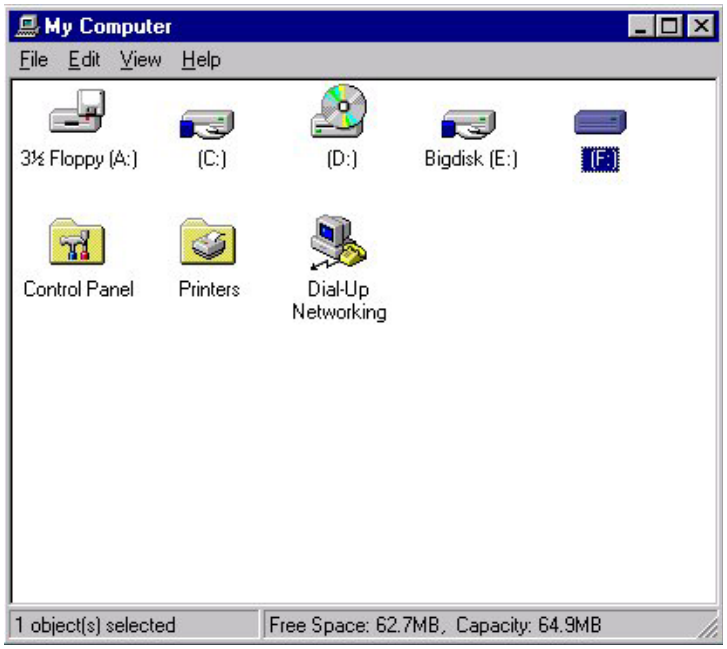

Figure 3.10 Displaying Connected Devices

2. Select the device you want to verify. From the **File** menu, click **Properties** (or right-click on the device and click **Properties**). The Properties dialog box displays (see Figure 3.11).

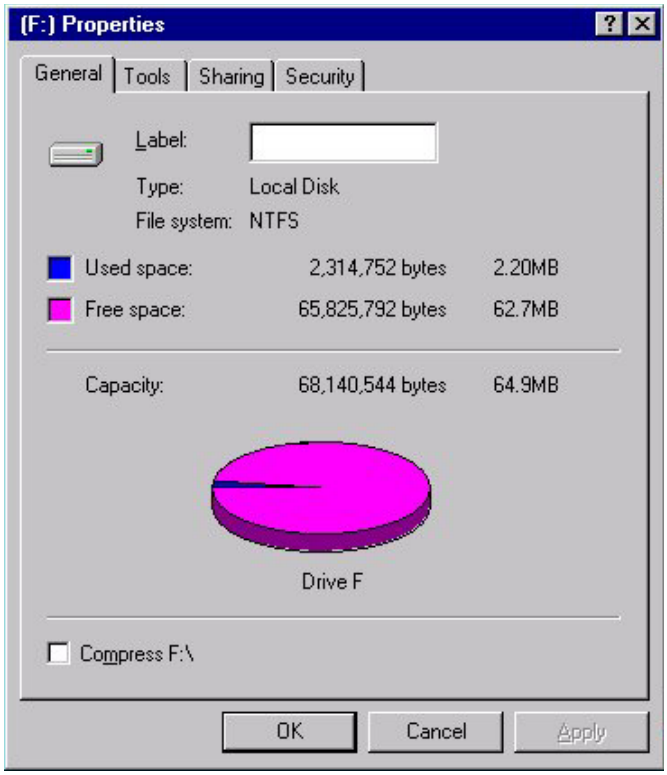

Figure 3.11 Properties Dialog Box

3. On the Properties dialog box, verify that the properties (label, type, capacity, and file system) are correct.

   Note: Label is optional.

4. Copy a small file to the new device. Then display the contents of the new device to be sure the copy operation completed successfully (see Figure 3.12). The copied file should appear with the correct file size. If desired, compare the copied file with the original file to verify.

   Note: In this example, [F:] is the only new device.

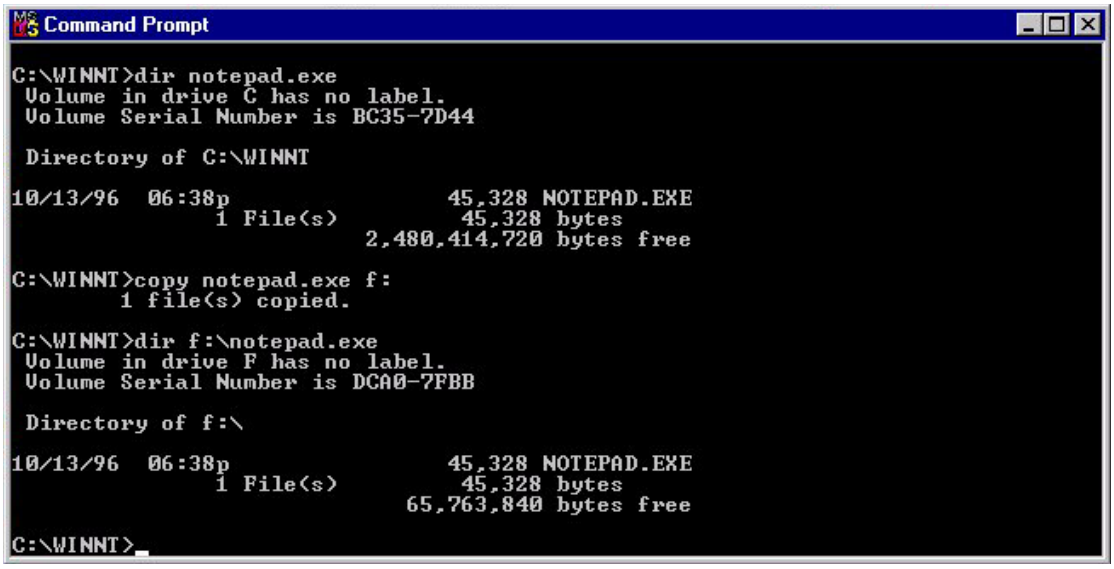

Figure 3.12 Verifying File Copy Operation

5. Delete the copied file from the new device, and then verify the file was deleted successfully.
6. Repeat steps 2 through 5 for each additional new SCSI disk device.

3.4 Verifying Auto-Mount

The last step in configuring the new devices is to verify that all new devices are automatically mounted at system boot-up.

To verify auto-mount of the new devices, use the following procedure:

1. Shut down and then restart the Windows XP system.
2. Open **My Computer** and verify that all new SCSI disk devices are displayed.
3. Verify that the Windows XP system can access each new device by repeating the procedure in section 3.3:
   a) Verify the device properties for all new devices (refer to Figure 3.11).
   b) Copy a file to each new device to be sure the devices are working properly (refer to Figure 3.12).

3.5 Disabling “Write Cache Option” on Hitachi Data Systems External Disks

> ***WARNING:*** Ensure that all Hitachi Data Systems external disks are configured with “Write Cache Option” **disabled**. There is strong potential for data loss if this feature is enabled. The write cache option is strictly a Just a Bunch of Disks (JBOD) or internal disk setting and should never be used with intelligent disks.

To disable the Write Cache Option:

1. Right-click **My Computer**.
2. Click **Manage**.
3. Click **Device Manager**.
4. Click the plus (+) sign next to **Disk Drives**
5. Double-click the first external HDS disk drive.
6. Select the **Policies** or **Disk Properties** tab.
7. Verify that **Enable Write Caching on the Disk** is **disabled** (no check-mark), as shown in Figure 3.13.
8. Repeat this procedure for all Hitachi Data Systems external disk drives.

Note: If the Enable Write Cache option is grayed-out, as shown in Figure 3.14, the feature is already disabled.

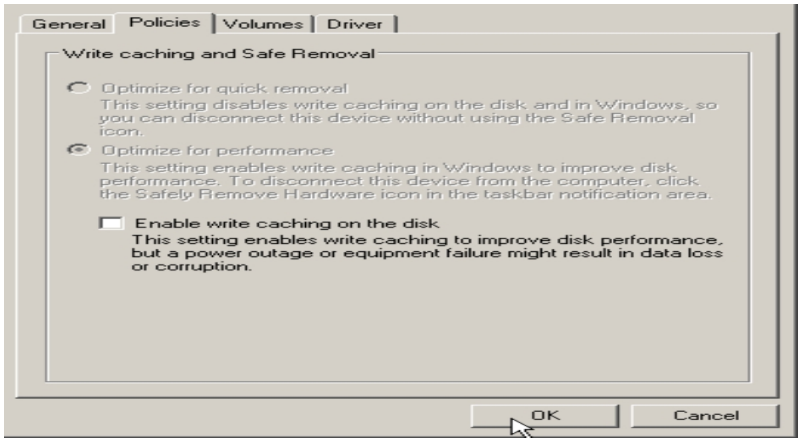

Figure 3.13 Disabling Enable Write Cache Setting

Figure 3.14 Example of Enable Write Cache Setting Already Disabled

Chapter 4 Troubleshooting

4.1 Troubleshooting

For troubleshooting information about Adaptable Modular Storage system, refer to the *Hitachi TagmaStore Adaptable Modular Storage Model AMS500 User's Guide* (MK-95DF714) or *Hitachi TagmaStore Adaptable Modular Storage Model AMS200 User's Guide* (MK-95DF713).

Note: If there is an error in communication between the DF700 iSCSI and the host, it could be one of three possible causes:

- An error on the host,
- An error on the network, or
- An error on the Adaptable Modular Storage subsystem itself.

Table 4.1 lists potential error conditions during Adaptable Modular Storage device configuration for Windows XP and provides instructions for resolving each condition. If you are unable to resolve an error condition, contact your Hitachi Data Systems representative for help, or call the Hitachi Data Systems Support Center for assistance.

Table 4.1 Troubleshooting

Error Condition	Recommended Action
The devices are not recognized by the system.	Be sure the READY indicator lights on the Adaptable Modular Storage subsystem are ON. Be sure the iSCSI cables are correctly installed and firmly connected.
The Windows XP system does not reboot properly after hard shutdown.	If the Windows XP system is powered off unexpectedly (without the normal shutdown process), wait three minutes before restarting the Windows XP system. This allows the Adaptable Modular Storage internal time-out process to purge all queued commands so the Adaptable Modular Storage is available (not busy) during system startup. If the Windows XP system is restarted too soon, the Adaptable Modular Storage continues trying to process the queued commands and the Windows XP system will not reboot successfully.

4.2 Calling Hitachi Data Systems Support Center

If you need to call Hitachi Data Systems Support Center, ensure that you provide as much information about the problem as possible, including circumstances surrounding error or failure and the exact content of error messages displayed on the host system(s).

The worldwide Hitachi Data Systems Support Centers are:

- Hitachi Data Systems North America/Latin America
  San Diego, California, USA
  1-800-446-0744
- Hitachi Data Systems Europe
  Contact Hitachi Data Systems Local Support
- Hitachi Data Systems Asia Pacific
  North Ryde, Australia
  011-61-2-9325-3300

Appendix A Using Microsoft iSCSI Software Initiator

Microsoft iSCSI Software Initiator is the iSCSI software initiator driver for Windows XP provided by Microsoft. It includes both the Microsoft iSCSI Initiator service and the Microsoft iSCSI Initiator software driver. Microsoft iSCSI software initiator makes it possible for businesses to take advantage of existing network infrastructure to enable block-based storage over wide distances, without having to invest in additional hardware

To install and use Microsoft iSCSI Software Initiator, use the procedures in the following sections.

A.1 Requirements for Using iSCSI

The following list describes the requirements for using iSCSI with Windows XP. For current requirements, please contact your Hitachi Data Systems representative.

- DF700 hardware with an iSCSI interface board installed.
- Storage Navigator Modular version 3.00 or later.
- For WMS100, AMS200 and AMS500, microcode version 0730/B or higher is required. For AMS1000, micro code version 0732/A or higher is required.
- A switch, network-interface card (NIC), and host bus adapter (HBA) directly connected to the DF700 iSCSI port. The switch, NIC, and HBA must support Institute of Electrical and Electronics Engineers (IEEE) 802.3ab 1000Base-T, full-duplex operations.
- Category 5e (enhanced Category 5) or Category 6 network cabling.
- The latest Service Packs and patches for your operating system and NIC drivers. Operation under virtual OS environment is not supported.
- A host with an iSCSI interface that is either a network port on the host motherboard or a NIC that is recommended by the vendor of the host.
- If using the DF700 iSNS client, Microsoft iSNS Server 3.0 must be installed on the same IP-SAN.

A.2 Download Microsoft iSCSI Software Initiator

To download Microsoft iSCSI software initiator:

1. Open a Web browser and navigate to www.microsoft.com.
2. Click **Downloads** and browse to the Microsoft Download Center.
3. Search the iSCSI initiator.
4. Select the Microsoft iSCSI software initiator that matches your operating system and host.
5. Follow the instructions to download the software.

A.3 Install Microsoft iSCSI Software Initiator

To install the Microsoft iSCSI software initiator:

1. Double-click the file you downloaded from the Microsoft site.
2. On the Software Update Installation Wizard dialog box (see Figure A.1), click **Next**.

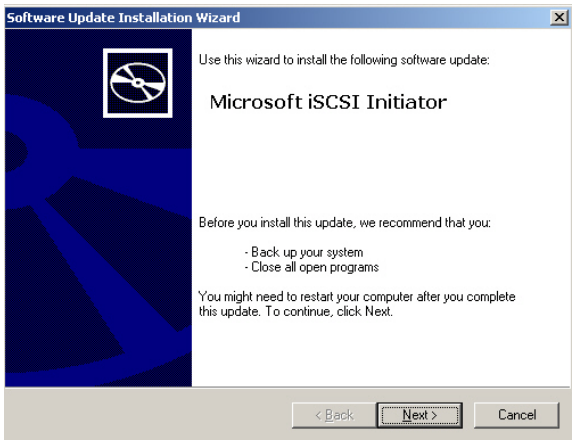

Figure A.1 Software Update Installation Wizard Dialog Box

3. On the Microsoft iSCSI Initiator Installation dialog box (Figure A.2), select **Initiator Service** and **Software Initiator**, and then click **Next**.

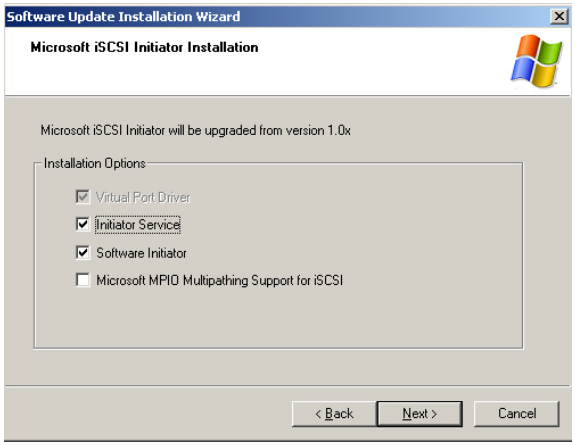

Figure A.2 Microsoft iSCSI Initiator Installation Dialog Box

4. When the License Agreement displays (see Figure A.3), read it, select the **I Agree** radio button, and then click **Next**.

   Note: You must agree to the License Agreement to install the software.

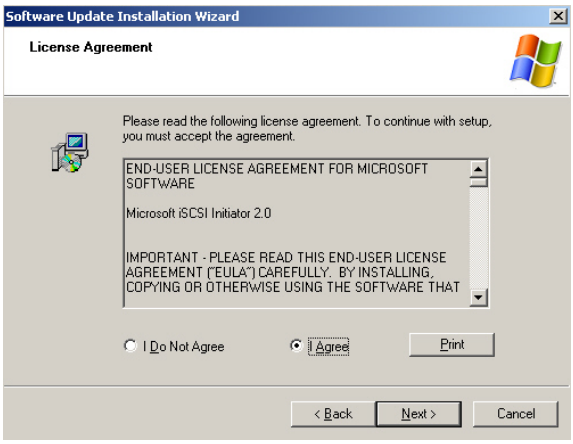

Figure A.3 License Agreement Dialog Box

5. The installation is completed. To exit, click **Finish** (see Figure A.4).

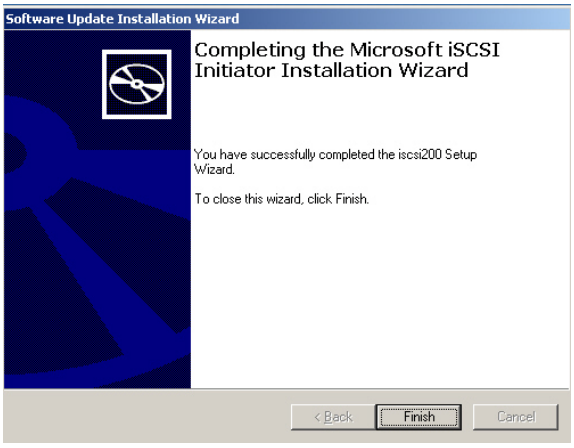

Figure A.4 Software Update Installation Wizard Dialog Box

A.4 Setting Up Microsoft iSCSI Software Initiator

To set up the Microsoft iSCSI software initiator:

1. On your Windows Server™, open the Windows control panel.
2. Open the iSCSI Initiator Properties dialog box (see Figure A.5).

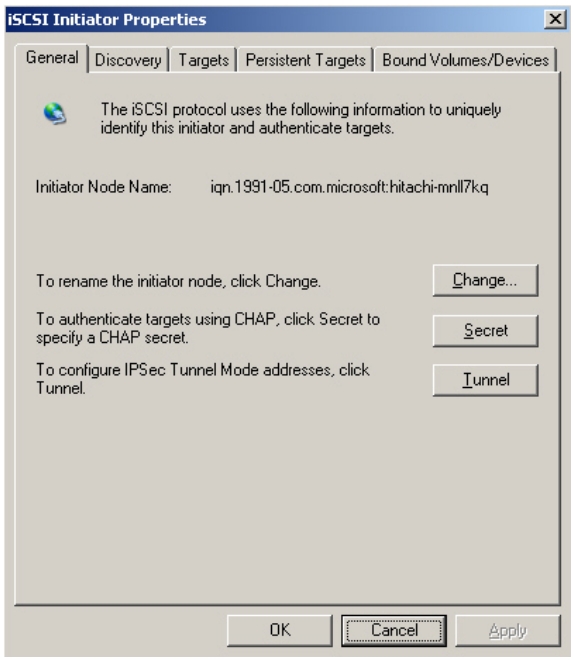

Figure A.5 iSCSI Initiator Properties Dialog Box

3. When applying two-way authentication (i.e., Mutual CHAP step 16 in this procedure), click **Secret** on the General tab, enter the host secret, and then click **OK**.

   Note: CHAP is a protocol for authenticating the peer of a connection and is based upon the peers sharing a secret (a security key similar to a password). The CHAP secret is case sensitive. The length of the secret key must be from 12 (96 bits) to 16 characters. For security, each typed letter appears as a dot (see Figure A.6).

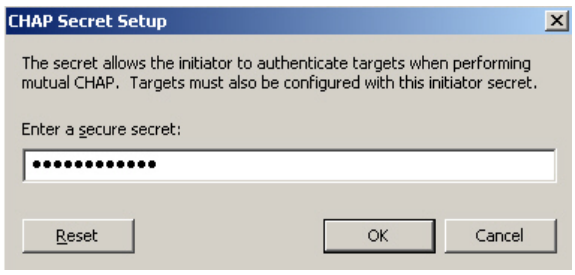

Figure A.6 CHAP Secret Setup Dialog Box

4. Select the **Discovery** tab (see Figure A.7).

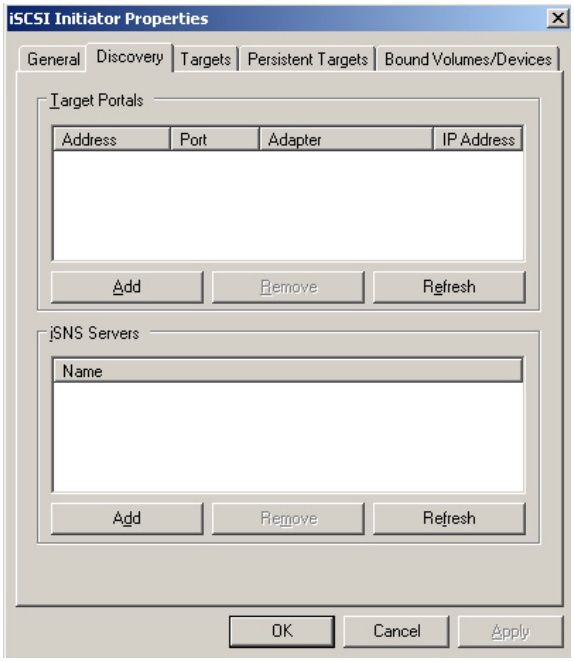

Figure A.7 iSCSI Initiator Properties, Discovery Tab

5. Microsoft iSNS Server is used for discovery of targets on an iSCSI network If iSNS is used, click **Add** and enter the address of the iSNS server (see Figure A.8). Skip to step 11.

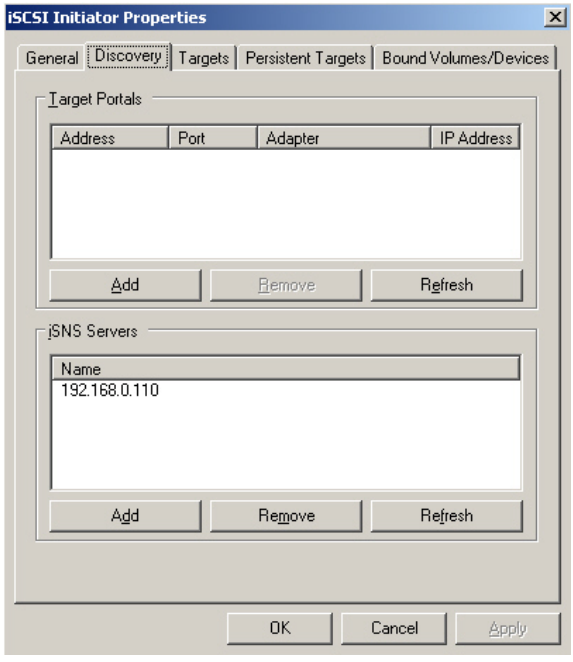

Figure A.8 iSCSI Initiator Properties (iSNS Server Address)

6. Under **Target Portals**, click **Add** and add the target to be connected.
7. In the Add Target Portal dialog box, specify the target's Internet Protocol (IP) address and, if appropriate, change the default port number from 3260.

   Note: Be sure you do not have a firewall blocking that's blocking the TCP port specified under **Port**.

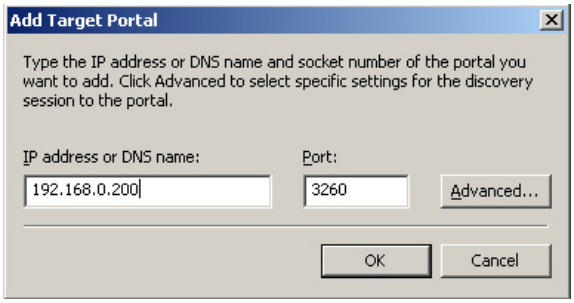

Figure A.9 Add Target Portal Dialog Box

8. Click **Advanced**. The Advanced Settings dialog box displays (see Figure A.10).

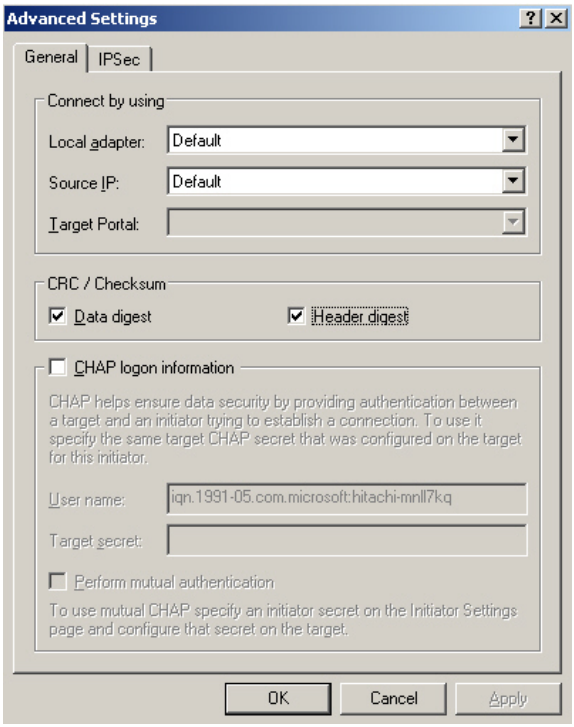

Figure A.10 Advanced Settings Dialog Box

9. Under **CRC/Checksum**, check **Data digest** and **Header digest**.

   Note: Enabling Header digest may decrease performance by nearly 90%, depending on network configuration, host performance, and host applications. iSCSI Data digest and Header digest should be used with an L3 switch or router that is in the path of the hosts and DF700 iSCSI port.

10. Click **OK**.

    Note: The DF700 iSCSI does not support CHAP authentication in the discovery session.

11. Click **OK**. The iSCSI Initiator Properties dialog box displays again (see Figure A.11).

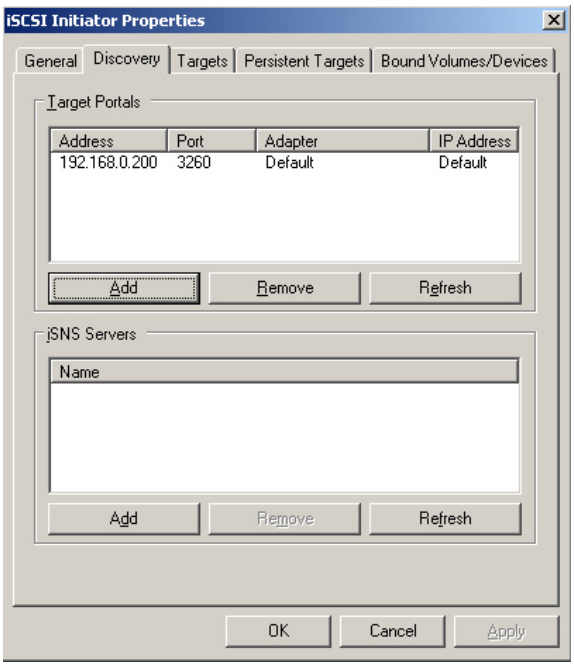

Figure A.11 iSCSI Initiator Properties Dialog Box

12. Select the **Targets** tab. You will see that the target is available, but the status is inactive (see Figure A.12).

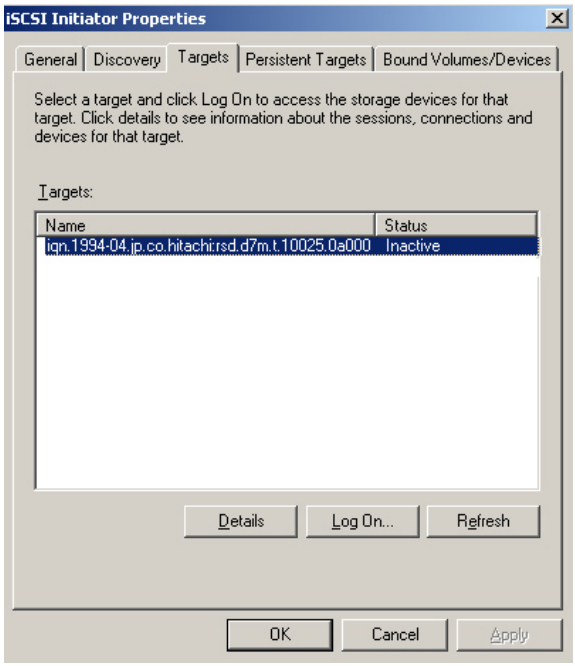

Figure A.12 iSCSI Initiator Properties, Target Tab

13. Select the target to login from the displayed target, and then click **Log On**. The Log On to Target dialog box displays (see Figure A.13).

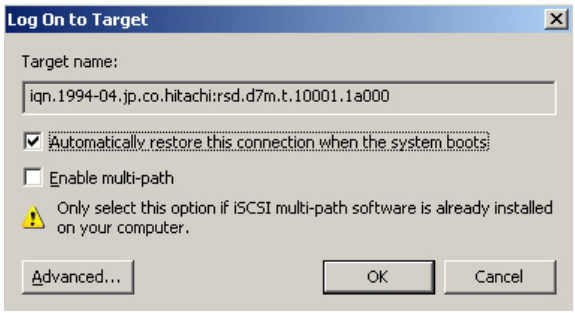

Figure A.13 Log On to Target Dialog Box

14. To reboot the host each time a reconnection is performed automatically, select **Automatically restore this connection when the system boots** (see Figure A.13).
15. Click **Advanced**.

16. Under CRC /Checksum, check **Data digest** and **Header digest** (see Figure A.14).

    Note: Enabling Header digest may decrease performance by nearly 90%, depending on network configuration, host performance, and host applications. iSCSI Data digest and Header digest should be used with an L3 switch or router that is in the path of the hosts and DF700 iSCSI port.

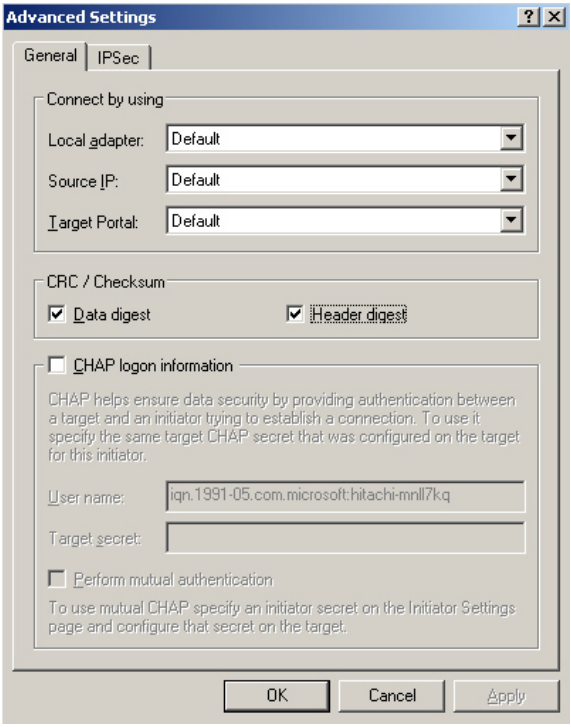

Figure A.14 Advanced Settings, General Tab

17. If the CHAP authentication will be performed at login from this initiator, click CHAP Logon Information. Then enter the username and target secret in the appropriate fields (see Figure A.15). The length of the secret key must be from 12 (96 bits) to 16 characters.
18. If mutual authentication is to be performed, click **Perform mutual authentication** and specify as the secret the same host secret entered in step 2.

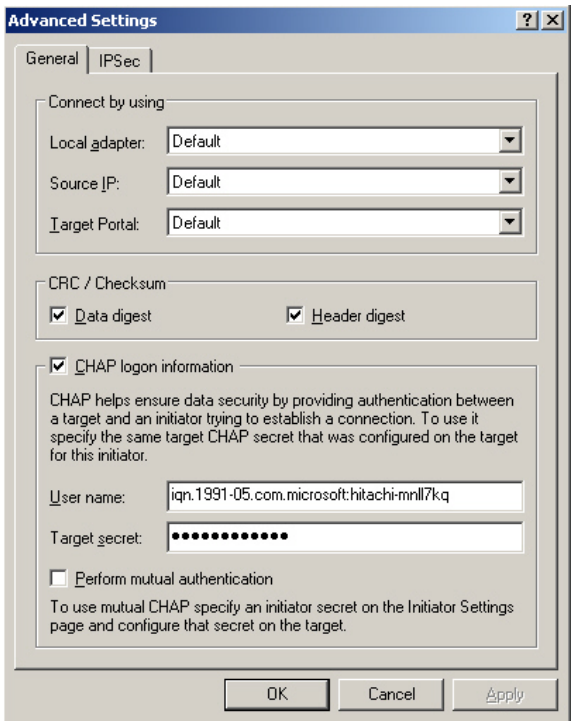

Figure A.15 Advanced Settings, Target Secret

19. Click **OK**. The Targets tab displays again.
20. Under **Targets**, verify that the status of the selected target is **Connected** (see Figure A.16).

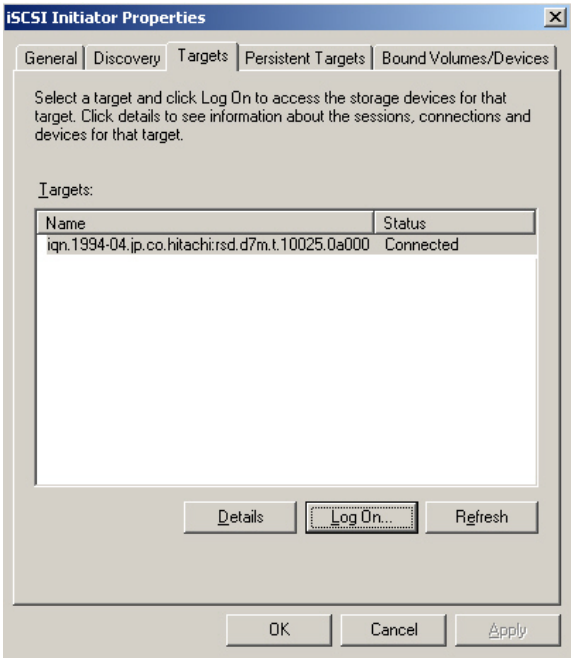

Figure A.16 Verifying iSCSI Initiator Properties

21. Click **OK**.

Disk drive authentication and formatting for iSCSI are the same as drives connected via fibre channel. Perform the appropriate processing for the added disk drive from **Control Panel → Management Tool → Computer Management → Disk Management**.

Note: If the setting of the partition and the format are performed in the area where the data is already stored, the data will be destroyed. Perform these procedures after verifying that there is no valuable data stored in the target area where these operations are to be performed.

Acronyms and Abbreviations

CLI	Command Line Interface
GUI	graphical user interface
HBA	host bus adapter
HDS	Hitachi Data Systems
I/O	input/output
LDEV	logical device
LU	logical unit
LUN	logical unit number, logical unit
LUSE	LU Size Expansion
MB	megabyte
NTFS	NT File System
PC	personal computer system
SCSI	small computer system interface